The Relationship between Colorectal Cancer Fatalism and Health Literacy of Three Generations of Nursing Students and Their Families

ABSTRACT

Background and Objectives: It is important to evaluate the relationship between health literacy and colorectal cancer fatalism. Because limited health literacy constitutes a barrier to information seeking and fatalistic beliefs reduce participation in healthy lifestyle behaviors. This study aimed to evaluate the relationship between colorectal cancer fatalism and health literacy of three generations of nursing students and their families.

Materials and Methods: This cross-sectional and correlational study was conducted during the 2022–2023 academic year at a Nursing Department in the Faculty of Health Sciences in Istanbul/Turkey and their families between March and December 2023. Students and their families were selected through a convenience sampling method. The sample calculation was calculated as 313 using the sampling calculation method with known population. The data were collected with the Information Form, the CRC Fatalism Scale, and the Health literacy Scale. Factors predicting CRC fatalism were also investigated in this study.

Results: The study was conducted with 472 participants, 272 were nursing students, 107 were parents of nursing students, and 93 were grandparents of nursing students. The majority of all generations didn't undergo CRC screening (97.8%, 92.5%, and 94.6%, respectively) and reported never having heard of early diagnosis methods for CRC (72.4%, 75.7%, and 76.3%, respectively) and were unaware of the risk factors for CRC (72.4%, 87.9%, and 60.2%, respectively). The age, having bowel disease and Health literacy Scale Score variables were found to be statistically significant, explaining 28.8% of the variance in the CRC Fatalism Scale total scores ($p<0.05$).

Conclusion: The study determined that the majority of nursing students, their parents and grandparents didn't undergo CRC screening and didn't know about early detection methods and risk factors related to CRC. In particular, the study results reveal the importance of providing training to improve health literacy in order to reduce CRC fatalism and increase cancer screening behaviours in individuals aged 50 years and over.

Paper Type: Research Article

Keywords: Cancer, Colorectal Neoplasms, Generations, Health Literacy, Nursing.

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Introduction

The Colorectal cancers (CRC) are the third most common type of cancer worldwide, following breast and lung cancer. In terms of cancer-related mortality rates, CRC ranks second after lung cancer (1). CRC is considered a significant cause of mortality, particularly in middle and older age groups. Moreover, it is projected that CRC cases will increase by 60% by 2030, further exacerbating the global cancer burden. These data underscore the significance of CRC as a major health concern worldwide, with the potential for exacerbation if preventive measures are not taken (2, 3).

Fatalism refers to the belief that all events are determined by a single supernatural force and their outcomes are unchangeable. Cancer fatalism, specifically, is the belief that a cancer diagnosis is predetermined fate, therefore it develops beyond one's control, and death is inevitable upon receiving a cancer diagnosis (4). Consequently, individuals with fatalistic beliefs may avoid seeking information, adopting healthy lifestyle behaviors, and undergoing cancer screenings (4, 5).

Health literacy is defined as talent of individuals to access, comprehend, evaluate, and utilize necessary health information to improve their quality of life, prevent diseases, and enhance their health (6). Individuals with limited Health literacy may encounter difficulties in accessing care during cancer diagnosis and treatment and avoid participating in screening programs. Increasing Health literacy encourages healthy lifestyle behaviors. Thus, it is associated with improving the quality of life of individuals (7).

The World Health Organisation (WHO) sees health literacy as a key to improving health status (8). The most critical role in this regard belongs to nurses. It is of great importance that nurses have a high level of health literacy while performing their duties as health educators and counsellors (9). They should be good role models for the society by implementing their own lifestyles. Increasing the health literacy levels of nurses is an important part of nursing education. In this context, it is extremely necessary for the health literacy levels of student nurses before graduation to reach an adequate level and to raise awareness on this issue. Studies show that the health literacy levels of nursing students are not at the desired level (9–11). In a study evaluating the health literacy of nursing students, 29.3% of the students had a problematic-limited health literacy level (11). In another study, it was reported that 62.1% of nursing students in the first year of university and 47.7% in the fourth year had limited health literacy level (12). In another study, it was stated that 6.1% of nursing students had inadequate health literacy and 36.5% had problematic health literacy (10). Nurses with high levels of health literacy can improve patient care and patient outcomes. They can also safely improve the health literacy of patients and society, use resources effectively, and reduce health inequalities. The knowledge, attitudes and practices of nursing students and their families who are in closest contact with them not only affect their lives but also have an impact on society. It is stated that determining the colorectal cancer fatalism and health literacy levels of nursing students and their families is the first step to development and that education

should be directed in line with the needs (9, 13–15). It is extremely important for nursing faculties to integrate the concept of health literacy into their education programmes in order to expand the knowledge of nursing students, to teach them the skills to develop healthy lifestyle behaviours (such as regular cancer screenings, vaccination, etc.) and to move their families, patients and society away from fatalism (9, 13).

Health literacy and fatalism of cancer interact with each other (16). A review of the literature indicates that limited Health literacy acts as a barrier to information seeking and that fatalistic beliefs reduce engagement in healthy lifestyle behaviors (16). It has been found that individuals with limited Health literacy tend to hold more fatalistic beliefs regarding cancer screening (5).

To increase societal awareness and sensitivity, it is crucial to investigate, analyze, and examine the status of CRC fatalism and Health literacy among healthcare professionals, particularly nursing students who are future healthcare providers. Identifying and addressing the educational needs in this area is essential. Understanding the characteristics of nursing students and their generations is crucial for determining and addressing these educational needs. A review of the literature reveals a limited number of studies about the relationship between CRC fatalism and Health literacy (16–18) However, despite being a significant issue, As far as we know, we could not find a study evaluating the relationship between CRC fatalism and Health literacy among three generations of nursing students and their families. Therefore, this study aimed to evaluate the CRC fatalism and Health literacy among nursing students and their families across three generations and to examine the relationship between them. Factors predicting CRC fatalism were also investigated in this study.

Materials and Methods

Design of the study

This study was conducted to evaluate the relationship between colorectal cancer fatalism and health literacy of three generations of nursing students and their families using a descriptive, correlational and cross-sectional research design.

Sample and setting

This cross-sectional study was conducted during the 2022–2023 academic year at a Nursing Department in the Faculty of Health Sciences in Istanbul/Turkey and their families between March and December 2023.

The population of the study consisted of all students (420 students) studying in the Nursing Department in 2023 and their families (approximately 1260 family members; parents, grandparents), totaling 1680 participants. The sample of the study consisted of nursing department students and their families who met the study inclusion criteria. Students and their families were selected through a convenience sampling method. The sample calculation was calculated as 313 at 95% confidence level, (α=0.05), P=0.5 and N=1680 using the sampling calculation method with known population. According to the known population sampling calculation, the sample size was determined as 313. Considering possible data losses, the study was completed with 472 participants. Of the 472 participants, 272 were nursing students, 107 were parents

of nursing students, and 93 were grandparents of nursing students. Individuals aged 18 years and over who are willing to participate in the study and had no communication problem were included in the study. Individuals with any communication barriers and those unwilling to participate in the study were excluded from the study.

Inclusion criteria of the study; the students had been agreed to participate, enrolled in university at any academic level (1st, 2nd, 3rd, and 4th year), were over 18years old and had no communication problem.

Data Collection

The data were collected using the Information Form, the CRC Fatalism Scale, and the Health literacy Scale. The data collection tools were administered face-to-face to the nursing students. The form and scales were delivered to the parents and grandparents of the students through the students themselves, and after the families (parents and grandparents) completed the forms, the students returned the forms to the researchers. Each student was given a total of 3 forms for himself/herself, his/her parents and garandparents, and the forms were handed over to the researchers by the students after having their parents fill them in (approximately 3 days later). Separate informed consent forms were also given to parents and grandparents through students. The purpose of the study and the fact that it was voluntary were explained to the students and this was also written in the informed consent form. The contact details of the researchers were also included on this form. The informed consent form included the signatures of the parents and grandparents indicating that they approved the form. In this way, it was ensured that the parents and grandparents were the ones filling out the forms.

Data Collection Tools

The Information Form

The form assesses participants' individual characteristics and approaches to CRC, and consists of two sections and a total of 19 questions about their sociodemographic characteristics, health habits, and CRC features (general health status, smoking and alcohol use, history of chronic diseases, history of bowel diseases, history of cancer diagnosis, presence of individuals diagnosed with CRC in the family and surroundings, awareness of early diagnosis methods, participation in screening tests, knowledge of CRC risk factors, conducting health-related research, fear of cancer). It was developed by the researchers in accordance with the literature.

CRC Fatalism Scale

The Powe Fatalism Inventory, developed by Barbara Powe in 1995, aims to measure fatalistic attitudes towards cancer (dimensions of pessimism, fear, inevitability of death, predestination) among the African American population (19). This scale is valid for all social classes. "The Turkish validity and reliability study of the scale was conducted by Aydın and Çapık in 2017(20)." The CRC Fatalism Scale consists of 15 yes-no items and one dimension. In the answers, a yes answer gets 1 point and a no answer gets 0 point. Scores on the scale can range from 0 to 15, where higher scores indicate higher levels of fatalism. Aydın and Çapık (2017) found the Cronbach's Alpha coefficient of the scale as 0.850. For this study, "the Cronbach's Alpha

coefficient of the scale" was calculated as 0.870.

Health literacy Scale

The Health literacy Scale (HLS) was developed by Sørensen et al. (2013) (21) and later simplified by Toçi, Bruzari, and Sørensen (2013) to determine individuals' levels of Health literacy (22) "The Turkish validity and reliability study of the HLS was conducted by Aras and Temel (23)" The HLS is a 25-item scale structured in a five-point Likert format. Participants respond to scale items as follows: "5: I have no difficulty at all, "4: I have a little difficulty, 3: I have some difficulty, 2: I have a lot of difficulty, 1: I am unable/I have no ability/impossible." There is a positive relationship between the total scale score and Health literacy, meaning that as the score increases, individuals' Health literacy level also increases. There are no reverse items or cutoff points in the scale. The HLS consists of four subscales. The first subscale, Access to Information, consists of five items (Items 1-5). A minimum of 5 and a maximum of 25 points can be obtained from this subscale. The Understanding Information subscale consists of seven items (Items 6-12), with a minimum score of 7 and a maximum score of 35. The Valuation/Evaluation subscale comprises eight items (Items 13-20), with a minimum score of 8 and a maximum score of 40. The Application/Use subscale consists of five items (Items 21-25), with a minimum score of 5 and a maximum score of 25. The total score on the scale ranges between 25 and 125. Aras and Temel found the Cronbach's Alpha coefficient of the scale as 0.92. For this study, the Cronbach's Alpha coefficient of the scale was calculated as 0.978. When Cronbach's Alpha coefficients for this study are analysed according to the sub-dimension, it is 0.949 for Access to Information sub-dimension, 0.927 for Understanding Information sub-dimension, 0.945 for Forming/Evaluating sub-dimension, and 0.906 for Applying/Using sub-dimension.

Analyses

The data were analyzed using "the SPSS 26.0 package software". The descriptive data are presented as frequencies, percentages and means. "Shapiro-Wilk test" was used to analyze the data for normal distribution. The data were analyzed by correlation analysis. One-Way ANOVA was used for group-based difference analyses. In ANOVA analysis, Bonferroni Post-Hoc analysis was performed to determine between which groups the difference was. The prediction of CRC Fatalism Scale total scores of participants was evaluated using multiple linear regression analysis, considering variables such as age, gender, Health literacy total score, history of intestinal disease, participation in cancer screening, presence of intestinal disease or cancer diagnosis in the family or surroundings, and so on. It was decided whether the variables would be included in the model or not based on the multicollinearity test. Whether there was multicollinearity among the variables to be included in the model was evaluated with "Variance Inflation Factor" and tolerance. Variables with tolerance values above 0.2 and "Variance Inflation Factor" values below 10 were included in the regression analyses. No multicollinearity was detected between variables. Since no multicollinearity was detected between the variables, age, gender, history of intestinal disease, history of cancer diagnosis, presence of someone diagnosed

with CRC in the family or surroundings, participation in CRC screening, awareness of early diagnosis methods for CRC, and Health literacy Scale Total Score were included in the multiple linear regression analysis. "All results were considered significant at p<.05 and in a confidence interval of 95%."

Results

The results showed that the mean age of the students, their parents and grandparents were 20.84+2.23, 50.28+7.58 and 72.40 +7.35, respectively. Most of the students and their parents were female (79.8%, 67.3% respectively), but most of their grandparents were male (58.1%). Most of the students (95.2%) were single, while most of their parents (89.7%) and grandparents (79.6%) were married. While all students were attending university, the majority of their parents (49.5%) and grandparents (53.8%) had completed primary school education. Most of the parents (57.9%) were homemakers, and the majority of grandparents (48.4%) were retired. The income of most participants matched their expenses (58.5%, 68.2%, and 75.3%). The majority of parents (58.9%) and grandparents (67.7%) reported their overall health as moderate, while most of the students (61%) described their health as good. The majority of parents (54.7%) and grandparents (63.4%) reported having a chronic illness, while the vast majority of students (91.5%) did not have a chronic illness (Table 1).

Regarding health habits and CRC characteristics, the majority of the three generations did not have a diagnosed intestinal disease (98.9%, 100%, and 97.8%, respectively) or a family member diagnosed with CRC (93.0%, 88.8%, and 78.5%, respectively). The majority of all generations did not undergo CRC screening (97.8%, 92.5%, and 94.6%, respectively). Moreover, most participants in all generations reported never having heard of early diagnosis methods for CRC (72.4%, 75.7%, and 76.3%, respectively) and were unaware of the risk factors for CRC (72.4%, 87.9%, and 60.2%, respectively). The majority of participants across the three generations expressed fear of being diagnosed with CRC (69.9%, 79.4%, and 57.0%, respectively) (Table 2).

Table 3 compares the CRC Fatalism Scale and subscale scores of the students and their parents and grandparents. A statistically significant difference was found between the CRC Fatalism Scale Total scores of the three generations ($p<0.001$). According to the generation, the highest CRC Fatalism Scale Total score (7.623) was observed in grandparents, followed by parents (4.289), and students (3.114). A statistically significant difference was found between the health literacy scale and subscale scores of the three generations ($p<0.001$). The average Health literacy total and all subscales scores of students were statistically higher than those of their parents and grandparents ($p<0.001$). In the posthoc analysis performed to determine the origin of the difference, it was determined that there was no statistically significant difference between the total mean scores of the health literacy scale of parents and grandparents ($p=0.476$). In addition, in the posthoc analysis, it was determined that there was no statistically significant difference between the mean scores of the Valuation / Evaluation and Application / Use subscales of parents and grandparents (respectively, $p= 0.111$; $p=0.735$), (Table 3).

Table 1. Sociodemographic characteristics of the students, parents and grandparents (n=472)

Sociodemographic characteristics		Students	Parents	Grandparents
		Mean (SD) n (%)	Mean (SD) n (%)	Mean (SD) n (%)
Age		20.84 (2.23)	50.28 (7.58)	72.40 (7.35)
Generation		272 (57.6)	107 (22.7)	93 (19.7)
Gender	Male	55 (20.2)	35 (32.7)	54 (58.1)
	Female	217 (79.8)	72 (67.3)	39 (41.9)
Marital Status	Married	13 (4.8)	96 (89.7)	74 (79.6)
	Single	259 (95.2)	11 (10.3)	19 (20.4)
Education level	Primary school	-	53 (49.5)	50 (53.8)
	Secondary school	-	23 (21.5)	36 (38.7)
	High school	272 (57.6)	20 (18.7)	6 (6.5)
	Associate's degree	-	3 (2.8)	-
	Bachelor's degree	-	8 (7.5)	1 (1.1)
Occupation	Student	272 (57.6)	-	-
	Housewife	-	62 (57.9)	31 (33.3)
	Retired	-	10 (9.3)	45 (48.4)
	Employee	-	23 (21.5)	13 (14.0)
	Officer	-	12(11.2)	4 (4.3)
Income level	Income is less than expenses	71 (26.1)	20 (18.7)	7 (7.5)
	Income equal to expenses	159 (58.5)	73 (68.2)	70 (75.3)
	Income more than expenses	42 (15.4)	14 (13.1)	16 (17.2)
General Health Condition	Good	166 (61.0)	33 (30.8)	14 (15.1)
	Moderate	103 (37.9)	36 (58.9)	63 (67.7)
	Poor	3 (1.1)	11 (10.3)	16 (17.2)
Smoking	Yes	58 (21.3)	30 (28.0)	15 (16.1)
	No	214 (78.7)	77 (72.0)	78 (83.9)
Alcohol Use	Yes	46 (16.9)	10 (9.3)	34 (36.6)
	No	226 (83.1)	97 (90.7)	59 (63.4)
Chronic Disease	Yes	23 (8.5)	51 (47.7)	59 (63.4)
	No	249 (91.5)	56 (52.3)	34 (36.6)

SD: Standard Deviation.

Table 2. Health habits and colorectal cancer characteristics of the students, parents and grandparents (n=472)

Health and colorectal cancer Characteristics		Students n (%)	Parents n (%)	Grandparents n (%)
Do you have a diagnosed bowel disease?	Yes	8 (2.9)	-	2 (2.2)
	No	269 (98.9)	107 (100)	91 (97.8)
Cancer diagnosis status	Yes	3 (1.1)	9 (8.4)	15 (16.1)
	No	269 (98.9)	98 (91.6)	78 (83.9)
Is there anyone in your family diagnosed with colorectal cancer?	Yes	19 (7.0)	12 (11.2)	20 (21.5)
	No	253 (93.0)	95 (88.8)	73 (78.5)
Is there anyone around you (friend, neighbor) who has been diagnosed with colorectal cancer?	Yes	28 (10.3)	20 (18.7)	12 (12.9)
	No	244 (89.7)	87 (81.3)	81 (87.1)
Have you been screened for colorectal cancer?	Yes	6 (2.2)	8 (7.5)	5 (5.4)
	No	266 (97.8)	99 (92.5)	88 (94.6)
Have you ever heard of the early diagnosis method for colorectal cancer?	Yes	75 (27.6)	26 (24.3)	22 (23.7)
	No	197 (72.4)	81 (75.7)	71 (76.3)
Is colorectal cancer preventable?	Yes	192 (70.9)	69 (64.5)	25 (26.9)
	No	80 (29.1)	38 (35.5)	68 (73.1)
Do you know the risk factors of colorectal cancer?	Yes	75 (27.6)	13 (12.1)	37 (39.8)
	No	197 (72.4)	94 (87.9)	56 (60.2)
Are you afraid of getting cancer?	Yes	190 (69.9)	85 (79.4)	53 (57.0)
	No	82 (30.1)	22 (20.6)	40 (43.0)

Table 3. Comparison of the Colorectal Cancer Fatalism Scale, Health Literacy Scale and subscales scores of the students, parents and grandparents (n=472)

Variable	Colorectal Cancer Fatalism Scale Total Score	Access to Information Subscale	Understanding information Subscale	Valuation / Evaluation Subscale	Application / Use Subscale	Health Literacy Scale Total Score
Generation	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Students1 (n=272)	3.114 (2.965)	22.085 (3.780)	30.366 (4.762)	34.340 (5.795)	21.466 (3.755)	108.413 (15.408)
Parents2 (n=107)	4.289 (3.442)	18.953 (5.794)	25.691 (7.596)	30.074 (8.909)	18.307 (5.898)	88.820 (28.691)
Grandparents3 (n=93)	7.623 (4.430)	16.075 (5.532)	22.258 (7.488)	27.580 (8.024)	17.559 (4.429)	83.473 (24.055)
Total (n=472)	4.269 (3.814)	20.179 (5.252)	27.668 (6.937)	32.002 (7.612)	20.070 (4.684)	99.465 (23.216)
Test value	60.700	61.745	67.823	36.404	35.553	64.044
p	<0.001* 1-2: <0.01a 1-3: <0.01a 2-3: <0.01a	<0.001* 1-2: <0.01a 1-3: <0.01a 2-3: <0.01a	<0.001* 1-2: <0.01a 1-3: <0.01a 2-3: <0.01a	<0.001* 1-2: <0.01a 1-3: <0.01a 2-3: 0.111	<0.001* 1-2: <0.01a 1-3: <0.01a 2-3: 0.735	<0.001* 1-2: <0.01a 1-3: <0.01a 2-3: 0.476

One-Way Anova test was used. SD: Standard Deviation. * = p < 0.05, aBonferroni Post-Hoc test

Table 4 presents the correlation between the scores obtained from the CRC Fatalism Scale and the Health literacy Scale. A statistically significant negative correlation was found between the CRC Fatalism Scale and the Health literacy Scale and all subscales (Access to Information, Understanding Information, Application/Use and Valuation/Evaluation) (p<0.001) (Table 4).

Table 4. Correlation between the scores obtained from the Colorectal Cancer Fatalism Scale and the Health Literacy Scale (n=472)

Scales	Colorectal Cancer Fatalism Scale Total Scores	
	r	p
Access to Information Subscale	-.401	< 0.001
Understanding information Subscale	-.399	< 0.001
Valuation/Evaluation Subscale	-.327	< 0.001
Application/Use Subscale	-.344	< 0.001
Health Literacy Scale Total Score	-.402	< 0.001

Pearson correlation test was used.

The prediction of the CRC Fatalism Scale Total Scores of the participants, age, gender, having bowel disease, being diagnosed with cancer, having someone diagnosed with colorectal cancer in the family and surroundings, having colorectal cancer screening, hearing about early diagnosis method for colorectal cancer and Health literacy Scale Total Score were evaluated with multiple linear regression analysis (Table 5). Considering the analysis results, the model established was statistically significant (F =

18.692, p<0.001). The model including age, having bowel disease and Health literacy Scale Total Score variables were found to be statistically significant, explaining 28.8% of the variance in the CRC Fatalism Scale total scores (p<0.05). According to the standardised regression coefficient (β), age (β=0.359), health literacy (β=-0.241) and having a diagnosed bowel disease (β=0.103) were found to affect colorectal cancer fatalism. Age increases colorectal cancer fatalism by 0.35 times and having a bowel disease by 0.10 times. Health literacy decreases it by 0.24 times. Table 5 presents the results.

Table 5. Multiple regression analysis of the variables that affect Colorectal Cancer Fatalism Scale Total Scores (n=472)

Variable	B	Standard Error	Standard Beta (β)	t	p	95.0% CI	
Constant	5.845	1.001		5.837	<0.001	3.877	7.813
Gender / Male	0.054	.370	.006	.146	.884	-.673	.781
Age	0.063	.009	.359	7.039	<0.001	.045	.080
Do you have a diagnosed bowel disease?/ Yes	2.632	1.136	.103	2.317	.021	.399	4.864
Cancer diagnosis status/ Yes	-0.246	.720	-.015	-.341	.733	-1.661	1.170
Having colorectal cancer in the family / Yes	0.166	.545	.013	.304	.761	-.906	1.238
Presence of colorectal cancer in inner circle / Yes	.577	.521	.049	1.108	.268	-.446	1.600
Having colorectal cancer screening / Yes	-.032	.904	-.002	-.035	.972	-1.809	1.746
Hearing about the early diagnosis method for colorectal cancer / Yes	-.286	.397	-.033	-.721	.471	-1.068	.495
Health Literacy Scale Total Score	-.040	.008	-.241	-4.893	<0.001	-.056	-.024

Dependent variable: Colorectal Cancer Fatalism Scale Total Scores
R=0.537 R2= 0.288 Adjusted R2 = 0.273 F= 18.692 p< 0.001 Durbin-Watson = 2.282 (1.5-2.5)

Discussion

This study evaluated the CRC fatalism and Health literacy among nursing students and their families across three generations and examined the relationship between them. Additionally, factors predicting CRC fatalism were assessed using multiple regression analysis.

The majority of nursing students, their parents and grandparents did not undergo CRC screening, had never heard of early diagnosis methods for CRC, and expressed fear of being diagnosed with cancer. Consistent with the results of this study, Goel et al. reported that participants had a low level of knowledge about CRC and highlighted low participation in screening tests. Ekberg et al. investigated the factors influencing the decision to undergo CRC screening, including age, previous screening history, social environment, risk perception, fear of cancer, absence of symptoms, and reluctance and paternalistic attitudes. They indicated that acceptance of disease perception increases with age, leading to decreased screening rates (24). Ingrand et al. reported that even at

a young age, individuals with a family history of CRC had low screening rates (25). Honein-AbouHaidar et al. examined the factors facilitating and hindering participation in CRC screening tests, and found “awareness” as the greatest facilitator for undergoing screening tests (26) Tan et al. conducted a review of qualitative studies among first-degree relatives of patients diagnosed with CRC and determined the "fear of cancer" as the main factor deterring individuals from CRC screening (27) Another study indicated that fatalistic beliefs hinder CRC screening (28). Consistent with the literature, the reasons for nursing students and their parents and grandparents not undergoing CRC screening in our study are considered to be lack of knowledge about CRC screening and risk factors and fear of being diagnosed with cancer. Colorectal cancers are available in the second year of the nursing education curriculum. Students receive this information in the second year. However, the nursing students in our study population did not take any courses or course topics related to health literacy. In Turkey, CRC screening is performed in men and women between the ages of 50-70, with a colonoscopy every 10 years and a fecal occult blood test every 2 years. The reason why nursing students do not undergo CRC screening may be due to their young age and not seeing themselves as a risk group.

Cancer fatalism refers to the belief that cancer diagnosis is predetermined, beyond individual control, and inevitable in terms of death (29,30) Lyratzopoulos et al. (2015) examined the relationship between fatalistic beliefs and stage at diagnosis and reported the CRC Fatalism mean score as 10.7 (31) Aydın and Çapık (2017) reported that the CRC Fatalism mean score as 7.28±3.70. In this study found the CRC Fatalism mean score as found to be 4.269±3.814 and determined that the students had statistically significantly lower CRC fatalism compared to their parents and grandparents, while their Health literacy was higher. (20) Keller et al. (2021) found that as individuals' education level increases, fatalism decreases. With age, individuals may have been exposed to more uncontrollable events as a result of life experiences. This may lead to a higher level of fatalistic beliefs in some individuals compared to younger individuals (5). In our study, the lower fatalism among nursing students compared to their parents and grandparents may be because they have undergraduate education, are at younger age, and have taken courses related to health.

Accessing, understanding, and applying health information and services are essential for individuals to make informed decisions about their health (24, 25) Many studies have determined that individuals with low Health literacy tend to avoid visiting doctors, exhibit more fatalistic behaviors towards cancer, show less interest in screening tests of cancer, and avoid seeking information about their illnesses (32,34–36) In the current study, the participants' Health literacy Scale total score was determined to be 99.465±23.216. While the health literacy levels of the students' parents and grandparents were similar, the health literacy levels of nursing students were found to be higher than those of their parents and grandparents. It is expected that health professional students have more knowledge compared to other people and that nursing students have higher

health literacy than their parents and grandparents. Because although students do not take health literacy as a subject, their awareness on this issue increases throughout their health education. They learn about the importance of early diagnosis of diseases, cancer screenings, etc.

Our study determined that as Health literacy of the participants increased, their colorectal cancer fatalism decreased. Health literacy and cancer fatalism are interrelated and mutually influencing concepts. Similarly, Kobayashi and Smith (2016) reported higher levels of fatalism in individuals with limited Health literacy (16). Davis et al. (2020) also associated high levels of cancer fatalism with limited Health literacy (17). Leung et al. (2017) found that as fatalistic beliefs increased, health information-seeking behaviors decreased among individuals aged 60 years and over in Hong Kong (37). Consistent with these results, our study also identified a negative correlation between Health literacy total score and colorectal cancer fatalism scale score ($r= -0.402$, $p<0.001$, Table 4).

As an important result of our study, the model including age, having a bowel disease, and Health literacy Scale Total Score variables was statistically significant, explaining 28.8% of the variance in the Colorectal Cancer Fatalism Scale Total Scores ($p<0.05$). Accordingly, Health literacy negatively influenced the participants' colorectal cancer fatalism levels, and a one-unit increase in their Health literacy reduced their colorectal cancer fatalism level by 0.4 times. Furthermore, a one-unit increase in the age variable increased the colorectal cancer fatalism level by 0.6 times, and a one-unit increase in the variable of having a diagnosed bowel disease increased the colorectal cancer fatalism level by 2.6 times. Similar to our study results, a study has indicated that fatalism is higher in older ages (38).

Study Limitations and Strengths: The study has several limitations. The research was conducted at a single-center. The data is of a cross-sectional nature. While the results are useful for generating hypotheses, they do not imply causality and should be interpreted carefully. In this study, the occupation of parents and grandparents, especially health professionals, was ignored. This is one of the limitations of the study. The existence of any bias has been ignored. This is another limitation. In addition, the study also has strengths. The fact that our study was conducted in a broad and diverse metropolitan area allowed for data collection from multiple different community locations, which facilitated the applicability of our results to a much broader population across three different age groups.

Conclusions

The study determined that the majority of nursing students, their parents and grandparents did not undergo CRC screening and did not know about early detection methods and risk factors related to CRC. It was observed that the level of CRC fatalism was low while Health literacy was high among the nursing students compared to their parents and grandparents. Furthermore, it was discovered that as Health literacy increased, CRC fatalism decreased. Health literacy, age and having been diagnosed with colorectal disease were identified as the factors predicting 28.8% of CRC fatalism. CRC fatalism is prevalent in the Turkish population

and appears to be more prevalent among adults with low health literacy. People with low health literacy are less likely to seek information on colorectal cancer screening and risk factors. This may be explained by the fatalistic belief that cancer cannot be prevented. The results of this study showed once again that health literacy is critical for nursing students to protect the health of their parents and grandparents, to have colorectal cancer screenings, to reduce their fatalism levels, to protect and promote health, and to improve the quality of care. Even though they are trainee and student nurses, it is important for all nurses to recognize the role of fatalism in their care practices and to address its impact on health maintenance, enhancement, and promotion by adopting a holistic approach. CRC fatalism constitutes a significant barrier to Health literacy and cancer screening behaviors. Particularly based on the study results, providing education aimed at improving Health literacy in individuals aged 50 years and above is crucial in reducing CRC fatalism and increasing cancer-screening behaviors.

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