Self-Efficacy for Coping with Cancer Enhances the Effect of Reiki Treatments During the Pre-Surgery Phase of Breast Cancer Patients

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Abstract. *Background/Aim: Self-efficacy for coping with cancer plays a critical role in influencing psychological cancer-related outcomes, some studies suggested its role in enhancing or reducing the effects of psychological interventions in cancer patients. Reiki has recently been included among the efficacious complementary therapeutic intervention for cancer patients. Patients and Methods: The present study evaluated the role of self-efficacy for coping with cancer as buffer of the Reiki treatment effects on cancer- related symptoms in a randomized controlled trial (intervention versus control group) of breast cancer patients (N=110) during the pre-surgery phase. Results: Results showed that self-efficacy for coping with cancer can influence the effect of a Reiki treatment. Higher efficacious patients showed a more powerful effect of the Reiki intervention on both anxiety and mood than the low efficacious patients. Conclusion: From a practical perspective, the study provides insightful results for healthcare professionals.*

Breast Cancer is one of the leading causes of death among women all over the world (1). About 50-70% of cancer

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patients suffer from anxiety, depression and suicidal tendency (2, 3), in different phases of the treatment. This could also be the result of different cancer treatments (4, 5). Scientific literature demonstrates that moderate to high levels of psychosocial distress appears early during the cancer diagnosis process (4-6). In those phases seems very important to evaluate the stress of patients in order to apply targeted intervention to prevent psychiatric disorders that will persist long term in life (3, 7, 8).

Among many interventions to reduce anxiety during the critical phases of cancer diagnosis and treatment, Complementary Alternative Medicine (CAM) has shown a broader diffusion and many scientific studies designed to evaluate its impact on the response of patients. Compared with the general population, the rate of CAM use among individuals with cancer is high (9). Reiki has recently been included among the complementary therapeutic programs derived from eastern health and healing traditions for coping with cancer (10). A recent study stated that only 8.5% of 2047 subjects enrolled in a Breast Cancer study use Reiki therapy as a CAM (11). While Reiki is traced to origins in Japan, the philosophical and basic theoretical interpretation of both techniques is steeped in ancient, pre-scientific ideas or beliefs about the "flow of a psychic form of energy". Dr. Mikao Usui rediscovered the roots of Reiki in the early 1900s. Reiki was an ancient Tibetan healing art based on the laying of hands healing tradition. Dr. Usui instructed Dr. Chujiro Hayashi in the use of the technique, who then taught Hawayo Takato. She brought Reiki to Hawaii (and mainland United States) during the 1940s. Reiki was introduced to Europe in the 1980s. Reiki today is a system of natural healing techniques

administered by laying of hands and transferring energy from the Reiki practitioner to the recipient. It claims to enhance the body's natural ability to heal itself through the rebalancing of energy and thus restores physical, emotional, mental, and spiritual well-being (12). At this time different researches showed Reiki's efficacy on different psychological variables as anxiety, quality of life, and pain (9, 13) during cancer related treatments or surgery (14). Nonetheless also from a biological point of view a study stated the efficacy of Reiki in reducing stress response by analyzing comprehensively the sympathetic nervous system, the neuroendocrine response as well as the immune system (15). The authors showed significant difference comparing before and after a Reiki session in the level of Salivary Immunoglobin concentration (sIgA). The sIgA levels rose after the treatment, indicating a possible increase in immune function. Results showed also a significant drop in systolic blood pressure (SBP), conversely Skin temperature increased and electromyograph (EMG) decreased during the treatment, but before and after the treatment.

From a psychological and individual perspective, differences in coping strategies mitigate or exacerbate distress over time in cancer patients by engaging several mechanisms. For example, disengagement and denial of coping tend to undo the positive effects of optimism on stress in a Structural Equation mediated Model (SEM) of adjustment to breast cancer (16). Also, in a longitudinal model in breast cancer patients, emotionally expressive coping was associated with better physical outcomes and reductions in perceived stress (17). In social learning theory, Bandura (18) defined self-efficacy as people's belief in their abilities to generate the motivation, harness the resources, and exercise the action needed to influence events that affect their lives. Summarizing, it is the belief in one's capabilities to produce desirable outcomes (19). Along those lines, self–efficacy for coping with cancer, that is the expectations about the ability to cope with cancer, plays a critical role in influencing cancer-related outcomes including anxiety, directly or indirectly (4, 20, 21). There is a negative relationship between perceived self-efficacy for coping with cancer and anxiety in cancer patients (4, 20-25) and, specifically, in breast cancer patients (4, 26). Recently different studies are showing an extension of the role of self-efficacy, specifically in cancer patients, as statistic moderator of the effect of cancer stressors (27), and also in moderating the effect of intervention in breast cancer patients (28). Namkoong *et al.*, (2010) (28) in their study found that self-efficacy statistically moderated the efficacy of a Computer Mediated Social Support (CMSS) intervention in breast cancer patients. Patients with higher self-efficacy seem to accrue emotional benefits from the CMSS than patients with lower self-efficacy, in whose a negative effect on their emotional well-being was found.

According to this perspective, cancer patients with high self-efficacy expectations are better able to manage their personal functioning, harness the resources and influence the effect of a supporting treatment on their psychological well-being than patients with low self-efficacy. Thus, self-efficacy for coping, which has been studied primarily in the context of curative oncology care, and in palliative care as well (29), may play an important role also in enhancing or reducing the effect of stress target treatments in which the active role of the cancer patients can operate as a buffer of efficacy of the intervention.

There are no studies revealing the effect of Reiki intervention on breast cancer patients during "surgery phases" on related symptoms, nonetheless trying to evaluate the role of self-efficacy for coping with cancer as statistic moderator of the effect of the treatment. The main aim of this study is to evaluate Reiki intervention in reducing cancer related symptoms (*i.e.* anxiety and mood) in a randomized controlled trial of breast cancer patients during the pre-surgery phase (intervention vs control group). Secondarily the study evaluates for the possible influence of self-efficacy for coping with cancer as statistic moderator of the effect of the Reiki treatment on the psychological stress outcomes (*i.e.* anxiety and mood).

The main hypothesis of the study is that the patients in the intervention group would have a reduction of the perceived anxiety and an improvement in the mood (H1).

The second hypothesis of the study is that patients with high self-efficacy would have a lower levels of perceived anxiety and more positive mood states (H2).

Furthermore, since self-efficacy for coping, may play a role also as statistic moderator of anxiety target treatments, we also hypothesized that patients with high self-efficacy will drawn more benefits from the Reiki treatment on the anxiety variables (H3).

Patients and Methods

This study was conducted at the Breast Oncology Department of the National Cancer Institute 'Giovanni Pascale' Foundation in Naples, Italy. Medical consultants identified 110 newly diagnosed breast cancer patients during the period from January to April 2015. All patients were recruited during their hospitalization. These patients were admitted to hospital for examination and were then scheduled for surgery within 1-3 days. At the time of admission, the specific type of surgery that would be performed (*e.g.*, Lumpectomy, Quadrantectomy, or Mastectomy) had not been determined. Also none of these patients had previously received adjuvant chemotherapy or any other cancer treatments (*i.e.*, surgery or radiotherapy). Demographic information, staging data, and family history of breast cancer were collected from medical records after obtaining informed consent. All patients (N=110) consented to be enrolled in the study. In the final sample, age ranged from 23 to 65 years (Mean age=43.69; sd=10.01).

Procedures. All patients were approached by a psychologist who described the research project and presented the informed consent form, together with a document with written information. After

giving consent the Intervention group was scheduled for a Reiki session the day before the surgical procedure (Intervention group N=55). The Reiki sessions was administered by a Reiki master and lasted about 60 mins. The standard care group did not receive reiki session (N=55).

Before the reiki session (T1) a booklet of different questionnaires listed in the next section were administered by the first author (a psychologist trained in conducting diagnostic interviews). The same booklet was conducted also after the session before going to sleep (T2). The control group filled the questionnaire at the same timing of as the intervention group during the day before the surgery (T1) and before going to sleep (T2).

Measures. The interviews were based on the administration of the following measures.

Cancer Behavior Inventory Brief Form, Italian version. The Cancer Behavior Inventory-Brief-Italian form is a 14-item measure of self-efficacy expectations about coping with cancer (21, 27). The scale is composed by four factors labeled: "independence and maintaining a positive attitude", "participation in their medical care", "coping and stress management", "management of affect". A global score of the self-efficacy for coping with cancer of the patient can be calculated by summing all the item scores. Participants report their level of confidence to perform each coping behavior on a nine-point Likert-type scale ("not at all confident" to "totally confident"); item scores were summed to form the global score. Alpha for this scale was 0.94 in the original validation study. Internal consistency of the factors is very high in the present sample (Cronbach alphas ranging between 0.87 and 0.92; global score 0.93).

Mood State. Mood state was measured by the Profile of Mood States (POMS) inventory (30). The scale measures six mood or affective states: tension/anxiety, depression/dejection, anger/hostility, vigor/activity, fatigue/inertia, and confusion/bewilderment. A total mood score, either negative or positive, can be determined by summing all the scores. Fifty-eight, five-point Likert-type scales describe the mood states. (Cronbach's alpha ranging from: 0.82-0.90 in the present sample).

Anxiety. Anxiety was measured by the state form of the State-Trait Anxiety Inventory [STAI Form Y; (31)]. The scale is composed by 20 items, each was rated on a four-point Likert scale ranging from 0 (almost never) to 3 (almost always). The scale showed a good reliability based on the data in this study (Cronbach's alpha=0.87). Item scores for each were averaged to form an anxiety score with higher values indicating more anxiety.

Ethical considerations. The ethics committee of the National Cancer Institute 'Giovanni Pascale' Foundation approved the study (n.29/11). Informed consent was obtained from all participants. Data were confidentially gathered and collected anonymously with a smart code used to refer to the case. The voluntary nature of the study was emphasized and the authors have no conflicts of interest to report in the conduct of this study.

Results

Firstly a 2×2×2 mixed ANOVA were performed using SPSS (Version 22), considering as dependent variables the level of anxiety measured by the STAI and as independent variables a "within subjects" factor, namely TIME ("T1" *versus* "T2"), and two "between subjects" factors, namely INTERVENTION ("Reiki" *versus* "control group") and SELF-EFFICACY LEVEL (Low Level vs. High Level). A 2×2×2 mixed MANOVA, was instead performed considering as dependent variables the level of the six mood or affective states measured by the POMS (*i.e.* tension/anxiety, depression/dejection, anger/hostility, vigor/activity, fatigue/inertia, and confusion/bewilderment) and the same independent variables of the ANOVA.

Table I reports the univariate effects of the MANOVA analysis. Finally, in the following results' sections for simplicity we described in details, both for ANOVA and for MANOVA, the effects related to the specific hypotheses of the study, namely the interaction effect between TIME and INTERVENTION (H1), the main effect of the SELF-EFFICACY LEVEL (H2), and the interaction effect of TIME, INTERVENTION, and the SELF-EFFICACY LEVEL (H3). For these latter interactions' effects, the univariate or multivariate simple effects were also analyzed and described.

The effects of Time, Intervention and Self-Efficacy on patients' anxiety. As reported in Table II, overall the results of the ANOVA showed significant differences between the two groups for all the independent variables considered and their interactions on the patients' level of anxiety measured by STAI.

Overall the patients with relatively high self-efficacy reported lower levels of perceived anxiety (Mean±sd= 36.85±16.09) than patients with relatively low levels of self-efficacy (Mean±sd=58.92±14.69). Additionally, an interaction between the TIME and the INTERVENTION factors emerged, specifically, patients participating to the Reiki intervention showed a significant decrement (simple effect: $F_{(1,95)}$=183.48; *p*<0.001; η_p^2=0.659) in their level of anxiety across the time (Mean±sd_{T1}=52.22±10.88; Mean±sd_{T2}= 38.46±10.08). Conversely, the patients of control group reported a slight, but statistically significant (simple effect: $F_{(1,95)}$=24.927; *p*<0.001; η_p^2=0.208), exacerbation in their level of anxiety in the same time frame (Mean±sd_{T1}= 51.63±16.91; Mean±sd_{T2}=57.50±20.35).

Finally, the results of the ANOVA attested a TIME per INTERVENTION per SELF-EFFICACY LEVEL moderation effect. More specifically, as depicted in Figure 1, the patients of the intervention group which reported high-self-efficacy showed, across the time, a significant larger decrement (simple effect: $F_{(1,95)}$=293.578; *p*<0.001; η_p^2=0.756) in their level of anxiety in comparison with the decrement showed by patients with low self-efficacy (simple effect: $F_{(1,95)}$=30.040; *p*<0.001; η_p^2=0.240). With respect the control group, moreover, the patients with high self-efficacy showed no differences in their level of anxiety across time (simple effect: $F_{(1,95)}$=2.462; *p*=0.120; η_p^2=0.025), while the patients of the

Table I. *Univariate effects for the MANOVA analysis.*

Dependent variables	Effects	DF	F	*p*-Value	η_p^2
Tension	INTERVENTION	1,50	2.701	0.107	0.051
	SELF-EFFICACY LEVEL	1,50	0.119	0.732	0.002
	INTERVENTION * SELF-EFFICACY LEVEL	1,50	0.008	0.931	0.000
	TIME	1,50	40.296	<0.001	0.446
	TIME * INTERVENTION	1,50	92.240	<0.001	0.649
	TIME * SELF-EFFICACY LEVEL	1,50	21.877	<0.001	0.304
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	1,50	11.090	0.002	0.182
Depression	INTERVENTION	1,50	2.225	0.142	0.043
	SELF-EFFICACY LEVEL	1,50	0.200	0.656	0.004
	INTERVENTION * SELF-EFFICACY LEVEL	1,50	1.060	0.308	0.021
	Time	1,50	0.148	0.702	0.003
	TIME * INTERVENTION	1,50	13.277	0.001	0.210
	TIME * SELF-EFFICACY LEVEL	1,50	20.634	<0.001	0.292
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	1,50	5.627	0.022	0.101
Anger	INTERVENTION	1,50	5.347	0.025	0.097
	SELF-EFFICACY LEVEL	1,50	0.162	0.689	0.003
	INTERVENTION * SELF-EFFICACY LEVEL	1,50	0.827	0.368	0.016
	TIME	1,50	14.759	<0.001	0.228
	TIME * INTERVENTION	1,50	52.210	<0.001	0.511
	TIME * SELF-EFFICACY LEVEL	1,50	6.618	0.013	0.117
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	1,50	3.044	0.087	0.057
Vigor	INTERVENTION	1,50	0.316	0.576	0.006
	SELF-EFFICACY LEVEL	1,50	2.169	0.147	0.042
	INTERVENTION * SELF-EFFICACY LEVEL	1,50	0.216	0.644	0.004
	TIME	1,50	0.670	0.417	0.013
	TIME * INTERVENTION	1,50	5.188	0.027	0.094
	TIME * SELF-EFFICACY LEVEL	1,50	1.158	0.287	0.023
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	1,50	6.461	0.014	0.114
Fatigue	INTERVENTION	1,50	3.294	0.076	0.062
	SELF-EFFICACY LEVEL	1,50	0.943	0.336	0.019
	INTERVENTION * SELF-EFFICACY LEVEL	1,50	2.581	0.114	0.049
	TIME	1,50	49.406	<0.001	0.497
	TIME * INTERVENTION	1,50	128.535	<0.001	0.720
	TIME * SELF-EFFICACY LEVEL	1,50	3.501	0.067	0.065
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	1,50	.226	0.637	0.004
Confusion	INTERVENTION	1,50	2.202	0.144	0.042
	SELF-EFFICACY LEVEL	1,50	4.251	0.044	0.078
	INTERVENTION * SELF-EFFICACY LEVEL	1,50	5.788	0.020	0.104
	TIME	1,50	7.066	<0.001	0.497
	TIME * INTERVENTION	1,50	67.066	<0.001	0.573
	TIME * SELF-EFFICACY LEVEL	1,50	10.377	0.002	0.172
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	1,50	2.619	0.112	0.050

same group with low self-efficacy showed a significant improvement in their anxiety (simple effect: $F_{(1,95)}=109.432$; $p<0.001$; $\eta_p^2=0.535$).

The effects of Time, Intervention and Self-Efficacy on patients' mood. As reported in Table III, overall the results of the MANOVA showed significant multivariate effects on patients' mood states measured by the POMS for the "within subject" factor namely TIME, and for the interaction between TIME and the "between subjects" factors (*i.e.*

INTERVENTION and SELF-EFFICACY LEVEL). With respect to the SELF-EFFICACY LEVEL, overall, the patients with high level of self-efficacy did not report significantly different level of mood states, then patients with low level of self-efficacy did.

A significant multivariate interaction effect between TIME and INTERVENTION emerged (H1). Analyzing the univariate effects reported in Table I, this interaction effect was statistically significant for all the six mood dimensions measured by the POMS. Analyzing the multivariate simple effect associated to

Table II. *Results of the ANOVA.*

Effects		DF	F	*p*-Value	η_p^2
Between subjects	INTERVENTION	1,94	7.570	0.007	0.075
	SELF-EFFICACY LEVEL	1,94	26.004	<0.001	0.217
	GROUP * SELF-EFFICACY LEVEL	1,94	15.483	<0.001	0.141
Within subjects	TIME	1,94	38.72	<0.001	0.290
	TIME * GROUP	1,94	188.27	<0.001	0.667
	TIME * SELF-EFFICACY LEVEL	1,94	101.687	<0.001	0.520
	TIME * GROUP * SELF-EFFICACY LEVEL	1,94	6.918	0.010	0.069

Table III. *Results of the MANOVA.*

Effects		Wilks' Lambda	DF	*p*-Value	η_p^2
Between subjects	INTERVENTION	0.887	6,45	0.463	0.113
	SELF-EFFICACY LEVEL	0.888	6,45	0.474	0.112
	INTERVENTION * SELF-EFFICACY LEVEL	0.859	6,45	0.311	0.141
Within subjects	TIME	0.326	6,45	<0.001	0.674
	TIME * INTERVENTION	0.248	6,45	<0.001	0.752
	TIME * SELF-EFFICACY LEVEL	0.609	6,45	0.001	0.391
	TIME * INTERVENTION * SELF-EFFICACY LEVEL	0.715	6,45	0.015	0.285

this interaction, patients participating to the Reiki intervention, overall, showed a significant decrement across the time (multivariate simple effect: Wilks' Lambda$_{(1,95)}$=0.233; $p<0.001$; η_p^2=0.767) in their levels of negative mood (Mean±sd$_{Tension-T1}$=11.93±5.36 and Mean±sd$_{Tension-T2}$=4.48± 4.14; Mean±sd$_{Depression-T1}$=13.14±10.89 and Mean±sd$_{Depression-T2}$=7.68±9.87; Mean±sd$_{Anger-T1}$=14.26±10.05 and Mean± sd$_{Anger-T2}$=4.48±6.47; Mean±sd$_{Fatigue-T1}$=11.31±6.46 and Mean±sd$_{Fatigue-T2}$=4.96±4.12; Mean±sd$_{Confusion-T1}$=10.68±5.55 and Mean±ds$_{Confusion-T2}$=5.95±5.19). Conversely, patients of the control group reported a statistically significant increment (multivariate simple effect: Wilks' Lambda$_{(6, 46)}$=0.576; $p<0.001$; η_p^2=0.424) in their levels of negative mood (Mean± sd$_{Tension-T1}$=8.91±7.67 and Mean±sd$_{Tension-T2}$=9.98±8.15; Mean±sd$_{Depression-T1}$=13.17±11.28 and Mean±sd$_{Depression-T2}$=16.76±10.69; Mean±sd$_{Anger-T1}$=11.15±10.66 and Mean± sd$_{Anger-T2}$=13.27±10.88; Mean±sd$_{Vigor-T1}$=14.51±6.94 and Mean±sd$_{Vigor-T2}$=16.49±6.38; Mean±sd$_{Fatigue-T1}$=11.00±6.23 and Mean±sd$_{Fatigue-T2}$=12.58±6.17; Mean±sd$_{Confusion-T1}$=11.02±5.12 and Mean±sd$_{Confusion-T2}$=12.93±5.05).

Finally, the results of the MANOVA attested also a multivariate moderation effect of the self-efficacy on these latter effects. However, the analysis of the univariate effects reported in Table I revealed a significant effect of the interaction TIME * INTERVENTION *SELF-EFFICACY LEVEL only for Tension ($F_{(1,50)}$=11.090; p=0.002; η_p^2=0.182), Depression ($F_{(1,50)}$=5.627; p=0.022; η_p^2=0.101) and Vigor ($F_{(1,50)}$=6.461; p=0.014; η_p^2=0.114). In particular,

as depicted in Figure 2 and analyzing the simple effect associated to this interaction, the patients of the intervention group with high-self-efficacy showed, across the time, a significant larger decrement in tension (simple effect: $F_{(1,77)}$=148.014; $p<0.001$; η_p^2=0.658) in comparison with the decrement showed by patients with low self-efficacy (simple effect: $F_{(1,77)}$=87.373; $p<0.001$; η_p^2=0.532). The patients of the intervention group with high-self-efficacy showed, also a significant decrement in depression across the time (simple effect: $F_{(1,66)}$=33.38; $p<0.001$; η_p^2=0.336), while the patients of the same group with low self-efficacy showed no differences across the time (simple effect: $F_{(1,66)}$=2.18; p=0.145; η_p^2=0.032). Finally, the patients of the intervention group with relatively higher levels of self-efficacy showed an improvement in their vigor tending to the statistical significance (simple effect: $F_{(1,10)}$=3.292; p=0.074; η_p^2=0.045), while patients of the same group with low self-efficacy did not change their vigor's level across time (simple effect: $F_{(1,70)}$=0.009; p=0.924; η_p^2=0.000).

With respect the control group, moreover, as reported in figure 2, the patients with high self-efficacy did not change their level of tension (simple effect: $F_{(1,77)}$=0.103; p=0.750; η_p^2=0.001) and of depression (simple effect: $F_{(1,66)}$=0.015; p=0.904; η_p^2=0.000) across time. Conversely the patients with low self-efficacy showed a significant increment on the level of these two negative patients moods (simple effect Tension: $F_{(1,77)}$=13.968; $p<0.001$; η_p^2=0.154; simple effect Depression: $F_{(1,66)}$=24.337; $p<0.001$; η_p^2=0.269) across the
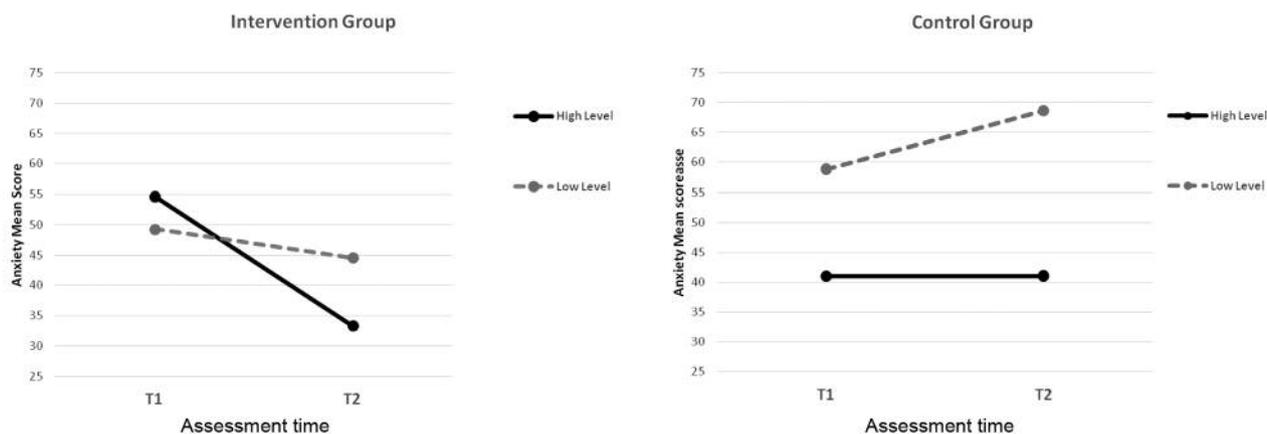
Anxiety

Figure 1. *Anxiety mean scores across time (T1 vs. T2), self-efficacy level (High level vs. Low Level), and intervention (Intervention Group vs. Control group).*

same time frame. Additionally, the analysis of the simple effects showed that patients of the control group with high levels of self-efficacy showed an increment in their vigor across the time (simple effect: $F_{(1,70)}=8.128$; $p=0.006$; $\eta_p^2=0.104$), while these levels remain substantially the same (simple effect: $F_{(1,70)}=1.841$; $p=0.179$; $\eta_p^2=0.026$) in patients with low self-efficacy.

Discussion

As can be seen from the rising percentage of CAM therapy used to supplement traditional Western therapeutic strategies, modern healthcare consumers have taken interest in a more holistic approach to healthcare delivery (32). The use of alternative medicine has grown exponentially since 2000. An abundance of literature has shown a reduction in anxiety, mood improvement and well-being when CAM therapies are used. Reiki therapy has been cited as a complementary therapy that is easy to learn, inexpensive, non-invasive, and associated with relaxation and pain reduction (33). In the current study, we evaluated whether Reiki therapy was able to improve mood and decrease anxiety of breast cancer patients hospitalized for surgical procedure.

According to our first hypotheses, we were able to show that patients receiving Reiki treatment had a sensitive reduction of anxiety and an improvement of the mood, conversely when patients received the standard care (control group), both increases in anxiety and decrease of the general mood were noticed. The differences shown between and within subjects suggest that Reiki intervention in breast cancer patients the day before the surgical procedure is an effective practice in improving the general patients' well-

being. Not surprising our results are in line with past literature, that found similar results in cancer patients (34-36), also in the same phase of cancer care trajectory (surgical phase) (37, 38).

Moreover, results of the study also confirmed the second hypotheses of this study, in fact, data showed that higher self-efficacious patients overall, receiving or not receiving the Reiki treatment, were more able to manage their anxiety than the lower self-efficacious patients. This result is completely in line with the social cognitive theory, that posits self-efficacy for coping with cancer in a strict negative relationship with stress and positive relationship with quality of life of cancer patients (21, 24). Therefore, also past literature results confirmed these relationships (4, 25).

Furthermore, in our sample, we were able to show that self-efficacy has an important role in buffering the effect of the Reiki intervention. In our study, in fact, a cancer patient more confident in his/her ability to cope with the disease related stressors, drawn better the benefits coming from the Reiki intervention than the patients with lower confidence in coping with the disease stressors.

This finding is particularly interesting, because extant previous research has observed that supportive treatment among breast cancer patients have several positive health outcomes, including psychological benefits (39), however, this study suggests that the positive effects are conditional, based on the patients' level of coping self-efficacy. Self-efficacy for coping with cancer is a state-like expectation in one's competence (40) to cope with cancer-related stressors. Both theoretical and empirical evidence suggest that cancer patients with high self-efficacy should be better-adapted and thereby less likely to have negative psychological outcomes.
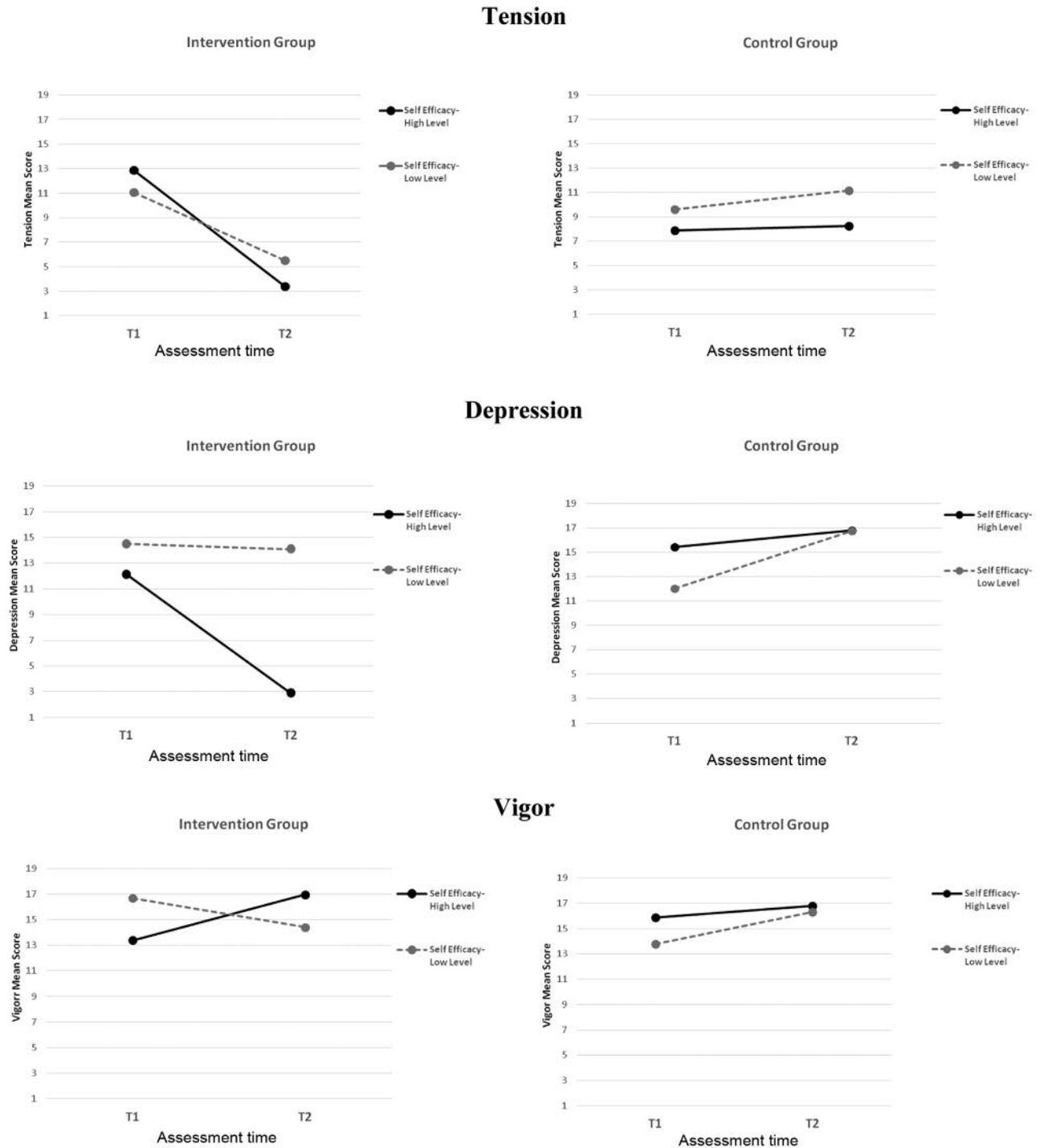
Tension

Depression

Vigor

Figure 2. *Tension, Depression and Vigor mean scores across time (T1 vs. T2), self-efficacy level (High level vs. Low Level), and intervention (Intervention Group vs. Control group).*

In our sample of cancer patients, self-efficacy for coping with cancer may play an important role in mitigating the stressful condition of patients during the first hospitalization phase for a cancer diagnosis. The interaction analysis, in fact, revealed a critical role of self-efficacy for coping with cancer acting as buffer of the efficacy of the Reiki intervention, in our sample, patients that felt more able to cope with cancer reported an higher impact of the Reiki treatment in reducing

the perceived anxiety than the lower efficacious patients. The potentially statistical powerful moderator role of the self-efficacy for coping with cancer fits with both the theoretical framework and with empirical data. In line with theory, a highly efficacious cancer patient may actively search for certain desired outcomes, being able to manage stress deriving from cancer diagnosis/hospitalization and either to draw as much as possible benefit from Reiki treatments

In conclusion, CAM seems to be a powerful tool able to reduce the stress of the patients since the first phases of cancer diagnosis. The present study provided insightful results about the possibility to account for individual differences (self-efficacy for coping with cancer) able to moderate the effects of a Reiki treatment on cancer patients. Seemingly patients with higher level of self-efficacy can draw more benefits by the treatment than lower efficacious patients.

Ascertained that there are available easy-administrable tools that allow clinicians and health professionals to assess the self-efficacy of coping with cancer (*i.e.* Cancer Behavior Inventory (21, 27); and that psychosocial interventions have shown great promise in improving self-efficacy for coping with cancer (41), understanding the impact of the perception of self-efficacy as it applies to health behavior, and cancer related stressors it is a new challenge for interventions paradigms. In fact, from a practical perspective, health professionals can screen patients accounting for their level of coping self-efficacy, before a Reiki treatment, then it may be possible to target low efficacious patients with an intervention to enhance self-efficacy in order to improve the effects of the Reiki treatment.

Future research should examine how coping with cancer self-efficacy is related with key outcomes in cancer trajectories, in longitudinal studies and with a larger number of participants providing evidences for interventions targeting and/or accounting for the coping with cancer self-efficacy patients level. Then effects of the Reiki treatment in longitudinal studies with different timing, at different point in the cancer trajectories, can be evaluated taking in consideration the role of the coping with cancer self-efficacy.

The limitation of the study is the small size of the sample. Although, it is enough for the analysis, could be considered low for the power of the statistical analysis.

Acknowledgements

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