

## Previous toothache, dental visits and caries presence among primary school children in Dar es Salaam

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### Abstract

**Background:** Dental pain is an ache or soreness within or around a tooth. It has a wide range of etiology, the commonest being dental caries. Dental pain is one of the main reasons for seeking dental care. **Objectives:** To assess the relationship between experiences of toothache, dental visits and caries experience among primary school children in Dar es Salaam. **Subjects and Methods:** This was a cross-sectional study carried out among children attending standard one, two and three at Olympio primary school. Each of these classes had three streams, one stream was randomly picked and all children from selected classes who were present on the examination day were recruited. Structured questionnaires were used to interview children and clinical forms to record findings of clinical examinations which were done under natural daylight. Pain was recorded as ever had toothache or not. Those who reported history of toothache were asked whether they had ever been to a dentist due to toothache. Caries was scored according to WHO criteria, then children were categorized into caries free and having at least one DMFT. Analysis was done using Statistical Package for Social Sciences (SPSS) version 13.0. Frequency tables were generated and Cross tabulations done. Chi- square test was employed to test statistical differences. P-value of >0.05 was set as a level of significance. **Results:** A total of 203 pupils were examined, 57.1% of them being girls. One hundred and twenty (59.1%) children reported toothache experience. Majority were females (55.0%). Among the 120 who reported pain, only 76 (63.33%) had consulted a dentist for toothache. Most (70.94%) of the pupils were found with dental caries which was more prevalent (79.2%) among the children who reported pain experience, than those who did not (59%). The difference was statistically significant. There was no difference in caries presentation between the group which had seen a dentist (78.9%) and those with no history of consulting a dentist (79.5%) for toothache. **Conclusion:** A large proportion of children (59%) reported history of dental pain. Out of those who have had pain 63.3% had consulted a dental professional and of those who had consulted a dentist for dental pain, a significant proportion (79.2%) was found with caries.

Running title: Toothache, dental visits and caries experience

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### Introduction

Dental pain (toothache) also known as odontalgia or less frequently odontalgy, is an aching pain or soreness within or around a tooth (1,2). Dental pain may result from a wide range of sources. These include dental caries, fractures, an exposed tooth root, gingival and periodontal diseases, and impactions. The pain can also be referred from elsewhere for example the temporomandibular joint (TMJ) disorders (2). In addition to causing pain, if left untreated, dental caries may lead to numerous complications such as dental abscesses which may even migrate to facial spaces, osteomyelitis of the facial bones, and loss of teeth due to extractions, thus loss of function and negative consequences leading to dental malocclusion (3-4). Besides the medical implications and discomfort that may result from dental caries a child's daily activities may be affected, like play, sleep, eating and school

activities (5-8). Dental pain is common among children, reported to range from 5% to 52% in various countries (6,9-12), and is higher among older children and those from lower social economic groups who have limited access to care (6,8,10). Dental pain among children is a sizeable problem with substantial consequences for the children, their guardians and the society as a whole (11). It has been established as a public health problem based on its impacts on the society in form of the high cost of curative treatment, absenteeism from school and the use of medications (13). Even in countries where caries prevalence in children is low, dental pain and discomfort have been cited as the common reasons for seeking dental treatment (6,13).

Although a big percentage of the population may have experienced dental pain, it is common for people to

delay if not avoid seeking dental treatment. For instance, Jurgensen and Petersen reported that while 69% of the children in Lao had toothache during the previous 12 months, only 29% reported dental visits for that period and 42% had never seen a dentist (5). Other patients would try other treatments prior to seeking professional help (14,15). Some of the reasons for delaying or avoiding seeking dental consultations are reported to include cost, distance, fear, negligence, poor dental services or not getting treatment promptly even on visiting a dentist (5,15-17). Shqair et al in 2012 (14) reported that a large number of children was brought to dentists with complaints which started long before, indicating delay.

Another study shows that health seeking behavior for dental concerns and consequently the exposure to dental services is low (18). Furthermore, despite presence of other dental conditions among Tanzanians such as gingivitis, visible dental plaque, trauma and oral tumors (19-21), caries remains the leading dental disease and the main cause of pain, (19,20, 22). Besides many reports showing a high need for dental treatment among Tanzanians, utilization of dental services is low (19). It is however not known whether those who have dental pain do visit a dentist or they endure the pain. Therefore, the aim of this study was to determine the proportion of children with caries, experience of pain and visits to the oral health facility among primary school children in Dar es Salaam.

### **Subjects and methods**

This was a cross-sectional study carried out in 2010 at Olympio primary school which was conveniently selected. The study recruited a total of 203 pupils aged between 6 to 13 years old who were attending standard one, two and three. These classes were also conveniently chosen. Each of these classes had three streams, one stream was randomly picked and all children from selected classes who were present on the examination day were invited to take part in the study.

The research instrument had two parts: questionnaire and clinical form. The questionnaire was structured. It inquired on participants' socio-demographic information as well as their dental pain experiences and history of dental visit. The clinical form provided for recording of findings of the clinical examination.

Interviews and examinations were done under natural daylight by 36 dental students who worked in pairs. All children were asked to recall previous experiences of dental pain and those who reported history of pain were asked whether they had visited a dentist due to

dental pain. The examinations carried out under natural day light using mouth mirrors to aid vision were simple as no sophisticated instrumentation was employed. The examination was supervised by two instructors. Caries was scored according to WHO criteria (23). Caries was detected tooth by tooth, and the affected teeth were noted. Lesions were recorded as present when a carious cavity was apparent on visual inspection. Examined children were categorized into those who were caries free (DMFT = 0) and those who had caries experience (DMFT $\geq$ 1). Analysis was done using Statistical Package for Social Sciences (SPSS) version 13.0. For the purpose of analysis the children were categorized into two age groups, split at the median: younger (6-8years) and older (9-13years) groups. DMFTs for permanent dentition and that for deciduous dentition were calculated separately. Frequency tables were generated and cross tabulations done. Chi-square test was employed to test for statistical significant differences. P-value of  $\leq 0.05$  was set as a level of significance.

Written consent was sought from the child's parents or guardians. Verbal consent was sought from the children. The children who were found with dental problems were referred to the pediatric dental clinic at the dental school where free treatment was offered.

### **Results**

A total of 203 children were examined, 116 (57.1%) of whom were girls. The sample included children between 6 and 13 years of age with a mean age of 8.28 years. The group constituted slightly more of the younger pupils (53.2%), than the older ones. This was true for both males, and females, and the difference was statistically significant (P <0.01), (table 1).

One hundred and twenty children (59.1%) reported to have had toothache experience at some point in their lives. Majority of those who reported to have had toothache were females 66 (55.0%). Nonetheless, 62% of the boys had toothache compared to about 57% of the girls. This difference was however not statistically significant (p= 0.458). Age distribution versus history of toothache showed that 61 (56.5%) of the younger children reported history of toothache compared to 59 (62.1%) of the older group. The difference was not statistically significant, (table 2)

Among 120 children who reported to have had toothache, only 76 (63.33%) of them reported to have ever seen a dentist due to toothache. Sixty three percent of the boys and similar percentage (63.6%) of the girls had at least once been to a dentist due to toothache. Regarding age groups, most of the older

children (69.5%) had seen a dentist due to toothache compared to the younger children (57.4%). Likewise,

this difference was not statistically significant, (table 3).

**Table 1: Distribution of the participants by Sex and age group categories**

|           |               | Male        | Female       | Total       |         |
|-----------|---------------|-------------|--------------|-------------|---------|
| Age group | 6 to 8 years  | 37 (18.23%) | 71 (34.98%)  | 108 (53.2%) | P=0.008 |
|           | 9 to 13 years | 50 (24.63%) | 45 (22.17%)  | 95 (46.8%)  |         |
| Total     |               | 87 (42.86%) | 116 (57.14%) | 203 (100%)  |         |

Out of 203 pupils examined 144 (70.94%) were found with at least one carious tooth in either permanent or deciduous dentition but only 43 (21.2%) had caries on their permanent dentition. The DMFT for permanent dentition ranged from 0 to 6 (mean DMFT = 0.3941). On the other hand, the “dmft” for deciduous dentition ranged from 0 to 17, (mean dmft=3.0246). Fewer children had high DMFT/dmft compared to many who fall to the low DMFT/dmft. Decayed teeth composed most of the DMFT/dmft scores. Only 4 restorations and no missing teeth were recorded.

A larger proportion (79.2%) of the 120 children who reported to have experienced toothache were found with caries at the time of examination compared to those who had no toothache experience whom only 49 (59.0%) out of 83 were found with caries. This difference was statistically significant ( $p < 0.01$ ). The proportion of children found with caries was comparable among those who reported to have visited a dentist for toothache (78.9%) and those who have never visited a dentist for toothache, (79.5%), (table 4).

**Table 2: History of toothache by sex and age**

|            |           | Ever had a toothache? |            | Total        | P value |
|------------|-----------|-----------------------|------------|--------------|---------|
|            |           | Yes                   | No         |              |         |
|            |           | 120 (59.1%)           | 83 (40.9%) | 203 (100.0%) |         |
| Sex        | Male      | 54 (62.1%)            | 33 (37.9%) | 87 (100.0%)  | P=0.458 |
|            | Female    | 66 (56.9%)            | 50 (43.1%) | 116 (100.0%) |         |
| Age groups | 6-8years  | 61 (56.5%)            | 47 (43.5%) | 108(100.0%)  | P=0.416 |
|            | 9-13years | 59 (62.1%)            | 36 (37.9%) | 95(100.0%)   |         |

Among all the 203 pupils who were examined, only 34 (16.7%) never had toothache and were caries free while 25 (12.3%) children reported toothache experience but were caries free. Forty nine (24.1%) children who had no history of toothache presented with caries. The difference in toothache experience between those who had caries and those who were caries free was statistically significant, ( $p < 0.01$ ), (table 4).

### Discussion

This study was conducted to find out the prevalence of children who had previous experiences of dental pain and how many had visited a dentist for treatment. It was also intended to determine how many of them presented with dental caries at the time of study. To do that, the study had to request children's past experiences. Interpretation of the study findings therefore must bear in mind of possible recall bias. Furthermore, the study did not explore the reason behind the poor dental visit practices; therefore failure to explain the reasons behind what was observed.

The sex distribution of study participants (0.75:1 males to females) was slightly skewed from normal by which children under 15 years of age the ratio of males to females is 1.01:1 (24). Probably coincidentally there were more girls in the classrooms selected to take part in the study.

The prevalence of dental pain as reported by children in this study was high (59.1%) and concurs with other studies done among primary school children within and outside the region which also reported high prevalence of dental pain (9, 11). Of those who have had pain, slightly more than half were girls. This small difference is likely to be influenced by the larger number of girls who participated in the study. On the other hand, more of the boys have had pain unlike other studies which reported the impact of dental pain to be more among females (13). The results of this study however agrees with the findings reported by Lincoln et al (2004) who also found no association between female sex and high prevalence of dental pain (25). A similar inconclusive association have also been reported by Mirian et al (26)

**Table 3: Experience of ever seeing a dentist for toothache by sex and age –**

|            |           | Ever seen a dentist for toothache? |            |              | P value |
|------------|-----------|------------------------------------|------------|--------------|---------|
|            |           | Yes                                | No         | Total        |         |
|            |           | 76 (63.3%)                         | 44 (36.7%) | 120 (100.0%) |         |
| Sex        | Male      | 34 (63.0%)                         | 20 (37.0%) | 54 (100.0%)  | P=0.939 |
|            | Female    | 42 (63.6%)                         | 24 (36.4%) | 66 (100.0%)  |         |
| Age groups | 6-8years  | 35 (57.4%)                         | 26 (42.6%) | 61 (100.0%)  | P=0.169 |
|            | 9-13years | 41(69.5%)                          | 18(30.5%)  | 59(100.0%)   |         |

Majority 76 (63.33%) of those who had reported experiencing a toothache, had seen a dentist. It is likely that pain had influenced the children's visits to the dentist which may be in line with the outcome of the study which reported that most (77% to 97%) of patients sought treatment for pain, (22). Dental care seeking behavior was not different between sexes. At this stage of life the decision maker to seek treatment is usually the parent, hence cannot say much about personalities of boys or girls. Furthermore, slightly more of the older children than younger ones reported dental visits. The plausible explanation can be because the older children are able to express themselves to their parents better than younger ones. The fact that

nearly 40% of the children who have had dental pain had never visited a dentist implies that a substantial number of children live with pain without receiving professional intervention. This may be due to: lack of awareness among both parents and children, or lack of affordability to pay for the required services. It may also be due to lack of prioritization of children's health needs. Low utilization of dental services have also been reported by another study which reported a proportion of people who seek oral health care to be alarmingly low (27). This study however did not explore the reasons behind no attendance to dentist.

**Table 4: Distribution of children with caries by toothache experience and history of seeing a dentist for toothache**

|                                      |       | Caries free | At least one decayed tooth | Total        | P value |
|--------------------------------------|-------|-------------|----------------------------|--------------|---------|
| Ever had a toothache?                | Yes   | 25 (20.8%)  | 95 (79.2%)                 | 120 (100.0%) | P=0.002 |
|                                      | No    | 34 (41.0%)  | 49(59.0%)                  | 83 (100.0%)  |         |
|                                      | Total | 59 (29.1%)  | 144 (70.9%)                | 203 (100.0%) |         |
| Ever seen a dentist for a toothache? | Yes   | 16 (21.1%)  | 60 (78.9%)                 | 76 (100.0%)  | P=0.938 |
|                                      | No    | 9 (20.5%)   | 35 (79.5%)                 | 44(100.0%)   |         |
|                                      | Total | 25 (20.8%)  | 95 (79.2%)                 | 120 (100.0%) |         |

The number of children with untreated dental caries in both deciduous and permanent dentition was high (70.9%). The observation of such a high number of children who go with their dental needs unattended has been reported by other studies done in Tanzania. For example, Mashoto et al (12) found that a substantial proportion of students examined suffered from unattended dental caries. Although studied a more defined population of handicapped children, Simon et al (19) drew a similar conclusion on lack of dental attention despite treatment needs for pupils.

The fact that nearly 79% of those who had been to a dentist still had caries at the time of study suggest that seeing a dentist did not seem to influence future chances of someone experiencing caries since caries was diagnosed only when cavities were apparent on visual inspection. This is perhaps due to lack of comprehensive treatment planning or rather lack of

patient motivation which may contribute to patients not returning to complete their treatment. It could also be due to other factors such as financial or other restraining influences which were not explored in this study.

As has been previously reported (5-8) the children who have dental pain are likely to have been affected in their daily activities such as play, sleep or eating disturbance and loss of school hours.

**Conclusion and recommendations**

A large proportion of children (59%) reported history of dental pain. Out of those who have had pain 63.3% had consulted a dental professional and of those who had consulted a dentist for dental pain, a significant proportion (79.2%) was still found with caries. We recommend to dental professionals to educate parents to consult dentists whenever their children have dental problems.

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