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Predictors of Knowledge and Self-Care among Patients Undergoing Chemotherapy

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Abstract: ***Introduction**: Knowledge of chemotherapy-related side effects and self-care behavior are important components of symptom management during cancer treatment. This study aimed to identify sociodemographic and clinical predictors of knowledge and self-care behavior among patients receiving chemotherapy and to examine the relationship between these outcomes. **Methods**: Data were collected from 120 patients attending the medical oncology and radiation oncology units of AIIMS, Bhubaneswar. Sociodemographic and clinical proforma, a 22-item knowledge questionnaire and a 38-item self-care behavior rating scale were used for collecting the data. Multiple linear regression was used to identify predictors, and Spearman correlation was used to assess the relationship between knowledge and self-care behaviour. **Results**: Educational qualification ($p = 0.005$), religion ($p = 0.008$) and stage of cancer ($p = 0.047$) were significant predictors of knowledge. Family history of cancer ($p = 0.009$) and marital status ($p = 0.015$) were significant predictors of self-care behaviour. The reported R^2 values were 0.10 for knowledge and 0.08 for self-care behaviour. Knowledge and self-care behaviour showed a weak positive correlation ($r_s = 0.194$, $p = 0.034$). **Conclusion**: Selected sociodemographic and clinical characteristics were significant predictors of knowledge and self-care behavior; however, the regression models explained only a small proportion of the variation in these outcomes. Knowledge showed a weak positive correlation with self-care behavior.***

Keywords: Chemotherapy; knowledge; self-care behaviour; predictors; cancer

1. Introduction

Globally, cancer is the second leading cause of death which means 1 in 6 deaths is due to cancer. In 2018, cancer was responsible for an approximately 9.6 million deaths.[1] In India, around 2.25 million people are living with the disease.[2]

Chemotherapy is the most common and acceptable method to treat cancer at present. The major purpose of chemotherapy is to stop the abnormally dividing cancer cells. However, chemotherapy may affect some normal cells such as mucosal cells in the mouth, stomach, intestine, hair follicles and bone marrow cells and cause extensive side effects. Patient may also suffer from uncomfortable feeling including symptoms like anorexia, nausea, vomiting, fatigue, mouth sores and low white blood cells. Due to changes in physical, mental and social status, self-care behaviour of patients is affected.[3]The varied side effects of chemotherapy adversely affect the patient's quality of life and physical functioning. There is increase in morbidity, length of stay in hospitals and poor quality of life due to poor knowledge regarding chemotherapy treatment and managing side effects among patients. Patients are often unable to manage the symptoms of the disease and the side effects of the treatment. Developing and improving interventions aimed at managing the side effects of cancer treatment is a priority in cancer care.[4]

Patients undergoing chemotherapy may not perform suggested self-care activities despite chemotherapy-related symptoms. The varied reasons for poor self-care behaviour are: patients believe that the side effects are simply endurance, the patient's reluctance to complain, and the professional's reluctance to tell patients if the side effects can be mitigated, and the patient's poor memory of self-care provided to him. Studies conducted on management of pain and fatigue in cancer patients has found that the patient's hesitation to report symptoms and misconceptions about their symptoms and treatment are significant obstacles in management of symptoms.[5] The present study aimed to identify predictors of knowledge and self-care behaviour among patients undergoing chemotherapy and to examine the relationship between baseline knowledge and self-care behaviour.

2. Methodology

The study was conducted among 120 patients undergoing chemotherapy in the medical oncology ward and the day care units of the medical and radiation oncology departments at the All India Institute of Medical Sciences, Bhubaneswar. It examined predictors of knowledge and self-care behaviour and the relationship between these outcomes. Inclusion criteria for study participants included those who were receiving chemotherapy in the outpatient or inpatient settings, willingness to participate, ability to read, write and understand Odia, Hindi or English, and those who have completed of at least one cycle of chemotherapy. IEC permission was obtained from institutional ethical committee. Informed consent was obtained from the study participants. Sociodemographic and clinical characteristics were collected using a structured proforma. Knowledge regarding the management of chemotherapy-related side effects was assessed using a researcher-developed 22-item questionnaire.

Self-care behaviour was assessed using a researcher-developed 38-item rating scale.

3. Data Collection Tools

1) Sociodemographic and clinical proforma was developed by the investigator to collect demographic characteristics and clinical data. Content validity index was 0.84
2) Knowledge questionnaire was developed by the researcher to assess the knowledge regarding management of side effects of chemotherapy. The questionnaire consists of 22 questions related to self-care management of patients with emphasis on management of side effects of chemotherapy mainly myelosuppression constituting neutropenia, thrombocytopenia and anaemia, gastro-intestinal effects constituting nausea and vomiting, anorexia, stomatitis, diarrhoea and constipation, integumentary effects constituting alopecia and skin reactions, oncology emergencies constituting infection and pain. Content validity index was 0.86. Split half method and spearman brown prophecy formula was used for reliability (0.84).
3) Self-care behavior rating scale was developed by the researcher to assess the self-care management behavior among the cancer patients undergoing chemotherapy. It consists of total of 38 questions. Scoring was given based on four domains, 1 for never, 2 for seldom, 3 for usually and 4 for always. Higher the total score, higher is the self-care behavior. Content validity index of the 38 items was 0.83. Reliability of the tool was established by test retest method by administering the tool to 20 patients in the medical oncology ward, and the reliability coefficient of the tool was 0.8

Statistical analysis

Bivariate analyses were performed to identify sociodemographic and clinical variables significantly associated with knowledge and self-care behaviour. Variables showing significant associations were entered into separate multiple linear regression models for the two outcomes. Results were expressed as unstandardized regression coefficients (B), standard errors, standardized coefficients (β), t statistics, p values and 95% confidence intervals. Spearman's rank correlation coefficient was used to examine the relationship between knowledge and self-care behaviour. Statistical significance was set at $p < 0.05$.

4. Results

Predictors of knowledge and self-care behavior

Educational qualification, religion and stage of cancer were significant predictors of knowledge (Table 1). Family history of cancer and marital status were significant predictors of self-care behaviour (Table 2).

Table 1: Sociodemographic and clinical predictors of knowledge, n = 120

Predictor	B	SE	β	t	p	95% CI for B
Educational qualification	−1.483	0.517	−0.249	−2.866	0.005	−2.507 to −0.458
Religion	2.501	0.926	0.234	2.700	0.008	0.667 to 4.335
Stage of cancer	1.376	0.686	0.172	2.006	0.047	0.017 to 2.735

Table 2: Sociodemographic and clinical predictors of self-care behavior, n = 120

Predictors	B	SE	β	t	p	95% CI for B
Family history of cancer	−9.892	3.705	−0.234	−2.670	0.009	−17.229 to −2.555
Marital status	−5.488	2.218	−0.217	−2.474	0.015	−9.881 to −1.094

Relationship between baseline knowledge and self-care behavior

Baseline knowledge had a weak positive correlation with self-care behaviour (Table 3).

Table 3: Correlation between baseline knowledge and self-care behaviour, n = 120

Variables	Spearman r_s	p value
Knowledge and self-care behavior	0.194	0.034

5. Discussion

In the present study, educational qualification, religion and stage of cancer were significant predictors of knowledge, while family history of cancer and marital status were significant predictors of self-care behaviour. Other studies have also examined patient characteristics associated with self-care. In a study of 112 cancer patients receiving radiotherapy in Bangkok, social support and socioeconomic status were identified as significant predictors of self-care; stage and site of cancer were also associated indirectly through social support.[6] Another study among 127 adults with cancer reported better self-care among patients with more education, higher anxiety, lower performance status and less social support.[7] A study among 133 patients undergoing chemotherapy reported that age, education level and income were not associated with self-care behaviour.[3] These differences may reflect variation in populations, treatment settings and measures of self-care. The association between educational qualification and knowledge in the present study highlights the importance of considering patients' ability to understand treatment-related information. Parker and colleagues found that health literacy, marital status and income were associated with chemotherapy knowledge among women with breast cancer. [8] Although educational attainment and health literacy are distinct constructs, these findings suggest that knowledge may reflect both educational background and the ability to interpret health information. The identification of marital status and family history of cancer as predictors of self-care behaviour suggests that the

patient's family context warrants further consideration. In a qualitative study involving 26 Indian patients with cancer, immediate family members provided emotional support, helped patients navigate hospital services and assisted with treatment adherence. [9] These findings offer a possible explanation for the relevance of marital status, although marital status alone does not indicate the availability or quality of support. Previous experience of cancer among family members may have increased awareness of treatment-related care and encouraged better self-care practices.

Knowledge and self-care behavior showed a statistically significant but weak positive relationship ($r_s = 0.194$, $p = 0.034$). The weak positive correlation between knowledge and self-care behaviour indicates that greater knowledge may not consistently translate into better self-care practices. In a cross-sectional study of 213 participants, Papadakos and colleagues found that self-efficacy contributed significantly to variation in chemotherapy self-management behaviour, whereas health literacy was not significantly associated with self-management. [10] Qualitative evidence further illustrates why knowledge alone may explain only a limited part of self-care behavior. Coolbrandt and colleagues, through interviews with 28 adults receiving chemotherapy, described symptom management as a process of learning from treatment experiences, shaped by perceived control, coping strategies, professional attitudes and information resources. [11] A study conducted in Thailand among 133 cancer patients, knowledge was associated with self-care behaviour of patients treated with chemotherapy.[3]Although health literacy differs from knowledge, this finding suggests that confidence in managing treatment-related problems may be relevant alongside understanding what actions to take. Self-efficacy could therefore be considered in future studies examining additional predictors of self-care behaviour.

6. Limitations

The self-reported nature of the data may have introduced response bias.

7. Conclusion

Educational qualification, religion and stage of cancer were significant predictors of knowledge, while family history of cancer and marital status were significant predictors of self-care behaviour. Baseline knowledge showed a weak positive correlation with self-care behaviour.

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