DENTAL CARIES STATUS AND ORAL HEALTH NEEDS AMONG DISABLED CHILDREN LIVING IN CARE CENTERS IN KATHMANDU VALLEY, NEPAL

JEMISH ACHARYA

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……
Miss Jemish Acharya
Candidate

……
Asst. Prof.Natkamol Chansatitporn, Sc.D
Major advisor

……
Assoc. Prof. Kulaya Narkasawat, D.D.S,MPH,M.Sc.(Medical Epidemiology)
Co-advisor

……
Prof. Banchong Mahaisavariya, M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

……
Assoc. Prof. Oranut Pacheun, Dr.PH.
Program Director
Master of Public Health
Faculty of Public Health
Mahidol University

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was submitted to the Faculty of Graduate Studies, Mahidol University
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on
March 28 ,2013

……
Miss Jemish Acharya
Candidate

……
Lect. Sutee Suksudaj,
D.D.S.,M.P.H.Ph.D.
Chair

……
Asst. Prof.Natkamol Chansatitporn,
Sc.D
Member

……
Assoc. Prof. Kulaya Narkasawat,
D.D.S,MPH,M.Sc.(Medical
Epidemiology)
Member

……
Prof. Banchong Mahaisavariya,
M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

……
Assoc.Prof.Phitaya Charupoonphol,
M.D.,Dip.Thai Boardof Epidemiolog
Dean
Faculty of Public Health
Mahidol University

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Dr.Jemish Acharya

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JEMISH ACHARYA 5536831 PHMP/M

M.P.H.

THEMATIC PAPER ADVISORY COMMITTEE : NATKAMOL CHANSATITPORN,SC.D., KULAYA NARKSAWAT

ABSTRACT

Although various attempts are being made to better the situation of dental caries in Nepal, the problem of caries among disabled children still seems to have reached a still. The general objective of this study was to identify the dental caries status by prevalence and severity (DMFT), knowledge and attitude in oral health practices and the oral health needs among children with disabilities aged 12-15 age group living in care centers in Kathmandu, Nepal. It was a cross sectional study with 120 respondents. Data was collected using constructed questionnaire and analyzed by using percentage, arithmetic mean, standard deviation, Chi square using level of significance at 0.05 and Mann-Whitney test.There was significant association between the type of disability and DMFT scores of the children.

The dental caries prevalence in the sample population was 98.3% and the mean DMFT of the children was 4.80±3.01.56.90% of physically disabled children and 34.50% of children showed "high" severity of dental caries .95% of the children needed treatment, the decayed component being the highest area of treatment need. The means of knowledge, attitude and practice were 5.57±1.72, 19.95±4.95 and 5.10±1.99 respectively.

There was significant difference of means of DMFT by the type of disability of children. Sensory disabled children had higher mean(2.48±0.65) than physically disabled children(2.06±0.79).Based on the analysis it is mandatory that special attention be given to disabled children to improve the dental caries status and their knowledge, attitude and practice .It is also suggested that along with encouraging oral health education programs, it was seen necessary that their treatment needs should be fulfilled along with preventive care being given to them.

KEY WORDS: DENTAL CARIES STATUS/DISABLED CHILDREN/ORAL HEALTH NEEDS

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CHAPTER I
INTRODUCTION

1.1 Background And Rationale

Dental caries and periodontal diseases have historically been considered the most important part of the global burden of oral diseases. Oral health is an essential part of the general health and well being of an individual. Despite various interventions being done all over the world , there are problems all over the world , mainly in the under privileged and marginalized groups of population suffering from some kind of oral disease in many countries.

Dental caries is a chronic infectious diseases caused by bacterial by products that dissolve on the enamel surface of teeth. It results as a result of interaction between a susceptible host (the tooth surface),specific bacteria present in the dental plaque found on tooth surfaces and a diet composed of fermentable carbohydrate mostly sugar.(1)It has been found that 60-70% of schoolchildren all over the world suffer from dental cavities and 99% of adults have dental caries.(2).In the United States , a study revealed that among children of age group 5-17 years, the caries prevalence was 58.6%(3). Although it has been seen that oral health is gaining priority in the scenario of public health and interventions are being conducted for its prevention , the prevalence of oral diseases still shows an increasing trend especially in middle and low income countries.(2) The World Health Organization along with the FDI World Dental Federation founded a goal in the year 2000 for oral health was the to have 50% of the 5-6 years old children caries free and the global average of DMFT in 12-13 years old to be no more than 3(2).The major causes of oral diseases has been majorly attributed to hygiene and is the most significant factor when it comes to prevention of oral diseases.(4)Keeping in mind the rapid change in lifestyles it has been expected that the incidence of dental caries will increase in many developing countries, as a result of growing consumption of sugar and inadequate exposures to fluorides.(5).

In the present context, the pattern of dental diseases has shown a changing pattern in the prevalence and also in the distribution and pattern of spread in other high risk groups of people. In most countries preventive and curative oral health care is provided to the population while it has also been widely noticed that people in the deprived communities like disabled people are not covered by health care due to various reasons owing to the increasing incidence of dental caries in that particular population.(6)Rates of disability are increasing due to increased aging and chronic health conditions.15% of the world's total population suffer from some form of disability. According to the World Health Organization, between 110 million (2.2%) and 190 million (3.8%) people 15 years and older have significant difficulties in functioning and have been referred to as people with disabilities. In addition to that it has been noticed that 35% and 50% of people in developed countries, and between 76% and 85% in developing countries, received no treatment at all in general health categories.(7) In Nepal, 1.2% of the total population is living with some kind of physical disability.

Table 1.1Estimated prevalence (in percentage)of moderate and severe disability and age, Global Burden of Disease estimates for 2004 within ages(0-14)years is as follows

	Percent							
	Low-income and middle-income countries, WHO region							
Age group(years)	1.World	2.High income countries	3.Africas	4.Americas	5.South east Asia	6.Europe	7.Eastern Mediterranean	8.Western Pacific
0-14 yrs	0.7	0.4	1.2	0.6	0.7	0.8	0.9	0.5

Source: World report on disability 2011.: © World Health Organization 2011

Out of that the major affected age group is seen to be the children with 33.3% having dental problems and were living with some kind of disability.(8)General health care with focus on oral health care is not obtained by this population mostly due to motility causing problems in accessibility to the health care facilities resulting in irregular dental attendance, incidence of dental caries and other oral health problems having long term detrimental effects on health in the long run.(9)A study conducted in Nigeria among people with disabilities living in an institution found the caries prevalence in them to be 33.3%.Studies on other populations showed that people with disabilities had more dental diseases and untreated dental problems compared to their normal counterparts.(10).There was also differences found in the dental caries status of children living with different kind of disabilities. The prevalence of dental caries in hearing disabled children was found to be 55.9% compared to their normal counterparts who had prevalence of 13.8%.Similarly , in visually disabled children of 8-13 age group the prevalence of dental caries was found to be **8%**.(11)This highlights the fact that the type of disability the children are living with can have an effect on their existing caries prevalence status. Their poor oral health condition and higher prevalence of caries and other dental problems was also linked to age, severity of disability, residing conditions at the institution and mostly as a result of limitations to oral hygiene maintenance due to their disability.

Kathmandu is the capital and largest city of Nepal with the current population 1,006,656 inhabitants(12).Nepal belongs to 15% of countries of the world where oral health condition and periodontal diseases have been seen to be most prevalent(13). In an epidemiological survey done , it was found that 68% of people aged 12-19 years and 93% of 35-44 years showed presence of caries and periodontal problems due to calculus(13).The caries prevalence and mean dmft of 5-6-year- olds is 67% and 3.3 (urban 64% and 2.9; rural 78% and 4.0). The caries prevalence and mean DMFT score of 12-13-year-olds is 41% and 1.1 (urban 35% and 0.9; rural 54% and 1.5). Comparison of data over the last 20 years shows and increasing trend of untreated dental caries.(14).

In context to the disability scenario in Nepal, at present one million Nepalese suffer from physical disabilities(15).The traditional belief still runs that say that disability in an individual is a result of his/her past sins and are seen as inevitable

punishments rendered to them by the Gods. This leads to them being discriminated and live a compromised life in the society. Out of the total proportion of people with disabilities physical disability is the most prevalent followed by others as illustrated in the table below (16) .

Table 1.2 Disability specific data of Nepal by percentage by Japan International Cooperation Agency (JICA)

Type of disability	Percentage Prevalence
Physical	28.5
Hearing	13
Visual	7.3
Psychiatric	4.2
Intellectual	2.7
Overlap	44.3

In the global context, the impact of oral diseases on general health is quite big to be ignored. Untreated dental caries can easily progress to infections and abscess and can complicate to oesteomyelitis of the jaws, cavernous sinus thrombosis, infections of the floor of the mouth and neck space and death in children and adults. Periodontal diseases are highly associated with cardiovascular and cerebro vascular diseases and respiratory infections. Diagnosis of several systemic diseases can be aided early on by their oral manifestations. Oral health being an integral part of an individual's health has been seen to be highly neglected and prevalence of oral problems in disabled people is an observed trend for many years (13).In addition to that, there is a need for studies to be done with regard to oral health in individuals with disability as it is highly lacking in Nepal. The studies done and data researched are insufficient to plan interventions to change the trend that is being observed. (15)

The aims of this study were to assess the dental caries status, treatment needs and their oral health behavior among children of age group12-15 living with disabilities and their associations with caries status inclusive of hearing/vision/speech disability in organizations in Kathmandu Valley, Nepal. The results of the study will be used to plan oral health interventions to promote preventive behavior for the

prevention and control of incidence of dental caries and to plan oral health education programs to update their knowledge on oral diseases.

1.2 Research Question

- What is the dental caries status in terms of prevalence and severity among children with disabilities in children living in care centers in Kathmandu Valley?

- What are the levels of knowledge, attitude and practice regarding dental caries among children with disabilities in children living in care centers in Kathmandu Valley?

- What is the oral health needs among children with disabilities in children living in care centers in Kathmandu Valley?

- Is there any association between oral health practices and dental caries status among children with disabilities in children living in care centers in Kathmandu Valley?

1.3 Objectives

1.3.1 General Objectives

To identify the dental caries status by prevalence and severity(DMFT) , knowledge and attitude in oral health practices and the oral health needs among children with disabilities aged 12-15 age group living in care centers in Kathmandu, Nepal

1.3.2 Specific Objectives

1.3.2.1 To assess dental caries status (DMFT) and treatment needs of disabled children aged 12-15 years living in care centers in Kathmandu Valley

1.3.2.2 To describe knowledge, attitude and oral health practice of children with disabilities living in care centers of Kathmandu Valley

1.3.2.3 To determine association between dental caries status and knowledge, attitude and oral health practice among 12-15 years children with disabilities living in care centers of Kathmandu Valley.

1.4 Research Hypotheses

1.4.1 There are association between level of knowledge and practice regarding dental caries and dental caries status among children with disabilities aged 12-15 years living in care centers in Kathmandu, Nepal.

1.5. Variables of the Study

1.5.1 Independent Variables

1.5.1.1 Children's general characteristics (Non Modifiable factors)

- Age
- Gender
- Education
- Type of Disability

1.5.1.2. Children's specific characteristics:

Oral health behavior of the children (Modifiable Factors)

-Knowledge in dental caries

-Etiology of dental caries

-Signs and symptoms in the detection of dental caries

-Prevention of dental caries
-Treatment of dental caries
- Attitude towards prevention of dental caries
-Food habits
-Perception on brushing

Practice regarding dental caries prevention
-Brushing Behavior
-Snacking habit

1.5.2 Dependent Variable

Dental Caries status (DMFT) in terms of prevalence and severity and treatment needs of disabled children aged 12-15 years living in care centers in Kathmandu Valley.

1.6 OPERATIONAL DEFINITIONS

1.6.1 Disabled children

This referred to children living in care centers during the survey with age about 12-15 years old with these types of physical disability. Disability will be defined as "long term physical and sensory impairment which, in interaction with other barriers, may hinder a person's full and effective participation in society on an equal basis with others.

- physical limb disability
- visual ,speech, hearing disability(Sensory disability)

1.6.2. Care Centers: It refers to care centers for the disabled which will be selected in 3 close by locations within Kathmandu Valley, Nepal.

1.6.3 Dental Caries:

Dental caries was defined as cavities on the enamel and dentin, the outermost layers of the teeth. It is caused by bacteria metabolizing sugars and

carbohydrates in turn dissolving the enamel and dentin by forming organic acids which do so. Further progression of dental caries can lead to infection, abscess formation and subsequent tooth loss.

The criteria for diagnosis and coding (primary tooth codes within parenthesis) are (17):

0 (A) Sound crown. No evidence of treated or untreated clinical caries.

1. The following defects white or chalky spots;
2. discolored or rough spot that are not soft to touch with metal CPI probes;
3. stained pits and fissures in the enamel that do not have visual signs of undermined enamel, or softening of the floor or wall detectable with a CPI probe;
4. dark, shiny, hard, pitted area of enamel (moderated to severe fluorosis);
5. Lesions due to abrasion.

1 (B) Decayed crown. Caries is recorded as present when

1. a lesion has an unmistakable cavity, undermined enamel, or a detectably softened floor or wall;
2. a tooth with temporary filling;
3. Cases where the crown has been destroyed by caries and only the root is left.

Note: The CPI probe should be used to confirm visual evidence of caries. Where any doubt exists, caries should not be recorded as present

2 (C) Filled crown with decay. A crown is considered filled crown with decay, when it has one or more permanent restorations, and one or more areas that are decayed.

3 (D) Filled crown with no decay. A crown is considered filled, without decay, when one or more permanent restorations and there is no caries anywhere on the crown.

4 (E) Missing tooth, as a result of caries. The code is used for permanent or primary teeth that have been extracted because of caries. In some age group, it may be difficult to distinguish between unerupted teeth and missing teeth.

5 (-) Permanent tooth missing, for any other reason. This code is used for missing permanent teeth due to congenital missing, or extraction for orthodontic reason or because of periodontal disease or trauma.

6 (F) Fissure sealant. This code is used for teeth in which a fissure sealant has been placed on the occlusal surface.

7 (G) Bridge abutment, special crown or veneer. This code is used for a tooth forms part of fixed bridge (abutment). Missing teeth replaced by pontics are coded 4 or 5.

8 (-) Unerupted crown. This code is used for a tooth space with an unerupted permanent tooth but without a primary tooth.

T (T) Trauma (fracture). A crown is scored as fractured when some of its surface is missing due to trauma and there is no evidence of caries.

9 (-) Not recorded. This code is used for any erupted permanent tooth that cannot be examined for any reason (because of orthodontic band, severe hypoplasia).

Presentation of dental caries status (DMF-T) data

Dental caries status was presented using Decayed, Missing and Filled Teeth (DMF-T) index.

The index can be calculated as follow:

Decayed teeth (D-T) =Total number of decayed teeth (Code-1) and filled with decayed teeth (Code-2)

Missing teeth (M-T) =Total number of missing teeth (Code-4)

Filled teeth (F-T) =Total number of filled teeth with no decay (Code-3)

DMF-T=Total number of teeth with caries experience (total number of D-T + M-T + F-T) or (total number of teeth with code-1 + code-2 + code-3 +code-4)

Severity of dental caries was the level of severity of the dental caries status of the children with reference to their DMFT score(2). It will be as follows:

Low severity: Scores <2.6

Moderate severity:Scores from 2.7-4.4

High severity:Scores >4.4

1.6.4 Oral Health Needs: This was referred to any activities that needs to improve their oral health.It included :

- Treatment needs
- Oral health education needs related to oral health behavior

1.6.5 Treatment needs: This referred to the proportion of treatment the children would need in terms of their dental caries status evaluated by the component of Decayed teeth(DT)and coding used will be modified from WHO clinical assessment form. (17).These will be viewed as below(Table 1.2):

CODE	Treatment
0	None
P	Preventive, Caries arresting care
F	Fissure Sealant
1	One Surface Fillings
2	Two or more surface fillings
3	Pulp Care
4	Extraction
5	Need for other care(Please Specify)
6	Not Recorded

1.6.6 Age: Referred to the full age of the respondents at the time of the study in years.

1.6.7 Gender: Referred to the sex of the children as males and females.

1.6.8 Types of disability: Referred to the type of disability the children will be living with that is to be considered will be limb disability and sensory disability (visual disability, hearing disability and speech disability).

1.6.9 Caretaker: Referred to the people who spend the longest time with the children and who are most likely responsible for taking care of the children in the care facilities for the disabled.

1.6.10 Education of Caretakers: Refered to the highest educational achievements of the caretakers by the following levels:

1. No education: Never attended school
2. Primary school: Low
3. Secondary School: Moderate
4. Above Higher secondary school passed: High

1.6.11 Oral Health Behavior: It refered to the knowledge, attitude and practice regarding oral health of the children.

1.6.12 Knowledge in Dental caries: It was referred to knowledge in context with dental caries by the following:

1. Etiology of dental caries and how it is caused
2. Signs and symptoms of caries
3. Prevention of caries
4. Treatment of caries

Scoring: The scoring was 1 for correct answer and 0 for wrong answer.The scoring used for descriptive part of the analysis was as follows:

Good level was scores from 9-10(>80%of the scores)

Fair level knowledge was scores from 6-8(60-80% of the scores)

Poor level of knowledge was 0-5 (<60% of the scores)

For the sake of analysis,the scorings of Knowledge was regrouped using the mean as the cutoff point which was 5.57±1.72. The scores then regrouped were as follows:

Good-Fair level of knowledge was scores form 1-5

Poor knowledge was scores form 6-10

1.6.13 Attitude of physically challenged children aged 12-15 in oral health:

It referred to the attitude or feelings, positive and negative which can lead to causing caries, its detection, prevention and cure. The perception towards brushing behavior and food habits was also be considered. Total number of questions was 10. Scoring was as follows: 3 for Agree and 2 for Disagree and 1 for Uncertain. All questions will be positive statements.

Good: >80% Score 22-30

Fair: 60-80% Score 16-21

Poor:<60% Score 10-15

For the sake of analysis,scoring of attitude was regrouped using the mean as the cut off point which in this case was 19.95±4.95.The scoring used were as follows:

Good-Fair level of attitude: Scored ranging form 10-20

Poor level of attitude :Scores ranging from 21-30

1.6.14 Practice of disabled children aged 12-15 in oral health:

It referred to as the daily activities taken by children to maintain their oral health. It included brushing behavior, use of fluoride toothpaste, frequency of brushing, snacking habits. Total number of questions were 10.

Scoring: Scoring were "YES" and "NO" questions.

1=correct answer and 0=wrong answer and the scores were according to the questions asked. If a child said "YES" to a negative question it was scored 0 and "NO" to a positive question, he was scored 0.

- Good oral health practice: 60-80%Score ranging from 8-10
- Poor oral health practice: <60%Score ranging from 0-7

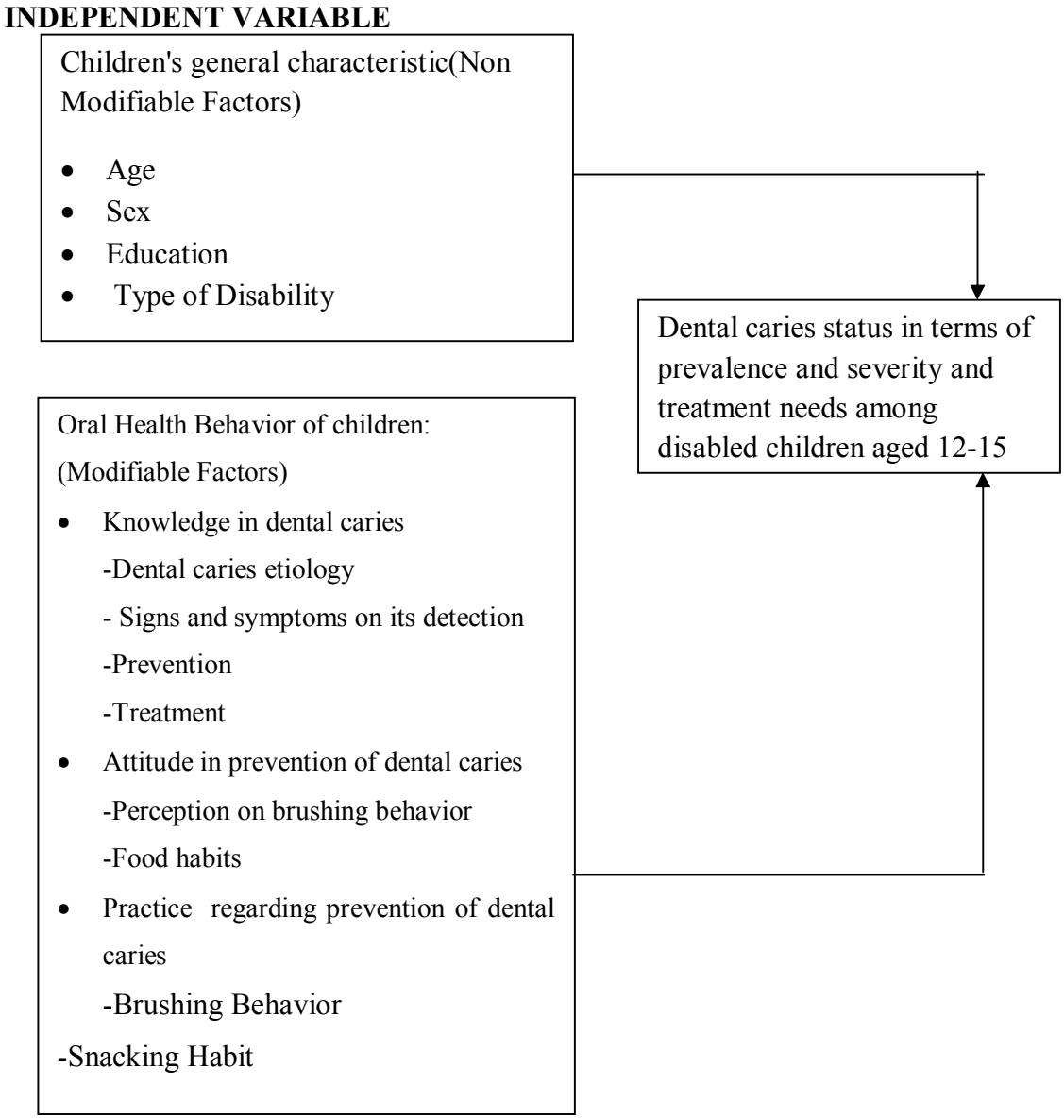
1.7 Scope and Limitation of the study

The sample was taken from disabled children aged 12-15 years from organizations in Kathmandu valley; therefore, it was not generalisable to the entire population of Nepal.

1.8 Usefulness of the study

The study can be useful in planning further oral health programs focusing on the benefit of the disabled population of Nepal. Being the first of its kind with reference to disabled children in Nepal, it can be used as a baseline for further researches and intervention planning.

1.9 Conceptual Framework



CHAPTER II
LITERATURE REVIEW

The contents of the literature review are as follows:

1. Dental caries Pathology

2. Etiology of dental caries:

- **Host**
- **Agent**
- **Environment**

3. Disability and Dental caries

4. Related studies for prevalence of dental caries among disabled children aged 12-15 years of age.

2.1 Dental Caries: The Disease

Dental caries is an infectious, communicable disease resulting in destruction of tooth structure by acid-forming bacteria found in dental plaque, an intraoral biofilm, in the presence of sugar. The infection results in loss of tooth minerals that begins on the outer surface of the tooth and can progress through the dentin to the pulp, ultimately compromising the vitality of the tooth(21) .

Dental caries is caused by the dissolution of the hard tissues of the tooth due to acids produced by bacteria in the biofilm of the dental plaque formed on the surfaces of the teeth and this finally leads to "holes" termed as "cavitities".This film comprises of microorganisms like streptococcus mutans and polysaccharides. When fermentable carbohydrate containing food matter comes in contact with this biofilm, it results in decay of the tooth. If this is prevented or stopped on time, saliva having its remineralizing property has the ability to stop the demineralizing process.

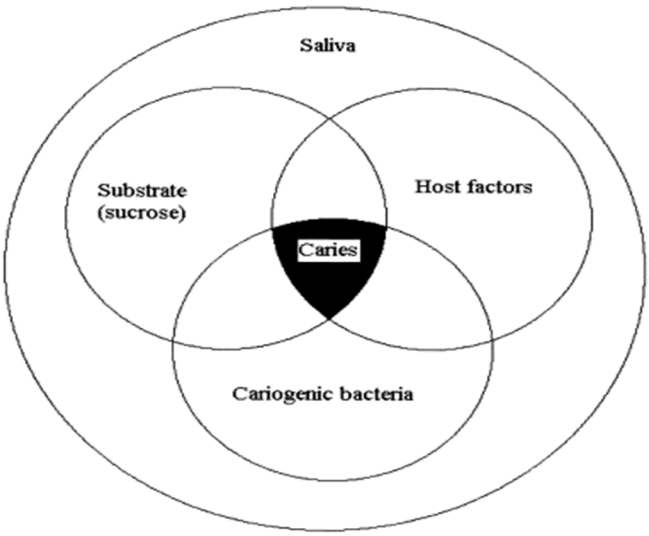


Figure 2.1 Factors necessary for dental caries(3)

Hence, the main causes of dental caries can be attributed to the presence of cariogenic biofilms and continuous consumption of food consisting of fermentable carbohydrates assisted by poor maintenance of oral hygiene.

Dental caries, although being a preventable and curable disease, if left untreated can lead to progressive infection of the jaws and cause advanced conditions that are very painful. In a study conducted in Eastman Institute among children and adolescents it was found that 83% were in pain due to dental caries and 20% had been in pain for over a month.(23)

2.2 Etiology of Dental caries: Host, Agent, Environment

Dental caries, a disease with multifactorial etiology gives us a number of different interpretations to attribute for changes in the prevalence of the disease with time, in developing and developed countries. These changes are due to alterations in dietary habits, especially the consumption of sugar, variations in the patterns of oral hygiene, fluoride, changes in the environment; changes in the ecology and virulence of oral and dental plaque micro flora and alterations in the oral protective mechanisms including the immune status of an individual(24).

2.2.1. Host factors

2.2.1.1 Age

Age is seen as an important factor contributing to the prevalence of dental caries.For growing children, 12-15 years of age is especially important .At 12 years, it is generally the age at which children leave primary school and the age at which the last reliable sample may be obtained via the school's system.Also, at this age all permanent teeth are likely to have erupted except, perhaps, the third molars. At 15 years of age, the permanent teeth will have been exposed to oral environment for 3-9 years also. Therefore the assessment of caries in children of this age gives more meaningful results(17).

In a comparative cross sectional study done to compare the dental caries status of healthy and deaf-mute children in East China ,it was found that the DMFT status in deaf children was 55.9% and it was 13.8% in normal healthy children of 12-15 years age group(25)

In another study it was revealed that the prevalence of dental caries was seen to be increasing with age and the highest trend of increase was seen in the 12-19 years age groups. The number of children who had had caries in their permanent was seen to be above 50% in this age group(26).Another study done to assess the oral hygiene status among children of age group 3-17 years revealed that their average dmft status to be 5.42 whereas that of normal children was 2.7-2.84.(27)It was seen that the average decayed teeth in disabled children of age group 3-14 was 1.3 as seen in another study.(28)These studies clearly show that the caries status in children aged 10-15 age groups have a significant prevalence of dental caries. In a comparative study to determine age-related differences, however, it was seen that there was no significant difference in the caries prevalence of the young/early middle age group and late middle age/elder age groups of populations.(29)

2.2.1.2 Gender

It has usually been assumed that gender is not a predisposing factor for the incidence of dental caries. However, in a study done in Japan to assess the caries prevalence by gender it was revealed that females had a higher caries

prevalence rate when compared to the males especially in the young and early middle age group. It was attributed to the difference in dietary habits of the males and females. Also, it was concluded that females were more prone to sweet food consumption than males which could have been the reason of higher prevalence of caries in them(29).Similarly, another study also concluded that girls showed a higher prevalence of dental caries than boys of the same age. It was believed to be due to the earlier eruption of permanent teeth in girls than in boys leading to more time of exposure in them than in boys of the same age.(30)

2.2.1.3 Morphology of the tooth

Dental caries has almost always been associated with the morphology or the shape of the tooth. Molars having a rounded shape with the presence of cusps and pits and fissures have been seen to be most frequently affected by dental caries.This was supported by a study which found out that out of 8.7% prevalence result of dental caries all 100% of the caries was seen in the occlusal surfaces of the permanent first molars(31)

2.2.1.4 Diet and Dental Caries

The causes of dental caries has mostly been attributed to poor oral hygiene, fluoride use and dental visits.However,the role of sugars and fermentable carbohydrates in the formation of dental caries is an important etiological factor that needs to be considered as well (32).Also, the frequency of consumption of such foods is being a bigger problem in contributing to dental caries than the quantity of consumption. "Sugars and other fermentable carbohydrates, after being hydrolyzed by salivary amylase, provide substrate for the actions of oral bacteria, which in turn lower plaque and salivary pH. The resultant action is the beginning of tooth demineralization"(33) or tooth decay or dental caries.Some food are also found to have a beneficial or protective mechanism in prevention of dental caries. Hard cheese is considered to increases the flow of saliva. Cheese also contains calcium, phosphate and casein, a milk protein, which protects against demineralization(32). Milk also contains calcium, phosphate and casein, and the milk sugar, lactose, is less cariogenic

when compared to other sugars. Provided oral hygiene is maintained, consumption of these foods has been seen to prevent dental caries.

The consumption of free sugar also differs according to the diet followed in different countries. The World Health Association has published that countries with low intake of free sugars should not increase their sugar intake as it has been seen that when free sugar consumption is less than 15-20 kg per year, incidence of dental caries is low. The frequency of consumption of sugars is also seen to not exceed more than 4 times in a day. In other countries where the consumption of sugars in the form of sweetened drinks,bakeries,carbonated beverages has increased, country specific policies and awareness interventions was seen necessary to counter balance the increased sugar containing diet in order to control the increase in the incidence of dental caries.(34)

A dynamic relationship exists between diet and dental caries with special emphasis being drawn on sugar containing diet. Many other factors along with sugars affect the process of caries formation, including the form of food, the time and duration of exposure sequence of eating, salivary flow, presence of buffers, and condition of oral hygiene. Studies have confirmed the direct relation between intake of dietary sugars and dental caries across the life span(33).

2.2.1.5 Knowledge, Attitude in Dental Caries Prevention

A study done in secondary schools in Kathmandu Valley, Nepal among children aged 13-18 years of age showed that 100% of the respondents knew that sweet food led to incidence of dental caries.Only 48%knew the significance of dental plaque whereas 28% thought that dental caries only causes staining of the teeth. Only 21% knew that brushing prevents inflammation of the gums and 93% were aware that dental caries has an effect on the aesthetics of a person. Importance of tooth brushing was known to 87%of the respondents and 53% knew about the role of fluorides in the prevention of dental caries.45% of the children knew the correct number of permanent teeth that is normal in the oral cavity of an individual. 73% of the respondents were aware that soft drinks have a negative impact on oral health. Around 19% of the children visited a dentist only in case of dental pain and never otherwise(35).

Another study conducted among children with visual disability showed that 44% of the children were aware of the role of sugar in formation of dental caries(11)Another study among 12 year old children showed that 74% of the total respondents thought that it was important to take care of their teeth(36).

The importance and association of knowledge regarding dental caries and its prevalence has been seen in many studies. Along with the child's education is important for the parents and caretakers to be well informed about the facts of dental caries.Especially in case of children with disabilities, they are highly dependent on their siblings, parents and caretakers on taking care of their oral hygiene.

2.2.1.6 Oral Hygiene Practice

2.2.1.6.1 Tooth brushing

A study revealed that only 40% of the children assessed followed the proper practice of brushing their teeth daily. Some of the respondents used toothpick (6%), salt (4%), coal (3%) and datiwan (3%). Most of the children brushed their teeth before going to the bed and / or in the morning. 32% of the respondents took at least 2-3 minutes to brush while 4% took less than one minute(35).

Another study done to assess the caries prevalence and oral hygiene practice status among 6-15 years old visually disabled children revealed that 81.25% of the children used toothbrush and tooth paste to clean their teeth.89.84% of the children cleaned their teeth twice everyday(37).

2.2.1.6.2 Fluoride Use

Since the past few decades, fluoride has been identified as an important factor in reducing the incidence of dental caries.Fluoride has been seen to reverse the demineralizing process that leads to dental caries formation, provided the lesion is detected on time. Scientists worldwide agree that maintaining fluoride at and within the enamel of the teeth is crucial in determining whether an early lesion will progress into deeper lesion or heal by remineralization by action of the fluoride present(38).

Water fluoridation has been used now a days to ensure optimum levels of fluoride is reached by individuals to reduce caries initiation. The American Dental Association has recommended the optimal concentration of fluoride in drinking water to be ranging from 0.7-1.2 parts per million (ppm) of fluoride depending on the country's temperature. Other forms of fluoride are topical applications, fluoridevarnish, fluoridedentrifrices and mouthwashes. Dietary fluoride supplements are provided to children living in areas of suboptimal levels of fluoride in drinking water(38) Most studies have shown 25-45% reductions in the decay rate on using fluoride varnish. A marked reduction of decay in pits and fissures was seen. A two-year study by Holm resulted in a 44% caries reduction rate following semi-annual fluoride varnish applications(38).

A study conducted among children in Michigan showed that there was 47.2% reduction of dental caries incidence on giving fluoride supplements to the children over a period of 3 years(39).In Asia, fluoridation is being followed in Hong Kong, Singapore and some parts of Malaysia. These countries boast the fact that children here have only half the number of dental caries than children in the neighboring countries. In 1961,with the introduction of fluoridation in Hong Kong there was 70% fall in the tooth decay rate(40).

The World Health Organization conducted a survey to assess the role of fluoride in caries and found out that water fluoridation reduced the incidence of dental caries by 15% and fluoride toothpastes and mouthwashes reduced dental caries by 24-26%(41).At certain concentrations of fluoride, water fluoridation is also associated with dental fluorosis (42) but it has been seen more in naturally fluoridated areas(43) and would not occur if pre assessment of fluoride levels is done prior to introduction of fluoridation. However no evidence has been found associated with problems due to fluoridated toothpastes or mouthwashes(44).

2.2.2 Agent Factors

Microorganisms

The microorganisms usually found as causative for dental caries are *Streptococcus mutans.* However a study indicated that other major bacteria were found to be predominant in causing dental caries like some species of the *Veillonella*, *Lactobacillus*, *Bifidobacterium*, and *Propionibacterium*, low-pH non-*Streprococcus. mutans* streptococci, *Actinomyces* spp., and *Atopobium*spp(45).The normal oral flora normally comprises of *s***treptococci, lactobacilli, staphylococci, corynebacteria**and a great number of anaerobes Consumption of sugar and fermentable carbohydrates nourish the oral bacteria which feed on the carbohydrates and release metabolic waste creating a high level of acidity in the mouth which affects the mineral content of the tooth leading to the beginning of the process of demineralization of teeth(46).A study has revealed that the early stages of caries was highly influenced by the presence of S.mutans and cavitated carious lesions were found to be associated with lactobacilli(47). Many other studies have demonstrated the association of high colonization of *Streptococcus mutans* and the presence of caries increasing the value of yearly detection of the bacteria in children and risk of dental caries in them(48)

2.2.3 Environmental Factors

2.2.3.1 Plaque

In the early 1940's , Stephan in his studies showed that dental plaque exposed to sucrose would rapidly lead to production of acids, followed by a drop of pH and then a gradual recovery back to the normal pH.Since then there has been as association between process of dental caries and role of plaque(49).Dental plaque defined as the " community of microorganisms found on a tooth surface as a biofilm, embedded in a matrix of polymers of host and bacterial origin"(50). There are basically two main schools regarding the role of plaque bacteria in the etiology of caries and periodontal diseases. The Specific Plaque Hypothesis and the Non Specific Plaque Hypothesis. The former one says that, out of the diverse collection of organisms comprising the resident plaque micro flora, only a few species are actively

involved in disease whereas the Non-Specific Plaque Hypothesis" considered that disease is the outcome of the overall activity of the total plaque micro flora wherein a heterogeneous mixture of microorganisms could play a role in disease(51).A study revealed that there was direct relationship between caries increment and presence of plaque combined with the presence of carbohydrates up to about 40%(52).

2.2.3.2. Saliva

Saliva and its components secreted from the salivary glands have been known to be important for dental health. It consists of salivary proteins which protect the enamel from dissolution by actions of acids produced in the mouth. The adsorbed layer, called the pellicle, is protective in function. Saliva also has antibacterial agents. It consists of calcium,gluoride and phosphates which are essential in remineralization of the enamel layer of the tooth. Saliva acts as a cleaner as well to wash away the debris in the mouth.Xerostomia or dryness of the mouth which can occur due to various reasons has been associated with incidence of dental caries.In a dry mouth, the natural buffering capacity is lost and the mouth becomes more acidic and more prone to demineralization by acid producing bacteria(53).This explains the role of saliva in the prevention of caries and its protective nature in the oral cavity for the prevention of incidence of dental caries .

2.3 Disability and dental caries

Disability has been a global health burden for many years now.Prevalence estimates done by WHO World Health Survey and Who Global Burden of Diseases in 70 countries estimated the incidence of disability to be around 110 (2.2%)by WHO World Health Survey and 190 (3.8%) million by the WHO Global Burden Of Diseases Survey experiencing significant difficulties in functioning(54). Including children, over a billion people (or about 15% of the world's population) were estimated to be living with disability. In a study conducted in Zambia to assess the types of disabilities prevalent in the country, it was found that 4.7%, 3.7%, 5.1% people were living with vision, hearing and limb disability respectively. The analysis of the

global burden of diseases 2010 analyzed that among those aged 0–14 years, the figures were 5.1% of which 0.7% had some kind of "severe disability"(54).

Disability shows an increasing trend at present with the number of disabled people increasing everyday(54).There is a higher disability prevalence in lower income countries than in the higher income ones. This has been attributed to the global increase in chronic health conditions like cardiovascular diseases, diabetes, neurological disorders which elevate the severity and prevalence of disability(54).One of the problems the disabled can be facing among many others are issues of dental caries and oral hygiene. Disabled children are reported to be more prone to accidents and trauma in their childhood leading to loss of teeth and orofacial trauma during the course of their growth(37). Hypoplasia of the teeth normally associated with visually disabled children is one causative factor for dental caries(37). Disabled children can have greater limitations in maintaining their oral health due to their potential motor, sensory, physical or intellectual disabilities. The ones who are young by age are dependent on their sibling, parents and caregivers for maintaining their oral hygiene and their lack of awareness regarding oral health can lead to adverse effects on the children's oral health.(10)Some studies done on select populations revealed that disabled children have more frequent unmet oral health needs and more dental problems and dental diseases compared to their normal counterparts(55, 56).Studies in developed countries showed that dental caries is the most prevalent unmet health care need with respect to disabled children. These children were already competing their oral health needs with other severe chronic health conditions which could be one of the reasons dental health was not given utmost priority(10).This was seen as a result of lack of understanding regarding the long term consequences and burden of dental problems in the children's own, their parent's and in the caregiver's part.(10)The result of this kind of untimely treatment of dental diseases led to infections of the oral mucosa and aggravation of concomitant medical conditions(57).Shaw et al has reported in his study that the prevalence of dental caries and poor oral hygiene is higher among disabled children attending special schools(58).In a study conducted by Nahar et al, it was found that "the average number of decayed tooth found was 5.6 in deciduous and 6.5 in mixed dentition in disabled children, and the numbers were 3.5 and 4.0 respectively in normal children"(59).The study clear points out the difference

of caries prevalence among normal and disabled children which highlights the need for more attention to these children. Poor oral health in children is also attributed to under diagnosis and differential oral health treatment on the medical professional's part due to probable lack cooperation and lack of understanding of modifiable approaches towards their treatment procedures than that of a normal child(60). A study conducted in Riyadh, Saudi Arabia revealed that among the total children studied comprising of the visually disabled and hearing disabled, the caries prevalence in 11-12 year old children was 88.2% and 93% in the hearing disabled. The mean DMFT was 3.89 (SD 2.67) and 5.12 (SD 3.45) in the visually disabled and hearing disabled respectively(61).Another study said that among 832 samples of disabled children comprising of hearing, visual, physical and children with developmental disorders, the proportion of children with caries was a high 88.8%(62).

2.4 Researches and studies done for prevalence of dental caries among disabled children aged 12-15 years of age

An epidemiological assessment carried out among physically handicapped children in care organizations demonstrated the prevalence to 71.5%.In the permanent dentition the mean DMFT was found to be 4.51 +/- 3.17(63)

A cross sectional study done to assess the prevalence of dental caries among disabled children in India , 65% of respondents (males) had dental caries and 74.3% of females had dental caries among those with visual disability. Among the speech and hearing disabled children,42% of males and 38% of females showed prevalence of dental caries(64)

A study done to assess the prevalence of caries in hearing and speech disabled children of age group 5-18 years of age concluded that 42% of the children had dental caries,61% of them had never visited a dentist before and only 17.11% of them brushed twice a day to maintain their oral hygiene(65).

Another study done in Nigeria to assess the prevalence of dental caries among the special needs children and adolescents was found it to be 33% as well(10).

A KAP study done among normal school students aged 13-18 years showed that the knowledge of the children regarding dental caries was very poor. Only

31.5% of the children brushed their teeth twice daily and 64.9% brushed only once a day(35).

A study conducted in Riyadh, Saudi Arabia revealed that among the total children studied comprising of the visually disabled and hearing disabled, the caries prevalence in 11-12 year old children was 88.2% and 93% in the hearing disabled. The mean DMFT was 3.89 (SD 2.67) and 5.12 (SD 3.45) in the visually disabled and hearing disabled respectively(61).

In a study conducted by Nahar et al, it was found that "the average number of decayed tooth found was 5.6 in deciduous and 6.5 in mixed dentition in disabled children, and the numbers were 3.5 and 4.0 respectively in normal children"(59).

Another study done in Croatia to evaluate the oral health and dental caries status among disabled and healthy children of age group 3-17 years revealed that the average DMFT values in disabled children was 6.39 and was 4.76 for normal children. Accentuating the need for preventive care measurements and improvement of dental care , particularly in the disabled children was highly recommended in the study(66).

In Kuwait, a study done to assess dental caries experience of children showed that over 5 years of age, the proportion of caries free children was only 24.2%.The smallest percentage of caries free subjects children was found in the hearing disabled(16.4%) and the highest percentage in the blind(35.5%).The caries of first permanent molars had the largest proportion of DMFT score (53.6%)(62).

Similarly, another study among handicapped children in Karnataka, India revealed that the mean DMFT among the children was 3.74.Females showed higher rate than the corresponding males. Around 70.7% of the children required filling in at least one surface of a tooth in their mouth indicating the presence of dental caries(67).

A study done in Chennai to assess the caries prevalence among children with speech and hearing disability has shown that the prevalence of caries in 13-20 years old children was slightly higher than that of children aged 5-12 years of age(0.852 and 0.985).It was also found that the prevalence was higher in males than in females of the study population(1.72 and 1.06)(68).

In Thailand, a study done to assess the oral health status and treatment status among school children in 2 schools showed that the prevalence of dental caries in the two schools was 80% and 67% (69).

Studies that were done in various cities in India show a similar trend in the prevalence of dental caries among the disabled population. In a study done in Udaipur,India among children with disabled hearing aged 13-17 years of age the caries prevalence was seen to be 88.3%(18).Another study done in Delhi to assess the caries prevalence among children with sensory disability aged 5-16 years revealed that in the deaf it was 72.43% and 59.68% in the blind children(70).Another study done to assess oral hygiene status and treatment needs of physically handicapped children showed that among the total respondents, 70.7% of them required filling in at least one surface of their teeth (67)

CHAPTER III
MATERIALS AND METHODS

3.1 Research Design

A cross sectional study was carried out among disabled children living in care centers aged 12-15 years old in Kathmandu valley in Nepal. The aims of the study was to assess the dental caries status, treatment needs and oral health behavior of the children.

3.2 Site of the study

The study was conducted in non government care centers in Kathmandu Valley, Nepal responsible for looking after the disabled children of various age groups. The organizations involved were Nepal Disabled Association, Kathmandu and Community Based Rehabilitation Center running under Nepal Disabled Association, Kathmandu, Nepal.

3.3 Study Population

Disabled children aged 12-15 years old living in the Nepal Disabled Association and Community Based Rehabilitation Center in Kathmandu valley, Nepal were the study population with a total number of 120 children.

Target Population: Disabled children aged 12-15 years in care centers in Kathmandu, Nepal were the target population.

3.3.1 Study population selection Criteria

3.3.1.1 Inclusion Criteria

1. Disabled children who were aged 12-15 years old living in care centers in Kathmandu valley, Nepal who were able to communicate.

2. Hearing disabled (deaf) and speech disabled (dumb) children who were able to read and write.

3. Children with visual disability (blind) who were able to communicate orally in local language.

4. Those that were given permission from the care centers to participate in this study with the signature of their care provider in the consent form.

5.Those who were willing to participate in the study and make a consent and assent as well.

3.3.1.2 Exclusion Criteria

1. Children with mental disability.

2. Those that had complicated disability and were unable to participate in the study.

3. Those who could not participate in oral examination.

4. Those that provided incomplete data for analysis were not included.

5.Those who were unwilling and could not participate in oral examination.

3.4 Sample Size

Sample Size estimation:

A study done in Udaipur, India showed the caries prevalence among disabled children aged 13-17 years to be 88.37% which was the prevalence used for estimating the sample size in this study (18).

Estimation of sample size was calculated from the following formula (19)

$$n = \frac{Z^2pq}{d^2}$$

Where,

Z^2=1.96

n=minimum desired sample size

p=prevalence of caries in the desired population=88.37%=0.8837

q=1-p=11.63=0.1163

d=least estimated difference of prevalence=0.07

Calculation:

$n = (1.96)^2 x 0.8837 x 0.1163 / (0.07)^2$

= 109

= 109

The minimum sample size is 109

From the above calculation, the minimum sample size is 109.An excess of 20% was taken to cover withdrawal issues and a total of 120 children will be studied.

3.5 Sampling Technique

From the total of 80 organizations in Kathmandu Valley, purposive sampling was done and basic organizations for the study was selected.

From the organization all the children were included based on the selection criteria comprising of children with physical impairment and sensory impairment.

3.6 Materials and methods

3.6.1 Materials used in this study

3.6.1.1. Questionnaire was constructed by the researcher; it consised of 4 parts:

Part 1: Demographic characteristics of the children:

- Age
- Gender
- Type of the Disability

Details on the medical history of the child was obtained from the hospital files and the records of the child in the organization.

Part 2: Knowledge in Oral Health comprised of 10 questions: It consisted of questions regarding etiology, prevention, detection and treatment of dental caries.

Part 3: Attitude in oral health comprised of 10 questions: It consisted of questions regarding attitude towards dental treatment, importance of fluoride, attitude regarding oral hygiene and oral health.

Part 4: Practice in oral health comprised of 10 questions: This section had questions regarding oral hygiene habits, brushing behavior, toothbrush and toothpaste use, frequency of dental visit and snacking habits of the children.

Scoring of knowledge, attitude and practice

Scoring of knowledge was classified according to Bloom (20) as given below. The total number of questions were 10.The maximum score was 10 and the minimum was 0.

- **1 score for correct answer**
- **0 score for wrong answer**

1) Good level of knowledge: >80% of total score (scores from9-10)

2) Fair level of knowledge: 60-89% (scores from 6-8)

3) Poor level of knowledge :< 60% (scores from 0-5)

For the sake of analysis,the scorings of Knowledge was regrouped using the mean as the cutoff point which was 5.57±1.72. The scores then regrouped were as follows:

- Good-Fair level of knowledge was scores form 1-5
- Poor knowledge was scores form 6-10

Scoring for attitude was done on a total of 10 questions. Maximum score was 30 and minimum was 10.

-Good attitude for dental caries prevention: >80% Score 22-30

-Fair for dental caries prevention: 60-80% Score 16-21

-Poor for dental caries prevention :< 60% Score 10-15

For the sake of analysis,scoring of attitude was regrouped using the mean as the cut off point which in this case was 19.95±4.95.The scoring used were as follows:

- Good-Fair level of attitude: Scored ranging form 10-20
- Poor level of attitude :Scores ranging from 21-30

Score for attitude was categorized into three levels of

- Agree=3
- Disagree=2
- Uncertain=1

Scoring for practice was on a basis of 10 question as "Yes" and "No" questions. The score was 1 for correct answer and 0 for incorrect answer. The maximum score iwas 10 and the minimum was 0.

- Good oral hygiene practice: Scores from 8-10
- Poor oral hygiene practice: Scores from 0-7

3.6.1.2 Oral Health Examination

3.6.1.2.1 The survey form from WHO was modified for this survey.

3.6.1.2.2 Instruments were sterilized for oral examination:

- Tray
- gloves
- mouth mirror
- explorer
- mouth mask
- table cloth
- Furniture from the researcher's clinic were used.

3.6.1.2.3 Survey team:

The team consisted of 2 interviewers, 2 recorders and 1 dental assistant.

3.6.1.2.4: Clinical Examination: Dental Status

The WHO oral health assessment form (1997) was modified and used for clinical examination of dental caries status of the children (17). DMFT-Index was used for oral examination and treatment needs.

Index:

DMF-T index which is the caries experience of the children was calculated by the following code of examination.

The codes are as follow:

0 (A) - Sound Crown
1 (B) - Decayed Crown
2 (C) - Filled Crown with Decay
3 (D) - Filled Crown with No Decay
4 (E) - Missing Tooth by extraction as a result of Caries
5 (-) - Permanent Tooth Missing, for any other reason
6 (F) - Fissure Sealant
7 (G) - Bridge Abutment, Special Crown or Veneer
8 (-) -Un erupted Crown

T (T) -Trauma Fracture

9 (-) -Not Recorded

Dental caries status was presented using Decayed, Missing and Filled Teeth (DMF-T) index.

The index was calculated as follow:

Decayed teeth (D-T) =Total number of decayed teeth(Code-1) and filled with decayed teeth(Code-2)

Missing teeth (M-T)=Total number of missing teeth(Code-4)

Filled teeth (F-T)=Total number of filled teeth with no decay (Code-3)

DMF-T=Total number of teeth with caries experience (total number of D-T + M-T + F-T) or (total number of teeth with code-1 + code-2 + code-3 +code-4)

Prevalence of dental caries was calculated as:

Prevalence=Total number of children who have at least ≥ 1DMFT ÷ Total number of children examined

Severity of dental caries was calculated as:

Group DMFT=ΣIndividual DMFT / Total number of children examined

To determine level of Severity using DMFT ,it was done as follows(56):

High Caries: Scores above >4.4

Moderate: Scores ranging from2.7- 4.4

Low: Scores below <2.6

Treatment need: This was assessed using the following codlings modified from WHO(6) as per the treatment required after assessment of the dental caries status of the child using the DMFT Index(Table 3.1).

CODE	Treatment
0	None
P	Preventive, Caries arresting care
	Fissure Sealant
1	One Surface Fillings
2	Two or more surface fillings
3	Pulp Care
4	Extraction
5	Need for other care(Please Specify)
6	Not Recorded

3.7 Calibration of examiners:

In order to assess the consistency of each examiner in the study (intra examiner) and also the variations between examiners (inter examiner) was conducted in a school in Bangkok, Thailand. The researcher along with the Department of Epidemiology of Mahidol University visited a school in Bangkok and examined 20 children and then reexamined the same group of 20 patients for duplicate examination. After this Kappa statistics was calculated. Then the findings were compared.

The calibration was performed using the following steps:

- Introduction and review of record form,codes,clinical assessment,diagnostic criteria.
- Actual Clinical Calibration(1 day):Each examiner will examined 20 children .The examiner and recorder discussed identified discrepancies in related aspects.

The number of patients examined were 20 in each group and the examiner and recorder are not allowed to discuss. At the second half of the day it was confirmed that all examiners were completely familiar with the examination and other procedures

of recording ,diagnostic criteria, record forms and handling of instruments and supplies.Duplicate examinations were performed by each examiner.

Determination of Intra and inter examiner Agreement

Data from multiple decisions will be pooled and the level of agreement will be calculated using kappa statistic. The criteria are as follows:

- 0.00: Poor agreement
- 0.00-0.20:Slight agreement
- 0.21-0.40:Fair agreement
- 0.41-0.60:Moderate agreement
- 0.61-0.80:Substantial agreement
- 0.81-1.00:Almost perfect agreement
- An agreement of 0.80 was considered necessary to confirm the examiners are suited for administering the clinical examination.

3.8. Data Collection

3.8.1 Questionnaire data collection:

1) The survey protocol was reviewed by the ethical committee.

2) Permission was asked from the Care centre authority to conduct the survey in the care centers.

3) Information sheet was provided to the care providers, informed consent was then signed by the care providers and collected.

4) Meeting of the survey team was conducted to understand and standardize the collection of data for oral health examination, questionnaire and a demonstration of examination and recording of data was done.

3.8.1.1 Process for questionnaire on Knowledge, attitude and Practice of care providers in dental caries

1. The questionnaire was distributed to the children and instructions to fill them out was explained for the children.

2. For the deaf and dumb children, they were to fill out the questionnaire on their own by reading it.Assistance was provided by sign-language experts in case the children had doubts regarding any of the questions.

3. For the blind children, oral interview was conducted.

Content Validity and reliability test for the questionnaire:

The questionnaire and coding and scoring criteria was developed as per the references with the advice from the preceptors and co preceptors involved with the researcher during the preparatory phase of the study. The clarity, accuracy and validity were checked by the advisor and co advisors .

A pre test was conducted among 20 children in an organization to assess the reliability of the questionnaire using Cronbach's coefficient of alpha test. Only questions scoring **> 0.7** were approved for conducting the interview.

3.8.2Clinical examination data collection:

After finishing the questionnaire interview, the children were told to hold onto the form with the clinical assessment attached to it. The examination for dental caries was conducted using the DMFT Index to determine how much of the dentition has been affected by dental caries until the day of the survey. Only permanent teeth was considered excluding all permanent third molars, if present. After this, the treatment needs of the children were assessed as per the dental caries status of the children.

3.9 Data Analysis

After the completion of the examination, the questionnaire and the oral examination form was entered by SPSS version16 and the following was calculated:

1. Descriptive Statistics by: Number, Frequency, Means with Standard deviation and caries status

2. Chi square tests was used to test the differences of proportion.

3. P-value less that 0.05 was accepted as statistically significant.

4. Mann-Whitney Test to compare the means of the types of disability/gender and severity of dental caries was done.

3.10 Ethical Considerations

1. The protocol was reviewed by the ethical committee.

2. Permission was taken from the authority of the care centers and a letter stating " No Objection" was obtained as a form of approval letter from the authorities of the organization.

3.The process of asking for the consent form from the children was performed before the study and also consent from the people responsible for the children was obtained based on the following concept:

Respect for persons:

1.Consent was done by informed consent form between the researcher and the children as well as the organization's authorities.

2.The researcher ensured that the information about the children would be strictly confidential.

3.The study population had the right to refuse and/or withdraw from the study at anytime without the need for any kind of explanation on their behalf.

Beneficence or do no harm:

1.This study did not include any harmful treatment or experiment to the children, physically or mentally.

2.The results of the study will be used for further treatment planning and recommendations will be provided and used for the betterment of the children involved.

Justice

1.The organization received the results of the study to improve oral health situations in the organization.

CHAPTER IV
RESULTS

The cross sectional study was carried out among disabled children aged 12-15 years old in Kathmandu Valley, Nepal. In order to assess and identify the dental caries status and oral health practices of the physically and sensory disabled children aged 12-15 years old, oral examination was carried out of 120 disabled children. This study also focused on the assessment of the associations between the dental caries status and the age, gender, type of disability ,duration of disability, the knowledge in dental caries, their attitude towards its prevention and also their oral hygiene practices towards the prevention of occurrence of dental caries. The 120 disabled children responded to self administered questionnaires on their general characteristics ,their knowledge ,attitude and practice in oral health. These data was entered into the software and then analyzed and the following results were obtained.

4.1 General Characteristics of the Study population

4.1.1 Characteristics of the population

The study population comprised of 120 disabled children out of which 58(48.3%) were physically disabled, 58(48.3)% were sensory disabled and 3% presented with both physical and sensory disability. Out of the total population, 24.2% were 12 years old,30.8% were 13 years old,16.7% were 14 years old and 28.3% were 15 years old. Among the 120 children 55.8% were males and 44.2% were females. The education status of these children presented with 34.2% having education above the Secondary Level of Education,39.2% at secondary level,18.3% at primary level and 8.3% did not have any formal education at the time of the study(Table4.1)

Table 4.1 General Characteristics of disabled children

Variables		Frequency(n)	Percent(%)
Age			
	12 years	29	24.2
	13 years	37	30.8
	14 years	20	16.7
	15 years	34	28.3
Sex			
	Male	67	55.8
	Female	53	44.2
Education			
	None	10	8.3
	Primary school	22	18.3
	Secondary school	47	39.2
		41	34.2
	Higher than Secondary school		
Type of disability			
	Physical	58	48.3
	Sensory	58	48.3
	Both	4	3.3

4.2 Caries Status among disabled children

4.2.1.Prevalence of dental caries

Children who had at least 1 score of DMFT was 98.3% while the prevalence of "Caries free" was 1.7% (Table 4.2)

Table 4.2 Proportion of Caries (n=120)

Variables	Total		Male		Female	
Dental Caries Status	Number	Percent	Number	Percent	Number	Percent
At Least 1 DMFT	118	98.3	66	98.5	52	98.1
Caries Free	2	1.7	1	1.5	1	1.9

4.2.2 Severity of Dental Caries

Out of 118 disabled children with caries,55(45.8%) of them were in the high severity group , 36,7% in the moderately affected group,13.3% in the low severity group and 4.2% in the very low severity group(Table 4.3).The grouping was done according to the WHO standards of dental caries severity index(2).

Table 4.3 Number and percent by levels severity of Dental caries

Variable **Severity of dental caries**	**Frequency**	**Percent**
Low score (<2.6)	21	17.5
Moderate(2.7-4.4)	44	36.7
High (>4.4)	55	45.8
Total	118	100

4.2.3.Mean and SD of DMFT status and different components of DMFT of disabled children

Mean DMFT was 4.80±3.01 teeth per child. The highest were decayed teeth in 3.6.±3.14 with maximum of 17 teeth in one child.The mean missing teeth was 0.16±0.45 per child and the mean no of filled teeth was 1.04±0.81 per child.The maximum number of filled teeth in one child was 4 in number.(Table 4.4)

Table 4.4 Mean and Standard deviation of DMFT disabled children

Variables	**Number**	Mean	Std. Deviation	Minimum	Maximum
Decayed Teeth(DT)	432	3.60	3.14	.00	17.00
Missing Teeth(MT)	19	.16	.45	.00	2.00
Filled Teeth(FT)	125	1.04	.81	.00	4.00
DMFT	576	4.80	3.01	.00	18.00

Regarding the details in the decayed teeth among the children ,it was seen that 6 children (10.3%) of children had 1 decayed teeth. It was seen that 7 (12.1%) of children among physically disabled children had the number of decayed teeth more than 5.Among sensory disabled children however, it was seen that 11(19%0 of children had more than 5 decayed teeth .(Table 4.5)

Table 4.5 Number of decayed teeth among the children by type of disability

Variables	Type of Disability					
Number of Decayed teeth	Physical		Sensory		Both	
	N	%	n	%	n	%
0	6	10.3%	1	1.7%	2	50.0%
1	10	17.2%	5	8.6%	0	.0%
2	14	24.1%	10	17.2%	0	.0%
3	16	27.6%	14	24.1%	0	.0%
4	3	5.2%	11	19.0%	0	.0%
5	2	3.4%	6	10.3%	1	25.0%
>5	7	12.1%	11	19.0%	1	25.0%

4.3. Treatment Needs of the children

The proportion of teeth needing treatment out of the total 120 children was 114(95%).From this,92.5% required fillings in their teeth whereas 2.5% needed rehabilitative care in the form of a fixed or removable partial denture for their missing teeth (Table 4.6).

Among the total children,the average number of teeth exmined in each child was 27.7.Regarding the decayed component of teeth in the children,it was seen that 12.5% of the teeth in the children required fillings.Out of this 167 teeth(10.4%)

were decayed in children with physical disabilities whereas 246(15.1%) of teeth in sensory disabled children needed fillings(Table 4.7)

Table 4.6 Types of Treatment needs of disabled children

Variable		
Treatment need	Number	Percent
No	6	5
Yes	114	95
Type of treatment needed(n=114)		
Contents	Number	Percent
Preventive care	0	0
Fissure sealant	0	0
Fillings	111	92.5
Pulp Care	0	0
Extraction	0	0
Other	3	2.5
NR	0	0
None	6	5%

Table 4.7 Number of sound teeth and teeth that need to be filled by types of disability of children

Variables	Number						
Types of Disability	Total examined teeth	Children	Sound teeth	Decayed Teeth	Missing by caries	Filled teeth	% of teeth to be filled
Physical	1622	58	1375	175	9	63	10.7
Sensory	1622	58	1313	246	7	56	15.1
Both	112	4	92	11	3	6	9.8
Total	3356	120	2780	432	19	125	12.8

4.3.1Knowledge,Attitude and Practice Score of the disabled children

The mean score for knowledge was 5.57±1.72 per child and for attitude was 19.95±4.95per child.The mean score for practice was 5.10±1.99 per child. (Table 4.8)

Table 4.8 KAP among disabled children

Variables		Number	Percent
Knowledge			
	Good(9-10)	3	2.5
	Fair(6-8)	70	58.3
	Poor(0-5)	47	39.2
	Mean 5.57 SD 1.72	Min=0	Max=10
Attitude			
	Good(22-30)	47	39.2
	Fair(16-21)	45	37.5
	Poor(10-15	28	23.3
	Mean 19.95 SD 4.95	Min=100	Max=10
Practice			
	good(8-10	12	10.0
	poor(0-7)	108	90.0
	Mean 5.10 SD 1.99	Min=0	Max=10

The results summarized that the percentage of correct answers obtained from the children on their knowledge of the etiology of dental caries ranged from 12.50% to 80% as shown in Table 4.7.From the three questions on the etiology of dental caries, question regarding the appearance of the beginning of caries was answered correctly by 80% of the children. Least knowledge was obtained in the properties of Fluoride at 12.50% .Knowledge regarding the necessity of a routine

dental check up was low at correct answers of 47.50% and question regarding the treatment of caries in permanent teeth was answered correctly by only 45%.(Table 4.9)

Table 4.9 Percentage of correct answers in Knowledge about dental caries by type of disability

Contents	N=120 Number(%)	Percent
1.What causes dental caries	86	71.7
2. What does the beginning stage of dental caries look like?	96	80
3. Which food mainly causes caries?	80	66.7
4. Which food is good for the teeth?	76	65
5. How can you prevent caries?	81	67.5
6.Fluoride is good because	15	12.5
7. How often should you change your toothbrush?	62	51.7
8. How can you treat dental caries?	60	50
9. If the permanent teeth has caries what should you do?	54	45
10. When should you visit a dentist?	57	47.5

4.3.2 Percentage of correct answers in attitude about dental caries prevention and oral hygiene

In terms of attitude, good attitude was shown towards prevention of dental caries by 41.70% of the children. However, 42.50% of the children agreed that if there is caries in teeth, it is better to remove it than get it filled ,showing poor attitude towards treatment of dental caries.40% of the children were uncertain that fluoride prevents dental caries showing poor attitude towards dental caries prevention.(Table 4.10)

Table 4.10 Percentage of correct answers of attitude for children

Contents	Level of Agreement					
	Uncertain		Disagree		Agree	
	n	%	n	%	n	%
1. We cannot cure dental caries by washing our teeth with mouthwash.	37	30.8	39	32.5	44	36.7
2. Dental caries is can be prevented.	42	35	28	23.3	50	41.7
3. Even if there is no pain after taking medicine you should to go to a dentist.	61	50.8	33	27.5	26	21.7
4. If there is caries in a tooth it is better to get it filled than get it take it out.	35	29.2	34	28.3	51	42.5
5 . Fluoride prevents dental caries.	37	30.8	48	40	35	29.2
6 . We should wash our mouth after every meal and not just in the morning.	36	30	41	34.2	43	35.8
7. Soft brush is better to clean teeth than hard brush.	39	32.5	34	28.3	47	39.2

Table 4.10 Percentage of correct answers of attitude for children (cont.)

Contents	Level of Agreement					
	Uncertain		Disagree		Agree	
	n	%	n	%	n	%
8 . Filling our teeth does not make it thin.	46	38.3	37	30.8	37	30.8
9 . Cleaning your teeth regularly does not make your teeth thin and weak.	45	37.5	35	29.2	40	33.3
10. Dental caries cannot be treated by eating mint.	41	34.2	39	32.5	40	33.3

4.4 Percentage of correct answers in practice about oral hygiene

A wide range was observed regarding the percentage of correct answers in practice regarding oral hygiene practices among the children.

Approximately 51.70% of the children answered that they used toothpick to remove food stuck between their teeth instead of a dental floss.65.40% of the children answered that they brushed their teeth twice everyday that showed good level of practice.79.20% of the children said that they rinsed their mouth after every meal .However, only 29.20% of the children said that they go to visit the dentist once every six months showing poor practice in terms of prevention and treatment of dental caries. However, only 36.70% of the children used toothpaste to clean their teeth whereas the rest used toothpowder (Table 4.11)

Table 4.11 Percentage of correct answers in oral hygiene practice

Contents	Number	Percent
1. You brush your teeth twice a day.	78	65.40%
2. Your rinse your mouth after taking sweet snacks every time.	52	43.30%
3. You always brush your teeth before going to bed and in the morning.	72	60%
4. You wash your mouth after every meal.	95	79.20%
5. You go for dental visit to a dentist every 6 months.	35	29.20%
6. You do not take sweet snacks more than 3 times a day.	61	50.80%
7. You use toothbrush to clean your teeth and not toothpowder.	44	36.70%
8. You do not use toothpick to clean your teeth if food gets stuck between your teeth.	58	48.30%
9. You have received fluoride mouth rinse before.P9:	62	51.70%
10. You go to a dentist when you have pain or stains in your teeth only.	56	46.70%

4.5 Factors associated with Severity of dental caries

4.5.1 General Characteristic

Table 4.12 shows the association between the general characteristics of the respondents. Chi-Square tests were applied to find the association between these

categorical items of the general characteristics and the dependent variable. For analyzing the dental caries status, the severity of dental caries was taken into reference and categorized as <1.26= "Low", 2.7-4.3="Moderate" and >4.4="High"(2).

The results showed that 55.2% of children aged 12 years fell in the "High" caries group whereas only 26.5% of children aged 15 years fell in that group. Among the genders, 46.3% of males were in the "High" caries group.. Among the disability types, sensory disabled children had "High" caries of up to 56.9% of the children falling in this group.(Table 4.12).Children with both types of disability were not included in the analysis as only 4 children belonged to that particular group.

Table 4.12 Association of severity of dental caries by general characteristics of disabled children

Variables		DMFT Status						P-value
		High		Moderate		Low		
		n	%	n	%	n	%	
Age								
	12 years	16	55.20	7	24.10	6	20.7	0.19
	13 years	20	54.10	12	32.40	5	13.5	
	14 years	10	50.00	7	35.00	3	15	
	15 years	9	26.50	18	52.90	7	20.6	
Gender								
	Male	31	46.30	25	37.30	11	16.4	0.93
	Female	24	45.30	19	35.80	10	18.9	
Type of Disability								
	Physical	20	34.50	22	37.9%	16	27.6	0.01
	Sensory	33	56.90	20	34.50	5	8.6	

P-value from Chi-Square

4.5.2 Knowledge, Attitude and Practice on Dental Caries etiology, prevention and treatment with severity of dental caries

The knowledge and attitude of the children was regrouped into"Good-Fair(6-10) and "Poor(1-5) for knowledge and "Good-Fair (21-230)" and Poor(10-20) for attitude for the purpose of analysis.The new cut off point was taken as per their respective means**.**Regarding Table 4.11, 57.4% of the children having "Poor" Knowledge fell into the "High" caries group while 43.6% of children having poor attitude fell into the "High" caries group. This was not statistically significant. Regarding practice, 18.5% of children having poor practice had "High" score of caries.(Table 4.13)

Table 4.13 Association of KAP with severity of Dental Caries

Variables			DMFT Status						P-value
			High		Moderate		Low		
			n	%	n	%	n	%	
Age									
	good-fair	(6-10)	16	21.9	29	39.7	28	38.4	0.08
	Poor	(1-5)	5	10.6	15	31.9	27	57.4	
Gender									
	good-fair	(21-30)	11	16.9	23	35.4	31	47.7	0.9
	Poor	(10-20)	10	18.2	21	38.2	24	43.6	
Practice									
	Good	(0-7)	6	50	5	41.7	1	8.3	0.67
	Poor	(8-10)	49	45.4	39	36.1	20	18.5	

P-Value from Chi-Square

4.6 Factors Associated with Type of Treatment Needs of the children

4.6.1. General characteristics and type of treatment needed.

Out of 120 children needing treatment, 4 children having both type of disability were excluded from this analysis. The results in Table 4.14 show that 53(91.4%) of physical and 57(98.3%) of sensory disabled children needed fillings.

Table 4.14 Association of treatment needs with type of disability

Variable		Treatment need				P-value
		None		Filling		
Type of Disability		N	%	n	%	
	Physical	5	8.6%	53	91.4%	0.2
	Sensory	1	1.7%	57	98.3%	

P-value from Fischer Exact Test

4.7 Comparison of DMFT

The DMFT status among disabled children when compared with the gender and types of disability gave varies results. In males the mean was 2.29±0.73 per child and 2.26±0.76 per child in female .This was not statistically significant. Normality test using Kolmogorov-Smirnov test was performed and the distribution was not normal in both gender and type of disability. In the types of disability, comparison between physical and sensory disability was considered and disabled children having both kinds of disability was excluded as only 4 children were in that category. On performing Mann-Whitney Test, it was seen that the mean was 2.06±0.79 per child and 2.48±00.65 per child in physical and sensory disabled children respectively. This was also statistically significant. (Table 4.15)

Table 4.15 Comparison of average score of DMFT by gender and Type of Disability

Variable		Mean	SD	Z-Test	P-value
Gender					
	Male	2.29	0.73	-0.21	0.85
	Female	2.26	0.76		
Type of Disability					
	Physical	2.06	0.79	-2.88	0.004
	Sensory	2.48	0.65		

P-value from Mann-Whitney U Test

CHAPTER V
DISCUSSIONS

The aim of this study was to assess the dental caries status, treatment needs and their oral health behavior among children of age group 12-15 living with disabilities in Kathmandu Valley, Nepal. Another part of the study was to extend the results to assess the severity of dental caries status and oral health needs among the children by identifying the association of the general characteristics involved and the knowledge, attitude and practice towards dental caries etiology, prevention and treatment.Recent studies carried out in Kathmandu,Nepal showed that dental caries has been a problem among children in the country.However,this being the first kind of study among the disabled population demonstrated the caries status among the disabled population of the country.In the present study,the prevalence estimate for caries was higher among the sensory disabled than among the physically disabled children.

The results of the study showed a very high proportion of dental caries among disabled children with a high 98.3%.Out of the total prevalence of 98.3% caries in the population, the severity of dental caries 45.8% fell in the high severity group , 36,7% in the moderately affected group, and 17.5% in the low severity group (Table 4.10) .The severity of dental caries was used to assess the associations between the factors due to the high prevalence in the caries proportion. This has been in approximate with past studies that revealed the dental caries prevalence among disabled children aged 9-12 years as having 93.1% and 13-17 years having prevalence of 88.37%[18]. The results showed that 55.2% of children aged 12 years fell in the "High" caries group whereas only 26.5% of children aged 15 years fell in that group. Among the genders,46.3% of males were in the "High" caries group. This was in concurrence with another study in Chennai ,india where the caries among females was found to be higher than in the males as well[68].

The mean DMFT in this study was 4.80±3.01 per child which showed was very high(Table 4.4).This was close to the results in a study conducted in

Belgaum,India where in the mean DMFT per child in males was 3.48 and in females it was 3.98 [67].

The high DMFT score can be because of poor dental service utilizations in part of the children as the results to the question "do you go to a dentist for routine check up once every six months?" resulted in only 29.20% answering the positive answer where as 46.70% of the children said that they "go to a dentist only when they have pain in their teeth"(Table 4.9). This clearly reveals poor practice on their part in terms of early prevention for dental caries.

54.2% of the 13 years old children fell under the "High" caries group in this study compared to 26.5% of the 15 years old children falling under that group(Table 4.10). Normally, age has been found as a significant factor in determining the dental caries status among children. Adolescents are found to be more aware of their aesthetics and health contributing to the lower prevalence of dental caries in their age as that to of younger children. Also, in Nepal the belief of disability being a "curse" from God deprives the disabled children from being treated equally in social terms .This can lead to then being aloof and uncomfortable with approaching the health services on their own explaining the very high prevalence of caries in this population.

In terms of the type of disability,children with sensory disability had higher prevalence of caries and 56.9% of them fell in the "High" caries group compared to the 34.9% of physically disabled children in this group. The decayed component was highest for all the children with the mean of 3.60± 3.14 per child(Table 4.4).This was concurrent with another study where in the decayed component was highest in sensory disabled children conducted in Iran. The reason behind this can be their inability in communicate properly to ask for treatment or explain their problems compared to physical disabled children who would not have problems of speech or hearing or vision so as to explain their problems if arises. Contributory factors include inadequate funding and resources, insufficient trained dentists to treat patients with disabilities, and complex treatment needs requiring special care or general anesthesia.

The majority of questions of knowledge, attitude and practice was not answered correctly by the children.

Only 12.5% of the children answered correctly regarding the benefits of fluoride(Table 4.7). This was contrary to the results of a study in Kuwait wherein 20% of the children studied knew about fluoride but were not sure if they were using it [62].

Regarding attitude,42.50% of children agreed that the treatment of caries in permanent teeth is to get it filled than extraction(Table 4.8).As stated in a study about the KAP models, it has also been seen in this study that there was no coherence regarding the relationship between knowledge, attitude and practice.

Besides knowing that toothbrush should be used to clean their teeth only 36.70% of children used toothbrush and the remaining used toothpowder to clean their teeth(Table 4.9). This was not similar to a study conducted in Nepal to assess the KAP of children with no form of disability where 100% of them were using toothbrush. This highlights the need for oral health education among the disabled population in Nepal [35]. Educational oral health programs in Nepal has been mainly conveyed to the public on a narrow scale by certain formal medical/dental institutes and dental schools in Nepal. However, these efforts are limited and insufficient nationwide; hence, there is a need for comprehensive educational programs to improve the oral health practice, knowledge, and attitudes of the secondary school children.

Also there were higher percent of sensory disabled (56.9%) in the "High" caries group than in the physically disabled population (34.5%).This was statistically significant(Table 4.10). Also, 45% of children having "Poor" practice fell in the "High" caries group of the population(Table 4.11). Regarding the treatment needs of the children, the highest scoring was for fillings. 95% of the children needed fillings of some kind(Table 4.5). This greatly emphasized the need for preventive as well as restorative care among the children of the disabled population as the figures are very high compared to that of the results of a study among normal children wherein the treatment needs was for only 87.4% of the total children studied [18].

The above findings clearly demonstrates the picture of the dental caries status of the disabled children in Nepal which is well below the goal of WHO to have the DMFT of children 12 years of age to be below 3 per child.The services are available but due to a lack of knowledge and awareness in the society , the practice of going to the dentist for preventive care is not well seen. Especially, regarding the disabled population, they have been a neglected part of the society for long, the fact

that this being the first kind of study for dental caries status being the evidence for the same. The knowledge and attitude needs correction for it to be practiced effectively. A wide range of oral health education programs and dental health camps is required to better the current situation of dental caries in the population.

CHAPTER VI
CONCLUSION AND RECOMMENDATION

Conclusion

Limited knowledge and poor practice in the children's part has seemed like it resulted in a very high caries index among the disabled population and it future could create serious challenges to the Government of Nepal in reaching the WHO goal.Although regarding certain aspects, the knowledge was seen to be above average, it was not being implemented positively in their practice.

In the present context, quite a few efforts are being made by the local and private hospitals and dental clinics to impart awareness on oral health and also for the treatment of oral health problems for the general population. However, the fact that the disabled children need special attention has been highlighted when the results of this study proved that the oral health situation among them is worse compared to that of the general population. Oral health programs should be made to suit the communication skill sof the sensory disabled so as to make sure that they benefit from the programs.

This was a cross sectional study done among disabled children living in a care centre in Jorpati, Kathmandu,Nepal. Statistics used in this study were number, percentage, mean, standard, deviation, range and chi square.The type of disability was significantly associated with severity of dental caries.

In conclusion, disabled children are no different from normal children in terms of their rights to live and sustain a good life. There is a responsibility to provide them this right through combined efforts so as to let them have their rights.Their life needs to be adjusted according to their capabilities.With the principle of equitable distribution of primary health care,dental care needs to be provided at their doorstep.

Recommendation

Following are some possible measures that can be followed to improve the dental caries status of the disabled children in Kathmandu valley,Nepal.

1.Special focus to provide treatment to disabled children as required

Due to a lack of professionals trained to handle disabled children, the comfort in the utilization of those services is low. The treatments should be provided as suitable for the children. Dental professionals should be trained to treat disabled children as necessary. Training and oral health educations for the professionals would be highly helpful for the same. Different treatment needs of the children should be provided keeping in mind the kind of disability they suffer from .Preventive care should be given to the children, both physical and sensory disabled. Keeping in mind the high percentage of decayed teeth and subsequently high amount of fillings required in the children in this study, it is recommended that the children be provided with immediate treatment for the teeth.Also,for the remaining sound teeth,preventive care in the form of fissure sealants is recommended.

2.Provide oral health education to disabled children

Provision of oral health education and their frequency is on the rise at present in Kathmandu. However, as mentioned earlier, they are generally aimed for the general population. Disabled children should be focused to educate them regarding the prevention, etiology and treatment of dental caries as this would be helpful in reducing further increase in the dental caries index among them. Adequate education would aid in improving oral health practices and utilization of dental services so widely available in the valley. Education regarding fluoride and its uses is highly recommended as a high percentage of the children were found to be unaware about the knowledge and benefits of fluoride use. Information and education regarding oral health should reach their families and organizations taking care of them as they play a key role especially when it comes to children. Oral health programs should be made in forms understood by the sensory deprived children and made a part of the curriculum in the schools.

Limitation of the study

1.Study design: By the nature of cross sectional study,the associations cannot be implies as being "causal".A follow up study has to be done to determine the causation of dental caries status by the independent variables involved in this study.

2.Purposive sampling: The results from using purposive sampling produced unequal distribution of age and type of disability in this study. This affected the results of this study. It can be recommended to use one age group and one kind of disability in further studies.

3.Bias: The answers given by the children could have been subjected to recall bias.

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APPENDICES

APPENDIX A
QUESTIONNAIRE

dd mm yy

Serial No. Date of Interview:

Interviewer Name: _____ Interview Location: _____

Language of Interview: 1) □ Nepali 2) □ Other(Specify): _____

I.i General Information of Child

1.Age(yrs): _____

2. Sex: 1) □ Male 2) □ Female

3. Educational Status: 1) □ None

2) □ Primary

3) □ Secondary

4) □ Above Higher Secondary

4. Type of Disability: 1)Limb□ 2) Sensory □

5.Duration of Disability: □ Since Birth

□ Months □ Years

II. Knowledge of Dental Caries

Q No	QUESTION	CODING CATERGORIES
1.	What causes dental caries?	1) □ Insects 2) □ Food and Bacteria 3)□ Don't Know
2.	What does the beginning stage of caries feel like?	1) □ Pain 2) □ No pain 3)□ Don't Know
3.	Which food mainly causes caries?	1) □ Hard Food and sour food 2) □ Sticky and Sweet Food 3)□ Don't Know
4.	Which food is good for teeth?	1) □ Fruits & Vegetables 2) □ Chocolate, Milk, Ice Cream 3)□ Don't Know
5.	How can u prevent caries?	1) □ Visit temple 2) □ Brush twice a day regularly 3)□ Don't Know
6.	Fluoride is good because:	1) □ Prevents mouth from smelling

2)□ Prevents caries

3)□ Don't Know

7. How often should you change your toothbrush?

1)□ Once a month

2) □ When the bristles wear out

3)□ Don't Know

8. How can you treat dental caries?

1)□ By using mouthwash

2) □ Visiting a dentist for filling

3)□ Don't Know

9. If permanent tooth has caries what should you do?

1) □ Take it out

2)□ Get it filled

3)□ Don't Know

10. When should you visit a dentist?

1)□ When there is pain in tooth

2) □ Routinely once every six months

3)□ Don't Know

III. Attitude in Dental Caries

Q No.	QUESTION	CODING CATEGORIES
1.	We cannot cure dental caries by washing our teeth with mouthwash.	1) □ Disagree 2) □ Uncertain 3) □ Agree
2.	Dental caries is can be prevented.	1) □ Disagree 2) □ Uncertain 3) □ Agree
3.	Even if there is no pain after taking medicine you should to go to a dentist for check up.	1) □ Disagree 2) □ Uncertain 3) □ Agree
4.	If there is caries in a tooth it is better to get it filled than get it taken out.	1) □ Disagree 2) □ Uncertain 3) □ Agree
5.	Fluoride prevents dental caries.	1) □ Disagree 2) □ Uncertain 3) □ Agree
6.	We should wash our mouth after every meal and not just	1) □ Disagree

	in the morning.	2) □ Uncertain 3) □ Agree
7.	Soft brush is better to clean teeth than hard brush.	1) □ Disagree 2) □ Uncertain 3) □ Agree
8.	Filling our teeth does not make it thin.	1) □ Disagree 2) □ Uncertain 3) □ Agree
9.	Cleaning your teeth regularly does not make your teeth thin and weak .	1) □ Disagree 2) □ Uncertain 3) □ Agree
10.	Dental caries cannot be treated by eating mint.	1) □ Disagree 2) □ Uncertain 3) □ Agree

IV. Practice

Q No.	QUESTION	CODING CATEGORIES
1.	You brush your teeth twice a day.	1) □ Yes 2) □ No
2.	Your rinse your mouth after taking sweet snacks everytime.	1) □ Yes 2) □ No
3.	You always brush your teeth before going to bed and in the morning.	1) □ Yes 2) □ No
4.	You wash your mouth after every meal.	1) □ Yes 2) □ No
5.	You go for dental visit to a dentist every 6 months.	1) □ Yes 2) □ No

6.	You do not take sweet snacks more than 3 times a day.	1) □ Yes 2) □ No
7.	You use toothbrush to clean your teeth and not toothpowder.	1) □ Yes 2) □ No
8.	You do not use toothpick to clean your teeth if food gets stuck between your teeth.	1) □ Yes 2) □ No
9.	You have received fluoride mouthrinse before.	1) □ Yes 2) □ No
10.	You go to a dentist when you have pain or stains in your teeth only.	1) □ Yes 2) □ No

CLINICAL ASSESSMENT FORM

Dental Caries Assessment Form:

17	16	15	14	13	12	21	22	23	24	25	26	27	
47	46	45	44	43	42	41	31	32	33	34	35	36	27

Coding for Assessment will be:

0 (A) Sound Crown

1 (B) Decayed Crown

2 (C) Filled Crown with Decay

3 (D) Filled Crown with No Decay

4 (E) Missing Tooth by extraction as a result of Caries

5 (Permanent Tooth Missing, for any other reason)

6 (F) Fissure Sealant

7 (G) Bridge Abutment, Special Crown or Veneer

8 (Unerupted Crown)

T (T) Trauma Fracture

9 (Not Recorded)

Examination for Treatment Needs:

17	16	15	14	13	12	21	22	23	24	25	26	27	
47	46	45	44	43	42	41	31	32	33	34	35	36	27

Coding for examination for treatment needs will be:

CODE	Treatment
0	None
P	Preventive, Caries arresting care
F	Fissure Sealant
1	One Surface Fillings
2	Two or more surface fillings
3	Pulp Care
4	Extraction
5	Need for other care(Please Specify)
6	Not Recorded

APPENDIX B

प्रस्नावाली

विचार	पढेर बच्चाको सहभागीता लाई दिएका हो ? हो ☐ होइन ☐

नं. ☐☐☐ दिन महिना वर्ष

मिति: ☐☐ ☐☐ ☐☐☐

प्रश्न गर्नेको नाम:..... ठाउँ.....

भाषा: नेपालि ☐ अन्य ..... (कुन) ☐

#) साधारण बच्चाको:

क) वर्ष (उमेर) ☐☐

ख) लिंग: ☐ पुरुष ☐ महिला

ग) पढाई: ☐ छ ☐ छैन

☐ कक्षा १ सम्म

☐ कक्षा २-५ सम्म

☐ कक्षा ६-१०सम्म अथवा १० भन्दा बढि

घ) अपाङ्गताको किसिम: ☐ हात /खुट्टा

(अन्यअंगहरु) ☐ आँखा

☐ कान

☐ मुख

ङ) अपाङ्गता भएको कति समय भयो: ☐ वर्ष

महिना ☐

दिन ☐

(II) सहि उत्तरमा (√) चिन्ह लगाउनुहोला

प्र.नं.	प्रश्न	उत्तर
१.	दाँतलाई माउथब्रसले धुनाले दाँत सड्नबाट रोकिन्छ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
२.	दाँतको सडन रोक्व मिल्ने रोग के हो?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
३.	दाँत दुखेपछि औषधी खाँदा दुखाई रोकिएमा पनि दन्त चिकित्सकहाँ जान जरुरी छ ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
४.	दाँत किराले खाएमा भर्नुभन्दा निकाल्नु ठिक होइन ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
५.	फ्लोशाइडले दाँत सडन बकाट बचाउँछ ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
६.	दाँत ब्रस गनुको साथै धागोले पनि सफा गर्नुपर्छ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
७.	नरम ब्रुसले भन्दा कडा ब्रसले दाँत सफा राम्रो गर्छ ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
८.	हाम्रो मन्जनमा फ्लोराइड हुनुपर्छ ?	☐ बेठिक ☐ ठिक ☐ थाहा छैन
९.	दाँत सफा गर्नले हाम्रो दाँत पातले र कमजोर हुदैन?	☐ बेठिक ☐ ठिक ☐ थाहा छैन

१० ल्वाइको तेलले दाँत सडेको निको हुन्छ ?

☐ बेठिक ☐ ठिक ☐ थाहा छैन

ठिक उत्तरमा (√) चिन्ह लगाउनुहोला

पेज न. २

प्रश्न नं.	प्रश्न	उत्तर	
१.	तपाई दिनको २ पटक दाँत माझ्नुहुन्छ ?	हो ☐	होइन ☐
२.	तपाईको मन्जनम क्लोराइड छ ?	हो ☐	होइन ☐
३.	तपाई राति सुत्ने बैला दाँत माझ्नुहुन्छ ?	हो ☐	होइन ☐
४.	तपाई खाना खाएपछि मुख कुल्ला गर्नुहुन्छ ?	हो ☐	होइन ☐
५.	तपाई हरेक ६-महिनामा दन्त चिकित्स कहाँ जानुहुन्छ ?	हो ☐	होइन ☐
६.	तपाई दिनको ३ पटक भन्दा बढि मिठाई खानुहुन्छ ?	हो ☐	होइन ☐
७.	तपाई दाँत सफ गर्न धागो प्रयोग गर्नुहुन्छ ?	हो ☐	होइन ☐
८.	दाँतमा खाना अड्केको खण्डमा सिन्काले निकल्नु हुन्छ ?	हो ☐	होइन ☐
९.	तपाईले क्लोराइडले दाँत सफा गर्नुभएको छ ?	हो ☐	होइन ☐
१०.	तपाई दन्त चिकित्सककोमा दाँतमा दाग लागेमा मात्र जानुहुन्छ ?	हो ☐	होइन ☐

APPENDIX C

१०. परियोजना अध्ययनको शिलसिलामा तपाईलाई आईपर्ने खतरा, नसोचेका घटना आइपर्दा अपनाउनु पर्ने उपाय र रोकथामका तरिकाहरू तपाई परियोजनामा सहभागि हुँदा बताइनेछ ।

- अध्ययनको शिलसिलामा सहभागि हुँदा शारीरिक र मानसिक खतरा जबरजस्ती हुनेछैन ।
- तपाईलाई प्रश्नको उत्तर दिदां समयसिमा र असजिलो/अप्ठेरोपन हुनसक्दछ ।
- अनुसन्धानकर्ताले प्रश्नबारे ब्याख्या गरि प्रशस्त समयसिमा तपाईलाई उत्तर दिन बताउनेछन ।
- दाँत र मुल सम्बन्धि स्वास्थ्यको जाँचमा सफा र वैज्ञानिक तरिकाको औजार प्रयोग हुनेछ ।
- परिक्षामा थपाईलाई केही असजिलो/अप्ठेरोपन महशुस हुनसक्दछ त्यसो भएमा तपाई केहीबेर परिक्षकसंग अनुमती मागी आराम गरी पुनः अगाडी जान सक्तछौं ।

११. तपाईले लिइएको डाटा सुरक्षित र गोप्य कसरी राख्न सक्दछौ ?

- तपाईले दिएका उत्तरपुस्तिकाहरू एकलौटी रूपमा साँचो लगाई फाईलिङ्ग दराजमा राखिनेछ ।
- उत्तरपुस्तिकामा तपाईको नामसंग जोडिने कुनैपनि आबद्ध रहने छैन ।
- डाटा र परिक्षा फारमहरूमा कोड (संकेत) प्रयोग गरिनेछ ।
- डाटाहरू कम्प्यूटरमा राखिसकेपछि सबै कागजहरू नष्ट गरिनेछ ।
- कुनै कारणवश छापियो भनेपनि तपाईको नाम सम्बन्धि सूचनालाई सहयोग पुग्न सक्दैन ।

१३. परियोजनाबाट निष्कासन हुन तपाईलाई पुरा अधिकार छ । यो परियोजना पुर्ण रूपले स्वंमसेवक भएको हुँदा तपाईलाई अर्न्तवार्ताका लागि कुनैपनि अभिभारा, बाध्यता नभएको हुँदा कुनैपनि समयमा परिक्षा छोड्न सक्नुहुनेछ र सहभागिता नभएपनि संस्थाालाई कुनैपनि असर पर्नेछैन ।

◆◆◆

आपतकालिन स्थितीको आधिकारिक सम्पर्क ठेगानाः

डा. जेमिश आचार्य
बिद्यार्थी परिचय-पत्रः ५५३६८३१ (पि. एच. एम. पि/एम)
एम. पि. एच. अन्तरराष्ट्रिय कार्यक्रम
जन स्वास्थ्य विभाग
महिडोल विश्वविद्यालय
बैंकक, १०४००
थाइलाण्ड फोन : ०८७-७०२-९७९६

नेपालको सम्पर्क ठेगानाः
डा. जेमिश आचार्य
नयाँ बानेश्वर, पोष्ट बक्स नं. ८९७५ इ. पी. सी. ६००४
काठमाडौं, नेपाल
फोन नं. ९७७-९८४९०३१९००, ९७७-९८४१२९२९९९

यो अनुसन्धात्मक परियनेजना इथीकल रिभ्यू कमिटी फर ह्युम्यान रिर्सच, जनस्वास्थ्य विभाग, महिडोल विश्वविद्यालयबाट प्रमाणित गरिनेछ ।
कार्यालय ठेगानाः
बिल्डीङ्ग-१, चौथो तल्ला, ४२०/१ राजभिठी रोड, राजठेवी, बैंकक १०४००, फोनः ०-२३५४-८५४३-९ एक्सटेन्सन ११२७, ७४०४,
फ्याक्सः ०-२६४०-९८५४

जानकारा पत्र
(बाबु आमाको लागि)

१. परियोजनाको शिर्षक:
काठमाडौं नेपालको हेरविचार गर्ने केन्द्रहरूमा बसिरहेका अपाङ्ग भएका बालबालिकाहरू मध्य दाँत सम्बन्धि मौखिक स्वास्थ्य (Oral Health)र दन्त चिकित्साको स्थिति

२. अध्ययन गर्ने क्षेत्र:
यो अध्ययन नेपाल अपाङ्ग संघ, समुदायमा आधारित अपाङ्ग पुर्नस्थापना केन्द्रमा गरिने छ ।

३. परियाजनाको उद्देश्य:
मुख्य सल्लाहकार सहायक प्राध्यापक डा. नाटकामोल चान्सटिर्पोनको सुपरिवेक्षणमा डा. जेमिश आचार्यबाट यो परियोजना गरिने छ ।

४. छोटकरीमा परियोजनाको पृष्ठभूमि:
मुख सम्बन्धि स्वास्थ्यको हेरविचार गर्न हरेक ब्यक्तिको महत्वपूर्ण दायित्व हो । स्वास्थ्य तथा सरसफाई मध्य मुख सम्बन्धि रोग पनि मुख्य हो । यो रोग रोकथाम गर्नुपर्ने हुन्छ । कुनै कुनै देशहरूमा मुख सम्बन्धि रोगको हेरविचार र रोकथाम सबै जनमानसमा सगंसगै गरिन्छ तर स्वास्थ्य सेवा र दन्त हेरचाह अपाङ्ग भएका बालबालिकाहरूलाई विभिन्न कारणले गर्दा नेपालमा सेवा पुऱ्याउन सकेको छैन । नेपालमा दन्त रोग र मुख सम्बन्धि स्वास्थ्यको समस्या दिन प्रतिदिन बृद्धि भईरहेको छ साथै काठमाडौंमा पनि यो रोग बढीरहेको छ यदि यस सम्बन्धि दन्तरोग (किराले खाएको) को सुरूमा उपचार नभएमा दिन प्रतिदिन बृद्धि भई गिजा र बंगराहरू पाकिन्छ । भविष्यमा बालबालिकाहरूको दन्तरोग सम्बन्धि उपचारत्मक सेवा पुऱ्याउनुपर्ने उत्तिकै आवश्यक पर्दछ । निम्न स्तरको मौखिक स्वास्थ्य सम्बन्धि उपचारले खासगरि अपाङ्ग भएका बालबालिकाहरूमा नकरात्मक असर परि अझबढी अन्य स्वास्थ्य सेवामा बृद्धि गरि मौखिक स्वास्थ्यको सेवाहरू आवश्यक छ । स्वास्थ्य सम्बन्धि स्थितिको पहिचान गरि बालबालिकाहरूको मौखिक स्वास्थ्य सम्बन्धि अध्ययन गर्न सहयोग पुग्नेछ जसबाट बालबालिकाहरूको स्वास्थ्य सम्बन्धि योजना र कार्यक्रम बनाई स्वास्थ्य सम्बन्धि कार्यक्रममा बृद्धि गर्न सकिन्छ । अपाङ्ग भएका बालबालिकाहरूमा मौखिक दन्त स्वास्थ्यको सर्वप्रथम अध्ययन गरि भविष्यमा समग्र रूपले अझ बढी अपचारत्मक सेवा गर्न मोडलको रूपमा यो पहिलो अध्ययन हुनेछ ।

५. दन्त रोग सम्बन्धिको स्थिति वर्तमान अवस्थामा (डि.एम.एफ.टि.) अपाङ्ग भएका १२ देखि १५ बर्षका बालबालिकाहरू जो काठमाडौं नेपालका हेरचाह केन्द्रमा बसिरहेकाछन ती बालबालिकाहरूका लागि ज्ञान, प्रब्रिती र मौखिक स्वास्थ्यको व्यवहारिकताको आवश्यकताको अध्ययन मुख्य उद्देश्य हो ।

६. तपाईलाई स्वंयमसेवकको रूपमा परियोजनाका लागि आमन्त्रण गरिन्छ किनभने यो परियोजना अध्ययनको सहभागिताका लागि आमन्त्रण गरिएको छ किनकि तपाई संस्थाको क्षेत्रमा छानिनुभएको छ ।

७. अनुसन्धान क्रियाकलापमा जस सम्बन्धि तपाई संलग्न छौ जब यो अनुसन्धान परियोजनामा स्वंयमसेवकको रूपमा सहभागिताका निम्न बुँदालाई ध्यान दिनु पर्दछ । (स्वंयमसेवक/विषयहरूको भागमा संग्लग्न) आफैले तयार पारेको प्रश्नावलीमा तपाईलाई सोधिनेछ र मुख स्वास्थ्य सम्बन्धि परिक्षाको लागि सहभागिता गरिनेछ । यदि तपाई दृष्टी विहिन हुनुहुन्छ भने मौखिक प्रश्न सोधिनेछ र हामि तपाईले दिएको प्रश्नको आधारमा प्रश्नावली भर्नेछौं ।

८. यस अनुसन्धान क्रियाकलापका लागि दिइएको समय भित्र तपाई संग्लग्न हुनेछौं । ज्ञानका लागि साधारण जानकारी, निश्चित प्रश्न, लक्षण, उपचार, रोकथाम, चिन्ह र दाँतमा किराले खाने कारणहरू बारे तपाईलाई उत्तर दिन प्रश्न गरिनेछ जुन समय ३० मिनेटको हुनेछ । तपाईलाई मौखिक स्वास्थ्य सम्बन्धि परिक्षा लिईनेछ जुन उक्त समय १५ देखि २० मिनेटको हुनेछ ।

९. परियोजनाबाट तपाई र अरूलाई फाईदा पुग्ने अनुमान:
- ◆ दाँत र मुख सम्बन्धिको स्वास्थ्य स्थिति, पुरानो तथा बिग्रेको दाँत र अन्य उपचार बारे तपाईलाई बताईनेछ र दाँतको अवस्था बारे समय सिमा तोकिनेछ ।
- ◆ दाँतलाई कसरी बचाउनु पर्दछ र दाँत र मुख सम्बन्धि सरसफाइका लागि तपाईले दन्त स्वास्थ्य सम्बन्धि शिक्षा हाशिल गरि दाँतमा आउने समस्याहरूको बारे कसरी रक्षा गर्नसकिन्छ भन्ने जानकारी लिनेछौ ।

१०. परियोजना अध्ययनको शिलसिलामा तपाईलाई आईपर्ने खतरा, नसोचेका घटना आइपर्दा अपनाउनु पर्ने उपाय र रोकथामका तरिकाहरू तपाई परियोजनामा सहभागि हुँदा बताइनेछ ।
- ◆ अध्ययनको शिलसिलामा सहभागि हुँदा शारीरिक र मानसिक खतरा जबरजस्ती हुनेछैन ।
- ◆ तपाईलाई प्रश्नको उत्तर दिदां समयसिमा र असजिलो/अप्ठेरोपन हुनसक्दछ ।
- ◆ अनुसन्धानकर्ताले प्रश्नबारे ब्याख्या गरि प्रशस्त समयसिमा तपाईलाई उत्तर दिन बताउनेछन ।
- ◆ दाँत र मुल सम्बन्धि स्वास्थ्यको जाँचमा सफा र वैज्ञानिक तरिकाको औजार प्रयोग हुनेछ ।
- ◆ परिक्षामा थपाईलाई केही असजिलो/अप्ठेरोपन महशुस हुनसक्दछ त्यसो भएमा तपाई केहीबेर परिक्षकसंग अनुमती मागी आराम गरी पुनः अगाडी जान सक्तछौं ।

EC-3 Form

APPENDIX D

INFORMATION SHEET

(FOR RELATED AUTHORITIES OF THE ORGANIZATION INVOLVED)

1. Title of project:

Dental Caries Status and Oral Health Needs among disabled children living in care centers in Kathmandu, Nepal

2.Study site:

The study will be conducted in Nepal Disabled Association Community Based Rehabilitation Center, Kathmandu, Nepal.

3.This project is conducted by Jemish Acharya under supervision of Major Advisor as follows:

Asst.Prof.Dr. Natkamol Chansatitporn

4.Brief Background, Rationale: (use simple word, understandable by volunteer participant)

Oral health is an essential part of the general health and well being of an individual. The major causes of oral diseases have been majorly attributed to hygiene and are the most significant factor when it comes to prevention of oral diseases. In most countries preventive and curative oral health care is provided to the population while it has also been widely noticed that disabled people are not covered by health care due to various reasons owing to the increasing incidence of dental caries in this population. In Nepal, the growing problems of oral health and dental caries among children are being seen everyday. In Kathmandu also, the trends of dental caries has been seen to be increasing. If not tended on time,caries can progress and lead to further complicated infections like abscess and other infections in the jaws as well.

Preventive care therefore is very important especially in children since promotion of oral health and increased knowledge in this aspect can help them in prevention of problems of oral health in the future as well. Poor oral health can have a negative impact on children and especially on disabled children since their other health problems can be a burden to them and added oral health problems can be avoided if possible.Therefore,this study will help to assess the oral health status of the children and then plan interventions and programmes of health promotion for the benefit of the children. This study will be the first study done to assess oral health status among disabled children so it will be a stepping stone and a basic model for future studies and evidence based planning for future interventions for the betterment of oral health among these children.

5.Objectives:

To study the dental caries status by prevalence and severity(DMFT) , knowledge and attitude in oral health oral health practices and the oral health needs among children with disabilities aged 12-15 age group living in care centers in Kathmandu, Nepal

6.You are invited to be a volunteer/subject to participate in the project because

The children in your organization are people of our interest,they can give us information concerning dental caries and oral health of themselves though they are invited to participate in this study

7. Research activities which involving you when you volunteer to participate in this research project will be as following: (focus on the parts that involve volunteers/subjects)

The child will be asked to answer the questions in the interview or in the questionnaire and also be asked to participate in oral health examination

8.Period of time that you will be involved in this research activities (Treatment/data collection):

If the child is allowed to participate in the study,s/he will be asked to answer the questions regarding their general information, certain questions regarding knowledge and attitude about the causes, signs and symptoms ,treatment and prevention of dental caries which will last about 30 minutes.S/he will also be asked to participate in the oral health examination which will take about 15-20 minutes.

9.Expected benefits of the project to you and to others:

The child will be told about their oral health status, decayed teeth and other treatment that their teeth need at that point of time.S/he will also receive oral health education in the chair side regarding maintaining oral hygiene to prevent further problems in their teeth.

10.Risks or any undesirable that may occur to you caused by this research and measure or prevention and risk reclusion method which will be provided during participation in the project.

There will be no foreseeable physical and mental risks as the child participates in the study. However, answering questions could give the children some discomfort and time consuming when trying to think about the answer. Researcher will provide explanations for the questions and adequate time will be provided for the answers. For oral health examination, clean and sterilized instruments will be used. Certain discomfort may arise during the course of the examination, the child may ask the examiner for a break or stop before continuing.

11.How can you securely store the data and keep them confidential? (such as how to take care data, where are data storage who will access, and how to destroy data and when)

The child's answer will be kept anonymous and all questionnaires will be kept in a locked filing drawer. There will be no ability to link the child's name with his/her answer forms. Codes will be used to identify the data collection forms and examination forms. As soon as the data have been entered into the computer, all papers will be destroyed. In case of publication, we will not include any information will may help the child's name be linked to his/her information.

12.The right of the subject (he/she) to withdraw from the project.

You have the right to not allow any child or to refuse to participate in the study if you or s/he does not want to. S/he can drop out anytime without any obligation during the process because the participation is strictly voluntary.

13.Contact address of authorized persons in case of emergency.

Dr. Jemish Acharya
Student ID:5536831 PHMP/M
MPH International Program
Faculty of Public Health
Mahidol University
Bangkok,10400
Thailand Phone: 087-702-9717

Contact Address in Nepal:
Jemish Acharya
New baneshwore
PO BOX 8975 EPC 6004
Kathmandu,Nepal
Ph no: 977-9849031900 977-9841292999

This research project be approved by the Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University. Office address at Building 1, 4th Floor, 420/1 Rajvithi Road, Rajthevi, Bangkok 10400, Telephone: 0-2354-8543-9 Ext. 1127, 7404 Fax: 0-2640-9854

EC-3 Form

Information Sheet

(For Children)

1.Title of project:

Dental Caries Status and Oral Health Needs among disabled children living in care centers in Kathmandu, Nepal

2.Study site:

The study will be conducted in Nepal Disabled Association Community Based Rehabilitation Center, Kathmandu, Nepal.

3.This project is conducted by Jemish Acharya, under supervision of Major Advisor as follows:

Asst. Prof. Dr. Natkamol Chansatitporn

4.Brief Background, Rationale:

Oral health is an essential part of the general health and well being of an individual. The major causes of oral diseases have been majorly attributed to hygiene and are the most significant factor when it comes to prevention of oral diseases. In most countries preventive and curative oral health care is provided to the population while it has also been widely noticed that disabled people are not covered by health care due to various reasons owing to the increasing incidence of dental caries in this population. In Nepal, the growing problems of oral health and dental caries among children are being seen everyday. In Kathmandu also, the trends of dental caries has been seen to be increasing. If not tended on time,caries can progress and lead to further complicated infections like abscess and other infections in the jaws as well. Preventive care therefore is very important especially in children since promotion of oral health and increased knowledge in this aspect can help them in prevention of problems of oral health in the future as well. Poor oral health can have a negative impact on children and especially on disabled children since their other health problems can be a burden to them and added oral health problems can be avoided if

possible.Therefore,this study will help to assess the oral health status of the children and then plan interventions and programmes of health promotion for the benefit of the children. This study will be the first study done to assess oral health status among disabled children so it will be a stepping stone and a basic model for future studies and evidence based planning for future interventions for the betterment of oral health among these children.

5.Objectives:

To study the dental caries status by prevalence and severity(DMFT) , knowledge and attitude in oral health oral health practices and the oral health needs among children with disabilities aged 12-15 age group living in care centers in Kathmandu, Nepal.

6.You are invited to be a volunteer/subject to participate in the project because

As you are one of our interest people in the organization,you can give us information concerning dental caries and oral health of yourself though we invite you to participate in the study.

7. Research activities which involving you when you volunteer to participate in this research project will be as following: (focus on the parts that involve volunteers/subjects)

You will be asked to answer all items of self administrated questionnaires and also be asked to participate in oral health examination. If you are visually impaired, an oral interview will be conducted where we will fill out the questionnaire for you based on the answers you give.

8.Period of time that you will be involved in this research activities:

You will be asked to answer the questions regarding their general information, certain questions regarding knowledge and attitude about the causes, signs and symptoms ,treatment and prevention of dental caries which will last about 30 minutes.S/he will also be asked to participate in the oral health examination which will take about 15-20 minutes.

9.Expected benefits of the project to you and to others:

You will be told about their oral health status, decayed teeth and other treatmentthat their teeth need at that point of time.S/he will also receive oral health education in the chair side regarding maintaining oral hygiene to prevent further problems in their teeth

10.Risks or any undesirable that may occur to you caused by this research and measure or prevention and risk reclusion method which will be provided during participation in the project.

There will be no foreseeable physical and mental risks as you participate in the study. However, answering questions could give you some discomfort and time consuming when trying to think about the answer. Researcher will provide explanations for the questions and adequate time will be provided for the answers. For oral health examination, clean and sterilized instruments will be used. Certain discomfort may arise during the course of the examination, you may ask the examiner for a break or stop before continuing.

11.How can you securely store the data and keep them confidential?

Your answer will be kept anonymous and all questionnaires will be kept in a locked filing drawer. There will be no ability to link your name with his/her answer forms. Codes will be used to identify the data collection forms and examination forms. As soon as the data have been entered into the computer, all papers will be destroyed. In case of publication, we will not include any information will may help your name be linked to his/her information.

12.The right of the subject (he/she) to withdraw from the project.

You have the right to refuse to participate in this study if you do not want to and drop out anytime without any obligation during the process of interview because the participation in this study is strictly voluntary. And not participating and drop out from this study will not affect anything related to being in the organization.

13.Contact address of authorized persons in case of emergency.

Dr. Jemish Acharya
Student ID:5536831 PHMP/M
MPH International Program
Faculty of Public Health
Mahidol University
Bangkok,10400
Thailand Phone: 087-702-9717

Contact Address in Nepal:
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This research project be approved by the Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University. Office address at Building 1, 4th Floor, 420/1 Rajvithi Road, Rajthevi, Bangkok 10400, Telephone: 0-2354-8543-9 Ext. 1127, 7404 Fax: 0-2640-9854

EC-4 Form

Informed Consent Form

Project Title:

Dental Caries Status and Oral Health Needs among disabled children living in care centres in Kathmandu,Nepal

Responsible person(s) and institute:

Jemish Acharya Mahidol University,Bangkok 10400,Thailand

Date ……...…… (day/month/year)

I (Mr./Mrs./Ms.)…….……..…..…… …...……

Home address……..…… Street…….…… Village number……..

Sub district……. District…...…….. Province……..…….. Postal code…..…

I have read and understood all statements in the **information sheet**. I have also been explained the objectives and methods of the study, as well as possible risks and benefits that may happen to myself upon the participation in the study. I understand that the information will be kept confidential and my name will not be declared in any case. I shall be given a copy of the signed **informed consent form**.

I have the right to withdraw from the project at any time without any adverse effects upon myself.

Signature…..……..… (Child)

(……..……..)

Signature…… …… ……..(Researcher)

(…….Jemish Acharya ……...)

Signature…..……..… (Responsible person)

(……..……..)

Signature…… …… ……..(Researcher)

(…….Jemish Acharya ……...)

I cannot read but before having finger print on this **informed consent form**, the investigator/interviewer has read and explained to me in detail about the study, the information sheet and the **informed consent form** until I completely understood.

Signature…….… (Child)

(…….)

Signature…….… (Responsible person)

(…….)

Signature…….… (Researcher)

(...……..)

Certificate of Approval
Ethical Review Committee for Human Research
Faculty of Public Health, Mahidol University

COA. No. MUPH 2013-017

Protocol Title : DENTAL CARIES STATUS AND ORAL HEALTH NEEDS AMONG DISABLED CHILDREN LIVING IN CARE CENTERS IN KATHMANDU, NEPAL

Protocol No. : 259/2555

Principal Investigator : Dr. Jemish Acharya

Affiliation : Master of Public Health (International Program)
Faculty of Public Health, Mahidol University

Approval Includes :
1. Project proposal
2. Information sheet
3. Informed consent form
4. Data collection form/Program or Activity plan

Date of Approval : 21 January 2013

Date of Expiration : 20 January 2014

The aforementioned project have been reviewed and approved according to the Declaration of Helsinki by Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University.

S. Nanthamongkolchai

(Assoc. Prof. Sutham Nanthamongkolchai)
Chairman of Ethical Review Committee for Human Research

(Assoc. Prof. Phitaya Charupoonphol)
Dean of Faculty of Public Health

420/1 Rajvithi Road, Bangkok, Thailand 10400
Tel. (662) 3548543-9 ext. 1127, 7404 Fax. (662) 6409854

BIOGRAPHY

NAME	Jemish Acharya
DATE OF BIRTH	August 20th 1986
PLACE OF BIRTH	Kathmandu,Nepal
INSTITUTIONS ATTENDED	Manipal University (2004-2009) Bachelor of Dental Surgery(BDS)
PERMANENT ADDRESS	PO Box 8975 EPC 6004 New Baneshwore Kathmandu,Nepal
EMAIL	jemish.acharya@gmail.com
WORK EXPERIENCE	Project Consultant(January 2010 to July 2010) Nepal Disabled Association, Kathmandu,Nepal Dental Surgeon(2010-2012) The Orthdodontic Center Kathmandu,Nepal