Oral Health and the Effect on Quality of Life in a Zambian population

Authors
Jenny Chen
Lisa Milton

Supervisor
Carina Mårtensson

Examiner
Pia Andersson
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Authors: Jenny Chen, Lisa Milton
Supervisor: Carina Mårtensson
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Abstract

The aim of this study was to investigate how oral health affects the quality of life among patients attending a dental clinic in Livingstone, and patients attending the Dental training school in Lusaka, Zambia. A total of 160 patients was consecutively selected and participated in the study, between the ages 16-68 (32 ± 11.8; mean ± SD). Interviews were done using a questionnaire “The oral impacts on daily performances” (OIDP). Of all the patients, 80% reported that they were affected by their oral health with at least one problem. Difficulty with “eating and enjoying food” was the most frequently performance affected (54%) and “speaking and pronouncing” was the least performance reported (16%). Overall, 20% of the participants reported that they did not have any problems. When reported having a problem, 3 and 4 number of problems were the most frequently occurring. Two open questions were asked, “What is the reason for your visit” and “What do you think is the problem”. The most common answer to the first question was “pain” (38.8%) and to the second question, “don’t know” (23.1%). This study found that 80% felt that their oral health affected their daily activities and QoL.

Keywords: Africa, developing countries, oral health, oral impacts, OIDP, quality of life
Oral hälsa och hur den påverkar livskvalitén i en Zambisk befolkning

Författare: Jenny Chen & Lisa Milton
Handledare: Carina Mårtensson
Empirisk studie
Datum: 120917

Sammanfattning

Syftet med studien var att undersöka hur den orala hälsan påverkar livskvalitén bland patienter som besökte en tandklinik i Livingstone samt på kliniken vid Dental training school i Lusaka, Zambia. Sammanlagt 160 patienter valdes konsekutivt ut och var i åldrarna 16-68 år (32 ± 11,8; medel ± SD). Studien utfördes genom intervjuer med hjälp av en enkät, ”The Oral Impacts on Daily Performances” (OIDP). Av patienterna svarade 80% att de blev påverkade av deras orala hälsa med minst ett problem. Svårigheter med att ”äta och njuta av mat” var det vanligaste problemet (54%) medan ”att tala och ha bra uttal” var det problem som var minst rapporterat (16%). Överlag, rapporterade 20% att de inte hade några problem alls. När de rapporterade att de hade problem var det vanligaste 3 och 4 antal problem. Två öppna frågor ställdes, ”Varför kom du till kliniken” och ”Vad tror du är problemet”. Det vanligaste svaret på första frågan var ”smärt” (38.9%) och på andra frågan ”vet inte” (23.1%). Denna studie kom fram till att 80% tyckte att deras orala hälsa påverkade deras liv och livskvalité.

Nyckelord: Afrika, livskvalité, OIDP, oral hälsa, oral påverkan, utvecklingsländer
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INTRODUCTION

Oral Health
The WHO describes "oral health" as having no chronic mouth and facial pain, being free from oral and throat cancer, from oral sores, birth defects, dental caries, tooth loss, and gum disease. Factors that can harm the oral health are high amount of alcohol use, tobacco, unhealthy diet and lack of oral hygiene (WHO, 2007).

Periodontitis and caries are two common oral diseases. Worldwide 5-20 % of the adult population suffers from severe periodontitis (Petersen, Bourgeois, Ogawa, Estupinan-Day & Ndiaye, 2005). Periodontitis is a disease which causes damage to the supporting tissue of the teeth. In some cases periodontitis is preceded by gingivitis, which is a reversible inflammation of the gums caused by dental plaque (Löe, Theilade & Jensen, 1965). In periodontitis pocket formation and/or gingival regression are usual findings. There are two types of periodontitis, chronic and aggressive periodontitis. Chronic periodontitis is initiated and maintained with bacterial plaque, and an individual’s host response plays an essential role in the pathogenesis. It also has a slow to moderate progression and is mostly found among adults. The disease can be connected to systemic diseases, for example diabetes mellitus (Mealey, Oates, 2006) or HIV (Reddy, 2007), and other factors such as cigarette smoking (Sreedevi, Ramesh, Dwarakanath, 2012) and stress(Goyal, Jaioo, Nagappa, Rao, 2011). Aggressive periodontitis is characterized by rapid tooth detachment and bone loss, with the severity inconsistent with the amount of bacterial plaque. This disease particularly affects certain teeth like incisors or first molars and is known to be genetic (Lang et al. 1999).

The other common disease, dental caries, affects a majority of adults and 60-90% of children in school (Petersen, Bourgeois, Ogawa, Estupinan-Day & Ndiaye, 2005). It is a disease caused by microorganisms and fermentable carbohydrates. Fermentable carbohydrates increase the rate of demineralization of the tooth tissue, and a high intake of extrinsic sugar can cause a greater risk for caries. A reduced intake of sugar with daily oral hygiene practice and fluoride toothpaste, dental caries can be prevented (Kidd & Joyson-Bechal, 1997; SBU, 2002; Sheiham, 2001). Untreated dental caries lesions lead to eating problems and pain (Makoni, Frencken & Sithole,
An important factor in preventing dental caries is having access to fluoridated water. This can benefit every inhabitant served by community water supplies in a country (Petersen, 2003). Fluoride has a capacity to impact the relationship between tooth and plaque because it can reduce tooth enamel solubility. It also promotes remineralization and can stop early dental caries lesions (Marinho, Higgins, Logan, Sheiham, 2003).

Dental erosion is an increasing oral illness in the world. Approximately 8-13% of the world’s adult population is affected depending on the consumption of acidic drinks, for example fruit juice and sugary drinks (Cate & Imfeld, 1996). Other oral diseases are oral mucosal lesions and oral cancer. The most common oral pre-cancer is leukoplakia (Petersen et al. 2005). Oral cancer is the eighth most frequent form of cancer and is especially high among men, while oropharyngeal cancer is more frequently found in developing countries (Petersen et al., 2005).

**Oral Health in Developing Countries**

In developing countries oral diseases are more common than in industrialized countries. In some developing countries people do not have access to clean water, are often malnourished and live under unhygienic conditions which are a risk to their oral and general health (Petersen, 2003; Auluck, 2005). Oral health services are limited. Preventive or restorative dental care is not a priority and the treatment is often limited to pain relief and emergency care (WHO, 2000; CIA, 2009). When feeling pain or discomfort, poor teeth are often left untreated or are extracted (Petersen, 2003). In Africa the dentist to population ratio is 1:150 000 (CIA, 2009). Most oral health services in Africa can be found at central hospitals which are often located in urban centers (CIA, 2009).

Periodontal disease, dental caries, oral mucosal lesions, xerostomia, salivary gland disease and several HIV/AIDS-related oral diseases particularly occur in poor populations, and are the most frequently found oral diseases in Africa (Petersen, 2006; Petersen, 2008; Ranganathan & Hemalatha, 2006). Because of poor oral hygiene and inadequate dental treatment, periodontal diseases occur from early childhood (Saparamadu, 1984). In periodontitis shallow periodontal pockets are more frequently found than deep pockets among African adults (Enwonwu et al., 2004). Caries is increasing but is still relatively low in most parts of Africa, and it is not a severe
health problem compared in developed countries (Petersen, 2003; Enwonwu, Phillips, Ibrahim & Danfillo, 2004). Fluoride is a vital substance to prevent dental caries (SBU, 2002). In developing countries it has been reported that the initiation of fluoridated toothpastes is a good strategy to prevent caries lesions (Petersen, 2003). Oral candidosis, necrotizing gingivitis, hairy leukoplakia are oral lesions. They are often found among patients suffering from HIV/AIDS, and very often affect the quality of life of the infected (Ranganathan et. al, 2006). In Africa the most common disease is HIV/AIDS (Thorpe, 2003). In 2000 it was reported that approximately 12% of a Tanzanian population was affected by oral candidosis (Matee, Scheutz, Moshy, 2000). Salivary gland disease and xerostomia is a deterioration of the salivary flow and is also linked to HIV/AIDS (Ranganathan et. al, 2006). The occurrence in Africa has been reported to be 47% of the studied Tanzanian population (Matee, Scheutz, Moshy, 2000).

In the early 1990s the dental caries prevalence for decayed, missing and filled teeth (DMFT) in Zambia between the ages 7-18 was 0.4 in the rural areas and in urban areas, DMFT was 1.3 between the ages 13-22 (Noar & Portnoy, 1991). For adults between the ages 35-44 DMFT was 2.9 in the late 1980s (Chintu-Tembo, 1987). In a study at Ndola Central Hospital dental department, it was showed that dental caries is increasing, especially among children and adolescents. This is due to poor oral hygiene, the availability of sugar and lack of natural fluoride. It was also found that periodontitis is noticeably high among males (Kabwe, 1996).

**Oral Health and Quality of Life**

The OHRQoL (oral health related quality of life) concept began to evolve in the late 1970s, and the evidence that oral diseases had a big impact on the QoL grew stronger (Shamrany, 2006). Nowadays oral health integrates with general health and plays an essential role in people’s well-being and QoL (Locker, 2004).

Historically, the oral cavity has been seen as an individual part, not included in the general health status (Locker, 1997). Oral disorders can have just as severe emotional and psycho-social consequences as other disorders (Locker, 1997). Oral diseases such as large caries lesions and periodontal diseases may cause different levels of pain, depending on the severity. Teeth loss may cause difficulty in chewing, and other oral diseases can also cause worry and anxiety. All of
these problems can have a negative effect on personal interactions, social activities and result in lower self-esteem, which in turn can influence their QoL and wellness (Petersen, 2003; Spolsky, Komberg & Lohr, 1983).

Oral health cannot be separated from general health (Locker, 2004). People who already have severe health problems also have a greater risk for developing oral diseases, which in turn can complicate their general health status even more (Petersen, 2003). There could also be an association between periodontal health and general health, especially for cardiovascular diseases (Jansson, Lindholm, Lindh, Groop & Bratthall, 2006) and diabetes (Firatli, 1997). Sociocultural determinant such as poor living conditions, education and access to safe water and sanitation also affects the QoL (Petersen, 2003).

Health problems do not always affect the individuals’ experience of their QoL. A lot of people who suffer from chronic health problems often rate their QoL more highly than healthy individuals (Allen, 2003). This proves that poor health does not equal with poor QoL. People’s attitudes vary over time and changes with experience, and they are forced to cope and adapt (Locker, 1997).

Oral health and QoL can be measured with different questionnaires. Geriatric or General Oral Health Assessment Index (GOHAI) (Atchinson & Dolan, 1990), Oral Health Impact Profile (OHIP) (Slade & Spencer, 1994), and Oral Impacts on Daily Performance (OIDP) (Adulyanon & Sheiham, 1997) are some of these questionnaires. Common to most of these is that they start with questions about oral problems, and are designed to measure problems importance to human welfare and quality of life (Wärnberg Gerdin, 2006). There are not many studies about quality of life outside North America and Europe (Åström & Okullo, 2003). However, a study conducted in Uganda, with the OIDP questionnaire showed that 62% of the participants experienced at least one oral impact that affected their daily life during the last six months (Åström & Okullo, 2003). Therefore it is interesting to conduct a similar study in Zambia concerning oral health and the effect on QoL.
AIM
The aim of this study was to investigate how oral health affects the quality of life among patients attending a dental clinic in Livingstone, and patients attending the Dental training school in Lusaka, Zambia.

MATERIALS AND METHODS
The study took place in Livingstone and Lusaka, between January and February 2012. During this time 160 interviews were conducted, using the OIDP questionnaire. At the end of the period data was summarized and analyzed.

Interview
The study was conducted at the Dental Training School in Lusaka and the Batoka dental clinic in Livingstone (Acknowledgement). The criterion for participating in the study was the ability to understand and speak English, and to be more than 15 years of age. Data was collected with personal interviews using a questionnaire (OIDP). A total of 160 interviews were conducted by the authors, 80 respectively at the two clinics. A consecutive selection was performed on patients attending the Dental Training School in Lusaka and the dental clinic in Livingstone. Every patient attending the clinics was asked to participate during the time of the study. Some of them did not want to participate and the loss was not documented. The interview was performed in a private room in Lusaka and in a room attached to the treatment room in Livingstone, before the patients visited the dentist or the dental therapist. The interviews were conducted before noon every day. Participation in the study was not mandatory and was designed to be anonymous. Only information about the participants’ age and gender were documented. Before the interview a document was handed out to the patients with information about the aim of the study, the study methods and aspects concerning their participation. This allowed the participants to ask questions about their participation. The participants had to understand their ethical rights before participating in the study. In addition to the questionnaire, the authors personally asked the patients two questions e.g. “What is your reason for visiting this clinic?” and “What do you think is the problem?” The second question was targeted to the reason of the problem that the
participants reported in question one. After every interview the patients were given a toothbrush for participating.

**Questionnaire**
The OIDP questionnaire (Appendix 2) was used and it measures how oral disorders can have an impact on functioning, well-being and quality of life (Adulyanon & Sheiham, 1997). It focuses on 8 physical, psychological and social aspects of daily life, and asks if the participants have experienced difficulties with these activities during the past six months, due to problems with their mouth and teeth, i.e. eating and enjoying food; speaking and pronouncing clearly; cleaning teeth; sleeping and relaxing; smiling, laughing and showing teeth without embarrassment; maintaining usual emotional state; carrying out major work or social role and enjoying contact with people. If the participant has had difficulty with an activity, they were asked to answer if they have had the problem on “regular basis” or “part of a period”. The questionnaire also asks the participants to estimate the frequency and the severity of their difficulties. Frequency stands for “how often” or “how much” the problem occurs, and is asked if the participant answers “regular basis” respectively “part of period” on the previous question. “How often” ranges from 1 to 5, where 1 is “less often than once a month” and 5 is “every day or nearly every day”. “How much” also ranges from 1 to 5, where 1 stand for “five days or less” and 5 stands for “more than 3 months”. Severity stands for how much the difficulty affects the participants’ daily lives. The severity scores ranges from 0 to 5, where 0 is “no effect” and 5 is “very severe effect” (Appendix 2). To provide a personal score for each participant the frequency score and the severity score were multiplied. This score was then divided by the sum of the highest possible score on all the eight performances (200). This was then divided by 100 to obtain the individual OIDP score (OIDPsc). The total personal score gives information about the frequency and severity on the participant’s everyday activities.

**Statistical Analyses**
To present data, descriptive statistics was used. Cross-tabs were used to present results by gender. The program Statistical Package of Social Sciences, SPSS 20.0 was used for analyzing the data.
ETHICAL CONSIDERATIONS
To respect and protect the participant’s integrity by adapting to their tradition and culture, as ethical principles should always be taken into consideration (Forsman, 2005). In line with The World Medical Association, the participants were adequately informed about the purpose, methods, potential conflicts of interest, the expected benefits, and possible risks that the study might have entailed. The participant must be informed of their right to refrain from participating in the study and that he or she may at any time terminate participation without suffering retaliation (The World Medical Association, 2008). All information about the questionnaire also had to be clear before starting the interview. The participants were also informed that the information and answers were strictly confidential and no unauthorized had access to the questionnaires. The questionnaires were kept in a safe deposit and when the study results have been compiled and passed examination the questionnaires will be destroyed (Olsson & Sörensen, 2007).
RESULTS

Study Sample
A total of 160 patients were interviewed during a period of nine weeks. Of these 43% were men (n= 69) and 57% were women (n= 91). The age ranged from 16 years to 68 years old (32 ± 11.8; mean ± SD).

Table 1. Description of study subjects age (n=160)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Women %* (n=91)</th>
<th>Men %* (n=69)</th>
<th>Total n* (n=160)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-25</td>
<td>35.2</td>
<td>39.1</td>
<td>59</td>
</tr>
<tr>
<td>26-35</td>
<td>35.2</td>
<td>21.7</td>
<td>47</td>
</tr>
<tr>
<td>36-45</td>
<td>16.5</td>
<td>17.4</td>
<td>27</td>
</tr>
<tr>
<td>46-55</td>
<td>9.9</td>
<td>13.0</td>
<td>18</td>
</tr>
<tr>
<td>56 ≥</td>
<td>3.3</td>
<td>8.7</td>
<td>9</td>
</tr>
</tbody>
</table>

* Numbers are round off and are therefore may not be exactly 100%
Oral Impacts on Daily Performances
Among the 160 subjects a total of 80% responded that their oral health affected their daily performances. The individual OIDP score ranged from 0 to 77.5 and the mean score was 14.8.

In the OIDP questionnaire “eating and enjoying food” was the most frequent reported performance (53.8%) and the performance with the least oral impact was “speaking and pronouncing clearly”, affecting 16.3% of the patients (table 2).

Table 2. Frequency distribution of patients affected with OIDP (n= 160)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Affected*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes %</td>
</tr>
<tr>
<td>Eating and enjoying food</td>
<td>53.8</td>
</tr>
<tr>
<td>Speaking and pronouncing clearly</td>
<td>16.3</td>
</tr>
<tr>
<td>Cleaning teeth</td>
<td>41.3</td>
</tr>
<tr>
<td>Sleeping and relaxing</td>
<td>46.9</td>
</tr>
<tr>
<td>Smiling, laughing and showing teeth without embarrassment</td>
<td>34.4</td>
</tr>
<tr>
<td>Maintaining usual emotional state without being irritable</td>
<td>29.4</td>
</tr>
<tr>
<td>Carrying out major work or social role</td>
<td>33.8</td>
</tr>
<tr>
<td>Enjoying contact with people</td>
<td>34.4</td>
</tr>
</tbody>
</table>

* Numbers are round off and are therefore may not be exactly 100%

The mean number of problems for the total sample was 2.89 (SD. 2.2). Of all the patients 20% was not affected by OIDP. Among women 17.6% and 23.2% among men, reported that they were not affected. The most frequent number of problems occurring was 3 and 4. The number of problems most commonly found for women was 0, 3 and 4 problems. For men it was 0, 2, 3 and 4 number of problems (table 3).
**Table 3.** Prevalence of impacts according to gender and the total

<table>
<thead>
<tr>
<th>Number of problems</th>
<th>Female (n=91)</th>
<th>Male (n=69)</th>
<th>Total (n=160)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%*</td>
<td>%*</td>
<td>%*</td>
</tr>
<tr>
<td>0</td>
<td>17.6</td>
<td>23.2</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>9.9</td>
<td>10.1</td>
<td>10.0</td>
</tr>
<tr>
<td>2</td>
<td>12.1</td>
<td>18.8</td>
<td>15.0</td>
</tr>
<tr>
<td>3</td>
<td>17.6</td>
<td>15.9</td>
<td>19.9</td>
</tr>
<tr>
<td>4</td>
<td>17.6</td>
<td>14.5</td>
<td>16.2</td>
</tr>
<tr>
<td>5</td>
<td>8.8</td>
<td>4.3</td>
<td>6.9</td>
</tr>
<tr>
<td>6</td>
<td>9.9</td>
<td>4.3</td>
<td>7.5</td>
</tr>
<tr>
<td>7</td>
<td>3.3</td>
<td>8.7</td>
<td>5.6</td>
</tr>
<tr>
<td>8</td>
<td>3.3</td>
<td>0.0</td>
<td>1.9</td>
</tr>
</tbody>
</table>

* Numbers are round off and are therefore may not be exactly 100%

In addition to the questionnaire two more questions were asked, (1) “What is the reason for your visit” and (2) “What do you think is the problem”. The patients had the opportunity to answer freely on these questions. Overall, the most common answer on question one was “pain” (38.8%) and “remove teeth” (30.6%). Other answers given on the first question were “cavity” (3.8%), “fix tooth” (0.6%) and “clean teeth” (3.8%). On the second question the most frequent answer was “do not know” (23.1%) and “cavity” (18.8%). Less frequent answers were “infection/illness” (3.8%), “food” (11.2%) and “bad habits” (0.6%).
DISCUSSION

Material and Method
The OIDP questionnaire has been validity tested in a few countries (Adulyanon, Vourapukjaru & Sheiham, 1996; Tsakos, Marcenes & Sheiham, 2001). In Africa studies have been made in Uganda and Tanzania with acceptable psychometric properties (Åstøm et al., 2003; Masalu & Åstrøm, 2003), therefore the questionnaire has been chosen for this study.

Both an urban and rural population was represented in the study. Thus, patients coming from Lusaka, which is the capital city of Zambia, may consist of mostly urban dwellers. People living in Livingstone however, can be assumed to consist of both rural and urban dwellers. The urban population may have been over-represented and therefore affected the results, since it has been reported that people living in urban areas more often have better periodontal health (Varenne, Petersen, Ouattara, 2004). Furthermore, the study sample may consist of a middle class population, since dental treatment has to be paid for. Therefore, the population living in poverty, 64 percent of the total population in 2008, assumable does not visit the dental care and are not represented in this study (UNICEF, 2008). This study therefore does not stand for the entire population of Zambia.

On patients attending the clinic before noon a consecutive selection was performed. In the mornings both clinics had “drop in”, where people suffering from oral problems were seen and in the afternoons they had appointments, consisting of mostly scaling. Conducting interviews before noon were more relevant and interesting for this study. Because of the consecutive selection in the study, slightly more females were interviewed than men and most of the participants were in the age of 16-25. The mean age was rather low; however, OIDP has previously been used on adolescents, adults and an elderly population (Åstrøm & Wold, 2012; Adulyanon et. al, 1996; Zeng, Sheiham, Bernabé, Tsakos, 2010). By using a stratified sampling, e.g. a predetermined number of patients participating in each age group, a more even study sample could have been obtained. A weakness in this study is that, the number of patients that refused to participate in the study and how many patients that visited the two clinics were not documented. Due to organizational constraints, this documentation was not possible.
It was expected that every patient would speak and understand English in Zambia because they learn it in school and it is the national language. Despite this, there were some difficulties with speaking and understanding some of the patients. This was most experienced in Livingstone, where some questions had to be explained. For example, the question about “maintaining usual emotional state without being irritable” sometimes was difficult to understand, and a further explanation had to be done. No questions were however dismissed, either in Livingstone or in Lusaka.

In the study interviews were conducted using the OIDP questionnaire, without clinical data. However, it would have strengthened this study to collect clinical data and get a wider perspective of OIDP, since this has been made in previous studies (Andersson, Hakeberg, Karlberg & Östberg, 2010; Johansson, Johansson, Unell, Ekbäck, Ordell & Carlsson, 2011; Kavakure, 2008). It was not possible to collect clinical data because of organizational reasons. Instead two additional questions were asked to the participants.

**Results**

This study found that 80% of all the participants had at least one oral impact that affected their daily performances. This is a higher prevalence than those found by Kavakure (2008) where 58% in Zambia was affected and in a study conducted in Sweden by Andersson et. al. (2010), reporting that 44% were affected. There is however a difference in participants affected between this study, conducted in a developing country and the study conducted by Andersson et al., where the participants were from a developed country. A reason for higher impact in developing countries could be that the burden of oral disease is great in disadvantaged and poor populations. There is also the fact that in developing countries not as much money is spent on oral health care, prevention and oral health care personnel as in developed countries. This study also found a higher amount of participants affected by OIDP compared to that of Kavakure (2008). A reason could be that this study also included participants from Lusaka, which may mostly consist of an urban population. It may be because it has previously been shown that the prevalence of caries is significantly higher in urban 12-year olds than rural (Varenne et al. 2004), which has also been
shown to affect the QoL. Regional oral health is reflected by risk factors related to living conditions, lifestyles and the execution of preventive oral health systems (Petersen 2008).

Of all the participants in this study 80% reported that their oral health affected their daily life. This could be due to that in 2007 14.3-16.4 percent of the adult population in Zambia lived with HIV/AIDS (WHO, 2008). Among these 40-50 percent has oral manifestations as a result of the disease. These manifestations can affect the QoL negatively by causing reduced salivary flow, producing a dry mouth with difficulty in chewing, swallowing and tasting food (Petersen et al., 2008).

The participants in this study experienced most problems with “eating and enjoying food” which corresponds to previous studies conducted in Europe (Montero, Yarte, Bravo & López-Valverde, 2011) and in studies conducted in Africa (Åström et al., 2003; Kavakure, 2008). The results also showed that 38.9% reported pain and 3.8% reported dental caries as their reason for visiting the dental clinics. When having dental caries, especially large caries lesions, eating and enjoying food can be painful and difficult. Caries lesions can, depending on the severity, produce different levels of pain (Spolsky et. al, 1983). A study conducted with OHIP-14 on adults in India, showed that dental caries has an effect on the QoL (Acharya, 2008).

The second most affected problem in this study was “sleeping and relaxing”, which is also shown in Kavakure’s (2008) study. In this study 38.8% of the participants were suffering from pain. It has been shown that people with pain often have problems with insomnia (Wilson, Eriksson, D’Eon, Mikail, Emery, 2002). According to another study, insomnia is associated with a reduced QoL, influencing mental health, vitality and general health, which can cause depression and anxiety (Katz & McHorney, 2002).

The activity with the least oral impact was “speaking and pronouncing clearly”, where 16% of the participants were affected. It seems that “speaking and pronouncing clearly” is not a major concern in Zambia, since previous studies also found the least oral impact on this activity (Kavakure, 2008). However, HIV/AIDS gives in approximately 50% of the cases oral
manifestations such as different kinds of candidosis, leukoplakia and reduced salivary flow, that in turn may affect speaking, pronouncing and QoL (Petersen et al. 2008).

The participants from both cities reported that they did not know the reason behind their oral problem (23.1%). A reason could be that not enough time and money is spent on education about the oral health and primary preventive care to the population, since the total governmental expenditure on health in 2009 was $36 per capita (WHO, 2011). Another reason could be that preventive or restorative care not is a priority (WHO, 2000; CIA, 2009), since it has been reported that only 50% of secondary high-school students had ever been to a dentist (Hagberg & Sjödal, 2007). It may also be noted that in Zambia, 491 oral health care personnel were employed, and the dentist to population ratio was 1/290 000 in 2004 (Ministry of Health, 2009).

The participants reported that they came to the dental clinic because of “pain” (38.9%). It may be because of the economic status some people do not visit the dental clinic until the oral problem gives psychical or psychological manifestations, since in 2006 51% of the population in Zambia lived in extreme poverty (e.g. living on less than $1.25-1.5 per day) and 20.7% of the participants had been denied care from a health facility because they were unable to pay (The Government of the Republic of Zambia & the United Nations Country Team, 2008; Central Statistical office Zambia, Central Board of Health Zambia, ORC Macro, 2003).

To reduce the oral impact on daily life, the introduction of economic barriers, the assuring of high quality care and promotion of healthy lifestyles are important (Åstrøm, Ekback, Ordell & Unell, 2011). By making some dental care free, more people may have the opportunity to visit the dental clinic regularly. In 2012 the government of Zambia declared that some dental care should be free. According to Dr. Mtolo at The Dental Training school “free dental care is given to everyone in all clinics under districts at primary health care level” (Mtolo, P.P. personal communication, 2012).

Overall, 80% of the patients had troubles with their daily life because of their oral health. An oral problem may presumably give symptoms that affect not only one but several daily activities. Pain may cause difficulties in eating as well as cleaning teeth properly and getting a good night’s
sleep. Embarrassment over the appearance of the teeth may harm the self-confidence and temperament of an individual so they cannot enjoy contact with people.

CONCLUSION
This study found that 80% felt that their oral health affected their daily activities and QoL. The performance most affected was “eating and enjoying food”. This study showed that oral health affects the quality of life in a Zambian population.

ACKNOWLEDGEMENTS
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REFERENCES


Mtolo, P.P. Personal communication, 2012-05-08.


APPENDIX 1
ORAL IMPACTS ON DAILY PERFORMANCES (OIDP)

AGE: ............
GENDER: ............

This question formula asks questions if the interviewed person has had problems related to the mouth and teeth which result in having difficulties with some of the daily activities and behavior. If it’s the case, I will then ask the frequency (how often) of the difficulty and its effects on your daily life.

**In the past 6 months, have you had any difficulty......... due to problems with your mouth and teeth?**

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
<td>Regular Basis</td>
<td>Part of period</td>
<td>How often?</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(1-5,9)</td>
<td>(1-5,9)</td>
<td>(0-5,9)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating and enjoying food</td>
<td>Every day or nearly every day.......5</td>
<td>For more than 3 months...............5</td>
<td>Very severe effect.......5</td>
</tr>
<tr>
<td></td>
<td>About 3-4 times a week...............4</td>
<td>For more than 2, up to 3 months.......4</td>
<td>Fairly severe effect.......4</td>
</tr>
<tr>
<td></td>
<td>About 1-2 times a week...............3</td>
<td>For more than 1, up to 2 months........3</td>
<td>Moderate effect...............3</td>
</tr>
<tr>
<td></td>
<td>About 1-2 times a month.............2</td>
<td>For more than 5 days, up to a month...2</td>
<td>Fairly minor effect........2</td>
</tr>
<tr>
<td></td>
<td>Or less often than once a month....1</td>
<td>Or for 5 days or less..................1</td>
<td>Very minor effect........1</td>
</tr>
<tr>
<td></td>
<td>Can’t say............................9</td>
<td>Can’t say............................9</td>
<td>No effect...................0</td>
</tr>
</tbody>
</table>

**CODE**
APPENDIX 2

Survey information

We are two dental hygienist students from Kristianstad University, Sweden. Our names are Ms. Lisa Milton and Ms. Jenny Chen. As a part of our Bachelor Degree we will conduct interviews among patients attending this dental clinic. We hope You would like to participate!

The aim of this study is to investigate if oral health affects the quality of life. The interviews are not mandatory and You can always choose to cancel the participation in the study. Everything will be confidential, which means nothing can be traced back to You. The interview questionnaires will be destroyed after the completion of the study.

Feel free to ask us questions. We will be happy to answer them!

Yours sincerely,

Jenny Chen & Lisa Milton
Dental Hygienist students
Kristianstad University, Sweden