

Relationship between Health Literacy and Medication Adherence of Turkish Cancer Patients Receiving Oral Chemotherapy

Huri Seval Gönderen Çakmak¹, Doğan Uncu²

¹Eldivan Vocational School of Health Services, Çankırı Karatekin University, Çankırı, ²Department of Medical Oncology, T. C. Ministry of Health Ankara City Hospital, Ankara, Turkey

Corresponding author: Huri Seval Gönderen Çakmak, PhD. Eldivan Vocational School of Health Services, Çankırı Karatekin University, Çankırı, Turkey. E-mail: sevalgonderen@hotmail.com

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ABSTRACT

Objective: The aim of this study was to explore the relationship between health literacy and self-report medication adherence of Turkish cancer patients receiving oral chemotherapy. **Methods:** The present research was a descriptive and cross-sectional study and conducted with 100 voluntary cancer patients who were admitted to the medical oncology outpatient clinic and received oral chemotherapy. The data were collected through a questionnaire form consisting of the Oral Chemotherapy Adherence Scale and the Turkish Health Literacy Scale (TSOY-32). The collected data were analyzed using descriptive statistics, one-way ANOVA, and Pearson's correlation coefficient. **Results:** The results revealed that 57% of the patients were female, 35% were primary school graduates, 51% were

breast cancer, and 36% took capecitabine. The mean index scores of the participants on both scales were calculated as 12.39 ± 1.51 and 73.25 ± 6.18 , respectively. Overall, a positive and strong correlation was found between oral chemotherapy adherence and health literacy of the participants ($r = 0.707$, $P = 0.000$). **Conclusions:** Medication adherence and health literacy levels among the cancer patients in Turkey are alarming so that patient-centered interventions and training are required to overcome the barriers to medication adherence.

Key words: Cancer, health literacy, medication adherence, oral agents

Introduction

One of the typical methods for treating cancer patients is chemotherapy, which uses oral forms of anticancer agents. Although anticancer agents offer many advantages to patients, they bring many risks due to poor medication adherence or nonadherence. Poor medication adherence or nonadherence is a serious barrier to successful chronic disease management. Medication adherence is affected by various factors, such as patients' health, beliefs about

disease and medication, patient-provider communication, and financial difficulty. Previous studies have reported that medication adherence is associated with poor health outcomes, including hospitalization, mortality, and health-care costs, in cancer patients using oral drugs at home.^[1-3]

Health literacy is a serious component of the cognitive and functional skills needed for adequate medication

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adherence and has become prominent as an essential factor in health outcomes.^[4] Not only is health literacy the ability to read, but also the implementation of reading, listening, analytical thinking, and decision-making skills to health-related situations for the protection and maintenance of health.^[5]

Turkey is one of the countries with lowest literacy rates, which leads medication adherence a uniquely challenging task since adequate health literacy rate is only 23.4% according to the Ministry of Health.^[6] Studies report that low or inadequate levels of health literacy lead individuals to have difficulty in understanding drug information, following medical procedures, side effect management and relevant instructions, and to encounter problems in accessing health-care services, which leads to health impairment and an increase in hospitalizations, mortality, and health-care-related costs.^[7]

The factors, such as difficulty in medication procedures, ineffective side effect management, and mental stress caused by cancer treatment, significantly affect the proper medication intake ability and disease knowledge of patients receiving oral chemotherapy for cancer.^[1] The lower the health literacy is, the poorer the ability to understand information regarding health, proper medication intake, medication time and method, prescriptions, and nutrition tables will be. Health literacy has a strong association with medication adherence and vice versa.^[8] Saqlain *et al.* reported that health literacy was found as the strongest predictor of medication adherence as a result of both Chi-square analysis and multivariate logistic regression analysis.^[9] Different researchers have concluded that health literacy is a critical factor in medication adherence.^[10-12]

Moreover, lack of health literacy would be expected to have an adverse impact on medication adherence in cancer patients receiving oral chemotherapy. Besides, the literature lacks the studies directly addressing the relationship between health literacy and medication adherence of Turkish cancer patients receiving oral chemotherapy. Therefore, the purpose of this study was to examine the relationship between health literacy and self-report medication adherence of Turkish cancer patients receiving oral chemotherapy.

Methods

Setting and participants

The data were collected through a questionnaire form consisting of the Oral Chemotherapy Adherence Scale (OCAS) and the Turkish Health Literacy Scale (TSOY-32).^[3,13,14] The questionnaire form also included a 1-page, open-ended questions about demographic variables of the participants, such as educational attainment,

gender, and cancer and medication types. The OCAS was developed by Bağcıvan and Akbayrak in 2015.^[15] The Cronbach's alpha coefficient was calculated as 0.73 for the OCAS (19 items). Developed by Okyay *et al.*, the TSOY-32 is a new health literacy scale consisting of 32 items.^[16] The scale offers four distinct health literacy levels by the scores obtained: inadequate health literacy (0–25), problematic/limited health literacy (>25–33), adequate health literacy (>33–42), and excellent health literacy (>42–50). The internal consistency coefficient of the scale was found to be 0.927. The research was a prospective study conducted between November 1, 2018 and January 30, 2019, with 100 voluntary cancer patients who were admitted to the medical oncology outpatient clinic and received regular oral chemotherapy.

Statistical analysis

Data analysis was conducted using SPSS version 22.0 (IBM Corp., Chicago, IL, USA). While Pearson's correlation coefficient was used for statistical significance between the variables, descriptive statistics were expressed as mean, standard deviation, and minimum and maximum values. Numbers and percentages were given for categorical variables. The normality of the data was assessed with the Kolmogorov–Smirnov test and the Shapiro–Wilk test. Since the data obtained from both scales were found to be normally distributed, the Student's *t*-test was used to compare the scores of the participants by gender. Then, one-way ANOVA was used to compare the scores of among the groups. Levene's test was used to assess the homogeneity of the variances. While Tukey's test was used if the assumption of homogeneity of variance was met, otherwise, Tamhane's T2 test was performed to uncover the source of differences. Finally, Pearson's correlation coefficient was calculated to see whether there was a correlation between health literacy and medication adherence. The significance value was taken as $P < 0.05$ for all statistical analyses.

Ethical approval

This study was approved by the Board and Ethics Committee of The Ankara Numune Training And Research Hospital (Approval No. E-18-2187). Informed consent was obtained from each patient verbally. The patients were assured of their right to refuse to participate or to withdraw from the study at any stage.

Results

The results revealed that 57% of the patients were female, 35% were primary school graduates, 51% were breast cancer, and 36% took capecitabine [Table 1].

The mean index scores of the participants on both scales were calculated as 12.39 ± 1.51 and 73.25 ± 6.18 ,

respectively. While those obtained 25 points or below on the TSOY-32 were considered in the category of inadequate health literacy, 83 points or below on the OCAS mean poor treatment adherence [Table 2].

A statistically significant difference was found among the groups by educational attainment, cancer type, and medication type. Medication adherence and health literacy scores were significantly higher in university graduates and patients diagnosed with brain cancer and using temozolomide compared to other groups ($P < 0.05$). In addition, there was a positive and strong correlation between oral chemotherapy adherence and health literacy ($r = 0.707$, $P = 0.000$).

Discussion

The present study concluded a significant relationship between health literacy and medication adherence of Turkish cancer patients receiving oral medication in oncology clinics. Since the relevant literature lacks the studies exploring such a relationship, this study can be considered as a reference for Turkey and other countries. The health literacy level of a patient plays a critical role in helping the patient understand the various treatment options and their side effects and facilitating discussions between the patient

and health-care professionals. Moreover, health literacy is a critical factor in patient–provider communication, positive health outcomes, and the provision of optimum health care. However, low health literacy level is related to poorer health, nonadherence, higher rates of hospitalization, and higher health-care costs.^[1,17-19]

Oral chemotherapy agents create unique challenges and opportunities for cancer patients' practices. Patients need not only to use drugs properly but also to be knowledgeable about what to expect of relevant therapies and how to manage their side effects.^[20] The present study found a positive association between health literacy and medication adherence, which is consistent with previous studies. Many systematic review and meta-analysis studies found a positive and statistically significant relationship between health literacy and medication adherence. These studies included adults with diabetes, patients with heart failure, the older adults, and human immunodeficiency virus (HIV)-infected patients.^[19] In addition, Saqlain *et al.* reported that adequate health literacy and independence in performing activities of daily living were found as statistically significant factors affecting medication adherence in older adults with hypertension in Pakistan.^[9]

Although the mean medication adherence (73.25) and health literacy (12.39) scores were found to be low, there was a positive and strong correlation between these variables in cancer patients receiving oral chemotherapy. Rust *et al.* detected a statistically significant relationship between initial health literacy and medication adherence.^[20] Wolf *et al.* reported that 31.4% of people with low medication adherence had marginal to low literacy skills.^[14] Osborn *et al.* indicated that health literacy was slightly associated with medication adherence.^[21] In addition, the studies reported that self-care behaviors were positively correlated with quality of life and self-efficacy in patients with cancer undergoing chemotherapy.^[22-24]

In this study, health literacy levels of the patients were found to be inadequate. Contrary to such a finding, Ozkaraman *et al.* reported that the study sample consisting of Turkish cancer patients had adequate health literacy. The result of "sufficient" health literacy results from the high social cultural levels of patients treated in a private hospital.^[23]

In the current study, it was determined that patients diagnosed with brain cancer and using temozolomide drugs got significantly higher medication adherence and health literacy scores than that of other groups [Table 3]. This finding is thought to be highly affected by educational attainment since most of such patients were university graduates. Health literacy was also found to partially mediate the association between low educational attainment and low self-report health status.^[25,26]

Table 1: Demographic characteristics of the patients (n=100)

Characteristics	n	%
Age, mean (SD)	60.59±8.75	
Gender		
Male	43	43
Female	57	57
Educational status		
Literate	14	14
Primary school	35	35
Middle school	32	32
High school	16	16
University	3	3
Diagnosis of the disease		
Breast cancer	51	51
Colon cancer	19	19
Gastric cancer	13	13
Brain cancer	11	11
Rectum cancer	6	6
OC drug		
Capecitabine	36	36
Tamoksifen	25	25
Sunitinibe	13	13
Temozolomide	11	11
Letrazol	9	9
Regorafenib	6	6

OC: oral chemotherapy

Table 2: The scores of the patients on the scales

Scale	Mean±SD	Min/Max	Median
Health Literacy Scale	12.39±1.51	10/16	13
Oral Chemotherapy Adherence Scale	73.25±6.18	60/86	75

Table 3: Descriptive statistics

Characteristics	Oral Chemotherapy Adherence Scale Average	P	Health Literacy Scale Average	P
Gender				
Male	76.13	<0.05*	13.48	<0.05*
Female	71.07		11.56	
Educational status				
Literate	72.96	<0.05**	12.34	<0.05**
Primary school	73.25		12.39	
Middle school	72.93		12.37	
High school	72.81		12.66	
University	76.43		13.52	
Diagnosis of the disease				
Breast cancer	73.20	<0.05**	12.39	<0.05**
Colon cancer	72.78		12.48	
Gastric cancer	72.97		12.75	
Brain cancer	76.13		13.48	
Rectum cancer	69.68		12.35	
OC drug				
Capecitabine	73.20	<0.05**	12.39	<0.05**
Tamoksifen	72.54		12.72	
Sunitinibe	72.97		12.75	
Temozolomide	75.85		13.40	
Letrazol	72.70		12.64	
Regorafenib	70.04		12.39	

*The student's test; **One-way ANOVA; OC: oral chemotherapy

Many researchers have concluded that patients with adequate health literacy are more likely to identify their medications by name, but patients with limited health literacy often rely on pill characteristics for identification.^[27] Low health literacy will also affect to determine the type of education to be offered to cancer patients. For example, web-based education materials cannot be understood by patients with low health literacy.^[28] Therefore, health literacy levels of individuals should be initially identified, and then educational content should be generated accordingly to ensure patients to benefit from educational tools related to medication, such as web-based contents, written and visual resources, and videos or animations.^[23] Overall, the development, implementation, and evaluation of health literacy interventions are deemed to be critical for cancer patients receiving oral chemotherapy to increase their medication adherence and improve their health outcomes.^[3]

Conclusion

This study revealed the needs of patients about side effects and their management associated with oral chemotherapy. In this context, it can be asserted, before or at the initiation of the first treatment cycle, health-care providers should ensure patients to understand information on the toxicities that are likely to occur during treatment and teach them how to recognize and report early signs and symptoms. Health-care providers should also consider the effects of health literacy on medication adherence of cancer

patients receiving oral chemotherapy. Finally, medication adherence and health literacy of cancer patients receiving oral chemotherapy should be assessed, and patient-centered intervention strategies regarding individual differences should be developed.

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Conflicts of interest

There are no conflicts of interest.

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