



Parents' oral care practices and oral health profiles of pediatric cancer patients receiving chemotherapy

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ABSTRACT

Chemotherapy in childhood cancer increases the toxic effects that impact the child's oral health. Appropriate oral care is the main intervention in children receiving chemotherapy. Oral care can reduce the colonization of oral cavity microorganisms, reduce pain, and prevent oral soft tissue infections that are at risk of becoming systemic infections. Children need parents to maintain oral health. This study aims to determine the oral care behavior of parents and the oral health profile of children who receive chemotherapy. The research design used a quantitative descriptive method. The sample in this study were parents and children with cancer who received chemotherapy. The results showed that the oral care behavior of most parents was in the less category, namely 76%. The oral health profile of children with cancer who received chemotherapy based on Oral Assessment Guide (OAG) was mostly in the unhealthy category, which was 52%. Nurses need to provide health education about oral health care to children and parents and provide written guidelines regarding appropriate oral care protocols. Future research is expected to be able to develop research on appropriate educational methods to improve parental behavior or oral care practices in children with cancer who are receiving chemotherapy

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ABSTRAK

Kemoterapi pada anak kanker meningkatkan efek toksik yang berdampak pada kesehatan mulut anak. Perawatan mulut yang tepat adalah intervensi utama pada anak yang menerima kemoterapi. Perawatan gigi dan mulut dapat mengurangi kolonisasi mikroorganisme rongga mulut, mengurangi nyeri, dan mencegah infeksi jaringan lunak mulut yang berisiko menjadi infeksi sistemik. Anak membutuhkan orang tua untuk menjaga kesehatan gigi dan mulut. Penelitian ini bertujuan untuk mengetahui perilaku perawatan gigi dan mulut orang tua dan profil kesehatan gigi dan mulut anak yang menjalani kemoterapi. Desain penelitian menggunakan metode deskriptif kuantitatif. Sampel dalam penelitian ini adalah orang tua dan anak penderita kanker yang menjalani kemoterapi. Hasil penelitian menunjukkan bahwa perilaku perawatan gigi dan mulut sebagian besar orang tua berada pada kategori kurang yaitu 76%. Profil kesehatan gigi dan mulut anak penderita kanker yang menjalani kemoterapi berdasarkan Oral Assessment Guide (OAG) sebagian besar berada pada kategori tidak sehat yaitu sebesar 52%. Perawat perlu memberikan pendidikan kesehatan tentang perawatan kesehatan gigi dan mulut kepada anak dan orang tua serta memberikan pedoman tertulis mengenai protokol perawatan gigi dan mulut yang tepat. Penelitian selanjutnya diharapkan dapat mengembangkan penelitian tentang metode pendidikan yang tepat untuk

meningkatkan perilaku orang tua atau praktek perawatan gigi dan mulut pada anak penderita kanker yang sedang menjalani kemoterapi.

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INTRODUCTION

Cancer is a chronic disease that increases child mortality. Around 200,000 new cases of childhood cancer are diagnosed annually worldwide (Ramirez et al., 2018). In recent years, the use of intensive regimens for the treatment of cancer in children has resulted in significant changes in patients' quality of life. However, these treatments also increase the toxic effects. Among these side effects, mucositis (inflammation of the oral cavity) significantly affects the success of treatment. Chemotherapy can cause side effects, including damaging the mucosal barrier which eventually causes mucositis, and causes neutropenia which will increase susceptibility to infection. Oral lesions due to chemotherapeutic agents attack rapidly dividing cells in the gastrointestinal tract. Oral mucositis also causes an increased risk of infection and often causes a delay in subsequent chemotherapy.

Mucositis is one of the most common side effects associated with pediatric cancer treatment; is an inflammation of the oral mucosa with various etiologies that causes pain and inability to eat. Lack of control and inadequate prevention of mucositis can lead to a significant reduction in the patient's quality of life (ie, pain, feeding difficulties, and malnutrition) (Peterson & Lalla, 2010; Rodríguez-Caballero et al., 2012). The incidence rate of oral mucositis ranges from 52% to 100% of patients receiving chemotherapy. If not managed with appropriate measures, mucositis is a limiting factor of chemotherapy and can worsen patient prognosis and adherence (Cheng et al., 2012; Triarico et al., 2022). The severity of mucositis can affect the treatment plan, including reducing the dose, delaying, or even stopping chemotherapy; lead to suboptimal therapy, resulting in increased patient morbidity and mortality (Hasibuan et al., 2019).

Proper oral hygiene is the main intervention in children receiving chemotherapy kemoterapi (McGuire et al., 2013; Yavuz & Bal Yılmaz, 2015). Oral care is fundamental to achieving optimal health, integrity, and function of the oral mucosa. Oral care can reduce the colonization of oral cavity microorganisms, reduce pain, and prevent oral soft tissue infections that are at risk of becoming systemic infections. The basic components of oral care include evaluating oral conditions, educating patients and/or families, brushing teeth, flossing, and rinsing (Eilers et al., 2014; McGuire et al., 2013). Children need parents to maintain oral hygiene and health because of limited knowledge and abilities. Parents need to be confident and firm in teaching proper dental and oral care to their children. Therefore, they need to learn and gain confidence in performing dental and oral care for children with cancer. The attitudes and behavior of parents in maintaining the health of their children's teeth and mouth greatly influence the habits of children in oral health care (Krisnana et al., 2021).

This study aims to determine the oral care behavior of parents and to describe the oral health profile of children with cancer who receive chemotherapy. The urgency of this research is the need to discuss parents' oral care behavior as an effort to prevent systemic complications in children with

cancer who receive chemotherapy. Oral health profile needs to be assessed periodically in children with cancer, as an indicator of the effectiveness of oral care performed by children or parents.

METHODS

The research design uses a quantitative descriptive method. The sample in this study were children with cancer who received chemotherapy and their parents. The sample consisted of 50 children and 50 parents, which were obtained by purposive sampling method. Researchers ask for patient consent to become respondents in this study, guarantee data confidentiality, respect patient rights, and ensure that this study does not harm and harm patients. Ethical approval was obtained from RSUP dr. Kariadi Semarang (No.1288/EC/KEPK-RSDK/2022).

The instrument used to assess parents' oral care practices is a questionnaire. This questionnaire was developed by researchers based on various literature, which consists of 15 statement items. The results of the questionnaire validity test showed that all statement items were valid (r table = 0.444; r count = 0.475-0.800). The reliability test obtained Cronbach's alpha value of 0.841. Descriptive analysis using a computer program was carried out to describe in detail the practices of parents in oral care and the oral health profile of children with cancer receiving chemotherapy.

RESULTS

Table 1. Frequency Distribution of Child Cancer Respondents Based on Age, Gender, Type of Cancer, and Chemotherapy Cycles in RSUP dr. Kariadi Semarang, November-Desember 2022 (n=50)

Variable	Frequency (f)	Percentage (%)
Age		
1. Infant	0	0
2. Toddler	9	18
3. Preschool	10	20
4. School-age	20	40
5. Adolescent	11	22
Sex		
1. Male	26	52
2. Female	24	48
Kind of Cancer		
1. Acute Lymphoblastic Leukemia (ALL)	24	48
2. Acute Myeloblastic Leukemia (AML)	5	10
3. Rhabdomyosarcoma	2	4
4. Neuroblastoma	4	8
5. Wilm's tumor	1	2
6. Sarcoma ewing	2	4
7. Yolk sac tumor	1	2

Variable	Frequency	Percentage
	(f)	(%)
8. Retinoblastoma	1	2
9. Nasofaring cancer	1	2
10. Germ cell tumor	5	10
11. Histiositosis sel langerhans	1	2
12. Limfoma non-Hodgkin		
13. Limfoma Hodgkin		
14. Astrocytoma		

Based on Table 1, it can be concluded that most of the respondents (children with cancer who received chemotherapy) were in the school age category (6-12 years), namely 20 children (40%). If examined further, 78% of cancers in children occur at the age of less than 12 years. Most respondents were male, namely 26 children (52%). There were 14 types of cancer suffered by the respondents, the majority were Acute Lymphoblastic Leukemia (ALL) as many as 24 children (48%).

Table 2 explains that most of the elderly respondents are in the early adult category (20-35 years), namely 32 people (64%). Most of the parents' education was high school, namely 30 people (60%), and most had never received health education about parental participation in oral care for children with cancer who were receiving chemotherapy.

Table 3 describes that most parents' oral care behaviors for children with cancer who receive chemotherapy are in the less category, namely 38 people (76%).

Table 2. Frequency Distribution of Parent Respondents Based on Age, Last Education, and Experience of Getting Oral Care Health Education in RSUP dr. Kariadi Semarang, November-Desember 2022 (n=50)

Variable	Frequency (f)	Percentage (%)
Parent's Age		
1. Early adulthood (20-35 y.o)	32	64
2. Middle adulthood (36-49 y.o)	18	36
3. Late adulthood (50-65 y.o)	0	0
Education		
1. No School	1	2
2. Primary School	0	0
3. Junior High School	15	30
4. Senior High School	30	60
5. College	4	8
Experience Getting Oral Care Education		
1. Ever been	28	56
2. Never		

Table 3. Frequency Distribution of Respondents Based on Parents' Oral Care Behavior in Children with Cancer Receiving Chemotherapy in RSUP dr. Kariadi Semarang, November-Desember 2022 (n=50)

Variable	Frequency (f)	Percentage (%)
<i>Oral Care Practice</i>		
Good	4	8
Average	8	16
Poor	38	76

Table 4. Frequency Distribution of Parental Oral Care Behavior in Children with Cancer Receiving Chemotherapy (n=50)

No.	Statement	Answer							
		Always		Often		Rare		Never	
		f	%	f	%	f	%	f	%
1.	I help my child to brush their teeth at least 2 times a day.	19	38	12	24	18	36	1	2
2.	I give a soft toothbrush for children.	26	52	23	46	1	2	0	0
3.	I give fluoride toothpaste to my child when I brush my teeth.	24	48	22	44	3	6	1	2
4.	I take care of the moisture in the child's oral mucosa by giving a spray or jelly moisturizer as recommended by the doctor.	1	2	3	6	31	62	15	30
5.	I do a facial massage on the child (cheeks, jaw, mouth) before the child brushes their teeth.	1	2	4	8	32	64	13	26
6.	I help my child rinse his mouth regularly by using mouthwash according to the doctor's advice.	10	20	14	28	17	34	9	18
7.	I regularly apply or drink medicine from a doctor to treat infections in a child's mouth.	9	18	11	22	16	32	14	28
8.	I take steps to reduce pain when the child cleans the mouth, for example by cryotherapy, distracting the child, and so on.	7	14	28	56	10	20	5	10
9.	I consult the dentist if my child has problems in the mouth such as: canker sores or other mouth infections, bleeding from the gums/lips/other parts of the mouth, difficulty swallowing, or other problems related to teeth and mouth.	11	22	25	50	13	26	1	2
10.	I routinely check/consult children's oral/dental health to the dentist at least once every 6 months.	7	14	5	10	27	54	11	22
11.	I have participated in educational activities about the oral health of children receiving chemotherapy.	0	0	2	4	25	50	23	46
12.	I did a self-examination of oral problems in children (stomatitis/sprue, dry mouth, sores, candidiasis/fungal infection, and so on).	15	30	26	52	5	10	4	8
13.	I give sweet food/snacks to children.	0	0	37	74	13	26	0	0
14.	I do not give food that is sour, spicy, hard, hot, or food that causes irritation.	10	20	36	72	3	6	1	2
15.	I consulted a nutritionist to get information about foods that are safe for oral health while children are undergoing chemotherapy.	8	16	24	48	15	30	3	6

Table 5. Frequency Distribution of Respondents Based on Oral Health Profiles of Children with Cancer Receiving Chemotherapy (n=50)

Variable	Frequency (f)	Percentage (%)
Oral Health		
Healthy	24	48
Unhealthy	26	52

Table 6. Frequency Distribution of Oral Health Profile Observation Results in Children with Cancer Receiving Chemotherapy (n=50)

Observation	Frequency (f)	Percentage (%)
Voice		
Normal	50	100
Deeper or raspy	0	0
Difficult talking or painful speech	0	0
Swallowing		
Normal swallowing	50	100
Some pain upon swallowing	0	0
Unable to swallow	0	0
Lips		
Smooth and moist	46	92
Dry or cracked	4	8
Ulcerated bleeding	0	0
Tongue		
Pink and moist and papillae present	50	100
Coated or loss of papillae with a shiny appearance with or without redness	0	0
Blistered or cracked	0	0
Saliva		
Watery	50	100
Thick or ropy	0	0
Absent	0	0
Mucous membrane		
Pink and moist	50	100
Reddened or coated (increased whiteness) without ulceration	0	0
Ulceration with or without bleeding	0	0
Gum		
Pink and moist	50	100
Reddened or coated (increased whiteness) without ulceration	0	0
Ulceration with or without bleeding	0	0
Teeth		
Clean, no debris	26	52
Plaque or debris in localized areas (between the teeth)	24	48
Plaque or debris all over the area	0	0

Table 4 describes in detail how the oral care behavior is carried out by parents in children with cancer who are receiving chemotherapy. The positive behavior that was always carried out by most respondents was giving children a soft toothbrush. Most of the positive behaviors that were never carried out by respondents were caring for the moisture of the children's oral mucosa by giving spray or jelly moisturizers and participating in health education on proper oral health care for children with cancer receiving chemotherapy. The most common negative behavior is

giving sweet food/snacks to children and giving food that is sour, spicy, hard, hot, or food that causes irritation.

Based on Table 5 it can be concluded that most of the the oral health profiles of child respondents based on OAG are in the unhealthy category, namely 26 children (52%). Table 6 describes that the elements of the mouth that are in normal or healthy condition are the voice, the ability to swallow, the color and moisture of the tongue, the condition of the saliva, the color and moisture of the oral mucous membranes, and the gums. Unsanitary conditions include dry or cracked lips and the presence of plaque or debris in localized areas (between the teeth).

DISCUSSIONS

The World Health Organization (WHO) through the International Agency for Research on Cancer (IARC) estimates that 8,677 Indonesian children aged 0-14 will suffer from cancer in 2020. This number is the largest compared to other countries in Southeast Asia (WHO, 2020). By 2022, it is estimated that 10,470 children (birth to 14 years) and 5,480 adolescents (age 15-19 years) will be diagnosed with cancer. Most new cancer diagnoses in children are for leukemia (28.1%) (*Coalition Against Childhood Cancer*, 2021).

Scientific evidence shows that the increased risk of cancer among men is relatively higher than that of women. Compared with girls, boys often have a higher birth weight, experience a higher number of childhood infections, experience growth-accelerated puberty, and experience a different hormonal environment during the childhood and adolescent periods; therefore, these differences in risk factors may contribute to the observed results of sex differences in the incidence of childhood cancer (Williams et al., 2018). Male gender is positively associated with most cancers. The higher incidence rates observed in males remain consistent throughout childhood and adolescence. The observed disparities in occurrence may be due to sex differences in exposure, genetics, or immune response (Williams et al., 2019).

Early adulthood and middle adulthood have the same concept of wisdom, which is more dominant in the reflective and cognitive dimensions, whereas in late adulthood it is only in the reflective dimension. An example of wisdom is a way of making decisions, perspectives, knowledge, experience, problem solving, considerations, and actions (Indati, 2019). The results showed that most of the parents were early adults. However, based on the above review, the differences in the age categories of the respondents did not influence the way of decision making, knowledge, experience, and behavior in oral care for children with cancer who received chemotherapy. The level of education has an influence on parental knowledge, the higher the level of education, the easier it is for someone to receive information. A good level of education will make it easier for parents to absorb all information related to the importance of knowledge about cancer in children and its treatment. Mother's education level influences mother's knowledge and attitude in receiving and understanding when receiving information about health, especially about cancer in children. Exposure to information through the process of education or health education is another factor besides education that influences the knowledge, attitudes, and behavior of parents in caring for children with cancer.

Cancer treatment causes significant side effects in the oral cavity, which may negatively impact the oral health of cancer patients. Pediatric cancer survivors experience early and late oral effects, which can lead to adverse effects on quality of life. Early effects include oral mucositis, xerostomia (dry mouth), oral infections (eg, candidiasis and herpes virus infection) and taste disturbances; late effects include abnormalities in tooth development and jaw development, as well as the development of caries and even secondary tumors. These results indicate that the side effects of cancer therapy on oral health greatly affect the quality of life of pediatric cancer patients because it causes pain, inhibits speech, eating, smiling and oral care (Noronha & Mary Ellen, 2016).

Oral health problems are the most identified problem for pediatric oncology patients after the start of chemotherapy and are one of the significant side effects of chemotherapy. Nurses should follow up the chemotherapy program with evidence-based care to prevent oral mucositis or treat it effectively. Health education to parents about oral care is a very important nursing intervention to ensure that parents can properly perform oral health care for their children. Oral health care education is an effective method for reducing the severity of oral mucositis in pediatric oncology patients. Health education about oral care should be given to children and their parents from the start of hospitalization (Kostak et al., 2020).

Several studies have shown that oral care measures can reduce the severity of oral mucositis in children under antineoplastic treatment (Yavuz & Bal Yılmaz, 2015). Therefore, oral care programs are considered as an effective strategy to prevent oral mucositis in pediatric cancer patients (Lyu et al., 2019; Qutob et al., 2015). Oral care is defined as activities that should be part of the patient's routine care during the period of cancer treatment to maintain good oral health and reduce the risk of inflammation and local infection, as well as systemic infection originating from the oral cavity. The goals of oral care are infection prevention (preventing infection of the oral mucosa and periodontium and preventing regional and systemic spread of infection), pain control (reducing discomfort and pain in the mouth), maintenance of oral function (promoting oral nutritional intake, oral fluid intake and ability to speaking), managing complications of cancer treatment (reducing side effects, chemotherapy, and improving patient quality of life (McGuire et al., 2013).

A qualitative approach study reported that although children and parents are aware of the importance of oral care, oral hygiene is often neglected because of the discomfort or pain caused by oral mucositis. Most parents describe oral hygiene moments as stressful for their children and for themselves. In younger children, parents must perform oral care accompanied by play activities (eg storytelling, playing music, composing puzzles) and using fun instruments (Robertson et al., 2019; Sampaio et al., 2021). Children need parents to maintain oral hygiene and health because of their limited knowledge and abilities. The availability of basic oral care protocols, which include prevention, supportive measures, and management of oral complications will improve the quality of care provided to children receiving chemotherapy. Health education programs for patients and families to increase knowledge and awareness of the importance of oral care and daily oral hygiene practices during or after completion of treatment/therapy are very important to increase parental participation in children's oral health care practices (S Alkhuwaiter, 2021). Parents are the most important

caregivers for children; therefore nurses must intervene to increase knowledge and skills in performing oral health care, including: proper oral cleaning techniques, selection of agents for oral care, application of atraumatic care in children's oral care, and making the right decisions if there are oral health problems in children that arise due to the effects of chemotherapy. Parents may have received information about oral health care but not apply it in practice (Pedrosa et al., 2019). Thus, the motivation of nurses to parents is very important.

Oral monitoring of patients after cancer diagnosis is essential for the prevention of complications in systemic conditions during antineoplastic treatment, especially stomatotoxic effects of chemotherapy, including oral inflammatory lesions and complications on salivary quantity and decreased oral functions such as swallowing and speech which can affect the quality of life of children and adolescents with them (Ribeiro et al., 2017). The side effects of chemotherapy damage the patient's oral health and increase the susceptibility to caries, which is characterized by the appearance of plaque or debris on the teeth. Patients receiving chemotherapy were found to have a low pH and decreased salivary buffering ability. Changes in the quantity and quality of saliva and dietary errors make the patient's oral hygiene worse. In addition, the effects of chemotherapy agents, lack of oral fluid intake due to nausea/vomiting, and decreased immunity, have contributed to the incidence of oral health problems, such as dry lips, plaque, and infection (Wang et al., 2021).

CONCLUSIONS & SUGGESTIONS

The conclusion of this study is that the majority of parents' oral care behavior in children with cancer who receive chemotherapy is in the less category, which is as much as 76%. The oral health profile of children with cancer who received chemotherapy based on the Oral Assessment Guide (OAG) was mostly in the unhealthy category, which was 52%. Nursing services are expected to be able to provide health education about oral health care to children and parents, provide written guidelines regarding appropriate oral care protocols, and teach parents to monitor the child's oral condition continuously.

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