Tooth loss: The Impact on the Quality of Life for patients visiting Kantipur Dental College and Hospital, Kathmandu, Nepal. A descriptive study

Jonas Alfredsson
Jakob Attin

Supervisor: Peter Carlsson, Senior Lecturer, Department of Cariology

Master Thesis in Odontology (30 ECTS)
Programme in Dentistry
February, 2017

Malmö University
Faculty of Odontology
205 06 Malmö
Summary

Aim The aim of this study was to investigate how tooth loss affects the oral health related quality of life through an OHIP-14 questionnaire and additional questions among patients visiting the Kantipur Dental College and Hospital (KDCH) in Kathmandu, Nepal. Materials and method Data was obtained from a questionnaire based on the OHIP-14 form, additional questions and a clinical examination. The study was of a descriptive nature and investigated consecutive patients (n=249) visiting the KDCH. Data from completed forms were analysed with SPSS to investigate how tooth loss affects the oral health related quality of life (OHRQoL) Results Mean age was 47.6 years with a gender ratio of 48 % (n=119) male and 52 % (n=130) female. The mean number of missing teeth was 5, and the mean total OHIP-score was 21.57 (SD 12.55). The most frequently impacted dimensions for the OHIP-14 were “Physical pain” (77 %) and “Psychological discomfort” (82.5 %). 96.8 % of the investigated population experiencing some form of impact on their OHRQoL. Conclusion A large majority of the patients visiting the KDCH experienced an impact on their OHRQoL related to missing teeth. The number of missing teeth had an impact on OHRQoL, but the position of missing teeth had not. The OHIP score with the criteria used in this study was found to be higher in comparison to other international findings.
Tandförlust och dess påverkan på den orala hälsorelaterade livskvalitén hos patienter som besöker Kantipur Dental College och Hospital, Kathmandu, Nepal.

En deskriptiv studie.

Jonas Alfredsson
Jakob Attin
Handledare: Övertandläkare Peter Carlsson, Cariologi-avdelningen

Examensarbete (30 hp)
Tandläkarprogrammet
Februari, 2017

Malmö högskola
Odontologiska fakulteten
205 06 Malmö
Sammanfattning

Syfte

Syftet med denna studie var att undersöka hur tandförlust påverkar den orala hälsorelaterade livskvalitén genom ett OHIP-14 fråge-formulär samt ytterligare konstruerade frågor, bland patienter som besöker Kantipur Dental College and Hospital (KDCH) i Katmandu, Nepal. **Material och metod** Data erhölls från ett frågeformulär baserat på OHIP-14, kompletterande frågor och klinisk undersökning. Studien var av beskrivande karaktär och undersökte konsekutiva patienter (n=249) som besökte KDCH. Data från ifyllda formulär analyserades genom SPSS för att undersöka sambandet mellan tandförlust och påverkan på livskvalitén. **Resultat** Medelåldern var 47.6 år med en könsfördelning på 48 % (n=119) män och 52 % (n=130) kvinnor. Det genomsnittliga antalet saknade tänder var 5, och den genomsnittliga totala OHIP-poängen var 21.57 (SD 12.55). De mest påverkade dimensionerna för OHIP-14 var ”Fysisk smärta” (77 %) och ”Psykologiskt obehag” (82.5 %). 96.8 % av den undersökta befolkningen upplevde någon form av påverkan på deras orala hälsorelaterad livskvalitet. **Slutsats** Resultaten i denna studie visar att en stor majoritet av patienterna som besöker KDCH upplever någon form av påverkan på sin oral-hälsorelaterade livskvalitet relaterad till tandförlust. De saknade tändernas position hade ingen signifikant effekt på den orala hälsorelaterade livskvaliteten medan en större inverkan på livskvalitén kunde observeras vid ökande antal saknade tänder. De OHIP-poäng, utifrån de kriterier som använts i denna studie, visade sig vara högre i jämförelse med andra internationella fynd.
Table of Contents
Summary ......................................................................................................................... 2
Sammanfattning .................................................................................................................. 4
Background ......................................................................................................................... 7
Dental Caries ......................................................................................................................... 7
Periodontitis ......................................................................................................................... 7
Prevalence of dental caries and periodontitis in Nepal ....................................................... 7
Oral Health Related Quality of Life Impact (OHRQoL) ...................................................... 8
Oral Health Impact Profile (OHIP) ..................................................................................... 9
Hypotheses ........................................................................................................................ 10
Aim ..................................................................................................................................... 10
Material and Methods ....................................................................................................... 11
Review of the literature ...................................................................................................... 11
The questionnaire ............................................................................................................... 11
Oral examination ............................................................................................................... 12
Data collection .................................................................................................................... 12
Study design, study population and sample size ............................................................... 12
Ohip-14 ............................................................................................................................... 13
Data analysis ....................................................................................................................... 13
Ethical approval .................................................................................................................. 13
Ethical considerations ........................................................................................................ 13
Financial information ......................................................................................................... 14
Results .................................................................................................................................. 14
OHIP-14 .............................................................................................................................. 16
Discussion ........................................................................................................................ 22
Material and methods ....................................................................................................... 22
Data collection (study design, population, sample size) .................................................... 22
Data analysis ....................................................................................................................... 23
Findings/Results ............................................................................................................... 23
OHIP-14 ............................................................................................................................... 23
Relation to international findings ..................................................................................... 23
Reflection regarding developing opportunities ................................................................... 25
Recommendations for future studies .............................................................................. 25
Conclusion ........................................................................................................................ 26
Acknowledgements .......................................................................................................... 26
References.........................................................................................................................27
Appendix 1: English Questionnaire..................................................................................30
Appendix 2: Nepalese Questionnaire................................................................................34
Background
Nepal is a small country with no coastline situated in southern Asia between China and India. The country is divided into three distinct geographical zones ranging from the terai (plains) at sea level to the hills and, thereafter, the mountains including the “rooftop of the world”, the Himalayas. Nepal is inhabited by approximately 31.5 million people, of which 18.6% are living in urban areas, with 1.4 million residents in the capital city of Kathmandu. The remainder of the population lives in the rural parts of the country. The country consists of a very young population with 53% of the inhabitants under the age of 25 years. The median age is 23.4 years with a life expectancy of 64 years (1). According to the World Health Organization (WHO) and “the World Bank”, Nepal ranks among the poorest countries in the world (2). The Gross National Product (GNP) was 730 US $ per capita in 2014, unemployment rates at 46% (2008) and approximately one fourth of the population living below the poverty line (2011), and 36% of the population being illiterate (1).

Earlier studies suggested that countries going through industrialization and development, such as Nepal, should be alert of the lifestyle diseases that industrialization brings, in regards of change in both culture and standard of living (3-5). In particular, the presence of dental caries and periodontitis, that are main causes of edentulism (6,7).

Dental Caries
Dental caries is a multifactorial disease dependant on internal and external factors that contribute to the aetiology of the disease, resulting in demineralization of the tooth’s minerals and collapse of the tooth’s integrity. It is not uncommon that the presence of dental caries induces pain and discomfort. Even though sugar control would be effective in caries prevention, the most common interventions are either prevention with fluorides and plaque control, excavation and filling or tooth extraction depending on the severity of the disease (8).

Periodontitis
Periodontal disease, similarly to dental caries, is caused by multiple contributing factors and dental plaque is important for the disease to be progressive. Periodontal disease is highly related to the formation of dental calculus which is formed when plaque that is not removed becomes mineralized by minerals in the saliva. Calculus formation provides great retention for an increased accumulation of dental plaque and progression of pocket depth due to the inflammation that follows. The inflammation can lead to irreversible loss of the hard tissue supporting the tooth. The periodontal bone loss can eventually lead to increased tooth mobility and discomfort, and may result in tooth loss (9).

Prevalence of dental caries and periodontitis in Nepal
Nepal is a country with an unstable infrastructure, which has made epidemiological studies difficult to perform because of the scattered population across the nation, and difficulties to travel. Studies made in the early- to mid-nineties reported that there is a low prevalence of dental caries in Nepal, but also suggested that preventative measures would be of great value to prepare for the industrialization that Nepal is facing in the future (3,4).

In 2003 WHO released an oral health report assessing the oral health status of the world and proposed different strategies for a better oral health status in the coming 21st century (5). The south-east region of Asia (SEA) is represented as low dental caries and low Decayed-, Missing-, Filled-Teeth values (DMFT) (5,10). Periodontal status was measured by a Community Periodontal Index score (CPI) where the status of the participant is scored between 0 and 4. According to the WHO’s oral health report, the SEA region is the lowest scoring on both CPI=0 (healthy gums) and CPI=1 (gingival bleeding on probing). More often
SEA fall into the categories of CPI=2-4 (CPI=2: formation of calculus, CPI=3: 4-5mm pocket depth, CPI=4: 6 mm or deeper pocket depth) where participants experience formation of calculus and pathological tooth pockets (5). Few studies have been performed evaluating periodontal status in Nepal for the recent years. It was found that 58 % of Nepalese schoolchildren at the age of 5-6 years old, 62 % of the age of 12-13 years old and 61 % of the age of 15-16 years old had dental calculus (11). In another article, it was stated that dental calculus was rarely removed; the explanation for the low priority of calculus removal being the restricted access to dental health care, where assets should be prioritized to more acute conditions (4). This could explain why 80-100 % of the adult population in Asia experience dental calculus or deep periodontal pockets (12). The presence of existing dental calculus is not a disease but only an indicator that the oral hygiene is lacking. 45 % of the population had a CPI score of 3 and the prevalence of deeper periodontal pockets was found to be associated with illiteracy, high age, poverty and people living in the rural parts of the country (13).

In 1981, WHO and the World Dental Federation (FDI) set goals for the oral health status to be achieved by the year of 2000, one of these goals was that 50 % of 5-6-year-olds to be free of dental caries (5). Four studies that examined the caries prevalence between the years of 2002-2015 found that the prevalence of dental caries among 5-6 years-old in Nepal failed to achieve these goals set up by the WHO in 1981 (14-17).

Through the DMFT index, it is possible to measure the lifetime experience of dental caries in the permanent dentition. In the report from 2003, WHO could present a pattern showing a trend with an increase in DMFT in developing countries. During the time of the study the DMFT-index for Nepal was scored as very low for both adults (DMFT <5.0) and 12-year-olds (DMFT <1.2) (5).

**Oral Health Related Quality of Life Impact (OHRQoL)**

The OHRQoL model was developed to evaluate how oral disease affects the individual’s quality of life. “Theoretically, OHRQoL is a function of various symptoms and experiences and represents the person’s subjective perspective” (18). Additionally, OHRQoL focuses to address health promotion and disease prevention by incorporating both positive and negative perceptions of oral health and health outcomes (18). The accumulation of untreated oral diseases can lead to an impairment of the patient’s quality of life which could affect the daily life in many different aspects such as lowered social or emotional wellbeing, or functional impairment. OHRQoL can also be affected by oral pain, bleeding gums or spaces between the teeth, it can also affect the treatment outcome through perceived satisfaction from the patient (19). Depending on the number of lost teeth, and the position of the lost teeth, missing teeth can have varying degrees of impact on OHRQoL (20).

Wellbeing itself is an utterly individual state regardless of age, gender or culture. Every person seek equilibrium between balancing challenges and the means to overcome these challenges in life. Challenges may present themselves as physical, psychological or social challenges. When the individual has the means to overcome these challenges, and feel in control of the situation, a state of wellbeing is achieved. By this definition, the balance between present challenges and the individual’s resources available to overcome these challenges, wellbeing is difficult to assess objectively, since every individual has their own perception of wellbeing (21).

No studies were found regarding the impact of missing teeth on OHRQoL in Nepal. However, in Sri Lanka, a country close to Nepal, found that “tooth loss and the position of missing teeth significantly affect the oral health-related quality of life of older individuals” (22) and also, that “As tooth loss emerged as one of the strongest predictor of oral health-
related quality of life, it is important to educate the public on the importance of preserving their natural teeth and a functional dentition throughout life.” (22). A systematic review made in 2010 assessed 10 studies reporting on 13 different samples from diverse countries around the world found evidence that tooth loss is associated with impairment in OHRQoL (20). The systematic review also agreed with the Sri Lankan study that location and distribution of teeth affects the OHRQoL impairment (20).

There are several different tools used for measuring OHRQoL. In the 1980’s the Social Impacts of Dental Disease (SIDD) was the first tool developed to measure dental impact on OHRQoL and many other instruments has been created (23). The WHO recommends that OHRQoL should be measured through seven dimensions; functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap and allows assessment and focus on a person’s social and emotional experience and physical functioning in defining appropriate treatment goals (18). To this day, the “Oral health impact profile”-format is the most commonly used for outcome evaluation and surveys with acceptable results (23).

**Oral Health Impact Profile (OHIP)**

The OHIP was constructed in 1994 by Slade and Spender (24), as an instrument to measure the OHRQoL. The original form consisted of 49 questions that measured how an individuals’ quality of life is affected by oral health through the seven dimensions suggested by the WHO. To ease the effort required from clinicians and make the form more efficient, a shorter version was constructed from the original 49 questions. The shorter form still investigates the original seven dimension but only consisted of 14 questions, two questions for each dimension. The Oral Health Impact Profile – 14 questions (OHIP-14) was found to have a good reliability, validity and precision compared to the original OHIP-49 version (25). The OHIP-14 format is one of the most used and known instruments used to measure OHRQoL and has been translated and validated into several different languages all around the world (25). In 2014 Vikram and Singh (26) translated and validated version of the original OHIP-14 in the native language of Nepal, Nepali. The researchers claimed that no earlier studies had been made in Nepal and there was a need for further investigations and use of the OHIP-14. The validation was performed by back-to-back translation and pre-tested on 25 individuals before necessary changes were done. The results of that study received a mean total OHIP-score of 23.45 (SD 7.73). This was the first translated version into Nepali, the authors claimed the English version was not suited to use on the Nepali population (26).

The circumstances in Nepal with very few dentists (1:47 300 dentist-patient ratio), low socioeconomic status (1), difficulties with accessibility to dental clinics, lack of regular dental visits and lack of preventive dental care means that patients often only seek dental care when in acute pain (6,16,17,27). This means that both periodontal and caries diseases are often treated during their later stages. As previously known the late stages of both diseases are the major contributors to tooth loss (6,20). With the knowledge of Nepal’s dental health situation and the aetiology of dental caries and periodontal disease, it is therefore interesting to investigate how tooth loss would affect the OHRQoL.
Hypotheses

- The most common reason for visiting the dentist is because of acute pain
- Nepali patients would rather prefer conservative treatment to tooth extraction, if possible
- Nepali patients seek dental care once a year or less
- Nepali patients need to travel a long way to reach dental care
- The position and number of teeth extracted have an impact on the OHRQoL
- Nepali patients have a high total OHIP score compared to other countries
- The most common reason for tooth extraction is dental caries

Aim

The first aim of this study was to investigate how missing teeth affects the OHRQoL through an OHIP-14 questionnaire among patients visiting the Kantipur Dental College and Hospital in Kathmandu city, Nepal. The second aim of the study was to investigate additional questions concerning frequency of visits to the dentist, reason for visiting the dentist, distance needed to reach the dental clinic etc.
Material and Methods

Review of the literature
A literature review was performed to find data on the oral health status of the population in Nepal since the mid 90’s. No studies were found that investigated the correlation between tooth loss and quality of life in Nepal.

A literature search was performed in PubMed with the following search terms:

<table>
<thead>
<tr>
<th>Search</th>
<th>Search term</th>
<th>Number of hits</th>
<th>Chosen articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>&quot;dental caries&quot;[MeSH Terms] OR (&quot;dental&quot;[All Fields] AND &quot;caries&quot;[All Fields]) OR &quot;dental caries&quot;[All Fields]) AND (&quot;Nepal&quot;[MeSH Terms] OR &quot;Nepal&quot;[All Fields])</td>
<td>32</td>
<td>17</td>
</tr>
<tr>
<td>#2</td>
<td>(&quot;periodontal diseases&quot;[MeSH Terms] OR (&quot;periodontal&quot;[All Fields] AND &quot;diseases&quot;[All Fields]) OR &quot;periodontal diseases&quot;[All Fields] OR (&quot;periodontal&quot;[All Fields] AND &quot;disease&quot;[All Fields]) OR &quot;periodontal disease&quot;[All Fields]) AND (&quot;Nepal&quot;[MeSH Terms] OR &quot;Nepal&quot;[All Fields])</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>#3</td>
<td>(&quot;tooth loss&quot;[MeSH Terms] OR (&quot;tooth&quot;[All Fields] AND &quot;loss&quot;[All Fields]) OR &quot;tooth loss&quot;[All Fields]) AND (&quot;Nepal&quot;[MeSH Terms] OR &quot;Nepal&quot;[All Fields])</td>
<td>9</td>
<td>0</td>
</tr>
</tbody>
</table>

Abstract reading of all identified articles for sorting was then performed with the following inclusion and exclusion criteria for full text reading.

Inclusion criteria:
- Article discuss how oral health affects quality of life
- Article presents prevalence for dental caries or periodontal disease
- Dental diseases that leads to extraction of teeth

Exclusion criteria:
- Articles published before 1995
- Diseases that cannot be correlated to tooth loss
- Missing abstract
- Already included from previous searches

In total, 23 articles were included for full text reading and later used for the literature review (3,4,6,7,11,13-17,27-39). The data from the literature review was used mainly for the introduction and discussion of this study.

The questionnaire
The study was designed as a questionnaire based on OHIP-14. The first page of the form consisted of a consent form. The second page consisted of eight questions regarding gender, age, reason for visiting the dentist etc. (See appendix 1, page 2). The third page of the form consisted of the validated version of the OHIP-14 questionnaire (26). The fourth and final page was filled by the investigator with information collected from an oral examination (see
When the entire questionnaire was completed, the investigator checked for questions left unanswered. If so, the participant was asked to answer the question(s) to the best of their abilities. One of the authors was always present with the participant if any questions arose. In the event of the participant or relative not being able to answer or read the questions in any of the given languages, help was given from two Bachelor Dental Surgery-interns (BDS) at KDCH with translating the questions. The BDS-interns were fluent in both English and Nepalese as well as having knowledge of odontology and Nepalese culture, which eliminates cultural misinterpretations and ease the communicative bridge between participants in the study and the foreign investigators. Prior to starting the data collection, the BDS were informed about the study and its purpose, how the questions should be distributed and how to lower potential bias by letting the participant answer to the best of their abilities. Any questions regarding data collection and the study were thoroughly discussed both prior to beginning and when new problems arose prior to continuing.

Due to delays with translation of the additional questions and consent form into Nepali, only the English version of the additional questions and consent form was used the first week of data collection. The Nepalese version of the OHIP-14 form was available the whole data collection period. The Nepalese version was translated and pre-tested in the native language, Nepali, with the help of a native bilingual translator with cultural knowledge. The pre-test showed both cultural and lingual correspondence when evaluated by three native Nepali speakers. The reason for a Nepali version of the additional questions to be made was to avoid impairment of the results due to lack of knowledge for the English language. After the pre-testing of the translated version of the additional questions for the questionnaire was completed, participants could choose to receive an English (Appendix 1) or Nepali (Appendix 2) version of the questionnaire, to whichever they felt most comfortable.

**Oral examination**

The reason why the tooth or teeth were missing was given by the participant and not compared to dental records. During status collection, a brief oral examination was performed by visually inspecting the oral cavity recording missing teeth only. When participants were questioned about the reason for missing the teeth, the participant’s subjective view was used to answer the question.

**Data collection**

*Study design, study population and sample size*

The study was performed at the “Kantipur Dental College, Teaching Hospital and Research Centre” (KDCH), Dhapasi, Basundhara, in the capital city of Kathmandu in Nepal. KDCH is a private dental clinic and hospital.

Data collection took place during an observation period between the 19th of June and 24th of July of 2016. Patients and their relatives who were visiting the hospital were asked if they wanted to take part in the study while waiting in the waiting room. To be eligible for the study the participant had to fit certain inclusion and exclusion criteria as follows:

**Inclusion criteria**
- Patient with at least one missing tooth
- 18 years or older

**Exclusion criteria**
- Treatment by extraction of the relevant tooth less than 4 weeks prior to questioning.
- Only missing the third molar or molars
- Tooth gap closed with fixed dental prosthesis
Participants who had extracted their teeth within the last four weeks were excluded from the study. Since pain or discomfort, as well as impairment of the chewing ability and ability to speak post extraction might affect the answers given in the questionnaire.

The sample size was estimated to be around 50-150 eligible participants based on the expected number of patients to visit the hospital during the observation period. According to the hospital records the total number of patients visiting KDCH during the observation period were roughly 800 patients per month. Field analysis quickly passed the estimate and a new population size of 250 participants was presented and approved by the Nepali Health and Research Council (NHRC). In total 253 forms were distributed.

**OHIP-14**

The OHIP-14 questionnaire is a standardized form that evaluates each question through 5 different answers and score these answers accordingly; from never (score 0) to very often (score 4). The results from the 14 questions were then summarized to give a perceptive score of the subjectively OHRQoL of the participant on a scale from 0 to 56. The total additive OHIP score could then be used to measure how much one or several missing teeth affect the OHRQoL. The seven subgroups in the OHIP-14 form could then be compared against each other to evaluate how they affect the total OHIP score in relation to each other.

**Data analysis**

Completed forms were analysed with IBM Statistical Package of Social Science (SPSS) Statistics version 23 to find means, median, standard deviation and to perform frequency analyses. Data from the questionnaires were analysed through chi-square and binominal tests with a significance level of 0.05 against constructed null hypotheses. Mean and mean rank comparisons were made with ANOVA tests as well as Friedman’s test for the OHIP-14 questionnaire.

**Ethical approval**

Permission to conduct the study was applied to the NHRC by the local supervisor to ease the application approval process. NHRC is a part of the Ministry of Health and Population that aims to facilitate the health researches in Nepal. Since its establishment, NHRC has been working in developing a research culture in the health sector of Nepal. The research proposal approval format conducted by the NHRC consisted of administrative information, financial information, research proposal description, and an ethical consideration regarding the study.

**Ethical considerations**

This study was considered to not have neither beneficial, nor harmful effects for the participant. After the brief oral examination no diagnosis or statements were given regarding oral health conditions. There was no risk involved for the participants since no treatment was given. This study only investigates the opinion of the participants own oral health. There are no questions about culture or social values and this study is, therefore, not sensitive to Nepali culture and social values. Participants were briefed that their answers would be treated anonymously and only used for statistical analysis. Participation was voluntary and participants were free to withdraw at any time, without giving reason.

Before agreeing to participate in the study the participant was asked to read and agree to a consent form based on the Declaration of Helsinki (40). The consent form was given both verbally and written in English or Nepali depending on the participant’s literacy. The investigator also signed the consent form to certify that the participant had reviewed the contents of the form and that it was the investigators opinion that the participant had understood the explanation given in the consent form.
The participant’s involvement in the study only took around 10-15 minutes and consisted of answering the questionnaire by themselves or with the help of a local translator or relative. No further involvement was required by the participant. After the questionnaire was completed the participant was given a toothbrush as compensation for participating.

Financial information
The authors received funding from the Swedish administrative authority “Swedish International Development Cooperation agency (SIDA)” who works on behalf of the Swedish government and parliament to reduce poverty in the world and carry through Sweden’s policies for global development. The funding was received through a Minor Field Studies grant.

Results
253 questionnaires were completed. In total 4 participants were excluded for not being able to answer the question about their age. In total 249 participants answered the questionnaire. 78 questionnaires were completed through the English version, and 171 through the Nepalese version. 52 % (n=130) of participants were female and 48 % (n=119) male. Mean age was 47.6 years old with a median age of 47 years (SD 17.4 years.). The youngest participant was 18 and the oldest participant was 101 years old (Fig 1).

60 % of the participants received help by an investigator or relative in answering the questionnaire and 40 % answered the questionnaire by themselves.

Participants were asked if they would rather consider a conservative treatment i.e. save the teeth, instead of tooth extraction if possible (question 4). 52 % (n=130) of participants stated that they would rather save the teeth through conservative treatment, if possible, compared to 45 % (n=112) not being interested in conservative treatment (ns).
A majority (56% n=140) of the participants considered that their financial situation did not prevent them from visiting the dentist while 44% (n=109) answered yes (p=0.049) (question 5).

Among the patients visiting the KDCH a clear dominance was seen for the answer “acute pain” as the reason of visit (Fig 2).

---

Figure 2 Reason for visiting the dentist in percent among all participants (p=<0.05). (Question 6)

Figure 2 Frequency of visiting the dentist in percent among all participants(p=<0.05). (Question 7)
A majority of the visitors (66 %) could reach the KDCH within one hour of travel time.

**OHIP-14**

The mean value for the total OHIP score among all participants was 21.57 (SD 12.55) (median 21.00). A higher mean total OHIP score was found among female (23.44), compared to males (19.52) (p=0.014). Of the total study population of 249 participants only 8 participants (3.2 %) had a total OHIP-score of 0. Resulting in 96.8 % of the investigated population experiencing some form of impact on their oral health related quality of life.

The most frequently missing teeth were the lower first molars (tooth 36 (n=82) and tooth 46 (n=95)). Out of the 249 participants 66 % were missing one to three teeth. The mean number of missing teeth was 5 (SD 6.6).

The participants were divided into one group consisting of participants missing teeth in the aesthetic region (central incisors, lateral incisors, and canines) and one group consisting of participants missing teeth in the premolar and molar region. The mean total OHIP score was 23.49 for the group missing teeth in the aesthetic region and 20.66 for the group missing teeth in the molar region (ns).
Table 1 Summary of the variance among the OHIP-14 answers for all participants

<table>
<thead>
<tr>
<th>OHIP-14</th>
<th>Never</th>
<th>Hardly ever</th>
<th>Occasionally</th>
<th>Fairly often</th>
<th>Very often</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional limitation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Trouble pronouncing words</td>
<td>132 (53%)</td>
<td>20 (8%)</td>
<td>47 (19%)</td>
<td>26 (10%)</td>
<td>24 (10%)</td>
<td>1,16</td>
<td>1,41</td>
</tr>
<tr>
<td>2. Worsened sense of taste</td>
<td>120 (48%)</td>
<td>25 (10%)</td>
<td>54 (22%)</td>
<td>27 (11%)</td>
<td>23 (9%)</td>
<td>1,23</td>
<td>1,39</td>
</tr>
<tr>
<td><strong>Physical pain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Painful aching</td>
<td>65 (26%)</td>
<td>24 (10%)</td>
<td>68 (27%)</td>
<td>29 (12%)</td>
<td>63 (25%)</td>
<td>2,00</td>
<td>1,51</td>
</tr>
<tr>
<td>4. Uncomfortable to eat food</td>
<td>49 (20%)</td>
<td>24 (10%)</td>
<td>64 (26%)</td>
<td>39 (16%)</td>
<td>73 (29%)</td>
<td>2,25</td>
<td>1,47</td>
</tr>
<tr>
<td><strong>Psychological discomfort</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Felt self-conscious</td>
<td>48 (19%)</td>
<td>25 (10%)</td>
<td>92 (37%)</td>
<td>45 (18%)</td>
<td>39 (16%)</td>
<td>2,01</td>
<td>1,30</td>
</tr>
<tr>
<td>6. Felt tense</td>
<td>41 (16%)</td>
<td>24 (10%)</td>
<td>74 (30%)</td>
<td>45 (18%)</td>
<td>65 (26%)</td>
<td>2,28</td>
<td>1,38</td>
</tr>
<tr>
<td><strong>Physiological disability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Unsatisfactory diet</td>
<td>77 (31%)</td>
<td>30 (12%)</td>
<td>68 (27%)</td>
<td>28 (11%)</td>
<td>46 (18%)</td>
<td>1,74</td>
<td>1,47</td>
</tr>
<tr>
<td>8. Interrupting meals</td>
<td>82 (33%)</td>
<td>28 (11%)</td>
<td>54 (22%)</td>
<td>38 (15%)</td>
<td>47 (19%)</td>
<td>1,76</td>
<td>1,51</td>
</tr>
<tr>
<td><strong>Psychological disability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Difficult to relax</td>
<td>111 (45%)</td>
<td>28 (11%)</td>
<td>47 (19%)</td>
<td>25 (10%)</td>
<td>38 (15%)</td>
<td>1,40</td>
<td>1,50</td>
</tr>
<tr>
<td>10. Felt embarrassed</td>
<td>109 (44%)</td>
<td>30 (12%)</td>
<td>53 (21%)</td>
<td>20 (8%)</td>
<td>37 (15%)</td>
<td>1,38</td>
<td>1,47</td>
</tr>
<tr>
<td><strong>Social disability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Irritable with other people</td>
<td>132 (53%)</td>
<td>42 (17%)</td>
<td>41 (16%)</td>
<td>17 (7%)</td>
<td>17 (7%)</td>
<td>1,98</td>
<td>1,26</td>
</tr>
<tr>
<td>12. Difficulty doing usual jobs</td>
<td>131 (53%)</td>
<td>37 (15%)</td>
<td>45 (18%)</td>
<td>13 (5%)</td>
<td>23 (9%)</td>
<td>1,04</td>
<td>1,32</td>
</tr>
<tr>
<td><strong>Handicap</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Life in general less satisfying</td>
<td>95 (38%)</td>
<td>35 (14%)</td>
<td>68 (27%)</td>
<td>27 (11%)</td>
<td>24 (10%)</td>
<td>1,40</td>
<td>1,34</td>
</tr>
<tr>
<td>14. Totally unable to function</td>
<td>140 (56%)</td>
<td>32 (13%)</td>
<td>45 (18%)</td>
<td>15 (6%)</td>
<td>17 (7%)</td>
<td>1,94</td>
<td>1,27</td>
</tr>
</tbody>
</table>
Among the seven dimensions that are investigated in the OHIP-14 form, the highest mean ranks from the Friedman’s test were found for the dimensions regarding physical pain (question 3 and 4) and psychological discomfort (question 5 and 6). The highest mean rank was found in question four. The lowest mean rank was found in question 14. (Fig 5)
Table 2. The reason, as given by the participant, for extracting the tooth/teeth. Shown in frequency and percentage. Unspecified consists of all cases of missing teeth for reasons other than Dental caries or Periodontal disease, for example trauma, orthodontic reason or reasons unknown to the participant.

<table>
<thead>
<tr>
<th>Reason for extraction</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental caries</td>
<td>160</td>
<td>64,3</td>
</tr>
<tr>
<td>Dental caries, Unspecified</td>
<td>4</td>
<td>1,6</td>
</tr>
<tr>
<td>Dental caries, Periodontal Disease</td>
<td>31</td>
<td>12,4</td>
</tr>
<tr>
<td>Unspecified</td>
<td>32</td>
<td>12,9</td>
</tr>
<tr>
<td>Periodontal disease</td>
<td>21</td>
<td>8,4</td>
</tr>
<tr>
<td>Periodontal disease, Unspecified</td>
<td>1</td>
<td>0,4</td>
</tr>
<tr>
<td>Total</td>
<td>249</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 6. A simplified pie chart, the participants’ reason for extraction is divided into three major groups; “Dental Caries”, “Periodontal disease” and “Unspecified”. If a participant were missing teeth because of more than one reason, they were included into every eligible group.
Figure 7. Scatter plot showing age and the mean number of missing teeth, as well as a linear trend line.

Figure 7 shows a trend that a higher age can be associated with a higher total number of missing teeth (p=0.01).

Figure 8. Scatter plot showing mean total OHIP for each age-group, as well as a linear trend line.

Fig 8 reveal an unevenly distributed plot between mean total OHIP-score and age-groups (ns).
Figure 9. Scatter plot showing mean OHIP-score and total number of missing teeth, as well as a linear trend line.

Fig 9 shows an association between the increasing number of missing teeth and increasing mean total OHIP-score (p=0.01).
Discussion

Material and methods

Data collection (study design, population, sample size)

Because of the descriptive nature of the study, it was not eligible for power analysis. The study was not conducted on a randomized population and did not use any control group. Participants were asked while waiting for their appointment at the dental clinic, which means that they are already seeking treatment for a problem. It is, therefore, not possible for the study to represent the population of Nepal. The participants were patients seeking treatment, which could mean they probably could afford dental care. It is, therefore, plausible that the study does not include individuals of Kathmandu that live in poverty and might not be able to seek dental care because of this.

One investigator was always present during data collection in case questions arose, in order to reduce bias from misinterpretation. The presence of an investigator is also a risk of bias since bias from observer-influence cannot be disregarded. When an investigator is present, there is a risk of the participant over-estimating the value of the question since the question at hand is elucidated. The participant will then answer a question the participant might seldom worry about otherwise. When performing a questionnaire study of this nature, one must also consider bias from fatigue. Patients were asked to participate while waiting for their appointment. Some participants might be stressed to complete the questionnaire faster in order to get ready if their name is called out. Another point of view is the amount of questions, the participant’s interest may decline towards the later questions and the answers become less thoughtful.

There was a perceived communication problem when the participants were illiterate. While a translator read the questions out loud to the participants, it was noted that some of the answers became long and elaborate while some got shorter. OHIP-14 is a self-rating questionnaire with a limited number of alternatives. The participant pick the answer that apply to them the best. There is no follow up question describing each individual case. The participants do not have an opportunity to give their own view. The translating investigator had to give an estimated answer from the story given by the participant. This situation occurred occasionally, although the participant was specifically asked to only give one answer of the five different alternatives in the OHIP-14 form.

A previous study (26) in Nepal found that there were difficulties among the participants understanding the English language. This study used both an English and a Nepalese questionnaire, and the authors noticed the same pattern as the previous study (26). Less questions arose from the participants who received a Nepalese version as opposed to participants who received an English version, this might be because the English version was used in its original form and not validated for a Nepalese population. Having the two BDS-interns nearby to interpret showed to be very helpful and necessary since even the literate Nepali participants occasion ally had a hard time understanding the translated Nepalese version due to phrasing and dialect. The OHIP-14 dimension regarding psychological discomfort was the most frequently misunderstood dimension. Question number six in the OHIP-form seemed to be especially difficult, trying to explain the meaning of “feeling tense because of problems with teeth, mouth or dentures” meant.

The additional questions were translated with the help of a local translator, associated to the hospital, who knew the professional language in dentistry. The translator was fluent in both English and Nepalese, as well as having a cultural knowledge about Nepal. No back-to-back
translation was made for these additional questions since no difficulties understanding them were observed during the data collection and, therefore, not regarded as a problem.

Data analysis
OHIP-14 was originally intended to be analysed as a nominal scale but the authors have chosen to treat the data as a numerical scale. When treating the OHIP-14 as a scale, the results became easier to use for comparisons with similarly made studies. As a scale the structured questionnaire can be analysed quantitatively to evaluate the results towards the study’s hypothesis.

Findings/Results
Prior to the investigation, the literature review revealed difficulties with accessibility to dental clinics among the Nepali population. This study found that a majority of visitors could reach KDCH within one hour of travel time.

This study did not take into consideration the reason for the extraction or how much knowledge the participant had about the loss of each tooth specifically. Since no dental records were available this study can, therefore, only present the self-reported reason for the missing teeth.

The hypothesis that patients visiting the KDCH only sought dental treatment when in acute pain could be verified (Fig 2). This result was predicted in the literature review.

In this study, roughly 60% of the participants needed help from an investigator or relative to fill out the form. This had both advantages and disadvantages for the prospected results of the study. Illiterate participants could receive help to understand the questions and answer them in a correct way. However, when a relative interprets an answer on behalf of the participant, misunderstandings from the relative might influence the answer.

The gender ratio was found to be almost equal between participants and with an even age distribution, as seen in figure 1. This study was conducted on consecutive patients visiting the dentist and no considerations were taken for allowing an equal distribution. The total OHIP-score was found to be higher among the female compared to male population. This is in agreement with earlier studies that present higher total OHIP scores among female, compared to male participants (41).

OHIP-14
Findings in this study are similar to those in a previous report from Nepal (26). No other national results for Nepal could be found for comparison with international findings.

Interestingly, question six was the most frequent question to report any kind of impact from the OHIP-14 form. Question six was also the most commonly misinterpreted question. This question seems to have either a high impact or the meaning of the question changed during translation.

The number of missing teeth was found to increase with age (Fig 7). Age was found to not have an impact on the total OHIP-14 score (Fig 8), but the number of missing teeth did (Fig 9). These finds show that although you lose more teeth with age, it is not the increase in age that impact the OHRQoL, but rather the loss of teeth.

Relation to international findings
A study made in Brazil (42), on 248 randomly selected participants 20-64 years old, presented a total mean OHIP-score of 10.21 (SD 1.16) and 57% of the participants were fully dentate. The three dimensions with most impact were psychological discomfort, physical pain
and physiological disability. Missing teeth in the anterior region were more likely to present a higher total OHIP-score compared to teeth missing in the posterior region. In Jönköping (41) Sweden, the mean total OHIP-score was 6.4 (SD 7.1) in a study population of 519 randomly selected participants, aged 20-80 years. The Swedish study presented the three dimensions with most impact; physical pain, psychological disability and psychological discomfort. Among all the participants in this study, 21 % reported no problems in the oral cavity. In India (43) the OHIP-14 combined with a clinical examination among 414 dentate participants (18-80 years old) recruited in the waiting room at a dental care centre, the mean total OHIP-score 11.8 (SD 8.4). Among the OHIP-14 dimensions, physical pain, psychological discomfort, physiological disability and psychological disability had most impact on the total score. Participants visiting the KDCH presented a similar pattern and the dimensions where the most impact was found in physical pain, psychological discomfort and psychological disability. The standard of living in Nepal could account for why these dimensions receive such a high impact. With periodical monsoons, landslides and poverty present in the country, the individual might seem to prioritize differently compared to other cultures. Most of the impacted questions that received a higher OHIP-score could be associated to pain and daily activities. The questions with less impact (Fig 5) are associated with social interactions, and it can only be speculated that the population in this study does not value these dimensions high enough to affect their OHRQoL. OHIP was originally constructed and used on a different culture than the one in Nepal. Even though it is validated and translated into many languages around the world, this does not mean that the questions are the most suitably for populations such as in this study.

In contrast to the Brazilian study (42), no correlation between the position of the tooth missing and impact on the total OHIP-score could be found in this study. A systematic review and meta-analysis found five studies investigating the position of lost teeth and the impact on OHRQoL (20). Four studies reported higher impact on OHRQoL for anterior tooth loss and one study indicating similar impact for both anterior and posterior location of tooth loss (20). This Nepalese study provided similar results to the single study found in the systematic review i.e. loss of anterior and posterior teeth showed similar impact on OHRQoL. As speculated earlier the Nepalese population could have a different approach towards the loss of teeth, not valuing the aesthetic needs as highly as other cultures. Although, the results in this study did not corroborate this.

In the Swedish (41) study 21 % reported no problems from the oral cavity compared to KDCH with 3.2 %. The mean total OHIP-score for the different studies was found to be between 6.4 and 11.8 while the participants from the KDCH reported a mean total OHIP-score of 21.6 (SD 12.6). The participants in the Swedish study (41) were invited to take part by mail while the Indian study (43) collected data from patients visiting the dental clinic. The KDCH study only included patients with missing teeth and did not investigate the situation among fully dentate patients. The studies in Brazil (42) and Sweden (41) investigates randomized patients and therefore presents a lower total OHIP-score. This should be taken into consideration when comparing this Nepalese study and the Brazilian (42), Swedish (41) and Indian (43) studies. It is hardly surprising the different approaches to participant selection yielded different results, this is evident when comparing this Nepalese study towards the Indian study (43) where participant selection was similar. The Indian study (43) excluded edentulous patients while this Nepalese study only included edentulous patient which might indicate the value of retaining the original teeth to prevent impact on the OHRQoL.
Reflection regarding developing opportunities
This study aimed to elucidate the value of retaining your natural teeth to further promote oral health and the importance of oral hygiene among people living in Nepal. In addition, there are several volunteer organisations in Nepal and around the world working to identify, prevent and treat dental caries, gingivitis and periodontitis, such organisations could benefit from the data reported in this study, since this study highlights the correlation between tooth loss and OHRQoL. The authors of the present study also want to provide a tool that can help evaluate the perception of oral health among the entirety of Nepal’s population, and be used to differentiate and compare Nepal’s different regions, municipalities and cities.

This study has been carried out at low costs and with little time required, but has generated results that can be used to identify problems or issues that may have an impact on a populations quality of life. By elucidating potential problems or issues it is possible to allocate resources that benefit the populations best interests.

Recommendations for future studies
To more accurately represent the entirety of Nepal’s population, a randomized study using the same questionnaire could be used.

The OHIP-14 questionnaire used was already validated and translated and could be administered even if there was a language barrier between investigator and participant. The option to choose between an English or Nepalese translation were shown to not affect the data collection in neither a positive, nor negative way. By using the English version among participants fluent in English no translator was needed which sped up the data collection. The most frequent users of the Nepalese version was among the elderly population. A majority of the participants chose to use the Nepalese version. To perform similar types of studies in Nepal the authors recommend future investigators to be fluent in Nepalese in case questions regarding the form arise.

With the benefit of hindsight, the authors would recommend excluding the additional constructed questions regarding conservative treatment and financial situation. These questions did not generate any data of interest towards the study’s main purpose, more thorough epidemiological studies on this matter is recommended. Question 6 (appendix 1) could be rephrased as “What’s your reason for visiting the dentist today?” to better differentiate these answers from question 7. Question 7 regarding the frequency of visits, the authors suggests the answers to be adjusted. Instead of chronological answers the answers could have been constructed as statements such as:

- First time ever visiting the dentist
- Only when in need
- On a regular basis

These answers would better represent the frequency of visits to the dentist among the study population.

If future studies wish to investigate the reason for tooth extraction, it is advised to verify the findings with patient journals or data records. By visually inspecting the oral cavity it is not possible to determine the cause for the missing tooth or teeth. The subjective views from the participants in this study cannot be considered as reliable since the knowledge in odontology among the participants is not investigated.
Conclusion
The results demonstrated that in a group of patients recruited in a dental hospital waiting room, most visited the dentist once a year or less. The most common reason for visiting the dentist was acute pain. Contrary to previous findings the participants in this study did not have to travel a long way to reach dental care. The missing teeth’s’ position had no significant impact on the OHRQoL while a greater impact on the OHRQoL could be found with increasing number of missing teeth. The OHIP score with the criteria used in this study was found to be higher in comparison to other international findings. The most common self-reported reason for tooth extraction was dental caries. Since this is the first study of its kind in Nepal, national studies of this nature on a randomized population would be of great interest to better describe the whole entity of Nepal’s population.

Acknowledgements
We would like to thank the following:

Peter Carlsson for his guidance throughout this project.

Dr. Prenit Khumar Pokhrel, Lecturer Department of Oral Maxillofacial Surgery KDCH for all his support to make this study a possibility. Without his help this would not have been possible.

Our invaluable BDS-interns at KDCH; Dinesh Shrestha and Manish Sapkota, for providing help with translation, administration and much, much more.

M. Vikram and V. Singh, for use of their validated and translated version of the OHIP-14 form.

Lena Irwe, for help with establishing a local supervisor in Nepal and inspiration to broaden our visions.
References


Appendix 1: English Questionnaire

Consent form

Tooth loss: Impact on quality of life in a Nepali population

Investigators:
Dental student Jonas Alfredsson, Sweden
Dental student Jakob Attin, Sweden

Before agreeing to participate in this research project, it is of great importance that you read and understand the following explanation of the purpose of the study and how it will be conducted.

Purpose of the study:

The assessment goals for this project is to collect information in order to examine and study the physical and psychological health correlated to tooth loss and individual well-being, in a Nepal population. Later on the assessed data will be analyzed and presented in Sweden and Nepal through different databases.

- I hereby confirm that I have read and understand the information for the study and have the opportunity to ask questions regarding the project.
- I understand that my participation is voluntary and that I am free to withdraw at any time, without giving reason.
- I agree to take part in the project.

Your participation will remain anonymous and will only be used in statistics analysis.

Name of participant: ___________________________ Date: ___________________________ Signature: ___________________________

For the investigator: I certify that I have reviewed the contents of this form with the subject signing above. It is my opinion that the subject understood the explanation given above.

Investigators Signature: ___________________________ Date: ___________________________
1. This survey form has been filled out by:
   - [ ] Patient
   - [ ] Patient with the help of an Investigator or relative

2. Gender:
   - [ ] Male
   - [ ] Female

3. Age: ________ Years old.

4. If possible, would you rather consider a conservative treatment (fillings or crowns) instead of tooth extraction?
   - [ ] Yes
   - [ ] No

5. Does your financial situation prevent you from visiting the dentist?
   - [ ] Yes
   - [ ] No

6. What's your reason for visiting the dentist?
   - [ ] Acute pain
   - [ ] Discomfort in the mouth
   - [ ] Regular dental check-up
   - [ ] Aesthetic reasons

7. How often do you seek dental healthcare?
   - [ ] Once a month
   - [ ] Once every third month
   - [ ] Once every six months
   - [ ] Once a year or less

8. How long do you have to travel in order to reach dental healthcare?
   - [ ] <1h
   - [ ] 1-2h
   - [ ] 2-6h
   - [ ] 6-24h
   - [ ] >24h
<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Never</th>
<th>Hardly ever</th>
<th>Occasionally</th>
<th>Fairly often</th>
<th>Very often</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional Limitation</strong></td>
<td>Have you had trouble pronouncing any words because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you felt that your sense of taste has worsened because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Pain</strong></td>
<td>Have you had painful aching in your mouth?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Psychological discomfort</strong></td>
<td>Have you felt self-conscious because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you felt tense because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical disability</strong></td>
<td>Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you had to interrupt meals because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Psychological disability</strong></td>
<td>Have you found it difficult to relax because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social disability</strong></td>
<td>Have you been a bit irritable with other people because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social handicap</strong></td>
<td>Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you been totally unable to function because of problems with your teeth, mouth or dentures?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**For the investigator:**

Position of all tooth/teeth missing after extraction (*mark with an X*)

---

*STATUS*

---

Reason for tooth extraction:

- [ ] Dental caries
- [ ] Periodontitis
- [ ] Other
Appendix 2: Nepalese Questionnaire

Tooth loss: Impact on quality of life in Kathmandu population

Abhishek Shrestha:
Jonas Alfredsson, Vichary (Dent. Phikitsaashala), Sweden
Jakob Attin, Vichary (Dent. Phikitsaashala), Sweden

This appendix contains questions on dental health and its impact on the quality of life in the Kathmandu population.

1. Have you lost teeth?
2. Did you lose your teeth due to tooth decay or gum disease?
3. Did you lose your teeth due to bone loss or degenerative disease?
4. Do you have any difficulty eating?
5. Do you feel self-conscious about your teeth?

Name ________________ Age ________________ Gender ________________

I certify that this questionnaire is completed by myself

Date ________________

I certify that this questionnaire is completed by myself

Date ________________

 signature

I certify that this questionnaire is completed by myself

Date ________________
Toothloss, Impact on Quality of Life for patients visiting Kantipur Dental College and Hospital, Kathmandu, NEPAL

1. सम्भव घटने का प्रमाण नहीं है?
   □ निरामी □ निरामीको सहयोगी

2. लिंग:
   □ पुरुष □ महिला 3. उम्र: _______

4. चींट निकालनु मन्दा पहिले तपाईले फिलिङ्ग वा बोल राख्ने दिन विचार गर्नु लाग्छ?
   □ नै □ गरिन

5. तपाईलाई वर्तमान चिकित्सक कहाँ जा भर्नेको समस्या कता?
   □ छ □ वैध

6. तपाईले वर्तमान चिकित्सकलाई किन केन्द्रक चाहनुहुन्छ?
   □ दाँत दुख्स्र □ मुखस्र अस्तिको अभाव
   □ नियमित अस्तिक गराउन □ यीहि कयों र अस्तिकाले भर्नु

7. तपाईंले कहाँले अन्य स्वास्थ्यकर्मी कहाँ जानुहुन्छ?
   □ महिनामा एक पटक □ तीन महिनामा एक पटक
   □ छ महिनामा एक पटक □ १ वर्षमा एक पटक

8. दल्दा स्वास्थ्यकर्मी कहाँ समय पुर्न तपाईलाई किन सशयक गर्नु?
   □ प्रति हफ्ता अन्त्य क्रम □ ९ दिनको २ घण्टा
   □ २ दिनको ६ घण्टा □ ६ दिनको २ ४ घण्टा □ २४ घण्टा लाग्ने ब्योजना रहेको
<table>
<thead>
<tr>
<th>Pashu Pahash</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याको कारणमा तपाईलाई कुनै निश्चित उपचारण गर्न गाडो भएको छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>2. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई स्वाद विशिष्ट बनाउन सक्छिन्?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>3. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा मुखमा असाध्य उपाइ भएको छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>4. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई कुनै खानेकुरा खान अजुयारी भएको छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>5. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई खानेकुरा स्वाद विशिष्ट बनाउन गर्न सक्छिन्?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>6. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई उपचारण निर्देशित गर्नुहुन्छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>7. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई आफूलेलो आहार सत्तैनगरक नभएन्छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>8. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई आफूलेलो खानापन छैन परिका छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>9. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई आफूलाई आराम गर्न गाडो भएको छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>10. तपाईको दाँत, मुख वा कृत्रिम दाँतको समस्याका कारणमा तपाईलाई लम्बा वा असाध्य भएको हुन्छ?</td>
<td>☐ कहिले पनि छैन ☐ धेरै कम ☐ कहिलेकाहिं ☐ ठिकिएकै ☐ धेरै पटक</td>
</tr>
<tr>
<td>□ कहिले पति छैन</td>
<td>□ धेरे कम</td>
</tr>
<tr>
<td>----------------</td>
<td>--------</td>
</tr>
<tr>
<td>११. तपाईले दात, मुख वा कृत्रिम दातको समस्याका कारणमा तपाईलाई अरुँमान्द्रसभो भरोसी लागे गर्दछ؟</td>
<td></td>
</tr>
<tr>
<td>□ कहिले पति छैन</td>
<td>□ धेरे कम</td>
</tr>
</tbody>
</table>
| १२. तपाईले दात, मुख वा कृत्रिम दातको समस्याका कारणमा तपाईलाई अफ्नो साझिको काम गर्न अप्नाउरो भएको छ?
| □ कहिले पति छैन | □ धेरे कम | □ कहिलेकाही | □ ठिकठाईके | □ धेरे पटक |
| १३. तपाईले दात, मुख वा कृत्रिम दातको समस्याका कारणमा तपाईलाई आफ्नो जीवन समग्रमा कम सन्तोषजनक भएजस्तो लाग्छ?
| □ कहिले पति छैन | □ धेरे कम | □ कहिलेकाही | □ ठिकठाईके | □ धेरे पटक |
| १४. तपाईले दात, मुख वा कृत्रिम दातको समस्याका कारणमा तपाई काम गर्न पूरा असमर्थ भएजस्तो लाग्छ?
| □ कहिले पति छैन | □ धेरे कम | □ कहिलेकाही | □ ठिकठाईके | □ धेरे पटक |