



Knowledge and Attitude of Cancer Patients' Companions towards Chemotherapy and Radiotherapy-induced Oral Complications and Dental Considerations

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Abstract

Background: Although Knowledge of the side effects of cancer treatments is crucial for everyone, it is more vital for patients' companions. Since they can significantly improve patients' attitudes towards cancer treatments and help them tolerate the disease; **Objectives:** therefore it is essential to investigate the companions' attitudes.

Methods: In this cross-sectional study, a questionnaire was provided to companions at Kowsar Hospital in Semnan University, Iran, in October 2021. A total of 176 companions were selected by simple sampling method. Inclusion criterion consisted of the companions who were most of the time alongside the patients. The researcher-designed questionnaire included three sections: demographic variables, knowledge of and attitude toward dental considerations, and oral complications related to chemotherapy and radiotherapy (15 and 4 items, respectively). The relationship between knowledge and attitude with variables (e.g., gender, education level, duration of the treatment, and the location of the cancer) was investigated.

Results: Overall, 176 companions participated in this research. A total of 152 (86.4%) individuals had low to moderate knowledge (score 7-14), and only 6 (3.4%) companions had high knowledge (score 15-19). Around 74 (42%) individuals had moderate attitude scores, and 98 (55.7%) had high attitude scores. Companions' knowledge scores increased significantly with higher education and having head and neck cancer patients. Moreover, companions' attitude scores decreased significantly with the age and duration of patients' treatments and increased significantly with higher education and having gastrointestinal cancer patients.

Conclusion: The level of knowledge and attitude of companions was low to moderate about chemotherapy- and radiotherapy-induced oral complications and dental considerations. Therefore, improving the comprehensive education of this group is required.

Keywords: Attitude, Chemotherapy, Dental Consideration, Knowledge, Medication, Neoplasm, Oral Complication, Radiation-therapy

1. Background

According to available data, after cardiovascular diseases and accidents, cancer is the third leading cause of death in Iran (1). Cancer management includes several different treatments in the field of prevention, treatment, and rehabilitation of malignant disease, and chemotherapy and radiotherapy are the most common modalities of cancer treatment (2). Radiotherapy and chemotherapy have long been used as treatments for cancer, and the oral side effects associated with them are well-known; however, people have little information about these treatments and their side effects. On the other hand, the stress caused by the diagnosis of cancer in patients and their families is the most obvious barrier to communication between individuals and medical staff (3,4). Oral complications associated with these treatments include oral ulcers (mucositis), dysphagia, an increased risk of tooth decay, candidiasis, dysgeusia, soft tissue necrosis, progressive loss of gingival connective tissue, and trismus. Complications of salivary gland involvement include decreased salivation, xerostomia, and skeletal

complications in the jaws, including osteoradionecrosis, which significantly affect the patient's quality of life (4,5). Studies have shown that the level of awareness about oral and dental complications related to chemotherapy and radiotherapy in many cancer patients is significantly low (6). Instead, awareness of the side effects associated with such treatments and related considerations will cause patients to take the necessary measures to prevent the occurrence of complications or reduce their severity, and ultimately their quality of life increases significantly. In addition, these studies have revealed that if people are educated enough about oral health care during treatments, the incidence of common complications, such as oral mucositis, xerostomia, and difficulty in mouth opening will be reduced, and patients' acceptance to continue treatment will be increased (7).

Cancer patients need more psychological support due to the sensitivity of the disease, and the presence of the family member has the greatest impact on improving patients' attitudes and helping to tolerate the disease and the treatment process (8); therefore, the key role of the patients' companions could be

realized. In several studies on cancer patients and their need for education on the side effects of their treatments, patients have stated that they tend to receive relevant educational information along with the presence of their family, and the importance of educating patients' companions in these studies has been noted (8,9). Having sufficient knowledge of and correct attitude toward dental considerations and oral complications of cancer treatments reduces the incidence of complications and improves the patients' quality of lives (2).

2. Objectives

Therefore, in this study, we aimed to examine the level of knowledge and attitudes of companions about dental considerations and oral complications related to chemotherapy and radiotherapy.

3. Methods

3.1. Study design and participants

In this descriptive-analytical cross-sectional study, knowledge and attitude of cancer patients' companions towards dental considerations and oral complications related to chemotherapy and radiotherapy in Semnan, Iran, in October 2021 were examined. Inclusion criterion was the companions who were most of the time with the patient, and exclusion criteria included lack of cooperation due to old age, lack of time, and illiteracy.

By attending the cancer treatment center of Kowsar Hospital in Semnan, all the companions of cancer patients desiring to participate in the study filled out a consent form and then received the questionnaire. Finally, 176 patients' companions were included in the study. Those who did not want to cooperate were excluded from the study.

3.2. Questionnaire

The researcher-designed questionnaire includes three sections: demographic (age, gender, and the level of literacy), knowledge of and attitude towards dental considerations, and oral complications related to chemotherapy and radiotherapy (15 and 4 items, respectively). It was provided by the research group using previous studies (6,8). The items were selected from the book "Little and Falace's Dental Management of the Medically Compromised Patients 2017" (10) (Appendix A).

The scoring method was such that in the knowledge section, each correct response was given a positive score, and a zero was given for choosing the wrong options. Four items had the option of "all cases" and a score of 2 was given for that and a score of 1 for all the other options. Furthermore, the lowest and highest scores were 4 and 19, respectively; a higher score meant more knowledge. Therefore, people's knowledge of dental considerations and oral

complications related to chemotherapy and radiotherapy reported as follows:

Very low knowledge: Score less than 7

Low knowledge: Score 7 to 11

Moderate knowledge: Score 11 to 15

High knowledge: Score 15 to 19

In the attitude section, the questionnaire was designed on 5 points Likert scale, which is: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. The lowest and highest scores were 4 and 20, respectively; a higher score meant a more positive attitude.

Questions were divided into six different sections, and the data were evaluated accordingly: knowledge of the symptoms of oral involvement (items 1 to 4), knowledge of bone complications in the jaws (item 6), knowledge of the complications of salivary glands involvement (item 7), knowledge of dental considerations related to the field of tooth extraction (items 8 to 11), knowledge of dental considerations related to the field of dental referral (items 12 to 15), attitude towards dental considerations related to the field of oral health care (items 16 to 19).

In the mentioned questionnaire, validity and reliability were evaluated. In reviewing the validity of the questionnaire, we consulted with five expert professors (three oral medicine specialists and two oncologists); afterward, the requested changes made by consultation were applied. These changes included deleting an item and replacing it with item no. 5, which was a sub-question with the correct answer of "No", and editing question no. 19; so that, like the rest of the attitude items, a positive answer has a higher score. Then, to measure the reliability, the questionnaire was given to 20 companions, and after three weeks, it was given to the same people again.

3.3. Ethical issues

This research started after obtaining the Ethical Code number IR.SEMUMS.REC.1399.304

3.4. Statistical analysis

Cronbach's alpha was used for internal consistency of attitude items which was 0.623 and was acceptable. The interclass correlation coefficient was used to evaluate the reliability, which was obtained from 0.708 to 0.983. Kuder-Richardson 20 was used for internal consistency of knowledge items with a value of 0.519. The Spearman-Brown correlation coefficient was performed to evaluate the stability in reliability with a value of 0.522.

4. Results

The demographic status of the companions is shown in Table 1. Mean \pm standard deviation of companions' knowledge score of dental considerations and oral complications due to chemotherapy and radiotherapy was 10.2 ± 2.8 (out

of 19). In addition, the mean ± standard deviation of companions' attitude score towards dental considerations related to oral health and care was 15.6 ± 2.5 (out of 20). According to our study, 152 (86.4%) of companions had low to moderate knowledge, and 76 (43.3%) of companions had low to moderate attitudes towards dental considerations and oral complications related to chemotherapy and radiotherapy. The distribution of knowledge and attitude scores of companions is presented in [Table 2](#).

The distribution of knowledge scores of men and women in the companion group was not significant (P=0.061). No significant correlation was observed between age and knowledge score of companions (P=0.421 and r=-0.064). There was a positive and significant correlation between the level of education and the knowledge score of the participants in the knowledge items (P=0.013 and r=0.186). The duration of patients' treatment in the companions' group and the companions' knowledge score was not significantly correlated (P=0.182). A significant relationship was seen between companions' knowledge score and patients' site of cancer [P=0.002, [Table 3](#)].

Table 1. Demographic status of the companions

Gender	No (%)
Male	88(50%)
Female	88(50%)
Age	
< 30	14(8.0%)
30 - 49	108(61.4%)
50 - 69	52(29.5%)
≥ 70	2(1.1%)
Level of Education	
Primary school	30(17%)
Middle school	18(10.2%)
High school	54(30.7%)
University	74(42%)
Duration of patient treatment (months)	
≤ 6	106(60.2%)
> 6	70(39.8%)
The site of the cancer	
Breast / Lung	56(31.8%)
Intestine / Rectum	34(19.3%)
Abdomen / stomach / liver	22(12.5%)
Blood / Bone Marrow	18(10.2%)
Genito-Urinary tract	30(17.0%)
Head and neck area	6(3.4%)
Lymph nodes / etc.	10(5.7%)

Table 2. Knowledge score and attitude of the companions

Study group	Concomitant	
	No (%)	No (%)
Very little knowledge (< 7)	18(10.2%)	Low attitude (5-10) 4(2.3%)
Low knowledge (7-10)	64(36.4%)	Moderate attitude (11-15) 74(42.0%)
Moderate knowledge (11-14)	88(50.0%)	High attitude (16-20) 98(55.7%)
High knowledge (15-19)	6(3.4%)	

Table 3. Mean and standard deviation of companions' knowledge score on dental considerations and oral complications related to chemotherapy and radiotherapy by sex, age, education level, and duration of the treatment and the site of the cancer group

Group	Knowledge score		
	Mean ± SD	Spearman correlation coefficient	P-value
Sex			
Male	9.9 ± 0.3		
Female	10.6 ± 0.3	-	0.061*
Age			
< 30	10.3 ± 0.691		
30 - 49	10.7 ± 0.211		
50 - 69	9.2 ± 0.508	-0.064	0.421**
≥ 70	13.0 ± 0.000		
Education level			
Primary school	9.5 ± 0.653		
Middle school	10.0 ± 0.485		
High school	9.9 ± 0.428	0.186	0.013**
University	10.8 ± 0.261		
Duration of treatment (months)			
≤ 6	10.0 ± 0.249		
> 6	10.6 ± 0.378	-	0.182*
The site of the cancer			
Breast / Lung	10.1 ± 0.291		
Intestine / Rectum	10.8 ± 0.364		
Abdomen / Stomach / Liver	10.7 ± 0.684		
Blood / Bone Marrow	11.2 ± 0.674		
Genito-Urinary tract	9.1 ± 0.623	-	0.002***
Head and neck area	13.3 ± 1.282		
Lymph nodes/ etc.	7.8 ± 0.712		

*Mann Whitney test

**Spearman's correlation coefficient

***Kruskal-Wallis test

Table 4. Mean and standard deviation of companions' attitude score on dental considerations and oral complications related to chemotherapy and radiotherapy by sex, age, education level, and duration of the treatment and the site of the cancer group

Group	Attitude score		
	Mean \pm SD	Spearman correlation coefficient	P-value
Sex			
Male	15.6 \pm 0.2	-	0.620*
Female	15.5 \pm 0.3		
Age			
< 30	16.0 \pm 0.593	- 0.159	0.035**
30 - 49	16.1 \pm 0.188		
50 - 69	14.3 \pm 0.430		
\geq 70	18.0 \pm 0.000		
Education level			
Primary school	14.1 \pm 0.691	0.214	0.004**
Middle school	15.0 \pm 0.511		
High school	15.7 \pm 0.285		
University	16.2 \pm 0.220		
Duration of treatment (months)			
\leq 6	15.9 \pm 0.270	-	0.001*
> 6	15.1 \pm 0.228		
The site of the cancer			
Breast / Lung	15.7 \pm 0.282	-	<0.001***
Intestine / Rectum	16.7 \pm 0.231		
Abdomen / Stomach / Liver	17.0 \pm 0.446		
Blood / Bone Marrow	14.9 \pm 0.478		
Genito-Urinary tract	13.8 \pm 0.669		
Head and neck area	15.0 \pm 0.632		
Lymph nodes/ etc.	15.0 \pm 0.558		

*Mann Whitney test

**Spearman's correlation coefficient

***Kruskal-Wallis test

The distribution of attitude scores of men and women in the companion group was not significant ($P=0.620$). There was a significant inverse correlation between age and attitude score of companions in the questionnaire ($P=0.035$ and $r=-0.159$). A positive and significant correlation was observed between the level of education and the attitude score of the companions in the questionnaire ($P=0.004$ and $r=0.214$). There was a significant relationship between the duration of treatment of patients in the companion group and the attitude score of the companions ($P=0.001$). A significant relationship was seen between companions' attitude score and patients' site of cancer [$P<0.001$, Table 4].

There was a positive and significant correlation between the knowledge score and the attitude score of the companions in this study ($P<0.001$ and $r=0.273$).

5. Discussion

The result of our study indicated that companions' knowledge score increases with higher education, and in head and neck cancer patients was higher than in other cancers. In addition, the companions' attitude score decreases with age and duration of patients' treatments and increases with higher education, and in gastrointestinal cancer patients was higher than in other cancers.

A study conducted by Jalili M. et al. (2021) revealed that people had the least awareness in the

field of oral and dental treatment plans and referrals (25% of people had the least awareness) (11). In a study by Anvari K. et al. (2013), 53% of people were interested in receiving educational information in the presence of their family; similarly, in a study carried out by Piredda M. et al. (2008), 85% of people stated that their families needed to be educated as well. As a result, in our study, we examined the knowledge and attitude of the companions (8,9).

According to the results of our study, 86.4% of companions had low to moderate knowledge, which was similar to the results of the study by Torabi M. et al. (2018) in which 76% of people had low knowledge. Furthermore, in the studies performed by Anvari K. et al. (2013) and Haghpanah S. et al. (2006), the level of knowledge of individuals was reported as 88% and 30%, respectively, which was similar to our study (6,8,12).

Another finding of this study was a direct correlation between education and companions' knowledge that was similar to the study by Hofman M. et al. (2006), which people with higher education had higher knowledge. However, in studies by Haghpanah S. et al. (2006) and Anvari K. et al. (2013), and Torabi M. et al. (2018), no relationship was found between knowledge and level of education (6,8,12,13). The reason for this difference could be that people with higher education usually deal with the information being assessed in this self-administered questionnaire of this research more; therefore, this correlation is reasonable.

In another study by Piredda M. et al. (2008), the

site of cancer was not related to individuals' knowledge (9); however, in our research, the site of involvement was significantly related to the level of knowledge and attitude of companions. Companions of patients who had head and neck involvement had the highest score of knowledge and the site of the abdomen/stomach/liver involvement had the highest score of attitude. A higher level of knowledge and attitude of the head and neck and gastrointestinal involvement sites and lower levels in the lymph nodes and urinary/genital area may be because of this fact that in some cancers, due to their greater prevalence, there is higher public knowledge about them. However, in the case of cancers with a lower prevalence, the level of knowledge and attitude is also low, and this fact was an important statistical result according to which more research should be conducted.

In our study, the level of knowledge of companions was significantly related to the level of education and the site of the patient's cancer, so that the companions with higher education and head and neck cancer patients had a higher level of knowledge. The results related to the attitude scores of companions were that the younger companions with more education and less patient treatment duration were treated, and the site of the patient's cancer in the gastrointestinal area had a higher attitude score. As mentioned, there is no study on the knowledge and attitude of companions in this regard; however, based on studies reported that increasing the treatment duration increases knowledge, this conclusion that increasing the patient's treatment duration reduces the attitude score of companions is far from expected. However, according to face-to-face and telephone interviews with patients and their companions, it was concluded that the more time patients spend on treatment, the less tolerance will remain for the side effects of chemotherapy and radiotherapy, and because of all the pain and suffering they experience, patient's companions have a negative attitude towards treatments and considerations that reduce this pain and suffering. Some companions generally, had negative perspective towards dental considerations, and in their opinion, such factors do not help much in improving the patient's condition, and this attitude is due to the high psychological pressure that patients' companions endure when they see their patient's conditions.

One of the reasons for the low to moderate knowledge and attitude scores of these people could be the lack of the effective basic training. Additionally, no training has been provided about the considerations that can prevent the worsening of oral and dental complications of these treatment modalities. Therefore, after the end of this study, educational measures were taken for patients, companions, and nurses using designed pamphlets,

collaborative seminars, and oral explanations.

The first suggestion in this field is to train nurses and then evaluate the effectiveness of training being provided by nurses to patients and their companions. Since patients seek treatment after the onset of complications of their disease and due to misinformation, they consider their complications unavoidable, since their first bridge of communication is nurses, it is necessary to carefully educate nurses about such complications and related considerations, to prevent and treat patients, and to improve the cultural competence of the medical staff. Furthermore, prescribing medicines that are effective in reducing the side effects of treatment proven in scientific studies could improve the patient's condition, for instance, Akhavan MH. et al. (2016) found that the Baremoom mouthwash was more effective in chemotherapy-induced mucositis than a placebo; hence, this agent can be recommended as an appropriate medication to eliminate mucositis symptoms and decrease oral ulcers (14). In addition, Akhavan MH. et al. (2016) reported that oral care with Propolis as a mouthwash for patients undergoing chemotherapy is an effective intervention to improve oral health (15). Another suggestion for nurses and oncologists is to refer patients with specific oral and dental problems to an oral and dental specialist. It is hoped that hospitals accepting patients undergoing chemotherapy and radiotherapy will continue to work with the Dental Faculties to maintain and increase public knowledge of chemotherapy and radiotherapy-induced oral complications and dental considerations.

One of the limitations of this research is that we only relied on people's statements (self-report questionnaire); the mental state of companions and life-related problems are also among the things that can affect the response rate of companions in the knowledge and attitude section. The physical and mental conditions of critically ill patients reduced their companions' cooperation in answering, as well.

6. Conclusion

Based on the findings of this study, the level of knowledge and attitude of companions towards dental considerations and oral complications of cancer treatments was low to moderate. Therefore, there is a need for comprehensive education for these people to improve their knowledge, attitude, and quality of life.

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Footnotes

Conflicts of Interest: None.

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