Effect of Kefir on the Quality of Life of Patients Being Treated for Colorectal Cancer

Gulbeyaz Can, PhD, RN, Erkan Topuz, MD, Duygu Derin, MD, Zehra Durna, PhD, RN, and Adnan Aydiner, MD

Purpose/Objectives: To determine kefir's effect on the prevention of gastrointestinal complaints and quality of life (QOL) in patients being treated for colorectal cancer.

Design: Randomized, controlled, prospective, interventional study.

Setting: Istanbul University Oncology Institute in Turkey.

Sample: 40 patients, 20 of whom were randomized to the experimental (kefir) arm and 20 who were randomized to the control arm.

Methods: Informed consent to participate in the study was obtained. Before treatment began, demographics, illness-related characteristics, complaints, and QOL of participants were evaluated. During treatment, side effects were evaluated one week after every cycle of therapy. QOL was evaluated after the third and sixth cycles of treatment.

Main Research Variables: The effect of kefir on the prevention of gastrointestinal complaints and QOL in patients being treated for colorectal cancer.

Findings: Following chemotherapy, the experimental (kefir) group had more treatment-related gastrointestinal complaints but a decrease in sleep disturbance. No difference was found between the two groups for QOL.

Conclusions: Kefir does not prevent or decrease gastrointestinal complaints in patients undergoing chemotherapy for colorectal cancer. Kefir did decrease sleep disturbances in the experimental group.

Implications for Nursing: Many patients use complementary and alternative medicine during cancer therapy. This study may provide information about the effectiveness of kefir in patients with cancer.

Colorectal cancer is the third most prevalent cancer and the second leading cause of death in Turkey (Eser, 2007). The primary method of treatment for colorectal cancer is surgical resection. To improve the general survival rate, adjuvant chemotherapy is used in high-risk stage II and is the standard of care in stage III colorectal cancer. Palliative chemotherapy is used in stage IV. The choice of chemotherapy is based on the patient's individual characteristics and the stage of disease. Generally, 5-fluorouracil (5-FU) or oral fluoropyrimidine-based treatment protocols are used (Aydiner & Topuz, 2004).

More than a third of patients with cancer use complementary and alternative medicine (CAM) (Jordan & Delunas, 2001). The use of kefir by patients undergoing chemotherapy in Turkey to prevent gastrointestinal complaints has increased; however, no randomized studies have examined the effectiveness of kefir in that population.

Background

People diagnosed with cancer often begin to use CAM without informing their healthcare providers. CAM therapies frequently are used at the recommendation of family and friends but without accurate information (Jordan & Delunas, 2001). One reported reason for the use of CAM is to increase hope and quality of life (QOL) (Kozachik, Wyatt, Given, & Given, 2006). Although the use of CAM continues to be studied (Lis, Cambron, Grutsch, Granick, & Gupta, 2006; Paltiel et al., 2001), more information is needed about its effects (Hessig, Arcand, & Frost, 2004) because some treatments can decrease the effectiveness of standard cancer treatment or increase the severity of treatment-related side effects. Studies have reported that 56.9% of patients with colorectal cancer use CAM (Patterson et al., 2002). Tas et al. (2005) reported that Turkish patients with cancer frequently choose CAM therapies; in particular, the number of patients using kefir has increased.

Kefir, which has been used for centuries, is a natural probiotic. It is the product of fermentation of milk with kefir grains and mother cultures prepared from grains. Kefir grains look like pieces of coral or small clumps of cauliflower and contain a complex mixture of bacteria

(including various species of *lactobacilli*, *lactococci*, *leuconostocs*, and *acetobacteria*) and yeasts (both lactose-fermenting and nonlactose-fermenting). The beneficial bacteria are similar to those found in yogurt. Kefir grains or mother cultures from grains are added to different types of milk. Any type of milk can be used (cow, goat, sheep, coconut, rice, or soy), but cow milk is used commonly. The grains cause milk fermentation, which results in numerous components in the kefir, including lactic acid, acetic acid, CO_2, ethyl alcohol, and aromatic compounds. Fermentation provides kefir's unique organoleptic characteristics: fizziness, acid taste, tartness, and refreshing flavor (Otles & Cagandi, 2003). Kefir is believed to have gotten its name from the Turkish word *keyif*. The word *keyif* in Turkish means to feel good. Kefir is known as omaere (in southwestern Africa), rob or roba (in some Arab countries), kjaklder mjoklk (in Norway), kellermilch (in Germany), tarag (in Mongolia), and kefir (in Turkey).

Although several scientific studies have been conducted on the treatment effects of kefir, no controlled clinical trials on the use of kefir in patients with cancer were found in the literature. Some literature has reported that regular use of kefir decreases gastrointestinal problems, regulates intestinal movements, supports the formation of a healthy digestive system, decreases risk for illness, and strengthens the immune system (deVrese & Marteau, 2007; Parvez, Malik, Ah Kang, & Kim, 2006; Roberfroid, 2000; Rolfe, 2000).

The most common complaints of patients receiving chemotherapy for colorectal cancer are gastrointestinal effects, such as nausea and vomiting, diarrhea, and stomatitis (Bernhard, Hurny, Maibach, Herrmann, & Laffer, 1999; Kim et al., 2003; Zaniboni et al., 1998). The purpose of this study was to determine the effectiveness of kefir in preventing treatment-related gastrointestinal complaints and to determine the effects of kefir on QOL among patients undergoing standard chemotherapy for colorectal cancer.

Methods

Setting and Sample

The study was approved by the ethical committee of the Istanbul University Medical Faculty and was conducted at Istanbul University Oncology Institute from October 1, 2005, to December 31, 2006. It was a randomized, controlled, prospective, interventional study. The study included 40 patients, 20 of whom were randomized to use a kefir product (experimental group) and 20 who were not (control group). The number of patients for the sample was calculated according to $\alpha = 0.05$, $\beta = 0.10$.

Inclusion criteria for the study were stage II, III, or IV colorectal cancer; age older than 18 years, Eastern Cooperative Oncology Group performance status of 0, 1, or 2; standard treatment with 5-FU or oral fluoropyrimidine; and informed consent to participate in the study. Patients who were to receive a different anticancer treatment, were diagnosed with stage I colorectal cancer, or had a social or psychological state that would interfere with their participation in the study, as well as those who did not want to participate in the study after it was explained to them, were not included in the study.

Procedures

A face-to-face interview was conducted with each patient to explain the study. After the interview, informed consent was obtained. Before treatment was started, a patient description form was used in the assessment of patient demographics and illness-related characteristics. The Memorial Symptom Assessment Scale (MSAS) (Portenoy et al., 1994) was used in the determination of complaints, and the Functional Assessment of Cancer Therapy–General (FACT-G) (Cella et al., 1993) was used in the evaluation of QOL of patients who were participating in the study. Patients were randomized to an experimental (kefir) or control group via a randomization list prepared by the statistical expert in the study. Kefir was prepared industrially by Altinkilic Company, Istanbul. The kefir grains (3%) were added to milk that had been pasteurized at 90ºC–95ºC for 10–15 minutes and cooled to 25ºC–30ºC. After a period of fermentation lasting 12–18 hours, the grains were removed by filtration and kefir was kept in a tank for one day. Then it was distributed in bottles, stored at 4ºC, and used within two weeks. Each batch was made with the same starter kefir grains with the same fermentation conditions to ensure that the probiotic constituents were similar. The researchers gave patients the industrially prepared and bottled kefir (500 ml) before every treatment cycle. Patients in the experimental group used 250 ml kefir two times per day for one week during chemotherapy treatment. One week after each cycle of chemotherapy, participants in both groups were asked about side effects related to treatment, and use of kefir by the patients in the experimental group was assessed. Patients' QOL was evaluated after the third and sixth courses of treatment.

Instruments

The patient information form used to assess demographics and disease-related characteristics was developed by the researchers. The form contained 23 items that addressed demographic data (e.g., age, income level, employment status) as well as disease and treatment characteristics at the time of the initial diagnosis.

The FACT-G is a QOL questionnaire validated in oncology (Cella et al., 1993). The general subscales common to all versions include physical well-being (PWB), social and family well-being (SFWB), emotional well-being (EWB), and functional well-being (FWB). The FACT-G total score

is based on 26 summed items (responses 0–4) from the PWB (7 items), FWB (7 items), SFWB (6 items), and EWB (6 items). Higher scores represent better QOL (Cella et al.). The Turkish version of the assessment scale, which has been validated in Turkish patients with cancer, has been used widely in national and international oncology studies and was used in the current study; for that reason, validity and reliability studies were not conducted for this tool in this study.

The MSAS is a 32-item, patient-rated survey that was developed at Memorial Sloan-Kettering Cancer Center (Portenoy et al., 1994). The first 26 symptoms are rated in terms of three dimensions (frequency, intensity, and distress), and the other six symptoms are rated in terms of two dimensions (intensity and distress). Each symptom characteristic is scored to reflect frequency: 1 (rarely), 2 (occasionally), 3 (frequently), or 4 (almost constantly); intensity: 1 (slight), 2 (moderate), 3 (severe), or 4 (very severe); and distress 0 (not at all), 1 (a little bit), 2 (somewhat), 3 (quite a bit), or 4 (very much). A 10-item MSAS Global Distress Index (MSAS-GDI) is considered to be a measurement of overall symptom distress. The MSAS-GDI is the average of the frequency of four prevalent psychological symptoms (feeling sad, worrying, feeling irritable, and feeling nervous) and the distress associated with six prevalent physical symptoms (lack of appetite, lack of energy, pain, drowsiness, constipation, and dry mouth). The Physical Symptom Subscale (MSAS-PHYS) score is the average of the frequency, severity, and distress associated with 12 prevalent physical symptoms: lack of appetite, lack of energy, pain, drowsiness, constipation, dry mouth, nausea, vomiting, change in taste, weight loss, bloating, and dizziness. The Psychological Symptom Subscale (MSAS-PSYCH) score is the average of the frequency, severity, and distress associated with six prevalent psychological symptoms: worrying, feeling sad, feeling nervous, having difficulty sleeping, feeling irritable, and having difficulty concentrating. The total MSAS (TMSAS) score is the average of the symptom scores of all symptoms on the MSAS instrument. Each symptom score is an average of its dimensions (Portenoy et al.). No Turkish version of this widely used and validity-tested tool exists. Therefore, after the researchers obtained permission to use the tool, they examined the validity and reliability of a Turkish version of the tool. The patients stated that the tool was easy to use and could be understood. In the additional statistical evaluation that was conducted before treatment, the Cronbach alpha values for the subscales varied from 0.69–0.76; for the total scale, 0.9. After treatment, the subscales' values were 0.61–0.7; the total scale, 0.86. The researchers determined that the Turkish version of the MSAS was a valid tool in the assessment of the patients' symptoms in Turkey.

Data Analysis

Data analysis was performed with SPSS® software, version 11.5. Descriptive statistics, means, medians, frequencies, and percentages were used to show the distribution of patient demographics, illness-related characteristics, and QOL level. In comparing the mean and median values of the treatment side effects and

Table 1. Sample Characteristics

	Total Sample (N = 37)		Control Group (N = 20)		Experimental Group (N = 17)	
Characteristic	**n**	**%**	**n**	**%**	**n**	**%**
Gender						
Male	24	65	12	60	12	71
Female	13	35	8	40	5	29
Marital status						
Married	29	78	17	85	12	75
Single or widowed	8	22	3	15	5	25
Educational level						
Illiterate	6	16	2	10	4	24
Primary school	19	51	14	70	5	29
Middle school	6	16	3	15	3	18
High school	5	14	–	–	5	29
University	1	3	1	5	–	–
Occupation						
Retired	14	38	7	35	7	40
Laborer	6	16	3	15	3	18
Civil servant	6	16	3	15	3	18
Housewife	11	30	7	35	4	24
Employment status						
Employed	9	24	4	20	5	29
Unemployed	28	76	16	80	12	71
Income level						
Can barely get by	4	11	1	5	3	18
Moderately good or good	33	89	19	95	14	82
Cigarette use						
Smoker	26	70	13	65	13	76
Nonsmoker	11	30	7	35	4	24
Alcohol use						
Does not drink	34	92	17	85	17	100
Drinks	3	8	3	15	–	–
Health insurance						
Civil servant fund	13	35	8	40	5	29
Social security	18	49	10	50	8	47
Tradesman fund	6	16	2	10	4	24

Table 2. Disease-Related Characteristics

Variable	Total Sample (N = 37) n	%	Control Group (N = 20) n	%	Experimental Group (N = 17) n	%
Cancer diagnosis						
Rectal	19	50	9	45	10	59
Rectosigmoid	1	3	–	–	1	6
Colon	12	33	6	30	6	35
Sigmoid	4	11	4	20	–	–
Cecum	1	3	1	5	–	–
Chemotherapy						
Adjuvant chemo-radiotherapy[a]	10	27	4	20	6	35
FUFA	12	32	7	35	5	29
FOLFOX	15	41	9	45	6	35
Surgical treatment						
No	10	27	5	25	5	29
Yes	27	73	15	75	12	71

[a] Adjuvant chemo-radiotherapy was external-beam radiotherapy (XRT) plus continuous infusion of 5-fluorouracil 225 mg/m² over 24 hours seven days per week during XRT.

FOLFOX—oxaliplatin 85 mg/m² as a two-hour infusion on day 1, leucovorin 200 mg/m² as a two-hour infusion on days 1 and 2, 5-fluorouracil as a bolus infusion on days 1 and 2, followed by a fluorouracil 22-hour infusion 600 mg/m² for two consecutive days every two weeks for 12 cycles; FUFA—5-fluorouracil 425 mg/m² plus leucovorin 20 mg/m² daily for five days every 28 days for six cycles

Note. Because of rounding, not all percentages total 100.

QOL in the experimental and control groups, nonparametric tests were used (Mann Whitney U and χ^2 tests). Internal consistency of the scale was tested by Cronbach alpha and Spearman's correlation.

Results

Distribution of Personal and Disease-Related Characteristics

The study included 40 patients (20 experimental, who used kefir, and 20 control, who did not use kefir). Three of the patients in the experimental group decided to continue their treatment elsewhere and were removed from the study. The researchers conducted a total of 198 interviews with patients before and after treatment to evaluate treatment-related side effects and QOL. Demographics and disease-related characteristics of the participants are shown in Tables 1 and 2. The patients' mean age was 54.32 years (SD = 12.77 years), 65% of the patients were men, 78% were married, 76% were unemployed, and most of them were treated with standard adjuvant chemotherapy regimens.

Distribution of Disease- and Treatment-Related Complaints

As a result of the analyses, the researchers determined no statistically significant difference between the two groups for disease-related complaints before treatment. The most common complaints from both groups were psychological, such as feeling nervous, worrying, having difficulty concentrating, having difficulty sleeping, sweating, lacking energy, and feeling sad before treatment. Assessment was directed at examining the treatment-related side effects that developed in both groups after treatment (see Table 3). The patients in the experimental group complained primarily of dry mouth, nausea, drowsiness, bloating, vomiting, sweats, lack of appetite, difficulty swallowing, mouth sores, weight loss, hair loss, and constipation; they reported fewer problems with sleep, and the difference was found to be statistically significant.

Grouping the problems experienced in both groups before and after treatment, patient scores reflecting overall symptom distress were evaluated with the MSAS-GDI, physical symptoms with the MSAS-PHYS, psychological symptoms with the MSAS-PSYCH, and all symptoms with the TMSAS. The differences between the two groups were examined.

Although the change in pre- and post-treatment MSAS-GDI scores was not statistically significant in the control group, the experimental group experienced a statistically significant increase in overall symptom distress beginning with the second cycle of chemotherapy until after the sixth cycle in comparison with pretreatment scores ($p < 0.05$). Despite the increase, when the two groups were compared, only the global distress score after the fourth cycle in the experimental group was found to be higher at a statistically significant level ($z_{MWU} = -2.13$; $p = 0.03$) (see Figure 1 for comparisons between groups on the MSAS and its subscales).

Examining the MSAS-PHYS subscale scores, the researchers found a statistically significant increase in the physical symptom score in the control group after the second, third, and fifth cycles in comparison with the pretreatment score ($p < 0.05$), but in the experimental group, statistically significant increases occurred in the physical symptom scores after every cycle ($p < 0.05$). When the two groups were compared, the physical symptom score was higher in the experimental group than the control group after the fifth cycle, and the difference was found to be statistically significant ($z_{MWU} = -2, 14$; $p = 0.03$).

Examining the MSAS-PSYCH subscale scores, the researchers determined that, in comparison with the pretreatment scores in the control group, after the first cycle a statistically significant decrease occurred in the psychological symptom scores ($p < 0.05$), but the changes in all scores after treatment compared with

Table 3. Side Effects Reported by Control and Experimental Groups After All Rounds of Chemotherapy

	Control Group (N = 105)		Kefir Group (N = 93)						
Symptom	n	%	n	%	χ^2	df	p	OR	95% CI
Dry mouth					6.59	1	0.01	2.19	1.19–4.01
No	79	75	54	58					
Yes	26	25	39	42					
Nausea					9.76	1	0.002	2.47	1.39–4.38
No	64	61	36	39					
Yes	41	39	57	61					
Drowsiness					8.49	1	0.004	2.56	1.34–4.87
No	85	81	58	62					
Yes	20	19	35	38					
Difficulty sleeping					3.77	1	0.05	2.42	0.17– 1.02
No	86	82	85	91					
Yes	19	18	8	9					
Bloating					6.68	1	0.01	2.6	1.24–5.45
No	92	88	68	73					
Yes	13	12	25	27					
Vomiting					20.09	1	0.001	7.76	2.83–21.22
No	100	95	67	72					
Yes	5	5	26	28					
Sweats					11.38	1	0.001	4.33	1.75–10.71
No	98	93	71	76					
Yes	7	7	22	24					
Lack of appetite					10.03	1	0.002	2.54	1.42–4.56
No	74	71	45	48					
Yes	31	30	48	52					
Difficulty swallowing					5.18	1	0.02	2.4	1.11–5.17
No	93	89	71	76					
Yes	12	11	22	24					
Mouth sores					6.41	1	0.01	2.45	1.21–4.97
No	90	86	66	71					
Yes	15	14	27	29					
Weight loss					4.87	1	0.02	2.56	1.08–6.02
No	96	91	75	81					
Yes	9	9	18	19					
Hair loss					4.25	1	0.03	2.51	1.02–6.19
No	97	92	77	83					
Yes	8	8	16	17					
Constipation					20.53	1	0.001	15.02	3.41–66.07
No	103	98	72	77					
Yes	2	2	21	23					

N = 198 interviews

CI—confidence interval; OR—odds ratio

Note. Because of rounding, not all percentages total 100.

pretreatment in the experimental group were not statistically significant ($p > 0.05$). In the comparison of the two groups, the experimental group's MSAS-PSYCH score after the sixth cycle was higher at a statistically significant level when compared to the control group ($z_{MWU} = -2.56$; $p = 0.01$).

Upon examining the TMSAS scores in the control group, the researchers found a statistically significant increase in all treatment-related complaints after the second and third cycles in comparison with the pretreatment scores ($p < 0.05$), but the experimental group had a statistically significant increase in complaints after all

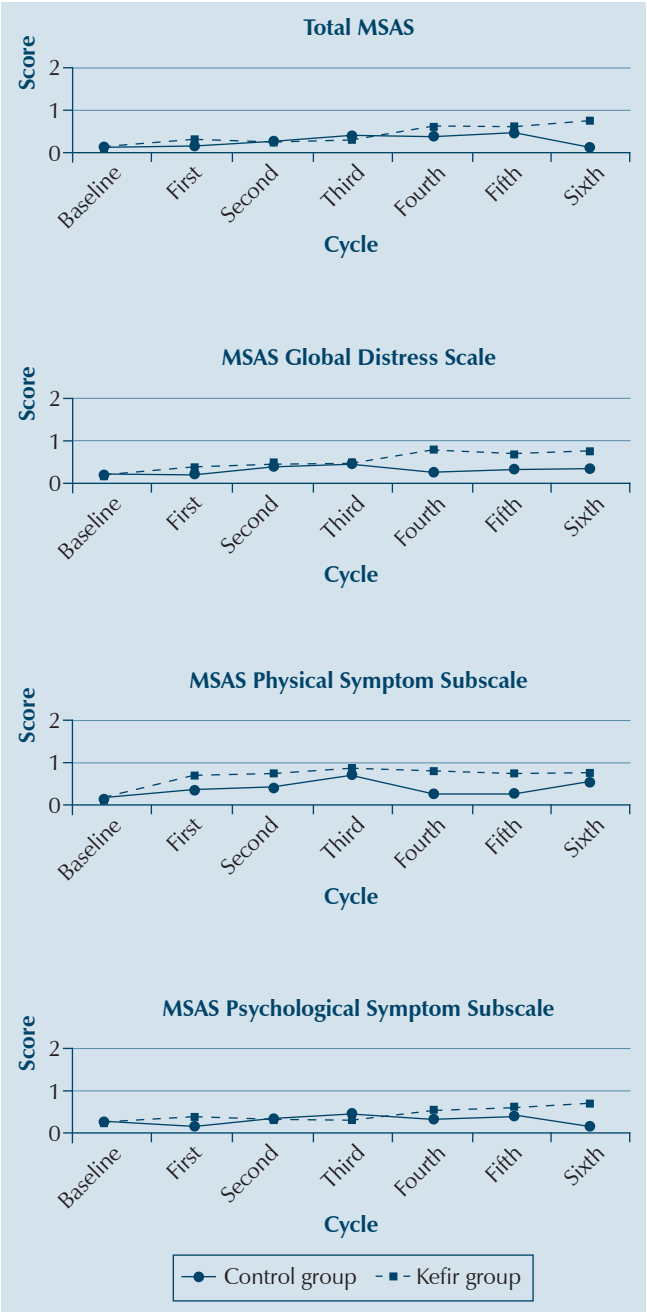

Figure 1. Comparison of Control and Kefir Groups' Memorial Symptom Assessment Scale (MSAS) Scores

cycles of chemotherapy in comparison with their pretreatment scores ($p < 0.05$). In comparison, the TMSAS score was higher at a statistically significant level in the experimental group after the fifth cycle compared to the control group ($z_{MWU} = -2.31$; $p = 0.02$).

Disease- and Treatment-Related Quality of Life

Using the FACT-G in both groups at the beginning, after the third cycle of chemotherapy, and after the sixth cycle, the researchers determined that general QOL was not affected by the treatment and that no statistically significant difference existed between the two groups ($p > 0.05$) (see Table 4).

Discussion

Patients with cancer are increasingly interested in CAM therapies (Hessig et al., 2004). Other studies have reported that patients choose to use such therapies because they give them hope and improve their QOL (Henderson & Donatelle, 2004; Kozachik et al., 2006; Patterson et al., 2002; Richardson, Sanders, Palmer, Greisinger, & Singletary, 2000), but more information is needed about their effects (Hessig et al.). Some studies have reported that CAM therapies have a negative effect on patients' QOL, particularly in those who have begun to use them recently (Cassileth et al., 1991; Lis et al., 2006). CAM therapies are chosen generally by adult patients with higher levels of education, and more than one-third of patients begin to use them immediately after being diagnosed with cancer (Jordan & Delunas, 2001).

A limited number of studies have examined probiotics, substances reported to prevent gastrointestinal complaints, particularly constipation. Probiotic yogurt has been reported to heal sensory conditions and decrease the risk of illness (Benton, Williams, & Brown, 2007), but the results of studies to date have not presented clear evidence. Further research is needed.

The purpose of this study was to determine the effectiveness of a specific probiotic, kefir, in preventing treatment-related gastrointestinal complaints and to determine the effect of kefir on QOL in patients with colorectal cancer being treated with 5-FU. No difference was found in QOL between the experimental and control groups. Some patients in the experimental group had an increase in some complaints but reported a decrease in sleep disturbances. To the authors' knowledge, no research reports have been published on the relationship between kefir and sleep. This effect may be related to tryptophan, which is a component of milk, used to produce kefir. Tryptophan is one of the essential amino acids that is well known for a relaxing effect on the nervous system, but the relationship must be evaluated with additional research (Otles & Cagandi, 2003). In a recent cross-sectional study comparing those who used CAM with those who did not, those who used CAM were found to have worse functional QOL (physical, emotional, social, and role function) and symptoms (fatigue and diarrhea) compared to those who did not use CAM (Lis et al., 2006; Paltiel et al., 2001).

In a study of patients being treated with 5-FU and folinic acid (FUFA) for colorectal cancer, 5.3% had stomatitis, 4.5% diarrhea, and 2.5% nausea or vomiting, so FUFA was reported to have a mild effect on patients' health status, and the patients' QOL was good in general (Zaniboni et al., 1998). As a result of the statistical analyses in the current study, the most common

Table 4. FACT-G Subgroup and Total Scale Scores

Variable	Control Group (N = 20) $\bar{X}$	SD	$\bar{X}$ Rank	Experimental Group (N = 17) $\bar{X}$	SD	$\bar{X}$ Rank	Z_{MWU}	p
Physical well-being								
Baseline	26.31	3.49	18.72	24.88	5.8	15.38	–1.1	0.27
Third cycle	23	4.13	12.5	19.81	6.33	9.64	–1.06	0.28
Sixth cycle	22.28	5.12	14.21	22.71	4.25	14.79	–0.18	0.85
Social and family well-being								
Baseline	22.06	4.18	17.31	21.41	4.66	16.71	–0.18	0.85
Third cycle	21.1	3.9	11.6	24.45	15.74	10.45	–0.42	0.67
Sixth cycle	21.15	3.57	14.69	20	5.64	13.36	–0.43	0.66
Emotional well-being								
Baseline	19.93	3.71	18.38	19.23	3.68	15.71	–0.8	0.42
Third cycle	20.5	2.83	11	20	3.97	11	–	1
Sixth cycle	20.14	4.07	15.75	19.14	3.84	13.25	–0.81	0.41
Functional well-being								
Baseline	20.25	4.98	17.13	19.76	4.61	16.88	–0.07	0.94
Third cycle	21.3	5.12	12.25	19.36	2.46	9.86	–0.88	0.37
Sixth cycle	21.21	5.49	15.96	19.5	4.31	13.04	–0.95	0.34
FACT-G								
Baseline	88.56	12.38	18.34	85.29	13	15.74	–0.77	0.43
Third cycle	85.9	12.51	11.9	83.63	15.74	10.18	–0.63	0.52
Sixth cycle	84.46	13.4	14.96	81.35	13.4	13.11	–0.6	0.54

FACT-G—Functional Assessment of Cancer Therapy Scale–General; Z_{MWU}—z Mann-Whitney U

complaints from patients before chemotherapy were psychological complaints, and no statistically significant difference occurred between the groups. However, after chemotherapy began, the patients in the experimental group had more complaints of dry mouth, nausea, drowsiness, bloating, vomiting, sweats, lack of appetite, difficulty swallowing, mouth sores, weight loss, hair loss, and constipation. In the control group, in comparison with pretreatment values, MSAS-PSYCH subscale scores decreased after the first cycle of chemotherapy. As the number of cycles increased, the experimental group's scores also increased. In comparison with the control group, the experimental group MSAS-GDI scores after the fourth cycle, MSAS-PHYS scores after the fifth cycle, and MSAS-PSYCH subscale scores after the sixth cycle were worse.

In some studies, probiotics have been shown to prevent gastrointestinal illnesses (deVrese & Marteau, 2007) and control acute viral and bacterial diarrhea and antibiotic-induced diarrhea (Parvez et al., 2006). In others, probiotics have not been shown to be effective (deVrese & Marteau). In a double-blind, placebo-controlled clinical study of 55 children, 7% who received probiotics and 31% of the control group developed diarrhea ($p = 0.035$) (deVrese & Marteau). In a study conducted by Black, Andersen, Orskov, Gaarslev, and Laulund (1989), probiotic use for traveler's diarrhea reduced the incidence from 71% to 43% ($p = 0.001$). Regular kefir consumption has been reported to relieve intestinal disorders, promote bowel movement, reduce flatulence, and create a healthier digestive system (Otles & Cagandi, 2003). However, in the current study, kefir did not prevent diarrhea and increased constipation. Patients taking kefir had an increase in nausea and vomiting because of its taste. For that reason, the authors suggest that kefir is not appropriate for patients with treatment-related gastrointestinal complaints such as nausea, vomiting, and constipation because its use may increase such complaints.

Limitations

Although the study recruited patients with colorectal cancer from a single oncology hospital, the hospital receives patients from all areas of Turkey, and the study had a representative sample of Turkish cultural characteristics. The study revealed that kefir increased some gastrointestinal complaints, such as nausea, vomiting, and constipation, but had no effect on QOL. Kefir did appear to prevent sleep disturbances in the experimental group. Further research could be planned to confirm a relationship among kefir, gastrointestinal complaints, and sleep disturbances in a larger, more culturally diverse patient population.

Conclusion

Studies have reported a relationship between CAM and QOL (Lis et al., 2006), but none has shown the effect of kefir on QOL of patients with colorectal cancer.

However, CAM use is increasing; 67.6% of people use at least one CAM therapy during their lifetimes (Deng et al., 2007; Hessig et al., 2004). In a study by Ernst and Cassileth (1998), 7%–64% of patients with cancer used some form of CAM, and mean CAM use prevalence was 31.4%. The rate of CAM use in patients with colorectal cancer has been reported to be 56.9% (Patterson et al., 2002). Although patients with cancer in Turkey have increased use of kefir for its health benefits, kefir was found to increase some physical complaints but did not have a negative effect on QOL. Kefir appeared to prevent sleep disturbances, but the reason is unclear. Because of the increase in gastrointestinal complaints, such as nausea, vomiting, and constipation, during treatment, the authors do not believe that kefir use during 5-FU treatment for colorectal cancer is appropriate. They recommend that further research explore the relationship among kefir, gastrointestinal complaints, and sleep disturbances in a larger, more culturally diverse patient population.

Gulbeyaz Can, PhD, RN, is an assistant professor in the Florence Nightingale School of Nursing at Istanbul University; Erkan Topuz, MD, is a professor at Istanbul University Oncology Institute; Duygu Derin, MD, is a physician at Kayseri Education and Research Hospital; Zehra Durna, PhD, RN, is a professor in the Florence Nightingale School of Nursing at Bilim University; and Adnan Aydiner, MD, is a professor at Istanbul University Oncology Institute, all in Turkey. No financial relationships to disclose. Mention of specific products and opinions related to those products do not indicate or imply endorsement by the *Oncology Nursing Forum* or the Oncology Nursing Society. Can may be reached at gulbeyaz@istanbul.edu.tr, with copy to editor at ONFEditor@ons.org. (Submitted May 2008. Accepted for publication December 9, 2008.)

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