



# Measuring Breast Cancer Patients' Opinion About Radiotherapy with Visual Analog Scale and the Effect of Informative Interview

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## OBJECTIVE

The objective of the study was to assess breast cancer (BC) patients' opinion about radiotherapy (RT) with visual analog scale (VAS) and investigate the effect of informative interview by a trained RT technician (RTT).

## METHODS

Eighty-one female BC patients treated with curative intent were included in the study. To represent both negative and positive views, VAS was modified and visually enhanced. Patients marked their opinion after initial consultation, after informative interview by an RTT, and finally after the completion of RT. We also asked which treatment modality was the easiest and hardest in their experience. Toxicities were reported according to RTOG CTCAE v4.0. VAS score was measured from 0, where minus axis denotes positive and plus denotes negative opinion. Difference between recordings was measured with paired t-test.

## RESULTS

On the first recording, average opinion was -6.5 mm on VAS. The second recording of -29.4 mm and final recording of -41.1 mm showed positive change. Difference between measurements was significant ( $p < 0.001$ ). About 78.9% thought chemotherapy, whereas 9.9% thought that RT was the hardest. RT was easiest for 74.6% followed by surgery for 9.5%.

## CONCLUSION

RT is the most elusive treatment modality for patients and non-oncology health professionals. Even though anxiety in BC patients is evaluated extensively, few studies focus on their concerns about RT. Misinformation from unauthorized resources can impair treatment compliance. We demonstrated that informative interview improves all patients' look and alleviates fears about RT, whether they present anxiety or not. RTTs role should extend into pre-treatment communication with patients to detect anxiety, address any existing fears, and provide reliable information.

**Keywords:** Anxiety, breast cancer, patient counsel, radiotherapy, visual analog scale.

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## Introduction

Anxiety is common in women undergoing treatment for breast cancer (BC), with 10-50% of patients experiencing some level of anxiety before the start of ra-

diotherapy (RT).[1-3] While chemotherapy (ChT) is associated with higher anxiety than other treatments,[4] RT still remains a terrifying mystery for both the patients and other health professionals. Usual information about RT is given regularly during the first

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consultation with the radiation oncologist (RO), but that hardly addresses patient's anxiety or individual reasons. Evidence shows that stress about radiation in general is due to the unknown or misinformation, and most of these are left unattended throughout the treatment.[5] Furthermore, even though patients feel calmer and have lower levels of anxiety as the treatment progresses, any side effects during RT may still exacerbate anxiety and have the patient asking radiation therapist repeated questions, revealing specific fears about RT, seeking remedies from unauthorized sources, and thus impeding an already hectic schedule. [6] Recently, Halkett et al.[7] published a detailed report that showed BC patients informed by RT technicians (RTTs) and showed reduced psychological stress about RT compared to patients given usual informative care. The majority of the literature focuses on the negative spectrum of psychological state, ignoring the possibility that any patient may have positive impressions of RT. Despite the abundance of data on the anxiety of cancer patients undergoing any given treatment, routine assessment and management of it is rare.

There are several instruments to measure anxiety in medicine. Hospital anxiety and depression scale (HADS) is one of frequently utilized tools to evaluate the psychological status of patients.[8] Another well-studied tool is the state-trait anxiety inventory (STAI). However, both take a significant amount of time to complete. Initially, the visual analog scale (VAS) was used to assess pain. The ease and speed with which VAS can be used have resulted in its widespread use to assess a variety of personal characteristics such as opinion, pain, and anxiety. VAS validity has been established in oncology patients, both for measuring anxiety and for interpreting care goals.[9,10]

Based on the literature, we aimed to interpret the anxiety levels of BC patients referred for RT with VAS and investigate the effect of an informative interview with a trained RTT. We modified VAS to show the magnitude of psychological state on opposing axes to illustrate both positive and negative impressions about RT. We used this tool to assess the impact of an RTT delivered interview on patients' perceptions of RT. Secondary goals include dispelling misconceptions about RT and general perceptions of RT in comparison to other treatment modalities.

### Materials and Methods

Female BC patients who received curative post-operative RT were included in the study. ChT was given in

adjuvant or neoadjuvant setting if indicated. Following surgery and ChT, patients began RT. Trastuzumab was administered concurrently if indicated. Patients with other cancers or a history of previous RT were not eligible. This study has been approved by the local ethical committee.

VAS was modified and visually enhanced to represent both negative and positive views on RT (Fig. 1). The horizontal scale was color coded and divided into two opposing axes. Green was applied to the left hand side (minus direction). Any marks to the left of point zero were considered positive perception. The right hand side (plus direction) was colored red, and any marks to the right of point zero are considered negative impressions and are defined as anxiety. Following a consultation with the RO in which the indication, specifics, and expected side effects of RT were discussed, all patients were asked to rate their impression about RT on the VAS chart. Any apprehensions about RT are classified as adverse effects, emitting radiation, technical details, claustrophobia, and fear of the unknown. Patients were then taken into an interview with an RTT who was specifically trained on BC and given a briefing on RT, answering any questions they may have. Following the interview, a second mark is noted down. We also inquired as to whether or not their fears persisted or changed following the interview. Patients marked their final opinion at the end of RT. In addition, they stated which treatment modality was the easiest and most difficult in their experi-

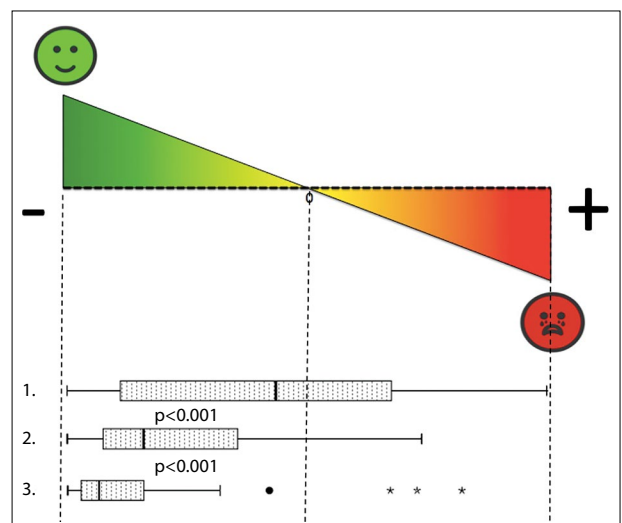


Fig. 1. Measurements as box plot charts on modified visual analogue scale (VAS) and corresponding p values in-between.

ence. Toxicities were reported in accordance with the RTOG CTCAE v4.0 standard.

The VAS score ranged from 0 to 50 mm on both the negative and positive axes in millimeters. The median and standard deviation (SD) were computed. The paired t-test was used to determine the difference between three recordings. The local ethics committee has approved this study.

## Results

The study enrolled 81 patients with BC. Seven (8.6%) of them had Stage 1 disease, 19 (23.5%) had Stage 2, 48 (59.2%) had Stage 3 disease, and 7 (8.6%) had Stage 4 disease (Table 1). ChT was indicated in 71 of them (87.7%). Forty-two patients received ChT adjuvantly, while 29 patients began with a neoadjuvant regimen. In 36 (44.4%) of patients, modified radical mastectomy was the preferred procedure followed by breast conserving surgery in 45 (55.6%). Trastuzumab was indicated in 15 patients (18.5%).

Each patient stated that they were adequately informed and had all of their questions addressed. Twenty-four (24.7%) patients expressed no fear of RT, while 47 (58%) expressed fear of side effects, 6 (7.4%) expressed concern about radiation exposure, 1 (1.2%) expressed concern about the duration of RT, 5 (6.2%) expressed claustrophobic fear, and 2 (2.5%) expressed fear of the unknown. Following RTT delivered interview, 38 of the 47 patients stated their fears dispelled, leaving 25 patients starting the treatment with any fear. At the completion of RT, 12 (14.8%) patients claimed their fears came true. Of these, seven had persisting fears following RTT delivered interview.

Thirty-one patients (38.3%) demonstrated anxiety during the initial assessment. Seven patients (8.6%) reported persistent anxiety following the RTT delivered interview. Only 4 (4.9%) patients had anxiety levels on the VAS at the conclusion of RT (Table 2). On VAS, the initial measurement revealed a mean of -6.5 mm (SD 34.6). Following an informative interview conducted by RTT, second marks on VAS shifted to the left, scoring an average of -29.4 mm (SD 22.6) ( $p < 0.001$ ). Similarly, the difference between the second and third measurements was significant, shifting the VAS value toward -41.1 mm (SD 19.5) ( $p < 0.001$ ) (Fig. 1). When compared to receiving RT, RTT delivered interviews resulted in a -11.2 mm greater reduction in VAS ( $p = 0.012$ ). Of the 12 patients who stated their fears came true, eight presented anxiety at the first assessment, two at the second, and four at the last VAS. Grade 1 dermatitis was observed in four of

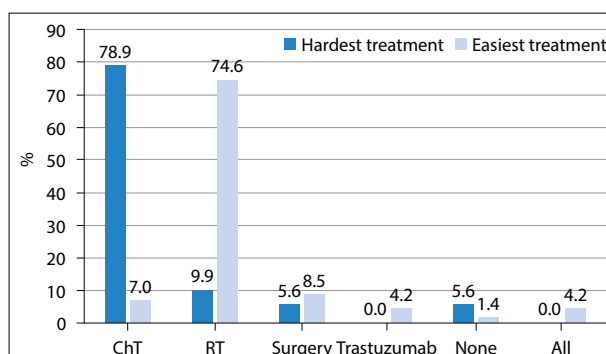
Stage and treatment distribution	Number of patients	%
Stage 1	7	8.6
Stage 2	19	23.5
Stage 3	48	59.2
Stage 4	7	8.6
Chemotherapy	71	87.6
Adjuvant	42	51.8
Neoadjuvant	29	35.8
Surgery	81	100
MRM	36	48.1
BCS	45	55.5
Trastuzumab	15	18.5

MRM: Modified radical mastectomy; BCS: Breast conserving surgery

Anxiety status	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
Average on VAS (mm)	-6	-29	-41
No anxiety (%)	50 (61.7)	74 (91.4)	77 (95.1)
Anxiety (%)	31 (38.3)	7 (8.6)	4 (4.9)

them, Grade 2 in four, and Grade 3 in one patient. Three of them had no skin changes at the completion RT.

Of the 71 patients treated in a trimodal setting, 56 (78.9%) believed that ChT was the most difficult modality, while 7 (9.9%) believed that RT was the most difficult (Fig. 2). The most manageable treatment was RT for 53 (74.6%) patients, surgery for 6 (8.5%), ChT for 5 (7%) patients, and trastuzumab for 3 (4.2%) patients. At the conclusion of RT, 17 (21%) patients had no skin changes, while 42 (51.9%) had Grade 1, 19 (23.5%) had Grade 2, and 3 (3.7%) had Grade 3 radiation dermatitis. There was no >Grade 3 toxicity. Of the seven patients who believed that RT was the most dif-



**Fig. 2.** Hardest and easiest treatment modality according to patients treated in trimodal setting.

ficult, two experienced no toxicity, three experienced Grade 1 skin changes, one experienced Grade 2 toxicity, and two experienced Grade 3 toxicity.

## Discussion

Psychological stress is frequently overlooked in cancer patients. Even in the highly researched BC, patients experience high levels of anxiety at the start of treatment. The prevalence of any type of anxiety ranges from 10% to 50%. Strong evidence supports the use of STAI and HADS for anxiety detection in oncology.[11] Lim et al.[4] showed that BC patients presented some level of anxiety irrespective of treatment modality, and ChT was associated with higher anxiety than any other treatment options. HADS and STAI were the most frequently used tool in their review. Tuncer et al.,[12] for example, used STAI to demonstrate that early stage patients carried stress levels when undergoing RT. They advocated for the use of more nurses to detect and eliminate any existing anxiety. In a comprehensive study, Halkett et al.[7] found that patients who were debriefed by the RTT experienced less anxiety than patients who were only informed by a RO. RTT focused on providing information and addressing patients' pre-treatment anxiety in their study. The researchers recommend that RTTs expand their role to assist patients before the start of RT. The findings are supported by the report from Elsner et al.[13] which emphasized the fact that RTTs are unique in that they have daily direct contact with the patient, allowing them to provide support through increased communication and information sharing.

Both HADS and STAI require the patient to answer multiple questions and take between 15 and 30 min to complete. VAS had been introduced to quantify pain and had proven to be effective in both children and illiterate individuals. One of the most significant advantages of VAS is that it is significantly faster to complete than multiple-choice questionnaires. In this study, we extended the VAS to assist patients in visualizing their perceptions of RT. While anxiety is frequently underdiagnosed and untreated, patients who do not experience any form of psychological stress are almost always ignored and left to fend for themselves. As a result, patients seek information from unauthorized sources and rely on hearsay, which can cause anxiety, mismanagement of side effects, and non-compliance with treatment.

Fears about RT seem to be focused on a few issues. Worry about side effects as well as fear of unknown were the main issues in the report by Halkett et al.[14]

They also noted that patients' fears were worse than their actual experiences during RT course. Therefore, they recommend the health professionals to listen to patients to assess their understanding of treatment and side effects. The same group showed that the patients' anxiety at baseline did not significantly drop until after treatment commencement, bringing forth the need for information in this patient group.[5] Our VAS-based assessment of anxiety is consistent with the literature. About 38.3% of patients demonstrated signs of anxiety. Detecting anxiety with VAS was straightforward, whereas evaluating anxiety with other tools such as HADS or STAI would have taken significantly longer time and workforce. While 38.3% expressed anxiety, 75.3% expressed concern about RT. The main issue was apprehension about perceived side effects. Toxicity profiles combined with lower anxiety levels revealed that patient's concerns about side effects were unfounded, emphasizing the importance of discussing patients' understanding and management of potential side effects. The effect of an RTT delivered informative interview on opinion is immediate and beneficial, even if the respondent is not anxious. It's also worth noting that RTT delivered interviews were more effective at relieving anxiety than treatment itself. When pre-treatment information is delivered, patients receive standard care, which frequently includes a standard discussion about RT. On the other hand, the RTT delivered informative interview addresses the patient's concerns or questions and provides reliable information about RT. RTTs' role extends beyond treatment delivery as the only member of the radiation oncology team who sees patients daily.

The study has a number of limitations. Our study's primary limitation is its retrospective nature. Despite the small sample size, we were able to demonstrate statistical significance for the RTT delivered interview. Due to the lack of data regarding patients' psychological status before treatment, we were unable to determine whether the anxiety is solely treatment related. In addition, any use of anxiolytic or antidepressant medication prescribed by a psychiatrist or another clinician was a confounding factor. The effect of RTT delivered informative interviews on other cancer types requires further investigation in larger prospective series.

## Conclusion

For patients and non-oncology health professionals, RT remains the most enigmatic and elusive treatment modality. Despite extensive evaluation of anxiety in BC patients, daily practice rarely focuses on their concerns

and opinions about RT. Misinformation obtained from unauthorized sources can jeopardize treatment adherence. In our study, we measured patients' attitudes toward RT and found that an informative interview improves all patients' attitudes toward RT, whether they are anxious or not. This interview has also been shown to be more effective in reducing fears than receiving the actual experience of RT. Because of their close daily communication with patients, we believe that RTTs play an important role in the RT course. Before treatment, patients' perspectives on RT and side effects should be considered.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** All authors declared no conflict of interest.

**Ethics Committee Approval:** The study was approved by the Private Iskenderun Gelisim Hospital Ethics Committee (No: 001/23, Date: 09/05/2019).

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