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Art therapy using famous painting appreciation maintains fatigue levels during radiotherapy in cancer patients

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Purpose: The purpose of this study was to evaluate the efficacy of art therapy to control fatigue in cancer patients during course of radiotherapy and its impact on quality of life (QoL).

Materials and Methods: Fifty cancer patients receiving radiotherapy received weekly art therapy sessions using famous painting appreciation. Fatigue and QoL were assessed using the Brief Fatigue Inventory (BFI) Scale and the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) at baseline before starting radiotherapy, every week for 4 weeks during radiotherapy, and at the end of radiotherapy. Mean changes of scores over time were analyzed using a generalized linear mixed model.

Results: Of the 50 patients, 34 (68%) participated in 4 sessions of art therapy. Generalized linear mixed models testing for the effect of time on mean score changes showed no significant changes in scores from baseline for the BFI and FACIT-F. The mean BFI score and FACIT-F total score changed from 3.1 to 2.7 and from 110.7 to 109.2, respectively. Art therapy based on the appreciation of famous paintings led to increases in self-esteem by increasing self-realization and forming social relationships.

Conclusion: Fatigue and QoL in cancer patients with art therapy do not deteriorate during a period of radiotherapy. Despite the single-arm small number of participants and pilot design, this study provides a strong initial demonstration that art therapy of appreciation for famous painting is worthy of further study for fatigue and QoL improvement. Further, it can play an important role in routine practice in cancer patients during radiotherapy.

Keywords: Cancer, Radiotherapy, Art therapy, Fatigue, Quality of life, Oncology

Introduction

Fatigue, which is defined as deficits in energy, mental capacity, and psychological status, is more commonly observed in cancer patients than others [1]. The majority of patients with advanced cancer experience fatigue as the most prevalent symptom [2,3]. Fatigue may be caused by cancer itself as well as pre-existing physical and psychological factors [3,4]. In

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addition, cancer treatments are clearly one cause of fatigue [5]. During anti-neoplastic treatment, 100% of patients become fatigued [6]. Radiotherapy is performed over a period of several weeks, resulting in side effects impairing nutrition and general condition [7]. Fatigue occurrence increases over the course of radiotherapy [8,9]. Irrespective of the cause, fatigue is frequently associated with anxiety, depression, sleep disturbance, and low degrees of physical functioning [10,11]. Overall quality of life (QoL) and the patient's ability to cope with their illness also decrease [12]. Furthermore, severe fatigue may lead to discontinuation of treatment [9,13].

Art therapy is defined as a mind–body intervention supporting the 'power of the mind to influence the body in ways which encourage and stimulate health and well-being' [14,15]. As a form of cancer management, art therapy can contribute to cancer patients improving their ability to cope with the difficulties of cancer treatment and adapt to stressful conditions from cancer care [16,17]. Psychological benefits of art therapy have been suggested in empowering individuals to recalibrate their sense of self, the adjustment process, and perceptions of stress [17-20]. Some of the effects can reduce negative symptoms regarding anxiety and depression, as well as increase feelings of energy [15,21,22]. Only half of cancer patients with fatigue from radiotherapy were recommended for an intervention, such as relaxation therapy and group psychotherapy [12]. Although recognition and caring for fatigue is an important and fundamental aspect of cancer management [3], only a few studies have quantified the impact of fatigue in cancer patients receiving radiotherapy.

The purpose of this study was to evaluate the efficacy of art therapy to control fatigue in cancer patients during course of radiotherapy and its impact on QoL. We hypothesized that art therapy would prevent the deterioration of fatigue during radiotherapy.

Materials and Methods

1. Study population

This trial was conducted at the Yonsei Cancer Center, Yonsei University College of Medicine in collaboration with faculty from the Graduate School of Clinical Art Therapy, CHA University. We used a prospective design and received approval from the Institutional Review Boards of the Yonsei Cancer Center, Yonsei University College of Medicine. We recruited adult ambulatory patients of the Department of Radiation Oncology between January 2015 and April 2015. Eligibility criteria included the following: scheduled to receive 4 or more

weeks of external-beam radiotherapy, older than 20 years, and able to understand questionnaires. Exclusion criteria included uncontrolled co-morbid medical or psychiatric illness, metastatic disease, poor performance (Eastern Cooperative Oncology Group [ECOG] > 2); and severe anemia (hemoglobin < 9 g/dL).

2. Art therapy

The therapy program utilized in this study involved the following elements: art therapy based on the appreciation of famous paintings conducted across four 15-minutes sessions once a week, as well as a one-to-one interview between the therapist and patient in a separate therapy room prior to radiotherapy. In order to reduce an anxiety for treatment room, art therapy was started before 30 minutes of radiotherapy appointment. The art therapy was conducted at least once a week for 4 weeks. The therapists and patients were randomly assigned in the first session, and the assigned pairs did not change throughout the program unless the patients had special wishes. Seventeen students, who major in art therapy, conducted art therapy and interviewed patients. In each session, one of the artworks was preselected as the object of therapy for that session. The patient expressed the feelings aroused by images of the painting, and the therapist inferred the patient's emotional, affective, and mental states based on his/her predilection when choosing the artwork and expression of the emotions aroused by the image of the painting. Art therapists led the process of artistic expression and interviewed the patients with the following processes: first introduction part, 1) viewing famous paintings to arouse interest in paintings and explore the images offered by them; 2) talking about the experiences of seeing paintings similar to the one chosen by the patient; 3) talking about the reasons for choosing the painting. Second activity part, 1) exploring the aesthetic elements used in the painting (colors, lines, and spatial composition); 2) imagining the artist's intention expressed through the painting; and 3) talking about the patient's feelings on seeing the painting. Third conclusion part, 1) talking about the emotions felt before and after the activities. The famous paintings were selected by an expert panel of three and clinical art therapists who had experience of implementing three or more art therapy sessions. An important selection criterion was that paintings were easy to understand and interesting for patients. Questions to aid selection were as follows: Is the painting related to the topic? Are the expression techniques and contents related to the topic? Is the painting easy for the patients to understand? Can

Table 1. List of the selected paintings

Session	Paintings
1. Landscape painting	Field with Poppies (Vincent Van Gogh, 1889) Houses at Argenteuil (Claude Monet, 1873) Banks of Seine Vetheuil (Claude Monet, 1880) Poplars on the Bank of the River Epte Tree Lake (Claude Monet, 1891) View of l'Estaque and the If Castle (Paul Cézanne, 1885)
2. Figure painting	The Child's Bath (Mary Cassatt, 1884) Motherhood (Mary Cassatt, 1890) Woman with a Parasol-Madame Monet and Her Son (Claude Monet, 1875) Love at First Sight (Arthur John Elsley, 1874) Meadow at Bezons, (Claude Monet, 1874) Ask Me No More (Lawrence Alma Tadema, 1906)
3. Color-centered painting	Sunflowers (Vincent Van Gogh, 1888) Polynesia, the Sea (Henri Matisse, 1946) Squares with Concentric Rings (Wassily Kandinsky, 1913) Water Lily Pond, Symphony in Green (Claude Monet, 1899)
4. Christian painting	The Infant Samuel (Joshua Reynolds, 1776) Praying Hands (Albrecht Durer, 1508) A Riverside Where I Can Rest (Yong Sung Kim, 2005) The Good Shepherd (Anonymous) The Virgin in Prayer (Il Sassoferrato, about 1640–1650)

the painting attract patients' interest? Can the painting evoke patients' internal motives? Are aesthetic elements clearly expressed? The famous paintings consisted of a landscape painting in the first session, a figure painting in the second session, a color-centered painting in the third session, and a Christian painting in the fourth session. Table 1 lists the selected paintings. A total of 21 famous paintings were used as therapy materials for the 4 sessions of the program. They were printed in resolutions of 300 dpi or higher and offered in real-size frames. The illumination of the therapy room was kept at the same level throughout the program. The paintings were placed at a distance of 50 cm from the patient, facing the therapist and patients in the same direction.

3. Assessment
All the patients were asked to fill the questionnaires at baseline before starting radiotherapy, every week for 4 weeks during radiotherapy, and at the end of radiotherapy. Fatigue and QoL

was assessed using the Brief Fatigue Inventory (BFI) and the Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F). The BFI was used for fatigue assessment and consists of 9 items that ask participants to rate the severity of current, usual, and worst fatigue and how much it interfered with their lives during the previous 24 hours. Fatigue and its interference are measured on a 0–10 scale, where 0 represents "no fatigue" and 10 denotes "as bad as you can imagine." The BFI score is calculated from the mean of the 9 items. Higher scores on the BFI represent worse fatigue. The validity and reliability of the BFI has been established [23,24]. The FACIT-F contains 40 items, where are the Functional Assessment of Cancer Therapy (FACT-G) instrument and additional fatigue–specific items [25,26]. The FACT-G consist of 4 primary QoL domains: physical well-being (PWB; 7 items), social/family well-being (SWB; 7 items), emotional well-being (EWB; 6 items), and functional well-being (FWB; 7 items). The fatigue subscale (FS) contains 13 items. It generates FACIT-F trial outcome index (TOI), FACT-G total score, and FACIT-F total score. The total FACT-G score is obtained by summing individual subscale scores (PWB + EWB + SWB + FWB). The TOI is the sum of the PWB, FWB, and FS score. Total scores for FACIT-F are obtained by summing all subscale scores (PWB + EWB + SWB + FWB + FS score). Higher scores for the scales and subscales indicate better QoL.

4. Statistics
A change was defined as the baseline value minus the value at each week during radiotherapy for each scale. Means and standard deviations were used to present the results. The overall impact of art therapy over time was evaluated using generalized linear mixed modeling for the BFI and each score from the FACIT-F. The mean values for scores at specific time points were plotted graphically. No adjustments for missing data were made beyond the use of generalized linear mixed modeling. All statistical tests were two sided, with significance level of 0.05.

Results

1. Compliance and baseline characteristics
Between January 2015 and April 2015, 50 patients were eligible and willing to participate in the study. Of these, only 34 (68%) participated in 2 or more sessions. Sixteen patients withdrew this study due to lack of interest. All 34 patients completed 4 sessions of art therapy. We analyzed the data of these 34 patients, which were appropriate for evaluate the effect of art therapy. Baseline characteristics are presented in Table 2.

The median age was 50 years (range, 34 to 68 years) and patients had a good performance status (ECOG, 0 or 1). Breast cancer patients were most common. There was no recurrent cancer patient and most patients had cancer treatment duration of less than 1 year. All patients received radiotherapy for curative, not palliative purposes. Baseline fatigue was mild to moderate with a mean BFI score of 3.1 (max, 10) and FS score of 39.1 (max, 52). However, 50% answered that they had fatigue irrespective of severity. There was no significant relationship between baseline fatigue and clinical factors.

2. Assessment of the impact of art therapy on fatigue over time

Table 3 demonstrates change scores at weekly time points during radiotherapy. Fig. 1 and Table 4 show these findings for the BFI and each FACIT-F domain. Generalized linear mixed modeling testing for the effect of time on mean change scores showed no significant worsening of scores from baseline for BFI and FACIT-F. Although statistical significance was not reached, art therapy decreased mean BFI scores during radiotherapy (from 3.1 to 2.7). For the FACIT-F, most summed scores (FACIT-F TOI, FACT-G, and FACIT-total) showed a similar pattern. No statistically significant change was observed. However, 4 primary QoL domains of FACT-G and FS showed a different change patterns during radiotherapy. PWB and FS slightly decreased, indicating worse QoL. On the contrary SWB, EWB, and FWS slightly increased, indicating better QoL. There were no associations between clinical factors and change in fatigue score at any time point in generalized mixed model.

3. Perceptions of art therapy

After the art therapy program was completed, a survey was conducted with the 34 patients who participated in all four art therapy sessions. The exit-interview questionnaire showed that all of patients indicated that the art therapy program was helpful and that they would recommend it to others. The item, "What is the most important thing that has happened?" in Table 5 was analyzed using the session notes that were used to record the progress of the art therapy program. It was found that the number for "express inner emotion" and "enhance and explore self-expression" were higher than those for other items, at 73 (24.8%), and 71 (24.2%), respectively. This indicates that the patients utilized the art as a medium through which they could reflect on their own mentality or situation, provide an opportunity for internal self-expression, and facilitate self-expression. However, "help take mind off pain or discomfort" (2.7%) was shown to be lower than most other items. The

Table 2. Baseline characteristics of the study population (n = 34)

Variable	Value
Sex	
Male	6 (17.6)
Female	28 (82.4)
Age (yr)	50 (34–68)
ECOG performance status	
0	18 (52.9)
1	16 (47.1)
Body mass index (kg/m^2)	23 (18.4–31.6)
Marital status	
Married	32 (94.1)
Unmarried	2 (5.9)
Living status	
Living together	34 (100)
Not co-habiting	0 (0)
Primary cancer	
Breast	22 (64.7)
Rectal	11 (32.4)
Prostate	1 (2.9)
Stage	
0	4 (11.8)
I	11 (32.4)
II	7 (20.5)
III	12 (35.3)
White blood cell (/μL)	
Before RT	5,756 ± 2,086
After RT	4,602 ± 1,639
Hemoglobin (g/dL)	
Before RT	12.9 ± 1.7
After RT	12.9 ± 1.5
Total dose of RT (Gy)	52.5 (50.4–60.4)
Fraction number of RT	28 (21–33)
Fraction dose of RT (Gy)	
Fraction dose	1.8 (1.8–2.4)
1.8–2.0	21 (61.8)
>2.0	13 (38.2)
Site of RT	
Breast or chest wall with/without regional LN, lymph node; area	22 (64.7)
Pelvis	12 (35.3)
Surgery	
Before RT	23 (67.6)
No	11 (32.4)
Chemotherapy	
Before RT	10 (29.4)
Concurrent	11 (32.4)
No	13 (38.2)
Hormone therapy	
Before RT	21 (61.8)
Concurrent	21 (61.8)
No	13 (38.2)

Values are presented as median (range) or number (%) or mean ± standard deviation. ECOG, Eastern Cooperative Oncology Group; RT, radiotherapy.

Table 3. Scores for questionnaire of BFI and FACIT-F at baseline and change from baseline

	Baseline score		Visit 1		Visit 2		Visit 3		Visit 4		End of RT	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
BFI average score	3.1	2.4	0.2	1.8	0.0	2.3	-0.2	2.8	-0.4	2.6	0.0	2.4
FACIT-F scoring												
PWB	22.8	5.2	-0.5	5.0	-2.3	5.2	-0.5	5.0	-1.4	6.4	-3.1	5.7
SWB	16.8	8.1	0.1	6.7	1.6	9.7	0.9	8.0	1.1	8.4	0.6	7.0
EWB	16.5	4.6	-0.3	5.1	0.7	4.7	1.1	5.1	1.7	4.8	0.0	5.0
FWB	15.6	6.8	0.0	7.9	1.7	8.2	2.0	8.4	2.6	7.5	1.7	8.8
FS	39.1	7.2	-2.4	8.8	-2.1	8.3	-0.5	8.1	-1.0	8.0	-1.7	9.8
FACIT-F TOI	77.4	15.7	-2.9	18.7	-3.8	17.8	0.8	17.6	-0.4	16.7	-3.7	19.2
FACT-G TS	71.6	18.0	-0.7	19.1	0.7	20.3	3.3	20.3	3.4	19.5	-1.3	18.5
FACIT-F TS	110.7	23.4	-3.1	26.6	-1.4	26.0	2.8	26.7	2.3	25.4	-3.0	26.4

BFI, Brief Fatigue Inventory; FACIT-F, Functional Assessment of Chronic Illness Therapy-Fatigue; RT, radiotherapy; SD, standard deviation; PWB, physical well-being; SWB, social/family well-being; EWB, emotional well-being; FWB, functional well-being; FS, fatigue subscale; TOI, trial outcome index; FACT-G, Functional Assessment of Cancer Therapy-General; TS, total score.

Table 4. Generalized linear mixed model estimates for least-squares means

	Baseline		Visit 1		Visit 2		Visit 3		Visit 4		End of RT		p-value
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	
BFI average score	3.1	0.4	3.3	0.3	3.1	0.3	2.9	0.3	2.7	0.3	2.7	0.4	0.773
FACIT-F scoring													
PWB	22.8	0.9	22.3	0.7	20.4	1.0	22.2	0.7	21.4	0.7	20.3	1.1	0.275
SWB	16.8	1.4	16.9	1.0	18.4	1.1	17.7	1.0	17.9	1.1	17.4	1.1	0.910
EWB	16.5	0.8	16.2	0.7	17.2	0.7	17.6	0.7	18.2	0.6	17.3	0.8	0.315
FWB	15.6	1.2	15.6	1.0	16.2	1.1	17.4	1.1	17.6	1.0	16.7	1.2	0.608
FS	39.1	1.2	36.7	1.5	37.0	1.6	38.6	1.3	38.1	1.2	37.5	1.9	0.822
FACIT-F TOI	77.4	2.7	74.6	2.8	73.6	3.4	78.2	2.8	77.0	2.4	74.5	3.9	0.853
FACT-G TS	71.6	3.1	70.9	2.5	72.3	3.0	74.9	2.8	75.0	2.8	71.7	3.4	0.843
FACIT-F TS	110.7	4.0	107.6	3.6	109.3	4.4	113.5	3.9	113.0	3.7	109.2	5.1	0.869

RT, radiotherapy; SE, standard error; BFI, Brief Fatigue Inventory; FACIT-F, Functional Assessment of Chronic Illness Therapy-Fatigue; PWB, physical well-being; SWB, social/family well-being; EWB, emotional well-being; FWB, functional well-being; FS, fatigue subscale; TOI, trial outcome index; FACT-G, Functional Assessment of Cancer Therapy-General; TS, total score.

item "enhance coping mechanism" was also found to be lower than other items. The art therapy based on the appreciation of famous paintings led to increases in self-esteem by increasing self-realization and forming social relationships.

Discussion and Conclusion

This was a study assessing the impact of art therapy on fatigue during the radiotherapy period. Although some patients
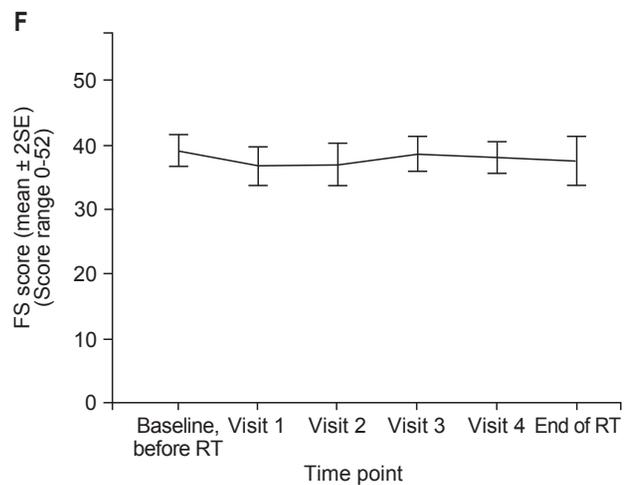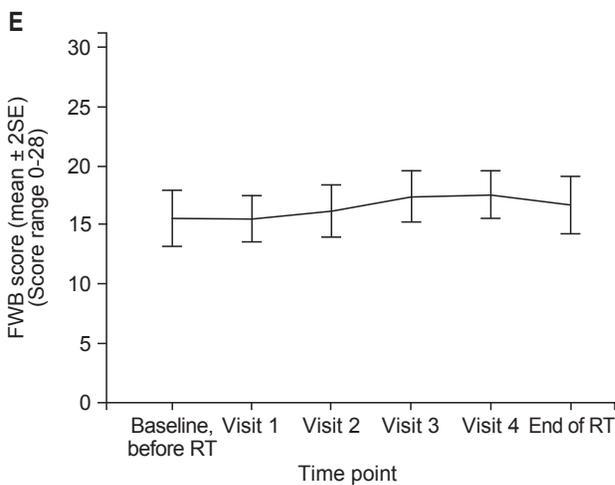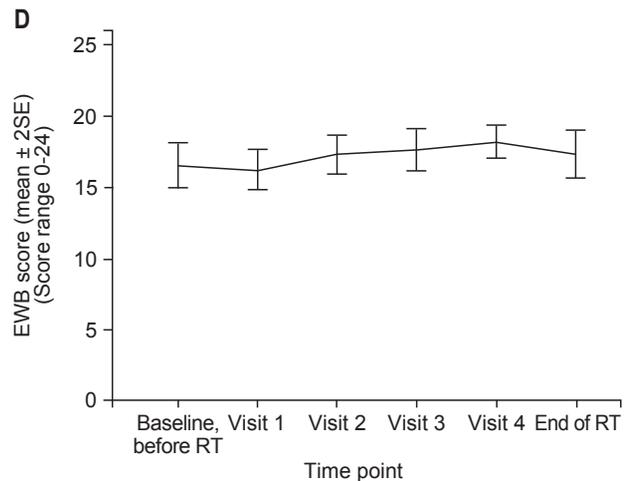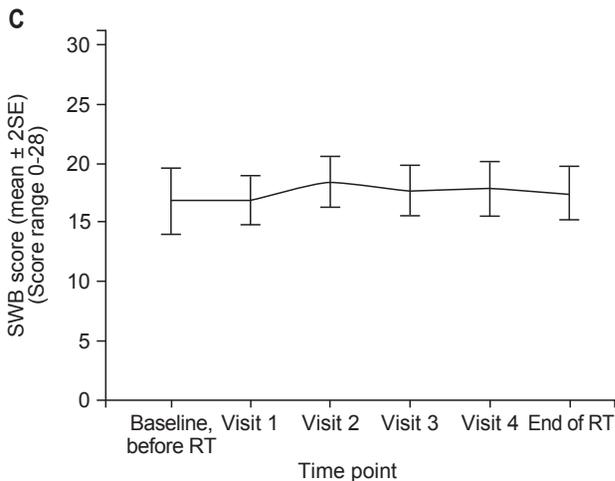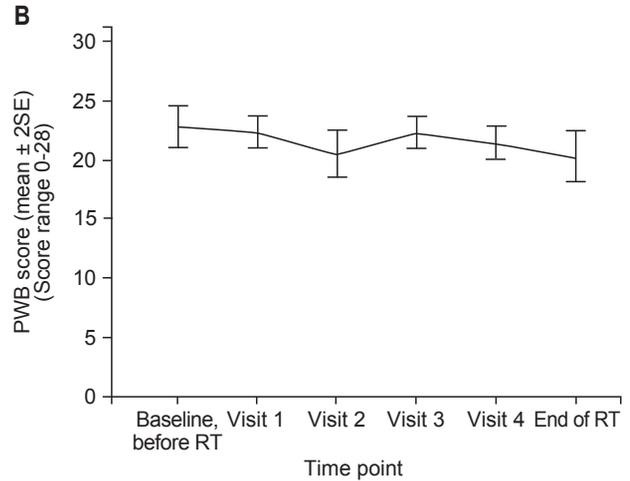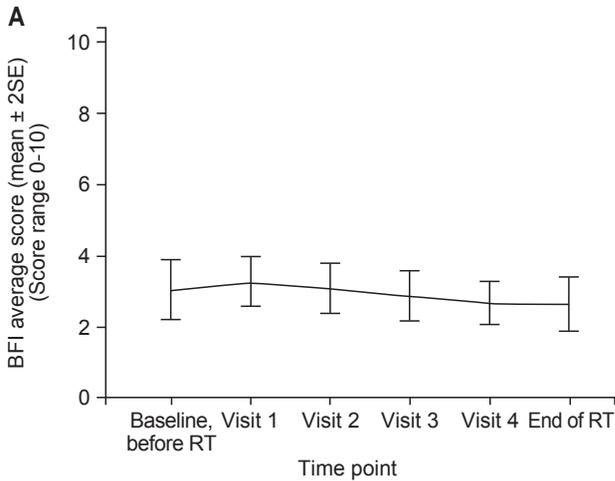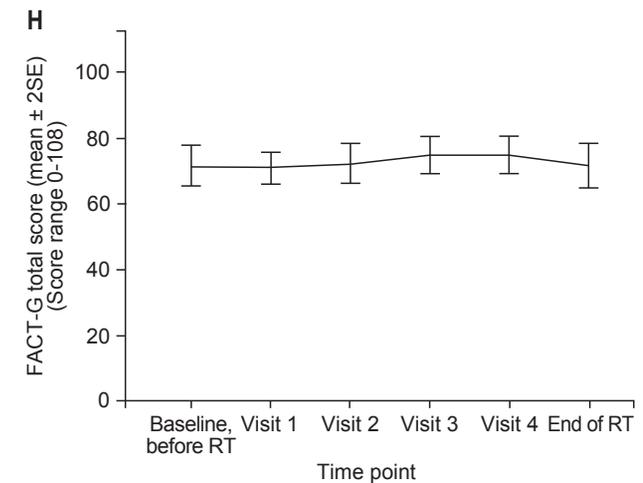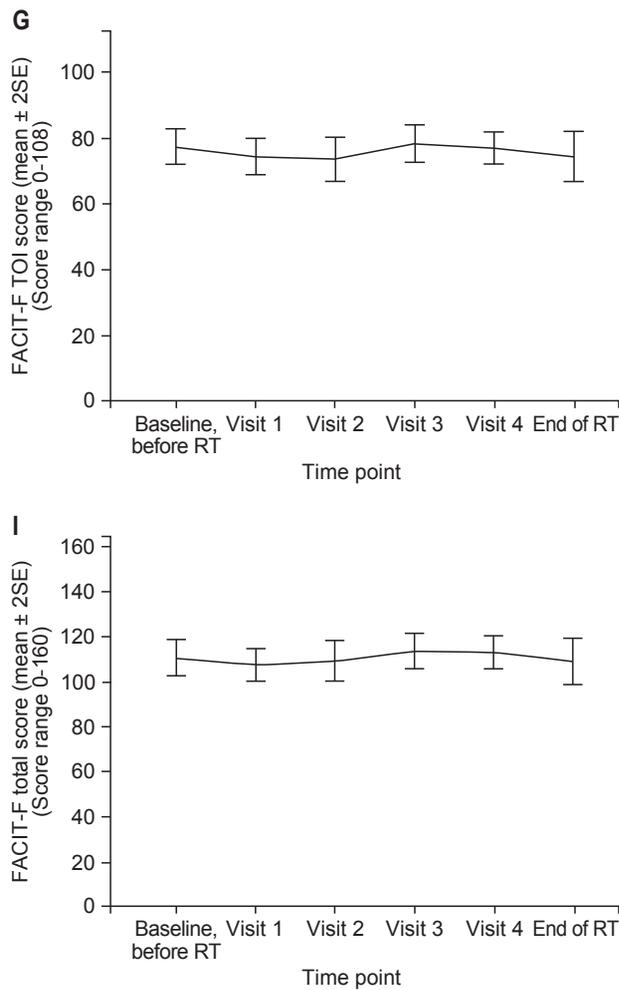
Fig. 1. Overall mean scores over time. (A) Brief Fatigue Inventory (BFI) score, (B) physical well-being (PWB) score, (C) social/family well-being (SWB) score, (D) emotional well-being (EWB) score, (E) functional well-being (FWB) score, (F) fatigue subscale (FS) score, (G) Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) trial outcome index (TOI) score, (H) Functional Assessment of Cancer Therapy-General (FACT-G) total score, and (I) Functional Assessment of Chronic Illness Therapy-Fatigue (FACIT-F) total score. RT, radiotherapy; SE, standard error.

Table 5. Survey assessing perceptions of art therapy (n = 34)

Exit interview questions	No. (%)
Was art therapy helpful?	
1. Yes	34 (100)
2. No	0 (0)
Would you recommend art therapy?	
1. Yes	34 (100)
2. No	0 (0)
What is the most important thing that has happened?[a]	
1. Express inner emotion	73 (24.8)
2. Enhance and explore self-expression	71 (24.2)
3. Communicate emotions	37 (12.6)
4. Enhance treatment or life will	32 (10.9)
5. See the importance of living and appreciate present living	22 (7.5)
6. Help improve relationship with other people: which could control anxiety, depression, and low self-esteem	22 (7.5)
7. Help control symptoms (anxiety, depression, and pain) and increase quality of life	22 (7.5)
8. Help take mind off pain or discomfort	8 (2.7)
9. Enhance coping mechanism	7 (2.4)

[a]Multiple choice question.

dropped out, enrolled patients seemed to be interested in the appreciation of famous painting to control fatigue and emotional distress. Most patients demonstrated no deterioration of fatigue and found the weekly art sessions to be relaxing during the radiotherapy.

Fatigue is considered one of the most frequent side effects in cancer patients undergoing radiotherapy [27-29]. The proportion of patients expressing fatigue during radiotherapy is increasing in various cancer types [30,31]. The fatigue starts increasing from the second week onwards and decreases subsequently at around 4 weeks after completion of radiation [9,12]. It is also closely related to acute radiation effects, which alter the patient's nutrition and blood parameters such as anemia, leading to aggravation of baseline fatigue [9]. Its prevalence can reach up to 80% when patients are undergoing radiotherapy [32]. This may cause a decrease in self-esteem as well as in social activities, becoming a factor that negatively affects patients' QoL [29]. Despite its high prevalence, fatigue has not been measured routinely in cancer patients [24]. In a Korean study, compared with the normal group, the cancer patient group showed higher fatigue scores [24]. In this study, current fatigue, usual fatigue, and worst fatigue on the BFI were comparable to those previously reported in studies on Korean cancer patients. However, the fatigue levels of our participants on the FACIT-F subscale (FS) were better than those published for patients with breast cancer receiving radiotherapy [5]. Based on this observation, fatigue is problematic for patients preparing radiotherapy, and appropriate clinical interventions are needed.

Art therapy is a form of psychotherapy aimed at increasing well-being and psychological functioning, and it has a significant benefit for cancer patients, providing a mind–body interaction for communication and expression [20]. It is also an attribute of self-care and self-management empowerment for those living with cancer [20,33]. Wood et al. [20] reported quantitative and qualitative evidence for the use of art therapy in the management of emotional, physical, functional, social, and spiritual symptoms in adults with cancer [17]. The most notable benefits from art therapy were spiritual and psychological well-being [17]. Moreover, there have been several reports that art therapy reduced the severity of a broad spectrum of symptoms common in cancer patients, including decreased levels of anxiety, depression, and stress; significant improvement of social functioning; and improved QoL [15,21,22]. In oncology outpatient clinics, there have been few reports of clinical trials of art therapy intervention [11]. Bar-Sela et al. [11] demonstrated that art therapy improves

depression and influences fatigue levels in cancer patients on chemotherapy [11]. Art therapy interventions differ in their approaches (e.g., anthroposophical, art pedagogical, and art-based) and in their applied methods and materials as well as the context in which they take place (e.g., facilities, length of the intervention). Generally, art therapy interventions are led by art therapists [34]. Considerable stress related to the diagnosis, surgery, and treatment was observed in many breast cancer patients. Almost 50% women with early breast cancer suffered from depression, anxiety, or both in the first year after diagnosis [35]. In radiotherapy, higher levels of stress have been observed among women than among men, and women with breast cancer reported the highest levels [36]. More women than men participated in this study. This phenomenon, which prefers art therapy in women, has been described [11]. The art therapy used in this study was based on appreciation of famous paintings. The participants could discuss the pictures with the art therapist leading to more free-flowing communication regarding their current physical and emotional state. Although art therapy did not significantly improve fatigue or QoL, generalized linear mixed models showed that there was no deterioration of fatigue or QoL during radiotherapy. Art therapy is worth considering as a positive influence on cancer patients receiving radiotherapy.

The main obstacle to accrual was poor insight for art therapy. At first impression, participants seem to find art therapy to be strange. Some of the participants said it hard to find additional time for art therapy. Self-selection to participate in art therapy is another limitation. The participants might already have positive thoughts about art therapy. We used several famous paintings as art therapy. However, the variations in the content of art therapy could also cause difficulty in determining efficacy and reliability. In terms of site for radiotherapy, breast or chest wall was most common site in this study. Various site of radiotherapy is needed to confirm role of art therapy. This is the single-arm study. Non-specific placebo effects cannot be excluded as possible explanations for the results. Therefore, a randomized controlled trial with more restrictive eligibility criteria is warranted.

In conclusion, fatigue and QoL in cancer patients with art therapy did not deteriorate during the radiotherapy period. Given the single-arm small number of participants and the pilot design, our studies provide a good basis demonstrating that art therapy of appreciation for famous paintings is worthy of further studies on fatigue and QoL improvement. This therapy can play an important role in routine practice among cancer patients during radiotherapy.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Acknowledgments

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