Original Article

International Journal of Dental and Health Sciences
Volume 04,Issue 03

# ORAL HEALTH STATUS OF CHILDREN WITH MALIGNANCIES AT MUHIMBILI NATIONAL HOSPITAL

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## ABSTRACT:

**Background:** Maintaining optimal oral health among children with malignancies (CWM) is important for treatment outcome and quality of life. There is a need to assess oral health status of CWM and ascertain its relationship with their caretakers' oral health knowledge and practices.

**Methods:** Information on oral health knowledge and practices from caretakers of CWM was collected. Clinical examination of each child included assessment of dental caries, oral hygiene and oral mucosal lesions.

**Results:** There were 88 CWM with their caretakers. Of the 88 CWM, 63.6% were male with mean age of 6.5 ± 4.0 years, ranging from 6 months to 17 years. Of the 88 caretakers 66.7% had knowledge on causes of dental caries and 96.6% knew the clinical presentation of dental caries, likewise 63.6% of caretakers had adequate oral hygiene practices, and 69% of them perceived their child's oral health as good. Among the CWM, the simplified oral hygiene indices (S-OHI) for poor, fair and good oral hygiene were 48.8%, 21.0% and 30.2% respectively. The means for DMFT, DMFS, dmft and dmfs were; 0.13 ± 0.49, 0.26 ± 0.97, 0.8 ± 2 and 1.9 ± 6.59 respectively.

**Conclusion:** The caries experience in the CWM was low and oral hygiene index of majority was either good or fair. The observed favourable oral health status could be contributed by efforts of clinical staff on instructing and supporting CWM with regards to oral hygiene.

**Keywords:** caretakers, child malignancies, knowledge, oral health status, practices.

## INTRODUCTION:

Cancer is a mass of tissue formed as a result of abnormal, excessive, uncoordinated, autonomous and purposeless proliferation of cells even after cessation of stimulus for growth which caused it. [1] It is caused by both external and internal factors that may act together or in sequence to initiate or promote carcinogenesis.[2] The development of most cancers is a series of events requiring multiple steps that occur over many years where a DNA of normal healthy cell is damaged.[3] According to estimates from the International Agency for Research on Cancer (IARC), by 2030, the global burden of cancer is expected to grow to 21.4 million new cancer cases and 13.2 million cancer deaths. [4]

Childhood cancer which usually refers to all cancers occurring in children before 15 years of age is generally not a public health priority in most developing countries where due to the burden of HIV/AIDS, malaria, and other infectious diseases, its treatment is often regarded as unaffordable. [2]

The number of childhood malignancies has been increasing over the past years; part of this increase can be due to an improvement in diagnostic and reporting

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techniques. [5] Higher incidence of these malignancies has been reported in developed countries in comparison to the developing ones, and this difference has been thought to be due to poor reporting in developing countries. [6] The worldwide incidence is between 120 and 150 new cases per million for children under the age of 15 years, varying by age, sex, ethnicity and geographic location.[6] The most common malignancies in children being nervous system tumors and acute leukemia, followed by lymphomas, Wilm's tumors and retinoblastomas. [5]

Oral complications of cancer or secondary to its treatment are more common in children than adults. [7] The common oral complications of pediatric cancer therapy are, dysguesia, widening of the periodontal ligament space and infections (including bacterial, fungal and viral).[8] Others include, mucosal pathological conditions caused by inflammations or infections e.g. mucositis, erythema, bleeding and candidiasis. [9]

Oral health contributes to morbidity and mortality throughout one's lifespan [10]; it is a state of being free from developmental abnormalities and pathological conditions [11]. Parental health behaviors influence children's oral health through diet and dental care, which can later emerge as dental diseases, mainly caries [12]. Apart from direct influence to children's oral health, the socio-economic status has a profound effect on oral health and health behaviors amongst caretakers; this may in turn affect their oral health knowledge, and practices for their children. [13]

Chemotherapy and radiotherapy are immunosuppressive treatment options for malignancies each having its own effects on the patient's oral health and quality of life. These effects increase the risk of infection, length of hospital stay, treatment cost and negative impact on the course and prognosis of the disease.[8]

Radiotherapy can lead to undesirable results that become apparent during or after the therapy is completed. To a large degree, salivary glands, oral mucosa, skin and bones are susceptible to changes that can result in constitutional complications such as dehydration, malnutrition and systemic infections.[14,15] Adverse effects consequent to cancer therapy, particularly salivary gland dysfunction, are known risk factors for dental caries.[16]

Children who suffer from poor oral health are 12 times more likely to have restricted-activity days than those who do not. [17] Oral disease or complication of cancer and its treatment, can lead to pain and tooth loss, a condition that affects the appearance, quality of life, nutritional intake and, consequently, the growth and development of children. [18] Good oral health must therefore be obtained and maintained in children with malignancies (CWM), because an

improvement of oral conditions may diminish their suffering and prevent the spread of serious infections from the oral cavity. [19]

There has been no documentation on oral health problems in pediatric patients with malignancies in Tanzania. This has rendered difficulties for dental practitioners and policy makers to establish oral healthcare intervention for this group of patients. The purpose of this research was to assess the oral health status of pediatric patients with malignancies and oral health knowledge and practices of their caretakers.

## MATERIALS AND METHODS:

This was a was a descriptive cross-sectional hospital based study, that targeted all pediatric patients with malignancies aged 17 years and below admitted in oncology wards, and their caretakers at Muhimbili National Hospital, Dar es Salaam, Tanzania. The study was carried out from August 2015 to October 2015, including a total of 88 patients and their caretakers.

The study included all pediatric patients with malignancies aged 17 years and below admitted in oncology wards and their caretakers who consented to participate in the study; the patient who were excluded from study included those who were critically ill (e.g. those who were in oxygen therapy) and those whose caretakers did not consent to participate in the study.

The study entailed interviews of the caretakers followed by questionnaire filling and clinical examination of the children. Information concerning diagnosis of the children and the treatment they were undergoing was obtained with consent, from the patient's medical records.

The principal researcher conducted personal interviews in Kiswahili with the caretakers, and information regarding the child and the caretaker was collected and filled in the questionnaire. Each filled questionnaire was given a serial number and at the end verification was done to make sure the questionnaires were properly filled.

Clinical examination was done while observing strict cross infection control protocols. Children were examined while seated or laying down on the bed, using a sterilized pre-packed standard mouth mirror. Dental caries, oral hygiene status, gingival bleeding and oral mucosal status were noted and recorded. The Simplified Oral Hygiene Index (OHI-S) by Greene and Vermillion [20] was used to assess oral hygiene.

Prior to analysis, all questionnaires and clinical forms were assigned serial numbers. Data coding for the variables to be measured, was be done then the data was transferred to the computer. Data analysis after data cleaning was achieved by using the SPSS computer program version 19. [21]

Dental caries experience was measured by the decayed, missing and filled

surface/teeth index for primary and mixed dentition.

The average individual or group debris and calculus scores were combined to obtain the Simplified Oral Hygiene Index. The oral hygiene of each child was classified as 'good' when the OHI-S score was 0–0.9, 'fair' when it was 1.0–1.9 and 'poor' when it was 2.0 up to 6. [22]

For the case of knowledge, the two groups were 'low oral health knowledge' (if caretaker answered 3 or less questions correctly regarding oral health knowledge), and 'high oral health knowledge' (if caretaker answered 4 or more questions correctly regarding oral health knowledge). For the case of practices, the two groups were 'inadequate oral health practices' (if caretaker answered 2 or less questions correctly regarding oral health practices) and 'adequate oral health practices' (if caretaker answered 3 or more questions correctly regarding oral health practices).

Bivariate analyses were conducted using cross-tabulations and chi-square statistics and p-value less than 0.05 was considered significant. Logistic regression was used in multivariate analysis to compare association between multiple variables such as mean DMFT, DMFS, dmft, and dmfs for the age group categories.

Ethical clearance was obtained through the school of dentistry of the Muhimbili University of Health and Allied Sciences (MUHAS) and consent was also sought from the patients' caretakers.

## RESUTS:

This study included 88 CWM, most of whom were males 63.6% (n=56), the male to female ratio was 1.75:1. The age range was 6 months to 17 years with mean age being 6.5 ± 4.0 years and age group was 0-5 years was commonest (n=41,46.6%).

With regards to the 88 caretakers, female comprised 81.8% (n=72), with M: F ratio of 1:4.5. The mean age was 33.91 ± 8.2 years with age ranging from 20 to 54 years, the age group 30-39 being the commonest (n=36, 40.9%). Of these 88 caretakers 69.3% (n=61) were married while the rest 30.8% (n=27) were single, widow, or divorced.

Describing the relationship of the caretakers with the child; 73.9% (n=65) were mothers, 9.1% (n=8) fathers and 17.0% (n=15) other guardians (such as grandparent, brother or sister). Majority of caretakers (85.2%, n=75) had formal education with 19.3% (n=17) having secondary or higher education levels and with regards to occupation, 76.1% (n=67) reported to have some sort of occupation. (Table 1)

Of the 88 caretakers interviewed on causes, presentation and prevention of dental caries, 96.6% (n = 85) had generally a high level of knowledge on oral health. However, on analysis of responses to individual questions, only 63.6% (n=56) of the caretakers knew the risk factors to developing dental caries despite that 94% knew the clinical presentation of dental caries. With

regards to knowledge on prevention of dental caries, 33% (n=29) did not know that tooth brushing with fluoridated tooth paste is one of preventive method. (Table 2)

With regard to the oral hygiene practice, 67% (n=59) of the caretakers, had adequate oral hygiene practices. Almost half of the caretakers (45.5%, n=40) reported to be brushing their teeth twice a day, with almost all of them using a plastic toothbrush (90.9%, n=80). Sugary drinks or foods were consumed once per day by 51.1% (n=45) of the caretakers and only 6.8% (n=6) reported to be using mouthwash. (Table 3)

The findings of the study also revealed that, overall 96.6% of care takers had high oral health knowledge. There was no significant difference in oral health knowledge amongst difference social demographic characteristics except with respect to sex of the care takers where 87.5% of male and 98.6% of female caretakers had high oral health knowledge, and this difference was statistically significant with p- value of 0.027.

Most of the care takers (69%) perceived their children's oral hygiene to be good and only 16% of them thought their children had poor oral hygiene (Figure 1). Majority of them (n=80, 90.9%) were of the opinion that, children under age of 7 years should be strictly supervised during tooth brushing, none the less 89.8% (n=79) of the caretakers also thought that child's oral cavity should be kept clean even if the teeth had not erupted yet. Despite of their positive attitude, only 85.2% (n=75), reported to have had been helping their child during tooth brushing; likewise only 29.2% (n=21) reported to have had started cleaning their children's oral cavity before the age of 7 months.

The overall caries experience in this study was 31.8%; the mean of DMFT, DMFS, dmft and dmfs for the CWM, is presented in table 4. The observed difference in means of dmfs and dmft between the age groups was not statistically significant; however the observed difference in means of DMFT and DMFS between the age groups was statistically significant (p-values 0.007 and 0.005 respectively).

The simplified oral hygiene indices (S-OHI) for poor, fair and good oral hygiene among the CWM were 30.2%, 21% and 48.8% respectively. Most of the CWM (n= 60, 69.8%) had good or at least fair oral hygiene. In general, children aged 10 years and above had poor OHI-S, than those aged below 10 years. Moreover, results also show that, most of the children with poor OHI-S were of those caretakers, with low oral hygiene knowledge; however, the differences observed were not statistically significant.

The different tumors that were encountered in this study were grouped as: leukemia, lymphomas, retinoblastoma, wilm's tumor, sarcomas, carcinomas and yolk sac tumor. The most

common group was the leukemia, lymphoma and retinoblastoma (Figure 2). Nevertheless, when analysis was done for individual tumors, the most prevalent malignant condition in this study was acute lymphoblastic leukemia (n=19, 21.6%), followed by retinoblastoma (n=16, 18.2%), Wilm's tumor (n =14, 15.9%) and Burkitt's lymphoma (n=7, 8%). Greater number of patients who had poor OHI-S was in the group of lymphomas, followed by retinoblastoma, and leukemia, yet still the difference observed was not clinically significant.

Out of the 88 CWM, 84.1% (n=74) were under some sort of treatment, those who were receiving chemotherapy alone comprised 59.4% (n=44), while 25.7% (n=19) had combination of surgery and chemotherapy. The various modes of treatment for different groups of malignancies have been presented in table 5. Modes of treatment had no significant effect on the OHI-S of CWM.

The treatment duration ranged from 1 day to 36 months, with the mean of 4.8 months. Almost two out of five of these CWM (n=36, 41.1%) who were undergoing treatment, had a duration of less than 3 weeks since initiation.

Soft tissue/ oral mucosal lesion occurred in 23.9% (n= 21) of children in this study, the most common condition was oral ulcers (n=9, 33.3%) followed by mucositis/ erythema (n=7, 25.9%), while bleeding was least common (figure 3). The commonest sites involved were the tongue, labial mucosa, and buccal mucosa. The presence of these soft tissue conditions had no effect on OHI-S of the CWM in this study. Moreover upon statistical testing, neither the diagnosis nor mode of treatment had significant contribution in occurrence of these soft tissue conditions (p-value=0.501).

## DISCUSSION:

This study reported upon the oral health status of pediatric patients with malignancies, and oral health knowledge and practices of their caretakers at the pediatric oncology ward of Muhimbili National Hospital which has a capacity of more than 50 beds.

The findings of this study depicted a male to female ratio of CWM to be 1.75:1. Similar to the findings of this study, several other studies reported higher incidence of childhood malignancy in male [8, 23, 24, 25]. This gender difference in childhood cancers may be explained by the growth rate of the embryo in males being higher than in females, not only in humans but in many different species too [26]. The extremely high rates of cell division and proliferation in males may enhance the likelihood of predisposition to the development of cancer. [27]

In this study, the commonest age group to be affected was of 0 to 5 years. Similar results were reported by several authors [7, 8, 25]. This may be explained by the fact that before the age of 5, the adaptive immune system is not well developed;

hence children may be susceptible to various viral infections, some of which may be oncogenic.

There were more female caretakers than their male counterparts in this study. Similar findings were depicted by Parry et al [28] and Vinick.[29] Women, especially mothers have generally been acknowledged to be the primary caretakers of the sick. Mothers are typically the primary link between the family and the medical care system in many societies. [28] Moreover, most women in this part of world are housewives and hence can spare time to escort their sick children to the hospital for the period of their investigations and treatment.

It is speculated that, the children's oral health is largely depended on the knowledge and practice of their caretakers; this can be validated to the fact that, children will practice what they are being taught, and likewise will eat what their caretakers eat. Taking this into account, an assessment of oral health knowledge and practices of caretakers was conducted in this study. Despite 94% of caretakers knowing the clinical presentation of dental caries, only 63.6% of them knew the risk factors for developing dental caries, moreover 33% did not know that tooth brushing could help in prevention. Similar findings of caretakers having a high level of oral health knowledge but being poorly informed on causes or prevention of dental caries have also been noted in two other studies done in the United Kingdom by William et al. [30], and Hood et al. [31]. Rwakatema et al. [32] , reported that only 43.7% of the guardians knew the cause of dental caries in a study done in northern part of Tanzania. Contrary to our findings, Tang et al. [33] reported 77.1% of the care takers knew the cause of dental caries in study done in Taiwan.

Reason for knowing presentation of dental caries and not the cause of it may be explained by an assumption that, most of the caretakers had personal experience of suffering from dental caries or had learnt from others who experienced it, and therefore knew how it presents. The causes of dental caries, however, cannot be identified by personal experience as it is a multifactorial disease involving a pathogenesis that cannot be appreciated with the naked eye and that is why fewer caretakers knew about it. Moreover other reasons thought to be contributory include lack of dental attendance, lack of information from a qualified health personnel and perhaps also due to insufficiency of teachings on oral health in primary and/or secondary schools.

Most of the caretakers perceived their children's oral health to be 'good' (69.3%). However this did not always correlate with their children's actual oral hygiene status on examination. This may be due to either ignorance on the part of the caretakers, or just generally overlooking the oral health of their children. This kind of perception hampers the expected efforts from the caretaker such as proper oral hygiene

practice in improving oral hygiene of their children, since they consider it to be ideal. There were some caretakers who perceived their children's oral health as 'Bad' (18%) and 'Very Bad' (6%). This was because their child had debilitating oral mucosal conditions that were either hindering proper oral hygiene, or ability to chew foods and even speak.

The findings of the study revealed a low overall caries experience amongst CWM. The mean dmft and DMFT were 0.8 ± 2 and 0.13 ± 0.49 respectively, contrary to what was reported in a similar study done in China by Kung et al [34], which reported a higher dmft and DMFT of 1.36±2.21 and 2.87±3.17 respectively.

The mean DMFT score according to the WHO for children of 12 years of age should be no more than 3. [35] The DMFT score among the children in this study did not exceed this threshold set by the WHO. The low caries incidence seen among the children in this study could be because of a low sugary diet they consume. This correlates to the caretaker's answers on how many times they consumed sugary foods/drinks; 51.1% of the caretakers said they consume sugary food or drink only once per day, followed by 28.4% who consumed sugary food/drink twice per day. So it is not surprising that caries incidence among these children was observed to be quite low as they could have few sugar moments per day similarly to their caretakers.

The OHI-S of about 70% of the CWM in this study was either good or at least fair. The fairly good oral hygiene index of the patient can largely be attributed to the efforts put forward by the medical staff in the pediatric oncology unit of MNH, since they give verbal instruction to each caretaker on how to take care of oral health of their children while undergoing treatment, and in addition to that, they provide tooth brushes and mouthwashes for these children.

It was also noted that generally children aged 10 years and above had poor OHI-S, compared to those aged below 10 years, in accord to our findings, Mahesh et al. [36], in a study done in India reported the oral hygiene of 5 years was better than that of 12 years. These findings can be linked to the fact that, children above age of 9 were seldom supervised during tooth brushing, and hence ineffective maintenance of oral hygiene.

The malignant conditions in this study were assembled into different groups in relation to their tissue of origin; the most prevalent group was the leukemia, followed by lymphoma and retinoblastoma. Nevertheless, on basis of individual tumors, the most prevalent malignant condition in this study was acute lymphoblastic leukemia (21.6%), followed by retinoblastoma (18.2%), wilm's tumor (15.9%) and Burkitt's lymphoma (8%). Contrary to our findings, Slone et al. [37] reported lymphoma (25.9%), Wilms tumors (22.8%), and retinoblastoma (17.9%) to be the commonest malignant lesions in

Zambia. A study done in Sudan by Haroun et al. [23], reported lymphoma (42.8%) to be the most prevalent followed by leukemia (19.8%) and kidney tumors (12.8%), In Sweden Thelesius et al. [15], reported leukemia (39%), and brain tumors (34%), to be the commonest.

Treatment of cancer is a multidisciplinary effort, and the proposed treatment modalities include surgery, radiotherapy, chemotherapy, hormonal therapy, immune therapy and combination of these modalities. [38] In the current study, 84.1% of CWM were under treatment, the rest had no any treatment initiated during the period of study because of reasons such as low hemoglobin levels and awaiting for biopsy results for conformation of diagnosis. CWM who were receiving chemotherapy alone comprised majority 59.4%, and about 77.3% of them had either leukemia or lymphoma. The main modality of treatment of these two groups of disease is chemotherapy. The remaining percentage of patients who received chemotherapy alone were those with sarcoma, carcinoma and wilm's tumor. In the case of later group of malignancy, chemotherapy was given as a neo adjuvant therapy or for palliation since some patient had a very advanced disease due to late reporting for treatment.

Chemotherapy and radiotherapy are generally cytotoxic for rapidly multiplying malignant cells; they also negatively impact the production of normal haemopoietic and secretory cells because of inability of differentiating normal and malignant cells. [39] This side effect often results in immunosuppression, inducing a number of changes in oral tissues. [39] Many authors report that the most common complications of pediatric cancer therapy are mucositis, xerostomia, bleeding, dysguesia, widening of the periodontal ligament space and infections (including bacterial, fungal and viral). [8]

In this study, soft tissue/ oral mucosal lesions occurred in 23.9% of children due to the direct effect of the treatment, or indirectly from immunosuppression caused by cancer itself; the most common condition was oral ulcers 33.3% followed by mucositis/ erythema 25.9%, while bleeding was least common. In contrast to our findings, Kung et al.[34], who reported the occurrence of oral mucosal pathology in 25% of CWM, found the commonest lesions to be erythema/mucositis (17%) followed by oral mucosal petechia (6%).

The difference in reported occurrences of oral mucosal lesions could be due to follow-up examinations of the patients being performed in the other studies as opposed to in this one. Following up cancer patients allows for additional oral mucosal conditions to be discovered. Additionally, despite the mean treatment duration being 4.8 months, 41.1% of CWM, had been under treatment for less than 3 weeks, thus the mucosal status at the time of the

examination may not have been representative of the whole effects of chemotherapy on the oral mucosa because the presentation of oral mucosa varies over the course of chemotherapy and radiotherapy. [34]

Some degree of caution should be taken into account when interpreting results of this study due to some limitations. Firstly, the study was a cross sectional, and such kind of study only reveals association in a given point time, and cannot be used when establishing a causal relationship. Second limitation is that we did not quantify the time spent by caretakers with the children prior to admission. Third limitation is that the study sample was small and it was a single institution study.

## CONCLUSION:

The findings of this study portrayed the oral health status of CWM, and oral health knowledge and practices of their caretakers. The caries experience in the CWM was low and oral hygiene index of majority was either good or fair. Majority of CWM with poor oral hygiene had caretakers with low oral health knowledge. The observed favorable oral health status could be contributed by the effort of clinical staff on instructing and supporting CWM with regards to oral hygiene. A wider longitudinal prospective study could serve to document the association of oral health status and treatment.

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## TABLES AND FIGURES:

**Table 1: The Social-demographic characteristics of CWM and their caretakers**

| Social demographic Characteristics | | Frequency | Percentage (%) |
|---|---|---|---|
| **Gender of CWM** | Male | 56 | 63.6 |
| | Female | 32 | 36.4 |
| **Age group of CWM** | 0-5 | 41 | 46.6 |
| | 6-10 | 32 | 36.4 |
| | 11-15 | 13 | 14.8 |
| | 16+ | 2 | 2.3 |
| **Gender of caretakers** | Male | 16 | 18.2 |
| | Female | 72 | 81.8 |
| **Age group of caretakers** | 20-29 | 27 | 30.7 |
| | 30-39 | 36 | 40.9 |
| | 40-49 | 22 | 25.0 |
| | 50-59 | 3 | 3.4 |
| **Marital status of caretakers** | Single | 13 | 14.8 |
| | Married | 61 | 69.3 |
| | Divorced | 7 | 8.0 |
| | Widow | 7 | 8.0 |
| **Relation with child** | Mother | 65 | 73.9 |
| | Not the mother | 23 | 26.1 |
| **Education level of care takers** | No formal | 13 | 14.8 |
| | Primary | 58 | 65.9 |
| | Secondary | 12 | 13.6 |
| | Higher education | 5 | 5.7 |
| **Occupation of care takers** | Has an occupation | 67 | 76.1 |
| | No occupation | 21 | 23.9 |

**Table 2: Oral health knowledge of the caretakers**

| Oral health knowledge of caretakers | | Frequency | Percentage |
|---|---|---|---|
| **What do you think is the cause of tooth decay?** | Sugary | 44 | 50.0 |
| | Don't know | 31 | 35.2 |
| | Bacteria | 2 | 2.3 |
| | Sugary + not brushing teeth | 2 | 2.3 |
| | Not brushing teeth | 7 | 8.0 |
| | Food remnants | 1 | 1.1 |
| | Chemicals in toothpaste | 1 | 1.1 |
| **Does dental caries present with cavitation?** | Yes | 85 | 96.6 |
| | No | 3 | 3.4 |
| **Does dental caries present with toothache?** | Yes | 85 | 96.6 |
| | No | 3 | 3.4 |
| **Does dental caries present with difficulty in chewing?** | Yes | 86 | 97.7 |
| | No | 2 | 2.3 |
| **Does dental caries present with a change in tooth color?** | Yes | 83 | 94.3 |
| | No | 5 | 5.7 |
| **Can dental caries be prevented by tooth brushing using fluoridated tooth paste?** | Yes | 59 | 67.0 |
| | No | 29 | 33.0 |

**Table 3: Oral health practices of the caretakers**

| Oral health practices questions to the caretakers | | Frequency | Percentage |
|---|---|---|---|
| **How many times do you brush your teeth per day?** | Once | 23 | 26.1 |
| | Twice | 40 | 45.5 |
| | Thrice | 25 | 28.4 |
| **What do you use to brush your teeth?** | Plastic toothbrush | 80 | 90.9 |
| | Miswak (Local toothbrush) | 7 | 8.0 |
| | Plastic toothbrush + Miswak (Local toothbrush) | 1 | 1.1 |
| **How often do you consume sugary drinks or foods per day?** | None | 5 | 5.7 |
| | Once | 45 | 51.1 |
| | Twice | 25 | 28.4 |
| | Thrice | 7 | 8.0 |
| | More than thrice | 6 | 6.8 |
| **Do you use a mouthwash?** | Yes | 6 | 6.8 |
| | No | 82 | 93.2 |

**Table 4: Dental caries experience amongst the deciduous and permanent dentition of CWM**

| Age group | Dental Caries Experience | | | |
|---|---|---|---|---|
| | **DMFT** | **DMFS** | **dmft** | **dmfs** |
| **0 – 5** | - | - | 0.68 ± 1.9 | 1.59 ± 5.94 |
| **6 – 10** | 0.03 ± 0.18 | 0.06 ± 0.35 | 1.13 ± 2.42 | 2.91 ± 8.5 |
| **11 – 15** | 0.38 ± 0.87 | 0.77 ± 1.69 | 0.46 ± 1.2 | 0.77 ± 2.2 |
| **Combined age groups** | **0.13 ± 0.49** | **0.26 ± 0.97** | **0.8 ± 2** | **1.9 ± 6.59** |

**Table 5: Mode of treatment to various groups of malignancies**

| Mode of treatments | Group of malignancy | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Leukemia | Lymphoma | Retinoblastoma | Wilm's tumor | Sarcoma | Carcinoma | Yolk sac tumor | **Total** |
| **Chemotherapy** | 20 (95.2%) | 14 (93.3%) | - | 5 (50%) | 3 (37.5%) | 2 (66.7%) | - | **44 (59.4%)** |
| **Surgery + Chemotherapy** | - | - | 11 (68.7%) | 4 (40%) | 3 (37.5%) | - | 1 (100%) | **19 (25.7%)** |
| **Surgery** | - | - | 4 (25%) | - | 1 (12.5%) | - | - | **5 (6.7%)** |
| **Surgery, Chemotherapy and Radiotherapy** | - | 1 (6.7%) | 1 (6.3%) | 1 (10%) | 1 (12.5%) | - | - | **4 (5.4%)** |
| **Radiotherapy** | - | - | - | - | - | 1 (33.3%) | - | **1 (1.4%)** |
| **Chemotherapy and bone marrow transplantation** | 1 (4.8%) | - | - | - | - | - | - | **1 (1.4%)** |
| **Total** | **21** | **15** | **16** | **10** | **8** | **3** | **1** | **74 (100%)** |

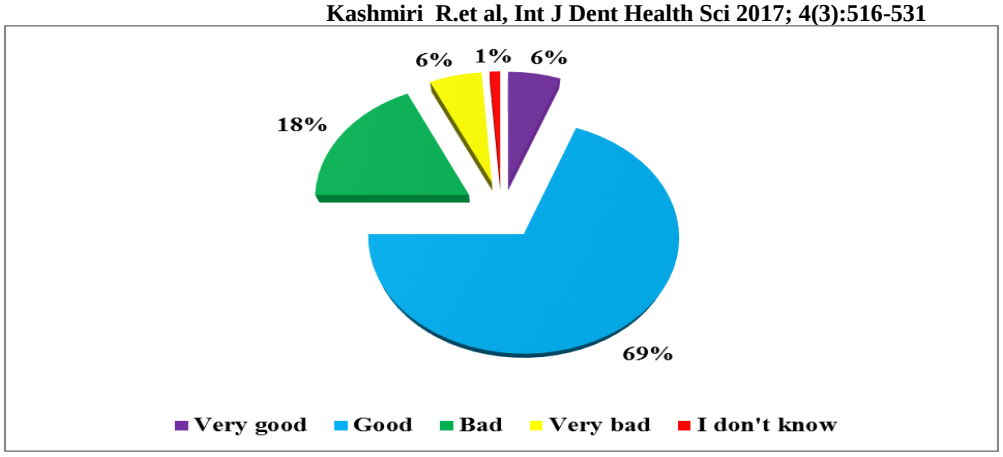


**Fig 1 : Perceived Oral health of the child by the caretaker**

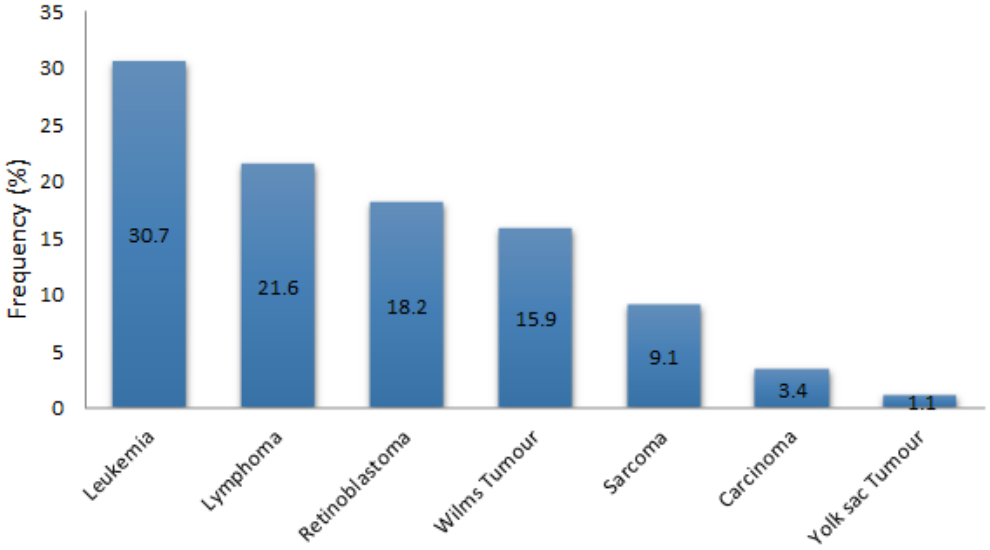


**Fig 2: Frequency of occurrence of different groups of malignancies**

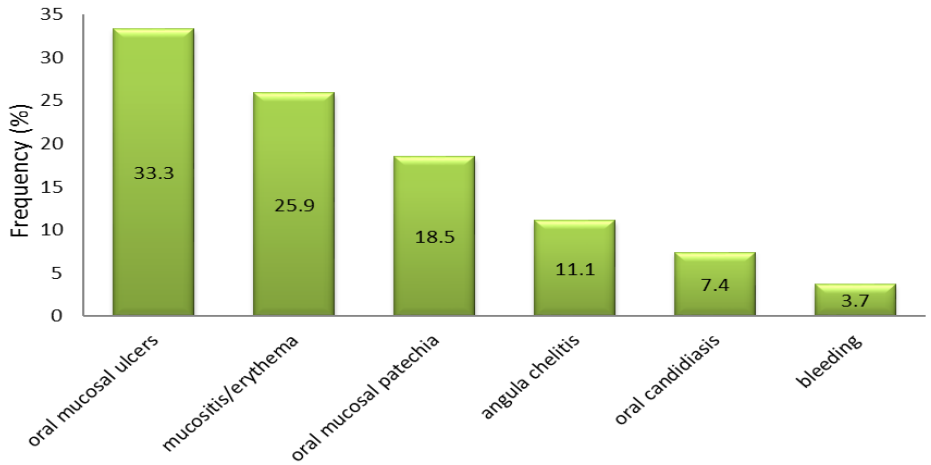


**Fig 3: Frequency of occurrence of different soft tissue conditions in CWM**