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Dispositional Optimism and Well-being in Cancer Patients: The Role of Cancer-Related Self-Efficacy

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Abstract

Optimistic attitudes of cancer patients are shown as an important personal resource for the psychological and physical adjustment to the illness. Coping styles and appraisals were suggested as indirect pathways through which optimism associates with better functioning in patients. The current study aimed to investigate the role of cancer-specific self-efficacy domains (i.e., coping with cancer-related side effects and stress, maintaining activity and independence, seeking and understanding medical information, and affect regulation and seeking social support) in the association between optimism and physical and psychological (i.e., depressive symptoms) well-being of cancer patients. A cross-sectional study was conducted with 120 patients in Ankara, Turkey. Majority of the participants were female, and about half of them were breast cancer patients. Participants filled a set of self-report questionnaires including Life Orientation Test-Revised, Cancer Behavior Inventory, Multidimensional Quality of Life Scale-Cancer, and Beck Depression Inventory. The data were analyzed separately for physical well-being and depressive symptoms through the bootstrapping method. Of the four self-efficacy domains, maintaining activity and independence accounted for a significant proportion of variance in the optimism-physical well-being and optimism-depressive symptoms relations. Findings highlight the importance of patients' beliefs in their ability to sustain their daily activities for having better physical and psychological well-being during cancer treatment as well as the role of optimism in promoting this particular self-efficacy domain. Interventions are suggested to focus on enhancing cancer patients' self-efficacy in maintaining activity and independence.

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1. Introduction

Cancer, a life-threatening event, causes major changes in the life of patients. During the treatment process, they face with various physical and psychological challenges (Kroenke et al., 2004; Rahnea-Nita et al., 2019). Regardless of the type of cancer, fatigue, sleep disturbances, dizziness, and pain are among the most disturbing and prevailing problems reported by patients in the course of radiotherapy (Hickok et al., 2005) and cancer treatment in general (Bower, 2014). The psychological burden of cancer diagnosis is also difficult to bear. A significant number of patients with breast cancer experienced long-term distress during the treatment process (Bidstrup et al., 2015). Also, severe major depression and depressive symptoms were observed in 10-25 % of cancer patients (Pirl, 2004). The way cancer patients perceive their illness is closely associated with their both physical and emotional health (Scharloo et al., 2005). Thus, addressing the individual differences and cognitive processes that facilitate patients' adaptation to the physiological and psychological challenges of cancer is important.

Dispositional optimism represents one's generalized tendency to hold positive expectations about future outcomes (Scheier & Carver, 1985). Those positive expectancies apply to a variety of situations over a considerable period of time (Carver & Scheier, 2014). Thus, it is described as a personality characteristic with a prominent cognitive component (i.e., having certain schema about future) (Carver & Scheier, 2014; Scheier & Carver, 1985). Studies indicated that optimistic tendencies were predictive of favorable outcomes in many aspects of life (e.g., professional, relational), even in the face of adversity or life-threatening circumstances (Carver & Scheier, 2014; Sorrenti et al., 2021). Optimism is related to a range of positive health-related outcomes (Carver et al., 2010). In the case of cancer treatment dispositional optimism is closely associated with better physical and psychological functioning (Mazanec et al., 2010). For example, it was shown that high scorers of optimism experience pain to a lesser extent and report higher daily functioning as compared to low scorers (Allison et al., 2000). In another study, optimism buffered the effect of pain on cancer patients' quality of life (QOL) (Wong & Fielding, 2007). In other words, the negative association between pain and QOL became weaker as patients' optimism levels increased. Similarly, a qualitative study examining the experience of women having breast cancer revealed that women perceiving the diagnosis as a small flaw in their life and expecting the outcome to be favorable did not articulate much physical difficulties of the illness and did not allow the illness to disrupt their daily routine and working schedules (Boehmke & Dickerson, 2006). Dispositional optimism seems to be important for the emotional adjustment of patients, too. Friedman et al. (2006) reported that dispositional optimism explains a substantial variance in cancer-related stress, emotional states, and mood dysfunctions of breast

cancer patients. Thus, dispositional optimism appears to be an important factor in terms of how cancer patients perceive and experience their illness and adjust to the treatment process.

Despite this apparent importance of optimism, the mechanisms explaining how it relates to the physical and psychological functioning of cancer patients have not been well understood in the literature. The concept of optimism does not indicate the ways one can attain the desired outcome (Carver & Scheier, 2014; Magaletta & Oliver, 1999). Previous studies indicated the mediating role of coping strategies in the optimism-adaptation link (Aspinwall et al., 2001; Kolokotroni et al., 2018; Ramírez-Maestre et al., 2012). It was revealed that breast cancer patients with high levels of optimism are more likely to use active coping strategies, which in turn decrease their level of stress at different points of treatment (Carver et al., 1993). More specifically, optimistic patients tended to approach the illness with acceptance, face reality rather than rejecting it, and take active steps to change the situation, which later on help them to feel relief. For example, Büyükaşık-Çolak et al. (2012) found that breast cancer patients with high optimism level are more likely to use problem-focused coping strategies, which later on help them to obtain positive consequences from their illness. Thus, dispositional optimism seems to be an important source for cancer patients to take action for better adaptation to the illness itself and the treatment process. In spite of the increasing incidence and prevalence of cancer (Torre et al., 2015) and its challenging treatment process, there is still a gap in the literature in explaining the factors that help optimistic patients to resist and achieve the positive outcomes they expected.

Self-efficacy may be a critical factor through which dispositional optimism relates to patients' better physical and psychological functioning during the treatment process. Self-efficacy is a psychological concept pertaining to social-cognitive theory of Bandura, which emphasizes the role of personal agency in shaping one's life (Bandura, 1999). Bandura (1982) defined self-efficacy as one's judgment of his/her competence in actualizing certain activities and he underlined its determinant role in to what extent people make an effort and persevere to achieve tasks despite encountering challenges. Similar to optimism, self-efficacy is also a future-oriented and goal-directed construct (Rand, 2018). Studies revealed a positive link between optimistic tendencies and self-efficacy beliefs of individuals (Phan, 2016; Tan & Tan, 2014). Usher and Pajares (2008) indicated optimism as an important source for individuals to sustain their self-efficacy beliefs. In the face of failure, optimistic individuals consider the impact of their actions and produce solutions to correct their behaviors for future tasks (Dixon & Schertzer, 2005). This finding may indicate that optimistic individuals endeavor in a way that they can develop self-efficacy beliefs in future tasks. From a social-cognitive perspective, Usher and Pajares (2008) also suggested that self-enhancing bias rooted in optimism motivates individuals to hold

on self-efficacy beliefs in spite of the challenges they experienced. Despite the impelling role of optimism in attaining and sustaining self-efficacy beliefs, empirical research showing the association of optimism with self-efficacy of cancer patients is scarce.

The literature has mostly focused on the relation of self-efficacy with patients' adaptation to cancer. Self-efficacy seems to be potent in both the physical and psychological experiences of patients (Manne et al., 2006). For example, patients having high self-efficacy reported better physical adjustment to the treatment (Haugland et al., 2016; Robb et al., 2013). In terms of psychological aspects, high self-efficacious cancer patients were less likely to display emotional strain (Hirai et al., 2002) and maladaptive behaviors (Beckham et al., 1997). Moreover, self-efficacy predicted psychological adaptation in breast cancer patients even after controlling the effects of coping strategies (Rottman et al., 2010). Thus, self-efficacy seems to be a strong predictor in the adaptation of cancer patients. In most of these studies, researchers used general self-efficacy measures, rather than self-efficacy measures specific to cancer-related tasks. Domain-specific self-efficacy, however, may provide more insightful and detailed findings (Manne et al., 2006), which hence, would help the preparation of more specific interventions for the adaptation of cancer patients to the treatment process.

The literature mentioned above suggested that optimism is an important personality characteristic in the physical and psychological functioning of patients with cancer during the treatment process. However, the factors accounting for the variance in this association have not been extensively studied in the literature. The theoretical link of self-efficacy with optimism suggests it as a possible agent in this association. Considering these findings and the gaps in the literature, the objective of the current study was to investigate the role of cancer-related self-efficacy domains in the relation of dispositional optimism with the physical and psychological (i.e., depressive symptoms) well-being of cancer patients. It was expected that self-efficacy domains specific to cancer-related tasks would account for a significant proportion of variance in the link of optimism with both (1) physical and (2) psychological well-being of patients.

2. Method

2.1 Participants

One hundred twenty inpatients and outpatients under active cancer treatment constituted the participants of this study. Participants were randomly recruited from Dr. Abdurrahman Yurtaslan Ankara Oncology Education and Research Hospital in Ankara, Turkey. The ages of participants ranged between 20 and 78 ($M = 49.21$, $SD = 11.83$). The majority of the participants were female ($N = 85$, 70.8 %). The participants have had cancer for a minimum of one month and a maximum of 334 months ($M = 20.91$, $SD = 34.40$) (see Table 1).

Table 1. Demographic Characteristics of Participants

	Frequencies	Percentages (%)
Education		
Primary and Secondary	57	47.50
High School	31	25.80
University and Above	32	26.70
Working Status		
Employed	32	26.70
Unemployed	88	73.30
Marital Status		
Married	86	71.70
Single, Divorced, Widowed	34	28.30
Income		
Low	35	29.20
Middle	77	64.20
High	4	3.30
Other Physical Illness		
Yes	25	20.80
No	92	76.70
Missing	3	2.50
Psychological Illness		
Yes	7	5.80
No	110	91.70
Missing	3	2.50
Other Treatments		
Yes	12	10.00
No	105	87.50
Missing	3	2.50
Cancer Types		
Breast	53	44.2
Osteoid	11	9.2
Colon	7	5.8
Lung	4	3.3
Prostate	4	3.3
Bladder	3	2.5
Stomach	3	2.5
Soft Tissue	3	2.5
Brain	2	1.7
Thyroid	2	1.7
Uterine	2	1.7
Ovarian	2	1.7
Cervix	2	1.7
Lymphoma	2	1.7
Kidney	1	0.8
Liver	1	0.8
Pancreas	1	0.8
Ball	1	0.8
Multiple Types	8	6.7
Missing	8	6.7

2.2 Materials

2.2.1 Life Orientation Test-Revised (LOT-R). LOT-R was developed by Scheier et al. (1994) to assess individuals' optimism levels. It consists of 6 items rated on a 5-point Likert type scale ranging from strongly agree to strongly disagree. While the internal consistency coefficient of the scale was .76, the test re-test reliability score was .79. This test was adapted to Turkish by Aydın and Tezer (1991) and revised by Türküm (2001). The internal consistency of the Turkish LOT-R was .50 and the test re-test reliability coefficient was .77. The Cronbach's alpha coefficient of LOT-R for the present sample was .66.

2.2.2 Cancer Behavior Inventory (CBI). CBI was developed by Merluzzi and Sanchez (1997) and revised by Merluzzi et al. (2001). It measures the degree of self-efficacy that individuals feel while actualizing cancer-related tasks. It consists of 33 items rated on a 9-point Likert type scale ranging from 1(not at all confident) to 9 (totally confident). Higher scores on the inventory indicate greater self-efficacy in coping with cancer-related tasks. CBI has 7 factors namely, maintenance of activity and independence (e.g., keeping busy with activities), seeking and understanding medical information (e.g., asking technologist questions), stress management (e.g., remaining relaxed throughout treatment), coping with treatment-related side effects (e.g., coping with physical changes), accepting cancer/maintaining positive attitude (e.g., maintaining hope), affective regulation (e.g., using denial), and seeking social support (e.g., seeking consolation). The internal consistency of the whole scale was .94 and it ranged between .80 and .88 for the subscales. The test re-test reliability of the scale was .74. The revised version of the scale (Merluzzi et al., 2001) was adapted to Turkish by Bozo et al. (2019). The Turkish version of the inventory consists of 4 subscales namely, coping with cancer-related side effects and stress, maintaining activity and independence, seeking and understanding medical information, and affect regulation and seeking social support. The internal consistency reliability of the scale was .91 and it ranged between .70 and .91 for the subscales. Turkish inventory had satisfactory construct and criterion-related validity scores. The Cronbach's alpha coefficient of total CBI for the present sample was .91 and it ranged between .71 and .92 for the subscales (see Table 2).

2.2.3 Multidimensional Quality of Life Scale-Cancer (MQLS-C). MQLS-C was developed by Padilla (1992) to assess cancer patients' quality of life in 5 different domains namely, psychological well-being, general physical well-being, nutrition, symptom management, and interpersonal well-being. It includes 33 items rated on a 100 mm line by marking "X" on it or by intersecting it with a "/" in order to indicate how they feel at that moment. The edges of the line indicate the best and the poorest quality of life. If the participants mark the most positive end, they obtain 100 points; but if they mark the most negative end, they get 0 point. This scale was adapted to Turkish by Pinar (2002) with an internal consistency of .76. The test re-test

reliability coefficients of the scale ranged between .56 and .91. The general physical well-being subscale was used to measure the physical well-being of patients in the current study. The Cronbach's alpha coefficient of the scale for the present sample was .75.

2.2.4 Beck Depression Inventory (BDI). BDI was developed by Beck et al. (1961) and revised by Beck et al. (1979). It consists of 21 items that are oriented to measure cognitive, emotional, motivational, and somatic symptoms of depression. For each item, subjects are expected to choose one of the four response alternatives describing how they felt within the last week. The scores of each item range between 0 and 3, and higher scores indicate higher levels of depressive symptoms. The first version of this inventory was adapted to Turkish by Tegin (1980) and the revised version was adapted to Turkish by Hisli (1988). Hisli (1988) found the split-half reliability of the Turkish version as .74 and the criterion-related validity as .63. The Cronbach's alpha coefficient of BDI for the present sample was .85.

2.3 Procedure

The data analyzed in the present study were collected as a part of a larger study, and some parts of the data were used in previous studies (Bozo et al., 2019). Prior to data collection, the study was approved by the Review Boards of Middle East Technical University, Ankara Provincial Health Directorate, and Dr. Abdurrahman Yurtaslan Ankara Oncology Education and Research Hospital. Participants were invited to the study face-to-face by the researchers and those who volunteered to participate in the study were asked to read and sign the informed consent form. After obtaining the consent of the participants, they filled out the questionnaires in approximately 40 minutes. Obtained data were analyzed using SPSS.

3. Results

3.1 Descriptive Analyses

Initial analyses were run to examine the descriptive characteristics of the measures. Descriptive features of the measures were represented in Table 2. Inter-correlations among the variables of the study were presented in Table 3.

Table 2a. Descriptive Characteristics of the Measures

Measures	<i>N</i>	<i>M</i>	<i>SD</i>	Min- Max	Cronbach's alpha
LOT-R	120	29.97	5.02	13-40	.66
CBI	120	221.13	38.30	82-292	.91
<i>Coping with Cancer Related Side Effects and Stress</i>	120	10.88	2.22	2.89-14	.92
<i>Maintaining Activity and Independence</i>	120	3.93	.83	0.56-5	.76
<i>Seeking and Understanding Medical Information</i>	120	4.11	.83	1-5	.81

Table 2b. Descriptive Characteristics of the Measures

Measures	<i>N</i>	<i>M</i>	<i>SD</i>	Min-Max	Cronbach's alpha
CBI					
<i>Affect Regulation and Seeking Social Support</i>	120	5.66	1.37	1.89-8.67	.71
MQLS-C	120	231.63	50.44	13.80-64.20	.93
<i>General Physical Well-being</i>	120	45.90	12.59	7-70	.75
BDI	120	11.88	8.14	0-41	.85

Note. LOT-R: Life Orientation Test Revised, CBI: Cancer Behavior Inventory, QOL: Quality of Life, MQLSC: Multidimensional Quality of Life Scale-Cancer, BDI: Beck Depression Inventory

Table 3. Zero order correlations between the measures

Variables	1	2	3	4	5	6	7	8	9
1. Age	1								
2. LOT-R	-.20	1							
3. CBI	-.33**	.50***	1						
4. Coping with Cancer Related Side Effects and Stress	-.31**	.55***	.90***	1					
5. Maintaining Activity and Independence	-.29**	.47***	.79***	.67***	1				
6. Seeking and Understanding Medical Information	-.32**	.34***	.73***	.55***	.57***	1			
7. Affect Regulation and Seeking Social Support	-.13	.17	.72***	.45***	.42***	.42***	1		
8. Physical QOL	-.14	.27**	.39***	.29**	.51***	.38***	.20*	1	
9. BDI	.20	-.43***	-.51***	-.49***	-.61***	-.36***	-.20*	-.61***	1

Note. LOT-R: Life Orientation Test Revised, CBI: Cancer Behavior Inventory, QOL: Quality of Life, BDI: Beck Depression Inventory. *Note 2.* * $p < .05$, ** $p < .01$, *** $p < .001$

3.2 Indirect Effects of Optimism on Physical and Psychological Well-Being

Indirect effects of optimism on physical well-being and depressive symptoms of cancer patients through four self-efficacy domains were tested by using parallel multiple mediation analyses suggested by Hayes (2018). A bootstrapping test with 5000 bootstrap re-samples from the SPSS macro of Hayes (2018) was performed separately for physical well-being and depressive symptoms as dependent variables.

Physical Well-Being

First, the indirect effect of dispositional optimism with the physical well-being of cancer patients through cancer related self-efficacy domains was tested. The suggested model was found

significant ($F(5, 114) = 9.39, p < .001$) and dispositional optimism and self-efficacy domains explained 29 % of the variance in physical well-being of cancer patients (explained 27 % of the variance after removing insignificant mediators). Dispositional optimism significantly predicted coping with cancer related side effects and stress ($B = .24, SE = .03, p < .001, 99\% \text{ CI } [.15, .33]$), maintaining activity and independence ($B = .08, SE = .01, p < .001, 99\% \text{ CI } [.04, .11]$), and seeking and understanding medical information ($B = .06, SE = .01, p < .001, 99\% \text{ CI } [.02, .09]$) domains but it did not significantly predict affect regulation and seeking social support domain ($B = .05, SE = .02, p = .06, 99\% \text{ CI } [-.10, .11]$) (a paths). Of self-efficacy domains, only maintaining activity and independence self-efficacy significantly predicted physical well-being ($B = 7.75, SE = 1.73, p < .001, 99\% \text{ CI } [3.21, 12.30]$) (b paths). The total effect of dispositional optimism on physical well-being was significant ($B = .67, SE = .22, p < .01, 99\% \text{ CI } [.09, 1.25]$) but the direct effect was not significant ($B = .17, SE = .24, p = .48, 99\% \text{ CI } [-.46, .80]$). After all other self-efficacy domains were controlled, only maintaining activity and independence domain of cancer related self-efficacy significantly explained the relation between optimism and physical well-being ($B = .61, SE = .20, 99\% \text{ CI } [.15, 1.16]$) (see Figure 1).

Psychological Well-Being (Depressive Symptoms)

The indirect relation between dispositional optimism and depressive symptoms of cancer patients through cancer-related self-efficacy domains was examined. The model was significant ($F(5, 114) = 15.67, p < .001$) and dispositional optimism and self-efficacy domains explained 41 % of the variance in depressive symptoms of cancer patients (explained 40 % of the variance after removing insignificant mediators). Dispositional optimism significantly predicted cancer-related self-efficacy domains except for affect regulation and seeking social support (a paths). Of the self-efficacy domains, only maintaining activity and independence was significantly associated with depressive symptoms ($B = -4.99, SE = 1.03, p < .001, 99\% \text{ CI } [-7.69, -2.31]$) (b path). While the total effect of dispositional optimism on depressive symptoms was significant ($B = -.69, SE = .14, p < .001, 99\% \text{ CI } [-1.04, -.33]$), its direct effect was not ($B = -.23, SE = .14, p = .11, 99\% \text{ CI } [-.60, .15]$). In other words, after controlling for self-efficacy domains, the relation between optimism and depressive symptoms turned to be non-significant. After controlling for all other self-efficacy domains, only maintaining activity and independence explained the relation between optimism and depressive symptoms ($B = -.39, SE = .14, 99\% \text{ CI } [-.77, -.06]$) (see Figure 2).

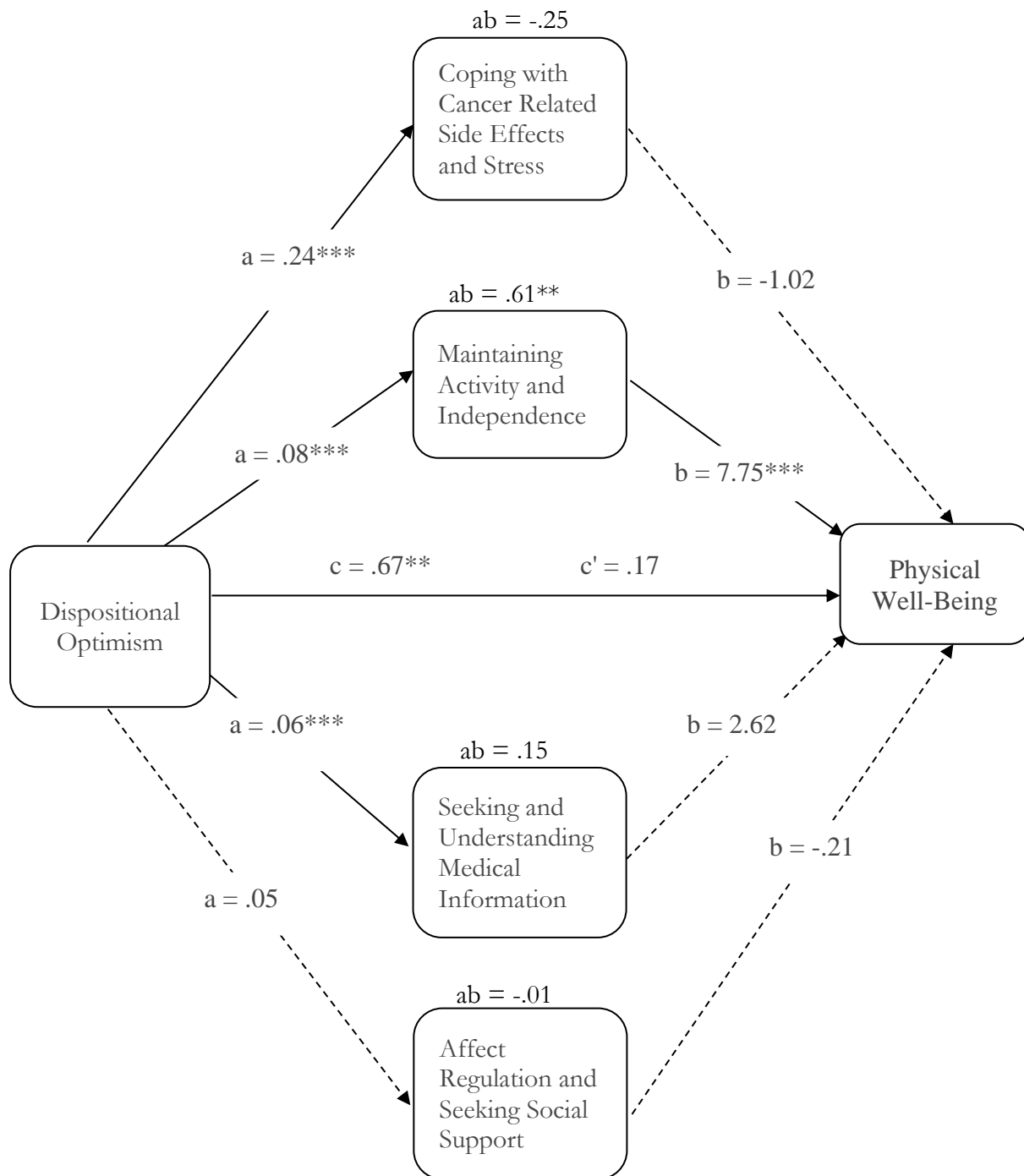


Figure 1. Mediating role of cancer related self-efficacy domains in the relation between dispositional optimism and physical well-being. Non-significant paths are shown by dashed lines.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

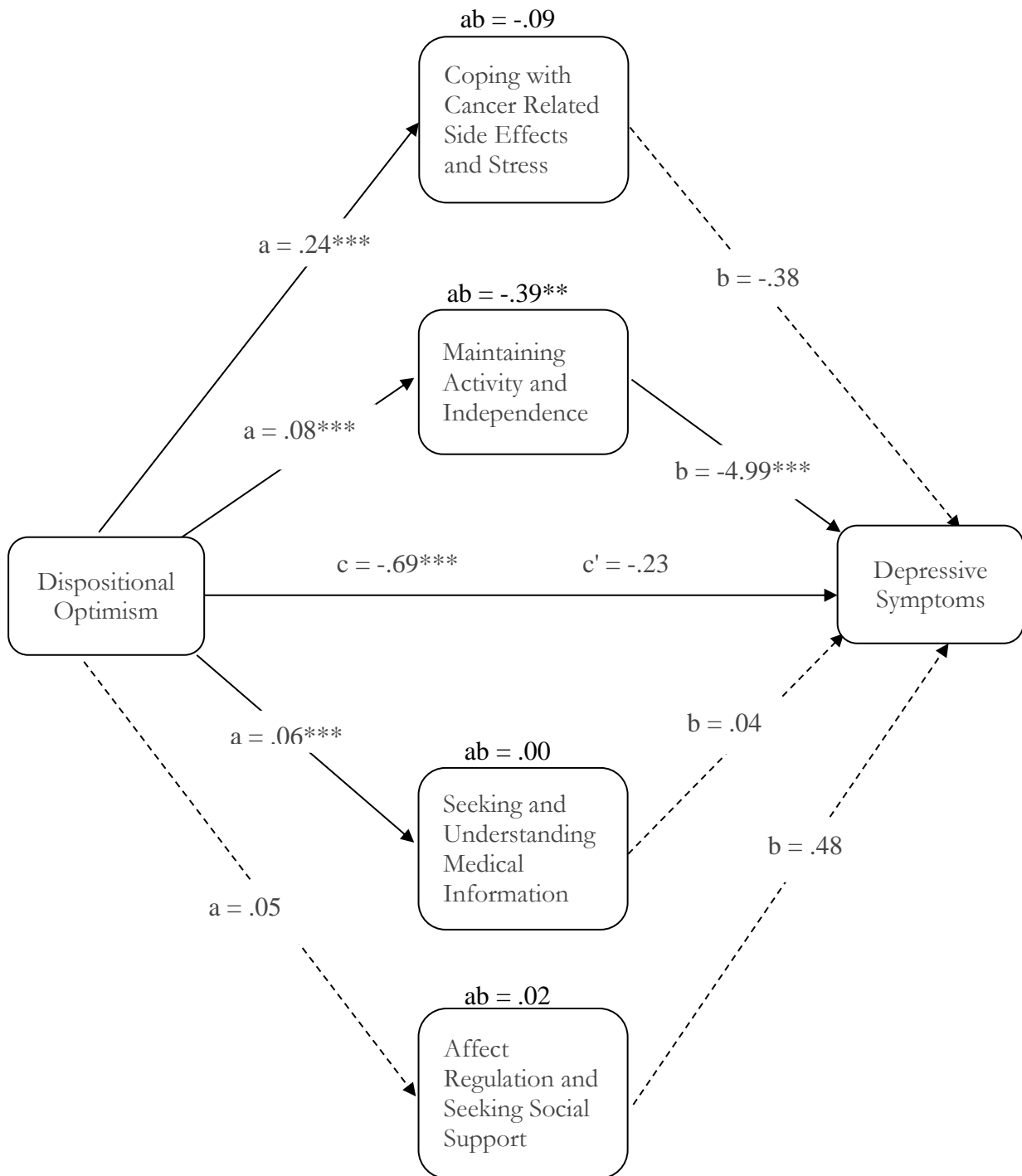


Figure 2. Mediating role of cancer related self-efficacy domains in the relation between dispositional optimism and depressive symptoms. Non-significant paths are shown by dashed lines.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

4. Discussion

The current study investigated the role of cancer-related self-efficacy domains in the association of dispositional optimism with the physical and psychological well-being of cancer patients. According to the results, dispositional optimism had an indirect effect on physical well-being and depressive symptoms of cancer patients through self-efficacy in maintaining activity and independence domain. Specifically, optimistic patients felt more self-efficacious in maintaining their daily activities and independence, which in turn, increased their physical well-being and decreased their depressive symptoms.

Optimism encourages individuals to attain desired goals, and hence, orients them to engage in activities facilitating goal attainment (Scheier & Carver, 1985). Self-efficacy ensures perseverance in engaged tasks, and optimism is the motivating source that helps individuals to sustain their self-efficacy beliefs (Usher & Pajares, 2008). The current study also showed that cancer patients who scored higher on optimism had better physical and psychological well-being through the mediating role of self-efficacy in maintaining activity and independence. That is, optimism improved physical well-being and decreased depressive symptoms of cancer patients by promoting their beliefs in sustaining daily activities and independence. Both optimism (Scheier & Carver, 1985) and self-efficacy (Bandura, 1997) were described as strong forces behind the behavior. Thus, both optimism and self-efficacy in maintaining activity and independence might help patients to sustain regular tasks, find new pursuits and occupy with them, and paddle their own canoe, which hence, would contribute to their physical and psychological well-being during the treatment process. Previously, it was also shown that breast cancer patients who perceived the diagnosis as a transitory setback in their lives and anticipated positive outcomes were reported to sustain their regular activities and manage the physical difficulties of the illness better (Boehmke & Dickerson, 2006). Similarly, in a qualitative study, women diagnosed with breast cancer expressed that living as they are used to despite the diagnosis gave them a sense of control in the face of uncertainty and helped them to normalize the situation (Drageset et al., 2010). Living differently than the usual way and being treated differently from others made them feel self-pity, and thus, increased their emotional burden. Luoma and Hakamies-Blomqvist (2004) did also indicate the meaning of physical constraints for cancer patients. Patients reported that physical restrictions make them feel weak, dependent on others, and unusual from the rest of society. Physical restraints and being unable to maintain one's usual life are, therefore, among the most challenging problems faced by the patients in the course of diagnosis and treatment (Williamson, 1998). Having cognitive control over these challenges, however, may provide significant improvements in the physical and psychological well-being of patients.

Bandura (1997) emphasized that self-efficacy specific to a particular task is stronger in predicting the outcomes related to this task. For instance, self-efficacy in coping with emotional symptoms was a unique mediator between cognitive impairment and emotional outcomes (i.e., depressive state and anxiety level) in the survivors of a bone marrow transplant, while self-efficacy in coping with physical or social problems did not mediate the same link (Wu et al., 2012). In addition to supporting this specificity hypothesis, the current study revealed that self-efficacy in a more physical aspect of functioning (i.e., maintaining activity and independence) could also predict the psychological well-being of patients. The other self-efficacy domains that might be relevant to physical or psychological well-being, such as self-efficacy in coping with cancer-related side effects or affect regulation and seeking support did not have an influence on our outcome variables. This may be related to the particular period that patients were passing through. As Bonacchi et al. (2018) suggested, the tasks that cancer patients need to carry out throughout the process may change from one phase to the other, and some tasks gain more importance depending on the stage of the treatment. Similarly, Tomai et al. (2019) showed that coping strategies that could be adaptive in the advanced stages of breast cancer were not effective in the early stages. Having self-efficacy in stage relevant tasks may have a substantial impact on more than one area of patients' lives. The sample of the current study mostly consisted of postsurgical inpatients. Previous studies revealed that physical and functional difficulties are among the most concerning issues for cancer patients after the surgery (Ercolano, 2017; Roth et al., 2005). Thus, we can speculate that for the postsurgical inpatients, believing in one's ability to be active and independent is particularly important in terms of both physical and psychological well-being. Therefore, we recommend future studies to assess and consider the phase of their treatment process while testing the domain specificity hypothesis. It would also be important to investigate which self-efficacy beliefs are more important in which phases of the process for the well-being of patients. Thus, we can tailor our interventions according to the phase of the treatment process that the patients are in.

This study is not without its limitations. First, the study is based on cross-sectional data and self-report measures. Since testing mediation with cross-sectional data could be biased concerning causal relations among variables, longitudinal research is necessary to truly understand the given associations over the course of coping with cancer and its treatment. Second, due to the difficulty of accessing this patient population, the sample size of the study was relatively small, which adversely affected the power to detect indirect effects. Further studies with larger sample sizes are needed to determine if non-significant indirect effects are a function of an absence of mediation or are the result of an underpowered study. Third, some features came to the fore in the demographic distribution of the participants. The majority of study

participants were female, unemployed, postsurgical inpatients with middle income, which limits the generalizability of the findings. Moreover, the sample varied considerably in cancer type and stage. The findings, however, may differ depending on the type and severity of the cancer. Furthermore, the study design could be susceptible to the common method bias. However, Harman's one-factor analysis (Chang et al., 2010) indicated that variance in the data cannot be explained by a single common factor. Finally, the internal consistency reliability of the optimism measure was below the average that might also impede the findings. Thus, considering these limitations, one needs to be cautious in interpreting and generalizing the findings.

Despite the limitations, the current study is important in terms of revealing possible underlying mechanisms of the associations of optimism with physical and psychological well-being in cancer patients. The results highlighted optimism as an important psychological resource for better adaptation to cancer treatment through increased self-efficacy beliefs. Although optimism is described as a disposition (Carver & Scheier, 2014), individuals can enhance this feature through effective psychotherapeutic interventions (Lee et al., 2006). Moreover, factors obstructing positive future expectations of patients may be identified to ensure better adaptation to the treatment. Gustavsson-Lilius et al. (2012) showed that the support of partners predicted higher optimism scores in female patients. Psychoeducational interventions targeting the social environment of patients may also help patients sustain their optimistic beliefs. This study highlighted the mediating role of cancer-specific self-efficacy domains, rather than focusing on general self-efficacy, which may provide more specific guidelines for health care professionals. As compared to other self-efficacy domains, self-efficacy in maintaining activity and independence seems to be more effective in increasing physical well-being and decreasing depressive symptoms of cancer patients. Thus, clinical interventions may target enhancing patients' self-efficacy in sustaining their activities and acting in independent ways. Future research may focus on other precursors of self-efficacy in maintaining activity and independence as well as factors that may discourage patients from holding this self-efficacy belief.

Ethics Approval. Approval was obtained from the ethics committee of Middle East Technical University. The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Availability of Data and Material. All data support the published claims and comply with field standards. The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' Contribution. All authors contributed to the study conception and design. All authors read and approved the final manuscript.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any potential conflict of interest.

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