



**CAREGIVER MANAGEMENT IN DEALING WITH THE EFFECT OF
CHEMOTHERAPY ON PEDIATRIC: LITERATURE REVIEW**

Rana Roidah Trianti, Ririn Muthia Zukhra*, Aidillia Yanhaz, Nurmala Anggraini

Faculty of Nursing, Universitas Riau, Jl. Pattimura No. 9, Pekanbaru Riau 28131, Indonesia

*ririnmuthiazukhra@lecturer.unri.ac.id

ABSTRACT

Cancer is the development of abnormal cells that can cause various symptoms during treatment. The most common treatment is chemotherapy. The chemotherapy drugs used affect not only cancer cells but also surrounding normal cells, such as skin, hair follicles and mucosa. Children need to be given measures to reduce the perceived effects of chemotherapy therapy. This study aims to look at the pharmacological and non- pharmacological measures given by caregivers to deal with the effects of chemotherapy. Using literature review using 3 databases namely Google scholar, Pubmed, and ProQuest. The articles used were researched from 2019-2023. Published in Indonesian or English, related to the actions of caregivers to deal with the effects of chemotherapy on children. Based on the analysis of 3 articles, the most common chemotherapy effects were nausea and vomiting, hair loss, and pain. Actions taken in the form of pharmacological actions, namely helping to administer drugs according to what has been prescribed. Non- pharmacological actions include giving eucalyptus oil to nausea and vomiting, inviting children to play therapeutic games to divert pain, using head accessories to deal with hair loss in children.

Keywords: caregiver management; chemotherapy; pediatric or children

INTRODUCTION

Cancer is a disease that occurs because there is abnormal cell growth in the body. Cancer cells grow and develop rapidly and will continue to metastasize to cause an organ to lose its function, which in turn can cause death in the organ (Hartini et al., 2020). Cancer is a combination of abnormal cells whose growth cannot be controlled, and is not coordinated with the surrounding tissue. Cancer can affect various ages, including children (Marpaung et al., 2019). Cancer can affect various ages including children under the age of 18. World Health Organization (2020) states that in the last five years the incidence of cancer in children is approximately 800.000 and will continue to increase. Indonesia is ranked fourth after China, India and the United States has the highest incidence of childhood cancer at 35.000 children (Tiala et al., 2023).

According to the Indonesian Childhood Cancer Foundation, the most common childhood cancer case is leukemia, 30-40% in children aged 3-6 years, retinoblastoma 20-30% in children 0.5-2 years old, and osteosarcoma cancer 20- 30% in children older than 10 years old. Based on Indonesia Healthcare Corporation (2021) the second leading cause of death in children aged 5-14 years is cancer (Lestari et al., 2020). According to Riset Kesehatan Dasar the prevalence of cancer in children aged <1 year to 14 years is a total sample of 273,751 people. The prevalence of cancer patients is most prevalent in Yogyakarta Province 4.86%, West Sumatra 2.47%, Gorontalo 2.44% (Risksedas, 2019). Based on The Indonesian Ministry of Health (2019) states that several medical procedures that can be carried out as a method of treatment for cancer patients are mostly surgery followed by chemotherapy, radiation therapy, or other treatments. A common type of treatment for cancer patients is chemotherapy. In Indonesia, around 24.9% of cancer patients receive chemotherapy treatment (Lydia F, 2019).

Chemotherapy works to kill cancer cells and can adversely affect healthy cells in the body. The most visible impact is on fast-growing cells such as skin, mucosa, hair follicles and spinal cord. Side effects that often appear after chemotherapy are nausea, vomiting, mouth problems, bruising, hair loss, sleep disturbances and changes in appetite and emotions (Komala, 2022; Lown et al., 2019). In times of illness, children still have needs that must be met like other children. Abraham Maslow divided human needs into: physiological needs, needs for security, social needs, needs for appreciation, and self-actualization needs. These needs must be met, including in children with cancer. Cancer patients tend to receive long treatments. This long treatment involves children undergoing chemotherapy, taking drugs, and maintaining a healthy lifestyle. Children with cancer need love and self-esteem from those around them. One of the main caregivers in children is parents, so parents have an important role as a provider of support for children facing the effects of chemotherapy they feel (de Dios et al., 2023; Marpaung et al., 2019).

Treatments to reduce the effects of chemotherapy in children can be pharmacological and non-pharmacological measures. Pharmacological actions that can be taken are by giving drugs according to the complaints that the child makes. Non-pharmacological actions are usually actions given by caregivers to children by providing distraction from children's complaints, as well as several actions that are usually hereditary (Rawat et al., 2021; Tiala et al., 2023). There have been many studies related to handling the effects of chemotherapy. There are also those who have conducted literature reviews, but only limited to adult patients. Therefore, researchers are interested in conducting a literature review related to caregiver management in handling the effects of chemotherapy in children.

METHOD

This study used a literature review approach. The literature review followed the guidelines of the Joana Briggs Institute (JBI) which provides an assessment checklist for the journals to be reviewed. The research article search strategy used relevant keywords and terms that were predominantly used in English. The search sources used were Google Scholar, Pubmed, and ProQuest with the keywords "management" AND "chemotherapy" AND "pediatric OR children". The inclusion criteria applied in the selection of articles are: articles published in 2019-2023, titles and abstracts according to research objectives, full text available, research samples are children, text in English or Indonesian, qualitative or quantitative research and not the results of review articles. Exclusion criteria were: adult patient, and did not meet the study objectives.

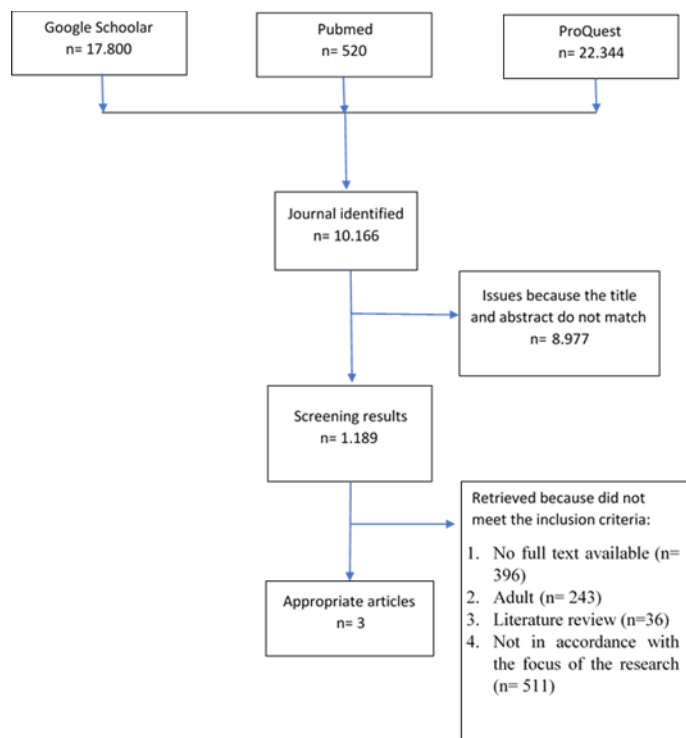


Fig 1. Flow Diagram of the Process of Selecting Included Studies

RESULT

Based on the search results with these keywords, 40.664 journals were found. After review, 30.498 were identified as duplicates and deleted, leaving 10.166. Then by looking at the suitability of the title and abstract, there were 8.977 that did not match the research objectives so they were deleted, leaving 1.189. There were 396 that did not have full text, leaving 793 studies. Furthermore, 790 studies were excluded that did not match the predetermined inclusion criteria so that the final result was 3 articles. Based on the results of research of study in Surakarta, Central Java regarding the characteristics of caregiver respondents with a total of 20 respondents, most of them were aged 31-40 years with 12 respondents (60%). Most of the education level is graduated from high school as many as 13 respondents (65%). Most respondents did not work or as housewives as many as 12 respondents (60%). The characteristics of child respondents based on age were mostly aged 6-12 years as many as 12 respondents (60%). Most of the child patients were male, namely 16 respondents (80%) (Wijayanti, 2017).

Based on the results of study in Yayasan Kasih Anak Kanker Indonesia (YKAKI) in Pekanbaru, the characteristics of respondents based on ethnicity are mostly Malay 12 people (40%). The most caregiver relationship with children is the mother as many as 27 people (90%). Most respondents' occupations were housewives 22 people (73.3%). The majority of respondents graduated from secondary education 12 people (40%). The most common type of cancer experienced by respondent's children is leukemia 21 people (70%) (Nabilla et al., 2023). The characteristics of respondents were mostly aged 26-35 years as many as 11 people (36.7%). The employment status of 26 people (26%) is not working. The last education of respondents was high school as many as 14 people (46.7%). The characteristics of the age of children are mostly 5-7 years old 12 people (40%). The length of treatment for most children is more than 1 year for as many as 18 people (60%) (Saraswati et al., 2018). Based on several articles, the most common side effects suffered by children after chemotherapy are pain, nausea and vomiting, hair loss, mucositis, emotional problems, and several other issues.

Therefore, the management carried out by caregivers is grouped into pain management, nausea and vomiting management, hair loss management, mucositis management, emotional problem management and other problem management.

Pain Management

Generally, the physical symptoms that children often feel after chemotherapy are pain due to chemotherapy drugs. Pain is also most commonly mentioned by children such as headache, low back pain, abdominal pain and arthralgia. Pain management provided by caregivers is to instruct children to perform breathing techniques, apply comfortable position and help provide drugs as prescribed (Lestari et al., 2020; Silva-Rodrigues et al., 2021). Children can be invited to therapeutic play if conditions permit. Therapeutic play can include coloring, origami, puzzles, and drawing. The duration of therapeutic play also affects the transfer of pain that children feel. The duration of therapeutic play that is effective for children is 10-30 minutes. The effect felt by children during therapeutic play is that it can make children feel happy, reduce stress and reduce post-chemotherapy pain (Lestari et al., 2020). Other actions that can be taken by caregivers to reduce pain in children after chemotherapy are to provide massage, give medicine, and help children rest. In line with research (Nabilla et al., 2023), it was found that 60% of caregivers gave massages to children from head to toe, then 11.1% of caregivers helped children to take medicine, 33.3% helped children to organize their routines every day, 5.5% of caregivers will help children to do relaxation breathing (Nabilla et al., 2023).

Nausea and Vomiting Management

Nausea and vomiting is one of the effects felt by children after undergoing chemotherapy. Nausea and vomiting are caused by chemotherapy that produce serotonin which is produced by the mucosa of the digestive tract and functions to activate the afferent nerves in the stomach, then proceed to the vomiting center so that children can nauseated and vomit. Feelings of anxiety and stress can also trigger nausea and vomiting felt by children (Nabilla et al., 2023). Some of the actions taken by caregivers to manage nausea and vomiting are offering a fruit-rich diet to children, increasing water intake, giving prescribed medications, helping children eat light and cold foods (Silva-Rodrigues et al., 2021). Other actions that can be taken are giving eucalyptus oil, giving aromatherapy such as lavender fragrances, ginger and others. Some caregivers also do nothing to reduce the child's pain. Another action is to invite the child to do relaxation techniques recommended by health workers (Nabilla et al., 2023).

Hair Loss Management

Hair is one of the body parts whose cells can grow quickly. Chemotherapy drugs have a damaging or disruptive effect on fast-growing cells. Therefore, many children experience hair loss and even baldness. The actions taken by the caregiver are to give medicine, give a hat or other head covering, comb the child's hair slowly, and apply coconut oil or hazelnut oil on the child's head (Nabilla et al., 2023; Silva-Rodrigues et al., 2021).

Management of Mucositis

Mucositis is also one of the effects that children complain about. The condition of mouth ulcers, dry mouth and sore throat is very uncomfortable for children. So some of the actions taken by the caregiver are to give medicine, talk to a nutritionist regarding the child's condition, ask the child to gargle 3-4 times a day so that the child's mouth is not dry. Actions that can be taken at home by the caregiver are to provide food that is soft and easy to chew. Children can be helped to drink more water (Nabilla et al., 2023).

Management of Gastrointestinal Problems

Problems that arise in the gastrointestinal system are diarrhea and constipation. Actions taken by caregivers are to give 8- 10 glasses of water a day, give medicine to overcome diarrhea, and avoid foods that are high in sugar or dairy products. Giving water to children with diarrhea aims to meet their needs child's fluids and maintain the child's electrolyte balance (Nabilla et al., 2023).

Emotional or Psychosocial Problem Management

Children with cancer after chemotherapy will feel sadness, crying, anger, and resentment towards their current condition. It is important for the caregiver to accompany the child and comfort the child in their current condition. Actions that caregivers can take are to rely on religious beliefs and hope for the child's recovery and comfort the child, helping the child accept his or her current condition (Fang et al., 2023; Silva-Rodrigues et al., 2021).

Other Issues

Other problems that usually arise after chemotherapy are loss of appetite, fatigue, and skin problems. Caregivers can help provide the child's favorite food so that the child's appetite improves. If the child is tired the caregiver can help provide physical exercise and reduce movement for unnecessary activities so that the child can save his energy. Skin problems can occur in children after chemotherapy such as dry skin. Management that can be done by the caregiver is to provide lotion, fulfill water intake, and use a soft cleansing soap for the child's skin.

Table 1.
 Studies Included in The Literature Review

Title	Author (s) (Year)	Findings
Overview of parents' actions in coping with side effects of chemotherapy in children with cancer	(Nabilla et al., 2023)	The results of the study obtained actions taken by parents to overcome nausea and vomiting. The majority of actions taken by parents to overcome nausea and vomiting are giving drugs (61.1%). The action to overcome hair loss by using coconut oil / candlenut to the patient's head (38.8%). To overcome mouth ulcers, dry mouth and sore throat, many were given to gargle the mouth 3-4 times a day (57.1%). For diarrhoea, parents gave 8-10 glasses of water per day (66.6%). For the problem of muscle nerve disorders, parents gave (33.3%). To overcome fatigue, it was recommended to rest or sleep when feeling tired (44.4%). Measures to overcome the risk of infection (fever, cough, flu) were given to drink water and consume healthy food (44.4%). were given to drink water and consume healthy food (78.5%). Measures to overcome anaemia Iron-containing foods were given by parents to children (77.7%). Skin problems skin problems were mostly solved by applying handbody lotion (60.0%). Constipation problem was solved by parents gave the child water to drink (63.6%). Actions to overcome side effects of decreased appetite were mostly done by parents accompanying the child in every meal and providing healthy drinks (70.6%). Meal and providing healthy drinks (70.5%).
Management of chemotherapy-related symptoms in children and adolescents: family caregivers perspective	(Silva-Rodrigues et al., 2021)	Eighteen family caregivers participated. The participants mentioned: physical symptoms, especially weakness, alopecia, low immunity, pain, mucositis, constipation, nausea, and vomiting; emotional or psychosocial symptoms such as sadness and mood changes; and constitutional symptoms such as loss of appetite and fever. Pharmacological and non-pharmacological measures were mentioned in the management of symptoms and adverse effects.

Description Of Therapeutic Play As A Diversion Of Pain In Post-Chemotherapy Cancer Pediatric Patients At Halfway House For Children's Cancer Care Foundation Bali	(Lestari et al., 2020)	The type of cancer experienced, 90% leukaemia, 6.7% bone tumour, and 3.3% retinoblastoma. The respondents' pain levels before playing were pain scale 0, 1, and 2. The types of therapeutic play were 46.7% colouring, 16.7% drawing, 23.3% puzzle, and 13.3% origami. Drawing, 23.3% playing puzzles, and 13.3% playing origami. The conclusion of this study is that the majority of respondents under 11 years old are male with leukaemia cancer type. Based on the two pain assessment instruments, the pain of post-chemotherapy cancer children is in the mild category. The majority of respondents played therapeutic colouring for 26 minutes.
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DISCUSSION

Chemotherapy in children generally has side effects. Such as nausea, vomiting, hair loss, digestive problems and even skin problems. As a person who cares for children, caregivers must help children reduce the side effects felt. Based on research by (Nabilla et al., 2023) nausea and vomiting is most common in children, which is 60% of the total sample. The actions taken by caregivers to deal with the effects of nausea and vomiting are pharmacological and non-pharmacological therapies such as giving prescribed drugs and eucalyptus oil. The least common side effect was anemia, which was 30%.

Based on several articles that have been reviewed, the average caregiver provides care to children with non-pharmacological therapies. To deal with pain in children caregivers provide massage, ask children to do breathing techniques and arrange positions comfortably. However, there are also those who provide pharmacological therapies such as in the state of nausea and vomiting children are given medicine, then there are also those who give eucalyptus oil. For hair loss caregivers provide head coverings to children and provide candlenut oil or coconut oil. For other effects such as diarrhea caregivers on average provide drinking water to children 8-10 glasses in a day, for mucositis disorders caregivers invite children to rinse their mouths. Caregivers, in this case parents and family, have a big role in caring for children after undergoing chemotherapy. Support from parents, family, external and spiritual support is needed for children (Wong et al., 2021). There are challenges that are certainly felt by caregivers during the care of children after chemotherapy. The challenge that is often faced by caregivers is not knowing how to care for children who have returned home after chemotherapy. Caregivers, especially those who are new to caring for children with cancer, will certainly feel confused when side effects of chemotherapy appear (Cheng & Tan, 2021; Er et al., 2022).

The challenges faced by caregivers can certainly have an impact on children. Therefore, caregivers need to be given education to care for children who are experiencing side effects of chemotherapy, education can be provided by nurses for caregivers (Quast et al., 2021). Ways that can be done such as the results of research by (Barani et al., 2023) namely by providing educational interventions based on efficacy theory in mothers who have children with cancer. As the times develop, the pattern of parenting for children is also developing. The results of research by (Mueller et al., 2022) there is an application that can help caregivers in reporting the health conditions of their children after chemotherapy through the m-Health application. In this literature review, it has explained the actions of caregivers in dealing with side effects of chemotherapy. However, a more specific explanation is needed regarding the action of each side effect felt by the child.

CONCLUSION

Cancer can affect various ages including children. The usual therapy given is chemotherapy. Chemotherapy are classified as a type of harsh drug that causes various effects. The most common effects are pain, nausea and vomiting, hair loss, mucositis, gastrointestinal problems, emotional or psychosocial problems and various other effects such as loss of appetite, fatigue and skin problems. Based on the results of the literature review, the most common side effects were nausea and vomiting. The action taken is to give anti-nausea and vomiting drugs as prescribed. In addition, caregivers also usually give eucalyptus oil to children because of the soothing aroma of eucalyptus oil and children will be distracted from their nausea and vomiting. The problem of hair loss is given a head covering and hazelnut oil or coconut oil which is usually used because it is useful for thickening the hair. Pain management that is mostly done is by giving medicine and massaging besides that it can also invite children to play therapeutically as a distraction from pain. Management of mucositis and gastrointestinal problems by inviting children to rinse their mouths, giving healthy food, giving more drink. Management of emotional and psychosocial problems by always being near the child so that the child feels comfortable and praying.

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