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Caregivers' Knowledge Regarding Infection Prevention in Children with Hematological Cancer Attending at Tertiary Cancer Hospital, Nepal

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ABSTRACT

Background: Cancer is the significant public health problem worldwide. Hematological cancers are the most common cancers which rank 1st among childhood cancers worldwide. Hematologic cancer patients with compromised immune systems are already susceptible to infections. Infection is one of the leading causes of death in patients with hematologic cancers The objective of the study was to assess the knowledge of caregivers' regarding infection prevention of children with hematological cancer attending at Tertiary cancer hospital of Nepal.

Method: A cross-sectional study design was conducted among 60 caregivers selected through purposive sampling technique. A structured interview schedule was used to collect data and analyzed using SPSS version 22 and interpreted using descriptive and inferential statistics.

Result: The mean age and SD of 32.53±11.179. More than half (53.3%) of respondents were female mainly the parents (73.3%). This study also revealed that, more than three-fifth (73.3% had good level of knowledge, one-fourth 15(25%) had moderate level of knowledge and only 1.7% had low level of knowledge regarding infection prevention in children with hematological cancer). A statistically significant association was found between the caregiver's relationship to the child and their level of knowledge (p-value = 0.013).

Conclusion: This study concludes that, though majority of the respondents had good and moderate level of knowledge regarding infection prevention in children with hematological cancer, gaps were noted in certain areas, particularly regarding the risks of raw or undercooked food during neutropenia and the placement of plants in children's rooms. Therefore, continuous education for caregiver is essential to address these gaps and safeguard the health of vulnerable children.

Key words: caregivers; hematological cancer; infection prevention; knowledge.

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INTRODUCTION

Cancer is the significant public health problem worldwide. Hematological cancers are the most common childhood cancer and its incidence is increasing day by day. It is one of the leading causes of mortality in the pediatric population.[1] Between 50% and 80% of hematological cancer patients face infections during their illness and treatment, which increases mortality and morbidity, raises healthcare costs, and requires more frequent hospitalization.[2] The diseases itself, or treatments such as chemotherapy, radiation, or hematopoietic stem cell transplantation, cause immunosuppression, specifically myelosuppression[3], which places these patients at an increased risk of a wide range of opportunistic infections.[4]

Since caregivers spend the most time with the child and supervise daily routines like hygiene, diet, and

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cleanliness, all of which are crucial in preventing exposure to pathogens in immunocompromised children. They are the first line of defence in identifying and managing infection risks.[5] However, parents may lack the necessary caregiving knowledge regarding infection prevention, managing treatment side effects, and offering emotional support for their child.[6] The survival of a child with haematological cancer may depend on parents and caregivers receiving sufficient information and assistance for early infection prevention and how to recognize and treat common symptoms like fever. So, this study aims to assess the level of knowledge of caregivers' regarding infection prevention of children with hematological cancer.

METHODS

A descriptive cross-sectional study was carried out to assess the level of knowledge of caregivers' regarding infection prevention of children with hematological cancer attending at B.P. Koirala Memorial Cancer Hospital (BPKMCH) which is a tertiary cancer center of Nepal. A total of 60 care givers, were selected through non-probability purposive sampling method. The care givers who were responsible for the daily care of the child and have direct contact with the child during treatment period such as, parents, sibling, grand-parents, uncle, aunts were included in this study. A structured interview schedule was used to collect the data consisting of two parts: Part I: related to socio-demographic variables and Part II: related to Knowledge regarding infection prevention. The Level of knowledge was measured by calculating the total scores and classifying in reference to Bloom's cut off point into three categories. Where, high level scores 80-100%, moderate level score 60-79% and low-level scores (≤59%).[7] Before data collection, ethical approval and administrative approval were obtained from BPKMCH, Institutional Review Committee (IRC). The written informed consent was obtained from all the care givers. Then all collected data were entered and analyzed by Statistical Package for Social Science (SPSS) version 22. Data was interpreted by using descriptive and inferential statistics &presented in different tables. A p-value <0.05 was considered statistically significant.

RESULTS

Demographic analysis revealed that mean age of the respondents was 32.53 and SD was 11.179 with maximum age of 58 years and minimum age of 18 years. Likewise, more than half (53.3%) of respondents were female and 38.3% of respondents had completed secondary education followed by basic education (35%). Likewise, majority (80%) were Hindu, 33.3% belonged to the Janajati ,80% reported they had income sufficient for less than six months to meet household essential needs and 60% of respondents had been providing care for less than six months. In terms of relation with child, 73.3% were either the father or mother of the child. Regarding residency, three fourth (75%) of respondents were from rural areas.

Regarding hand hygiene, most of the respondents (96.7%) recognized the importance of washing hands before and after touching the child and encouraging the child to wash hands frequently. Likewise, 93.3% ensured that visitors should wash their hands before meeting child. Additionally, 95% agreed that hand sanitizer should be used when soap is not available and 81.7% acknowledged the importance of keeping sanitizer in areas where the child spends most of their time. Regarding general hygiene practices, cent percent of respondents recognized that children should keep their nails short and clean, change clothes regularly, and bathe daily. Further more, 91.7% reported that children should brush their teeth twice daily, 66.7% agreed that Sitz bath helps to reduce infections and 73.3% acknowledged the need for clean and warm water for sitz bath as shown in Table 1.

Concerning environmental hygiene, cent percent of respondents knew that home surfaces should be regularly cleaned, 96.7% knew that the child's clothes and bedding should be washed regularly and the child's living space should be kept clean, 95% said that child should wear a mask in crowded places. Additionally, 91.7% understood that visitors with mild

symptoms should wear a mask, 88.3% recognized the importance of cleaning the child's toys, while 80% were known about the child's personal items should be kept separate and 83.3% said exposure to pets should be restricted. Moreover, only 30% knew that plants should not be placed in the child's room that indicate a gap in Knowledge (Table 1).

Table 1. Respondents' knowledge regarding infection prevention: hand hygiene precaution, general hygiene. (n=60)

Knowledge Variables	Correct response Frequency (%)
Hand hygiene	
Wash hand before and after touching child	58(96.7)
Encourage child to wash hand frequently	58(96.7)
Visitor should wash hand before meeting child	56(93.3)
Sanitizer should be used if soap not available	57(95.0)
Keep sanitizer where child spend most of time	49(81.7)
General hygiene practices	
Child should brush teeth twice a day	55(91.7)
Sitz bath helps to reduce infections	40(66.7)
Clean and warm water is used for sitz bath	44(73.3)
Child's nail should be short and clean	60(100)
Child should change clothes regularly	60(100)
Child should bath regularly	60(100)
Environmental hygiene	
Home surface should be regularly cleaned	60(100)
Child's clothes and bedding should be regularly washed	58(96.7)
Child's personal items should keep separate	48(80.0)
Child's living space should be cleaned	58(96.7)
Child's toys should be cleaned	53(88.3)
Restrict child's exposure to pets	50(83.3)
Plants shouldn't be place in child room	18(30.0)
Child should wear mask in crowded place	57(95.0)
Visitor having mild symptoms should wear mask	55(91.7)

In regards to knowledge on food hygiene practices, cent percent of respondents said that hands should be washed before eating; fruits and vegetables should be cleaned before serving. Similarly, 95% of the respondents knew that children should drink only boiled or filtered water, 91.7% said street or processed food should be avoided and 88.3% were aware that unpasteurized milk should not be given. However, less than half (46.7%) knew that raw or undercooked food should not be given in neutropenia as shown in Table 2.

Table 2. Respondents' knowledge regarding food safety practices. (n=60)

Knowledge variables	Correct Response Frequency (%)
Child should wash hand before eating	60(100)
Avoid giving street or processed food	55(91.7)
Fruits and vegetable should be clean before serving	60(100)
Unpasteurized milk should not be given	53(88.3)
Child should drink only boiled or filtered water	57(95.0)
Raw or undercooked food should not be given in Neutropenia	28(46.7)

Regarding level of knowledge on infection prevention, more than three-fifth of respondents (73.3%) had good level of knowledge, one- fourth (25%) had moderate level of knowledge and 1.7% had low level of knowledge regarding infection prevention in children with hematological cancer as presented in Table 3.

Table 3. Respondents' level of knowledge regarding infection prevention in children with hematological cancer. (n=60)

Level of Knowledge	Frequency (%)
Poor level of knowledge	1(1.7)
Moderate level of knowledge	15(25.0)
Good level of knowledge	44(73.3)

Table 4 depicts that statistically significant between the caregiver's relationship to the child and their level of knowledge (p-value= 0.013). Specifically, parents had significantly better knowledge compared to grandparents and others while other variables (age, gender, education, duration of care, residency) were not significantly associated with level of knowledge.

Table 4. Association between level of knowledge with selected socio-demographic variables: age, gender, education, relation to child, duration of care. (n=60)

Characteristics	Level of Knowledge			Chi-square (χ^2)	p-value
	Poor n(%)	Moderate n(%)	Good n(%)		
Age (years)					
18-28	0	6(27.3)	16(72.7)	10.532	0.104
29-38	0	6(24)	19(76)		
39-48	1(9.1)	1(9.1)	9(81.8)		
49-58	0	2(100)	0		
Gender					
Male	1(3.6)	5(17.9)	22(78.6)	2.818	0.244
Female	0	10(31.3)	22(68.8)		
Education					
No Education	1(12.5)	3(37.5)	4(50)	5.999	0.423
Primary Education	0	5(23.8)	16(76.2)		
Secondary Education	0	6(26.1)	17(73.9)		
Higher Education	0	1(12.5)	7(87.5)		
Relation to child					
Father/Mother	0	9(20.5)	35(79.5)	12.62	0.013*
Grandfather/Grandmother	1(33.3)	2(66.7)	0		
Others	0	4(30.8)	9(69.2)		
Duration of Care					
Less than 6 months	1(2.8)	10(27.8)	25(69.4)	3.6	0.463
6-12 months	0	2(50)	2(50)		
more than 1 year	0	3(15)	16(85)		

** Level of significance (p-value ≤ 0.05).*

DISCUSSION

Regarding hand hygiene, out of 60 respondents, 96.7% of the respondents recognized the importance of washing hands before and after touching the child and encouraging the child to wash hands frequently,95%) agreed that hand sanitizer should be used when soap is not available. These findings of the study are supported by the study conducted in Thailand in 2024, where the statement on washing hands regularly with soap or alcohol gel after exposure to germs before interacting with children had a mean score of 2.91 (SD = 0.28).[8] Additionally 81.7% acknowledged the importance of keeping sanitizer in areas where the child spends most of their time. Whereas, 93.3% of respondents ensure that visitors should wash their hands before meeting child. These findings of the study are consistent with the study of Kwon et al. where the respondents were fully known about washing hands every time after using restroom and after returning home from outside.[9]

Regarding general hygiene, cent percent of respondents recognized that children should keep their nails short and clean, change clothes regularly, and bathe daily. Likewise, 91.7% reported that children should brush their teeth twice daily. Cent percent of respondents knew that home surfaces should be regularly cleaned. 95% ensured that child should wear a mask in crowded places. Additionally, 91.7% stated that visitors with mild symptoms should wear a mask, 83.3% understand exposure to pets should be restricted, Similarly in this study, 68.6% agreed that Sitz bath helps to reduce infections and 74.5% acknowledged the need for clean and warm water for sitz bath and only 30% knew that plants should not

be placed in the child's room that indicate a gap in knowledge These findings are closely related with the study conducted in Iraq[10] in 2018 where, 64% answered pruning the hair and nails once every two weeks to ensure cleanliness, 98% reported wearing clean clothes, and changing underwear daily, 82% practiced daily bathing, and 70% used a toothbrush twice a day, 84% answered that house should be kept clean, 60% knew crowded places must be avoided, 82% avoid approaching people suffering from infection, 56% answered no pets inside the house and 38% avoid putting natural plants inside the house.

Present study revealed that 96.7% of respondents knew that the child's clothes and bedding should be washed regularly and the child's living space should be kept clean, 88.3% recognized the importance of cleaning the child's toys, while 80% were aware that the child's personal items should be kept separate. These findings of the study are similar with the study of Bagcivan et al.[11] conducted in 2015 and with the study findings of Klaisuban et al., where the practice of regularly cleaning bed sheets, pillowcases, and blankets to prevent dust accumulation had a mean score of 2.93 (SD = 0.27). [8]

Regarding food safety practices, cent percent of respondents correctly identified the importance of washing hands before eating and ensure that fruits and vegetables should be cleaned before serving, 95% respondents knew that children should drink only boiled or filtered water and 91.7% said street or processed food should be avoided. Additionally, majority (88.3%) had knowledge on unpasteurized milk should not be given. These study findings are closely related with the study conducted in Iraq in 2018 where 94% of participants reported washing hands before and after eating, 88% washed all fresh fruits and vegetables properly before eating, 64% used clean and uncontaminated water, 60% followed a proper diet and avoided junk food and 58% ensured the use of pasteurized milk.[10] However, less than half (46.7%) of respondents knew that raw or undercooked food should not be given in neutropenia. The study conducted in Korea in 2010 reported that the statement of not allowing children to eat raw food (fruits and vegetables etc.) had a mean score of 2.28±0.74.[9]

Present study found that 73.3% of respondents had good level of knowledge, one- fourth (25%) had moderate level of knowledge and 1.7% had low level of knowledge regarding infection prevention in children with hematological cancer. The study conducted in Egypt in 2019 reported that only 2.5% of caregivers had a good level of knowledge regarding infectious diseases and infection prevention and control measures, while 87.3% had a fair level of knowledge, and 10.2% had a poor level of knowledge.[12]

In this study, a statistically significant association was found between the caregiver's relationship to the child and their level of knowledge (p-value=0.013). Specifically, parents (father and mother) had significantly better knowledge compared to grandparents and others, while other variables were not significantly associated with level of knowledge. A study conducted in Korea on knowledge and practice of infection prevention by mothers of young children showed statistically significant between the level of knowledge and practice on infection prevention with mothers' education, monthly family income, and type of residence (p-value<.001), but there were no differences according to number of children and admission history of child for infectious disease.

CONCLUSIONS

Based on the findings of this study, it can be concluded that though majority of caregivers (73.3%) had a good level of knowledge regarding infection prevention of children with hematological cancer, gaps were noted in certain areas, particularly regarding the risks of raw or undercooked food during neutropenia and the placement of plants in children's rooms. Therefore, continuous education for caregivers is essential to address these gaps and safeguard the health of vulnerable children.

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