

## Review Article

# Cancer patients and loneliness: A systematic review

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## ABSTRACT

**Background & Aim:** The number of cancer patients has been continuously increasing due to early diagnosis and the developments in cancer treatment. This has led to an increase in psychosocial problems associated with the diagnoses and treatment of cancer. Loneliness is emphasized to be one of the most frequently observed psychological symptoms in cancer patients. Personal and external factors that cause stress in life and insufficient social support increase the level of loneliness in patients. This systematic review aimed to determine the effect of education and social support provided to the patients diagnosed with cancer on their loneliness.

**Methods & Materials:** This systematic review was prepared in accordance with the Preferred Reporting Items for Systematic review and Meta-Analysis Protocols (PRISMA-P) protocol. The databases of PubMed, CINAHL, ScienceDirect, Web of Science, Cochrane Library, Ulakbim Turkish Medical Index, and Turk Medline were scanned to August 31, 2016, without a limitation of date. The keywords used during the scanning were “cancer and loneliness,” and “cancer patients and loneliness.” Five studies were included in this review keeping in consideration the inclusion and exclusion criteria.

**Results:** The results of the studies included in this systematic review revealed the positive effect of education and social support on the sense of loneliness observed in cancer patients. Three of five randomized controlled studies found that education and social support positively affected loneliness.

**Conclusion:** The results of this review showed that the education and social support provided to cancer patients should be increased, and sociocultural factors should be considered while planning education and social support.

## Introduction

The incidence of cancer, one of the significant health problems today, has rapidly increased in recent years. According to the 2008 data of the World Health Organization (WHO), 12.4 million new cases of cancer and 7.6 million deaths due to cancer occurred around the world (1). Today, cancer is the second most frequent cause of death in many developed countries, following cardiovascular diseases (2). The prevalence of cancer increases by 1% to 2% each year in almost all countries around the

world. The incidence of cancer in Turkey is 227.2; 174 thousand people have been diagnosed with cancer (3).

Cancer is a chronic disease and the number of cancer patients has been continuously increasing due to early diagnosis and the developments in cancer treatment (4-6). This has led to an increase in psychosocial problems associated with the diagnoses and treatment of cancer (7). Loneliness is emphasized to be one of the most frequently observed psychological symptoms in cancer patients. Loneliness is a situation that depresses and impairs people and affects their entire life. As a subjective concept, loneliness can be defined as the emotional expression of feeling hollow and letting oneself go. It is an unpleasant feeling that

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arises when people's communication with their social environment is disrupted both qualitatively and quantitatively (8-12). Peplau and Perlman (1982) stated that loneliness results from the difference between what people desire and their relationships in real life (13). Younger defined loneliness as the sense of being alone despite the longing for others. He stated that the sense of loneliness brought the sense of aimlessness and uselessness (14). Living with cancer means a large number of changes in life. Personal and external factors that cause stress in life and insufficient social support increase the level of loneliness among the patients (15, 16). Cancer patients have difficulties in their interpersonal relationships due to the conditions and limitations of their disease. With the occurrence of physical problems such as intramuscular hematomas, hair loss, mouth sores, and various skin reactions during chemotherapy, patients are observed to isolate themselves from the society (6, 17, 18). Also, since the patients cannot receive satisfactory information from the healthcare personnel about the management of the symptoms and they have to cope with the symptoms using their knowledge and abilities, and they fail to manage the symptoms due to insufficient and wrong practices, which may further increase the patients' loneliness. Studies have indicated that cancer treatment and side effects increase the patients' sense of loneliness (19, 20). Studies conducted on the social support that is effective in the sense of loneliness have focused on two important approaches. The first approach claims that a direct relationship exists between social support and health. According to the second approach, the most important function of social support is to protect mental health by decreasing or balancing the damages caused by stressful life events (11, 21-23). In other

words, the function of social support is to decrease the harmful effects of negative life events on physical and psychological health by affecting the assessment of stressful events (21, 24). This indicates that education and social support plays an important role in decreasing psychological problems such as loneliness. Sevil et al. (2006) found in their study conducted on patients with gynecologic cancer that the level of loneliness was higher for the patients who needed social support (25). Improving the ability of the patients to cope with their disease, increasing their knowledge on stress management, social support, diagnosis and treatments, and positive experiences help decreasing the patients' sense of loneliness and increasing the quality of their communication in their social relationships (6, 25, 26). Therefore, it is important to provide information to patients on the symptoms that can emerge due to the diagnosis and treatment, improve their coping skills, and increase social support in order to decrease the sense of loneliness (6, 25, 26). This systematic review aimed to determine the effect of education and social support provided to the patients diagnosed with cancer on their loneliness.

## **Methods**

This review was prepared in accordance with the Preferred Reporting Items for Systematic review and Meta-Analysis Protocols (PRISMA-P) protocol, used as a guide for authors in improving the presentation of systematic review and meta-analysis studies (27). The databases of PubMed, CINAHL, ScienceDirect, Web of Science, Cochrane Library, Ulakbim Turkish Medical Index, and Turk Medline were scanned to select the studies to be included in this review. Databases were scanned to August 31, 2016, without a

limitation of date and language. The keywords used during the scanning were “cancer and loneliness,” and “cancer patients and loneliness.” Repeating studies (duplications) were identified using the EndNote X5 program. A total of 2921 studies (PubMed 313, CINAHL 218, ScienceDirect 2000, Web of Science 371, Ulakbim Turkish Medical Index 16, and Turk Medline 1) were found at the end of scanning. The titles and abstracts of the studies were analyzed, and five studies were included in this review, as shown in Figure 1.

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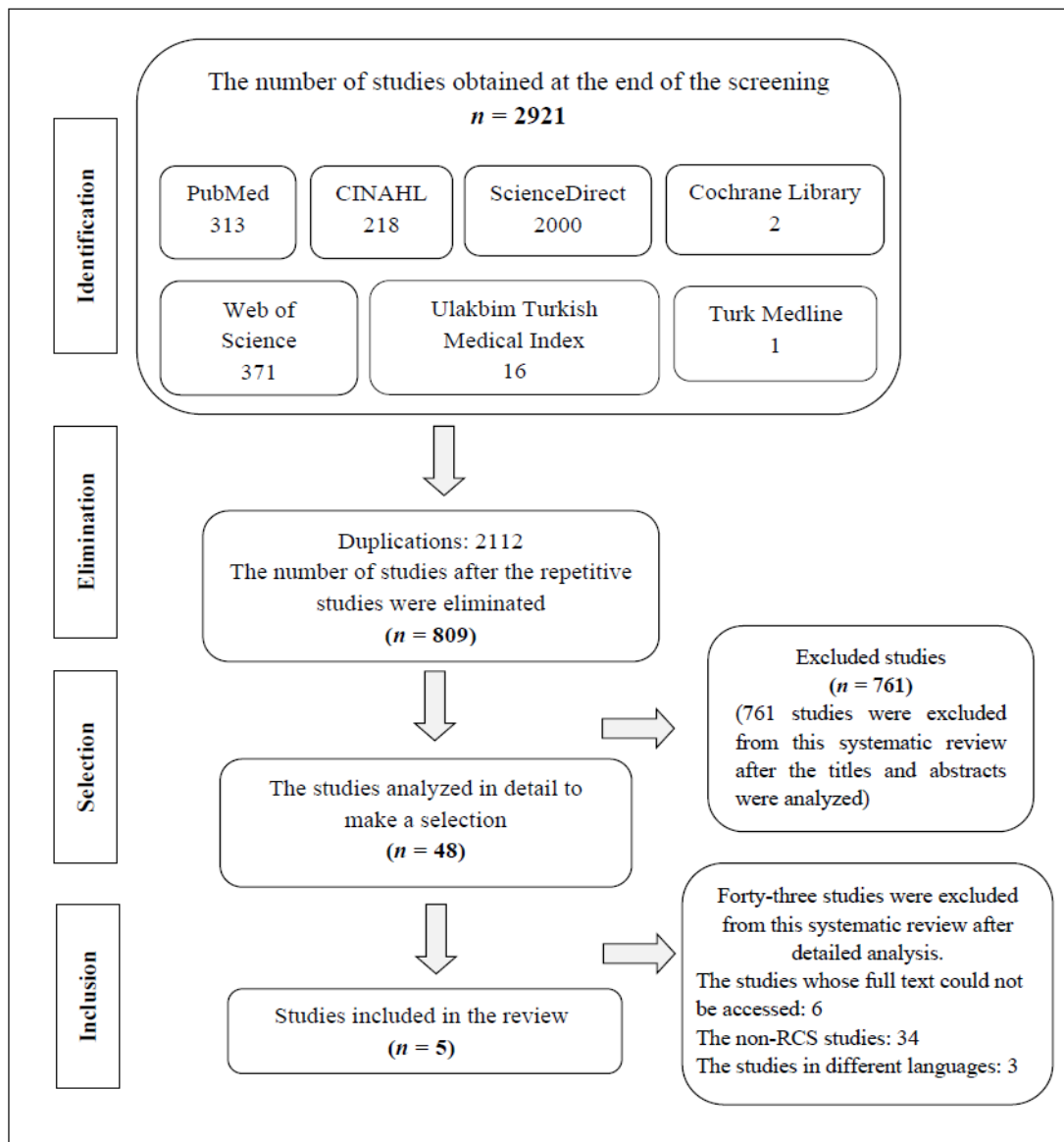


Figure 1. Characteristics of the studies included in this systematic review (PRISMA flowchart).

**Table 1.** Jadad Criteria Score

Study	Jadad score randomization, blinding, withdrawals	Total score
Dodds et al. (31)	2/2/1	5
Samarel et al. (32)	2/2/1	5
Coleman et al. (33)	2/2/1	5
Tabrizi et al. (34)	2/2/1	5
Fukui et al. (35)	1/2/1	4

The inclusion criteria for this systematic review were determined according to PICOS (P: population; I: interventions; C: comparisons; O: outcomes; and S: study design) (28).

### **Population**

The participants were patients aged 18 years and older diagnosed with cancer. No limitation was made regarding gender, socioeconomic status, ethnic origin, type of treatment, type of cancer or stage of the disease.

### **Interventions**

The interventions were determined to be education and social support in the studies included in this review.

### **Comparisons**

The studies in which the experimental and control groups consisted of cancer patients were compared .

### **Outcomes**

The studies analyzing the effect of education and social support on the level of loneliness were included in this review.

### **Study design**

The randomized controlled studies (RCS) published in English and Turkish on this subject were selected as high-evidence studies.

The studies included in this systematic review were English and Turkish RCSs with full text.

Descriptive, case-control, cohort, quasi-experimental studies, systematic reviews, and meta-analyses were excluded from this systematic review .

Quantitative papers was assessed by two independent reviewers for methodological validity prior to inclusion in the review

using standardized critical appraisal instruments for randomized controlled trials from the Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument (JBI-MASARI).

The critical appraisal instrument consists of 10 questions and four answer choices (yes, no, unclear, not applicable). In this systematic review, questions were evaluated for each study, 1 point was given for yes option and 0 points were given for other answer options. Any disagreements that arise between the reviewers was resolved through cooperation (29).

The five studies included in this review are of moderate or high quality according to measures assessed by the Jadad scale (Table 1). The Jadad scale is a tool used to measure methodological quality of controlled trials. Studies are scored out of five points based on three components: randomization, blinding, and accounting for withdrawals (30).

A total of 2921 studies were found in the electronic databases. After eliminating all duplications (manually and using EndNote X5), 809 studies were left to analyze their titles and abstracts. Full texts of 48 of these studies were tried to be obtained, full texts of 6 studies could not be obtained, and a total of 43 studies were excluded for various reasons. Five RCSs that were suitable for the purpose of this review and met the inclusion criteria were included in this systematic review. Figure 1 shows the screening and selection process.

**Table 2.** Characteristics of the assessed studies

Studies*	Sample characteristics	Instruments used in the studies	Level of loneliness	Intervention	Outcomes
Samarel et al. (2002) America	125 patients with breast cancer (between the ages of 30 and 83 years, average age: 53.8 years)  Experimental group (n=34) Control group 1 (n=48) Control group 2 (n=43)  Having had surgery 4 weeks ago or earlier	UCLA Loneliness Scale Version 3	Average Loneliness Score <b>Initial:</b> Experimental group: 35.94±9.50 Control group 1: 34.67±9.97 Control group 2: 35.19±9.21  <b>Phase II:</b> Experimental group: 33.18±9.15 Control group 1: 34.38 ±10.34 Control group 2: 40.02±11.15  <b>Phase III:</b> Experimental group: 34.03±9.58 Control group 1: 32.53±10.01 Control group 2: 39.32±10.73	-The experimental group received group social support and an education program through phone calls for 13 months. -The control group 1 received individual social support and an education program through phone calls for 13 months. -The control group 2 was sent a one-time education information. - The intervention was planned as Phase I (8–10 weeks), Phase II (8 weeks), and Phase III (8 months). - The experimental group received social support and education weekly through phone calls at Phase I. Weekly social support and education were provided at Phase II. At Phase III, social support and education were provided through phone calls once a month for 5 months and then twice a month for 3 months.	Mood disorders and loneliness were reported to decrease in the experimental group and the control group 1.
Fukui et al. (2003) Japan	50 patients with breast cancer (age: ≤65 years, average age: 53.5 years)  Experimental group (n=25) Control group (n=25)  Having had surgery 4–18 months ago	R-UCLA Loneliness Scale Japanese version	Average Loneliness Score: <b>Initial:</b> Experimental group:36.6±7.2 Control group: 32.8±6.8  <b>After 6 weeks:</b> Experimental group:33.9±7.7 Control group: 32.7±8.2  <b>After 6 months:</b> Experimental group:33.7±8.5 Control group:33.9±8.3	-The experimental group received a 6-week education on health, stress management, and abilities to cope, along with psychosocial support. -The control group did not receive any intervention.	The experimental group had lower loneliness scores compared with the control group.
Coleman et al. (2005) America	106 patients with breast cancer  Experimental group (n=54,	UCLA Loneliness Scale Version 3	Average Loneliness Score: <b>Initial:</b> Experimental group:34±1 Control group: 34±1	-The experimental group received four-staged social support and education through phone calls for 13 months. -The control group did not receive any	No statistically significant difference was found between the groups.

	average age: 57 years) Control group (n=52, average age: 58 years)  2nd to 4th weeks after the surgery		<b>Phase III:</b> Experimental group:34±1 Control group: 36±1	intervention. -Educational material was given to both the groups.	
Dodds et al. (2015) America	28 patients with breast cancer Experimental group (n=12, average age: 54.7 years) Control group (n=16, average age: 55.8 years)  Patients having a history of chemotherapy in the last 10 years but not receiving chemotherapy at the time of the study	R-UCLA Loneliness Scale Version 3	Average Loneliness Score <b>Initial:</b> Experimental group:38.3±10.6 Control group: 38.8±16.2  <b>After the intervention:</b> Experimental group:34.5±9.4 Control group: 35.5±10.2  <b>One month after the conclusion of the intervention:</b> Experimental group:37.4±15.4 Control group:37.9±16.6	-The experimental group received an 8-week cognitive-based compassion training (CBCT) (on awareness, stress reactivity, in-class discussion, and guided meditation) -The control group did not receive any intervention.	A significant difference was found between the level of depression, attention, functional deficiency due to the fear of recurrence and fatigue of the experimental and control groups; however, no significant difference in terms of the level of loneliness.
Tabrizi et al. (2016) Iran	81 patients with breast cancer Age: <50 and ≥50 years (stratification) Average age: 47.9 years  Experimental group: 41 Control group: 40  Having had surgery 4–18 months ago	R-UCLA Loneliness Scale Iranian Version	Average Loneliness Score: <b>Initial:</b> Experimental group: 34.15±8.45 Control group: 34.82±7.38  <b>After the intervention:</b> Experimental group: 31.42±7.15 Control group: 34.82±7.38  <b>Eight weeks after the conclusion of the intervention:</b> Experimental group:30.89±6.94 Control group: 34.87±7.43	-The experimental group was allocated into supportive-expressionist discussion groups of 6–8 patients, and the intervention was carried out in 90-min sessions for 12 weeks. -The control group only received routine care (a brochure about self-care during chemotherapy).	The level of loneliness significantly reduced and the level of hope significantly increased in the experimental group compared with the control group.

All of the studies included in the study sample were RCS

## Results

The studies included in this review were conducted between 2002 and 2016. Their samples consisted of cancer patients, and sample sizes were minimum 28 (31) and maximum 125 (32). Three studies were conducted in America, and the others were conducted in Japan and Iran. All of the studies included in this review were RCSs.

The studies included in this review used the UCLA Loneliness Scale – Version 3 (32, 33), R-UCLA Loneliness Scale – Iranian Version (34), the R-UCLA Loneliness Scale– Version 3 (31), and the R-UCLA Loneliness Scale – Japanese Version (35) to assess the level of loneliness in cancer patients. The UCLA Loneliness Scale assesses patients' sense of loneliness and consists of 20 Likert-type questions. Its items were scored between 1 and 4 that corresponded to “never,” “rarely,” “sometimes,” and “often.” The minimum and maximum scores of the scale were 20 and 80, respectively. Higher scores indicated a more intense sense of loneliness. The validity and reliability of the scales have been confirmed in that populations.

## Discussion

In the study by Samarel et al. (2002), while the initial average score of loneliness was  $35.94 \pm 9.50$  for the experimental group,  $34.67 \pm 9.97$  for the control group 1, and  $35.19 \pm 9.21$  for the control group 2, it fell to  $34.03 \pm 9.58$  for the experimental group and  $32.53 \pm 10.01$  for the control group 1, and increased to  $39.32 \pm 10.73$  for the control group 2 at Phase III. In the study by Fukui et al. (2003), while the initial average score of loneliness was  $36.6 \pm 7.2$  for the experimental group and  $32.8 \pm 6.8$  for the control group, it fell to  $33.7 \pm 8.5$  for the experimental group and increased to  $33.9 \pm 8.3$  for the control group after 6 months.

In the study by Coleman et al. (2005), while the initial average score of loneliness was  $34 \pm 1$  for both the groups, it remained  $34 \pm 1$  for the experimental group and increased to  $36 \pm 1$  for the control group at Phase III. In the study by Dodds et al. (2015), while the initial average score of loneliness was  $38.3 \pm 10.6$  for the experimental group and  $38.8 \pm 16.2$  for the control group, it fell to  $37.4 \pm 15.4$  for the experimental group and  $37.9 \pm 16.6$  for the control group after 1 month. In the study by Tabrizi et al. (2016), while the initial average score of loneliness was  $34.15 \pm 8.45$  for the experimental group and  $34.82 \pm 7.38$  for the control group, it fell to  $30.89 \pm 6.94$  for the experimental group and increased to  $34.87 \pm 7.43$  for the control group in the eighth week after the intervention.

In all studies included in this review, cancer patients in experimental groups were provided with education programs having different contents and social support. In the study by Samarel et al. (2002), the experimental group received group social support and an education program through phone calls for 13 months. The control group 1 received individual social support and an education program through phone calls for 13 months. The control group 2 was sent a one-time education information. The intervention was planned as Phase I (8–10 weeks), Phase II (8 weeks), and Phase III (8 months). The experimental group received social support and education weekly through phone calls at Phase I (encouraged to initiate the contact, encouraged to share their experiences and feelings, and education on the diagnosis and treatment). Weekly social support and education (on stress management, communication techniques, problem solving, and adverse effects of the treatment) were provided at Phase II. At Phase III, social support and education were provided through phone calls once a month for 5 months and then twice a month for 3

months (education on meeting the needs for continuous medical monitoring and the use of the strategies and techniques learned during the intervention). The control group 1 received the same intervention as the experimental group at Phases I and II and received only weekly social support and education through phone calls at Phase III. The control group 2 was sent a one-time education information and did not receive any intervention. The assessments were carried out before the intervention and after Phases I, II, and III. In the study of Fukui et al. (2003), the experimental group received a 6-week education on health, stress management, and abilities to cope, along with psychosocial support. The control group did not receive any intervention. The assessments were carried out at the beginning, in the sixth week, and in the sixth month. In the study of Coleman et al. (2005), the experimental group received four-staged social support and education program (on sharing the experiences, fears, and feelings, stress management, communication techniques, problem-solving skills and adverse effects of the treatment) through phone calls for 13 months. The control group did not receive any intervention. Educational material was given to both the groups. The assessments were carried out before the intervention and after Phases I, II, III, and IV. In the study of Dodds et al. (2015), the experimental group received an 8-week cognitive-based compassion training (CBCT) (on awareness, stress reactivity, in-class discussion, and guided meditation). The control group did not receive any intervention. The assessments were carried out at the beginning and end of the intervention and 4 weeks after the intervention. In the study of Tabrizi et al. (2016), the experimental group was allocated into supportive-expressionist discussion groups of six to eight patients, and the intervention was carried out in 90-

min sessions for 12 weeks. The control group received routine care (a brochure about self-care during chemotherapy) only. The assessments were carried out before and at the end of the intervention and 8 weeks after the intervention.

The effect size of the studies included in the sampling is between 0.20-0.46. Samarel et al. (2002) reported that mood disorders reduced at all of the three phases and loneliness reduced at Phases II and III for the experimental group and control group 1, with a statistically significant difference between the groups. Tabrizi et al. (2016) found that the level of loneliness significantly reduced and the level of hope significantly increased in the experimental group compared with the control group. Fukui et al. (2003) found a statistically significant difference between the loneliness scores of the groups. The remaining two studies (31, 33) indicated no significant difference between the groups.

In the included studies, the content of the education given to reduce loneliness and the initiatives done differ. Meta-analysis could not be done because of the diversity of initiatives, and the small number of samples in some studies.

At the end of this systematic review, education and social support were found to be an effective factor in reducing the level of loneliness at three of five studies. It is important to provide information to patients on the symptoms that can emerge due to the diagnosis and treatment, improve their stress management and coping skills, and increase positive experiences and social support to decrease the sense of loneliness (6, 25, 26).

Three studies included in this review indicated that education and social support had a statistically significant positive effect on the level of loneliness. However, two studies did not indicate this effect (31, 33). Coleman et al. (2005) performed a study on women living in different regions and



expressed that the study results might have been affected by the non-homogeneity of the number of patients included in the study and the differences between the sociocultural levels of the regions. Also, they emphasized that regional differences should be taken into consideration while preparing the interventions. Therefore, despite the long period of the education (13 months), the fact that sociocultural and regional differences were taken into consideration while preparing the education content might have negatively affected the study results. Dodds et al. (2015) found a significant difference between the level of depression, attention, functional deficiency due to the fear of recurrence, and fatigue. Despite the decrease in the loneliness score of the experimental group, they did not find a significant difference in terms of the level of loneliness and emphasized that more comprehensive studies should be conducted due to the low sample size of their study. Samarel et al. (2002) reported that mood disorders reduced at all of the three phases and loneliness reduced at Phases II and III for the experimental group and control group 1, the difference between the groups were significant, and the quality of communication increased in the experimental group and control group 1 compared with the control group 2 at Phase II. Also, they stated that individual phone support could be an effective alternative to face-to-face support groups, since the results of the experimental group and control group 1 were similar. Tabrizi et al. (2016) found that the level of loneliness significantly reduced and the level of hope significantly increased in the experimental group compared with the control group. They formed supportive-expressionist discussion groups during the intervention. These groups were effective, since they enabled patients to come together with the people in similar conditions and increase awareness. Fukui et

al. (2003) reported a statistically significant difference between the loneliness scores of the groups, and the education on health, stress management, coping skills, and psychosocial support program could be an effective support to manage the psychosocial problems related to the disease. Many studies also emphasized that education on the diagnosis and treatment and social support might reduce the sense of loneliness (25, 36-38). These studies implied that education and social support programs on health education, stress management, and coping skills enabled patients to be aware of the adverse effects and improve their coping skills for chronic diseases that require long-term treatment such as cancer. Also, these sources of support affect patients' assessment of their situation and the stressful events and help in reducing their sense of loneliness during the long and wearing treatment period. It is important to form discussion groups that help patients to effectively cope with their loneliness, start the education programs before treatment and continue them throughout the treatment, and establish psychological counseling centers for cancer patients.

There is limitation to the study language. A study published in Turkish was not reached about the topic and studies published in different languages were not included in the review. Also the gray literature was not scanned.

The effect of education and social support on reducing the level of loneliness in patients diagnosed with cancer is accepted three of five studies. The current data and a majority of the studies in this systematic review showed that education and social support was an effective factor in reducing the level of loneliness. The results of the studies included in this study revealed the positive effect of education and social support on cancer patients. In conclusion, all of the studies included in this review were

found to be high-evidence studies. However, this review indicated that a limited number of studies existed on this subject and hence more RCS should be conducted with sufficient sample sizes. Also, the results of this review showed that the education and social support provided to cancer patients should be increased, and sociocultural factors should be considered while planning education and social support.

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### **Conflict of Interest**

The authors declare that they have no conflicts of interest

### **References**

1. Boyle P, Levin B, (Editors). World cancer report 2008: World Health Organization International Agency for Research on Cancer; 2008.
2. American Cancer Society Cancer fact & figures. Atlanta: American Cancer Society; 2010. Available from: <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-026238.pdf> Accessed: February 20, 2015.
3. Ministry of Health Health Statistics Yearbook 2013: Ministry of Health; 2013. Available from: <http://sbu.saglik.gov.tr/Ekutuphane/kitaplar/sa%C4%9F1%C4%B1k>

%20istatistik%20y%C4%B11%C4%B1%C4%9F%C4%B1%202013.pdf Accessed: February 27, 2015.

4. Maddams J, Brewster D, Gavin A, Steward J, Elliott J, Utley M, et al. Cancer prevalence in the United Kingdom: estimates for 2008. *British journal of cancer*. 2009 Aug 04;101(3):541-7. PubMed PMID: 19568236. Pubmed Central PMCID: PMC2720244. Epub 2009/07/02. eng.
5. Pavlic DR, de Graaf P, Buntinx F, Lionis C. Primary care and care for chronic cancer patients in Europe: position paper of the European Forum for Primary Care. *Quality in primary care*. 2009;17(6):431-43. PubMed PMID: 20051194. Epub 2010/01/07. eng.
6. Deckx L, van den Akker M, Buntinx F. Risk factors for loneliness in patients with cancer: a systematic literature review and meta-analysis. *European journal of oncology nursing : the official journal of European Oncology Nursing Society*. 2014 Oct;18(5):466-77. PubMed PMID: 24993076. Epub 2014/07/06. eng.
7. Stanton AL. What happens now? Psychosocial care for cancer survivors after medical treatment completion. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2012 Apr 10;30(11):1215-20. PubMed PMID: 22412133. Epub 2012/03/14. eng.
8. Alkan S, Sezgin A. Loneliness in Adult patients. *Cumhuriyet University School of Nursing Journal*. 1998;2(1):43-52. Turkish.
9. Özkürkçügil AÇ. Loneliness in prison and the relation of loneliness to depression. *Kriz Journal*.6(1):21-31. Turkish.
10. Killeen C. Loneliness: an epidemic in modern society. *Journal of advanced nursing*. 1998 Oct;28(4):762-70. PubMed PMID: 9829664. Epub 1998/11/26. eng.
11. Arkar H, Sari O, Fidaner H, editors. Relationships between quality of life,

perceived social support, social network and loneliness in a Turkish sample. New symposium; 2004.

12. Öz F. Basic concepts in health field. Ankara: Domestic and foreign trade; 2004.

13. Peplau LA, Perlman D. Perspectives on loneliness. In: Peplau LA, Perlman D, editors. Loneliness: A sourcebook of current theory, research and therapy: Wiley New York; 1982. p. 1-18.

14. Younger JB. The alienation of the sufferer. ANS Advances in nursing science. 1995 Jun;17(4):53-72. PubMed PMID: 7625781. Epub 1995/06/01. eng.

15. Rokach A. Terminal illness and coping with loneliness. The Journal of psychology. 2000 May;134(3):283-96. PubMed PMID: 10907706. Epub 2000/07/25. eng.

16. Kara M, Mirici A. Loneliness, depression, and social support of Turkish patients with chronic obstructive pulmonary disease and their spouses. Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing. 2004;36(4):331-6. PubMed PMID: 15636413. Epub 2005/01/08. eng.

17. Yarbrow CH, Frogge MH, Goodman M, Groenwald SL. Cancer nursing principles and practice. London: Jones and Bartlett Publishers; 2006.

18. Dedeli Ö, Fadiloğlu Ç, Uslu R. A survey of functional living and social support in patients with cancer. Turk J Oncol. 2008;23(3):132-9.

19. Ekwall E, Ternestedt BM, Sorbe B. Recurrence of ovarian cancer-living in limbo. Cancer nursing. 2007 Jul-Aug;30(4):270-7. PubMed PMID: 17666975. Epub 2007/08/02. eng.

20. Rosedale M. Survivor loneliness of women following breast cancer. Oncology nursing forum. 2009 Mar;36(2):175-83. PubMed PMID: 19273406. Epub 2009/03/11. eng.

21. Öztürk H, Sevindik FN, Yaman SÇ. Examination of loneliness and social support in students and affecting factors. Firat University Journal of Social Sciences. 2006;16(1):383-94. Turkish.

22. Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychological bulletin. 1985 Sep;98(2):310-57. PubMed PMID: 3901065. Epub 1985/09/01. eng.

23. Sorias O. Social support and mental health. Ege University Medical Faculty Journal. 1988b;27(1):359-69. Turkish.

24. Sorias O. Social support concept. Ege University Medical Faculty Journal. 1988a;27(1):353-7. [Turkish]

25. Sevil U, Ertem G, Kavlak O, Coban A. The loneliness level of patients with gynecological cancer. International journal of gynecological cancer : official journal of the International Gynecological Cancer Society. 2006 Jan-Feb;16 Suppl 1:472-7. PubMed PMID: 16515647. Epub 2006/03/07. eng.

26. Boucher JE. Telephone intervention: Hope for cancer patients [Ph.D.]. Ann Arbor: University of Massachusetts Amherst; 2002.

27. Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. Bmj. 2015;349:g7647.

28. Dissemination CfRa. Systematic Reviews: CRD's Guidance for Undertaking Reviews in Healthcare. York: University of York NHS Centre for Reviews & Dissemination. 2009.

29. Joanna Briggs Institute Meta Analysis of Statistics Assessment and Review Instrument 2014 Systematic Review Protocol Template. 2014 Available from: <http://joannabriggs.org/assets/docs/jbc/operations/prot-sr-bpis-tech-templates/jbi-sr->

protocol-template.docx Accessed: June 16, 2016.

30. Jadad AR, Moore RA, Carroll D, Jenkinson C, Reynolds DJ, Gavaghan DJ, et al. Assessing the quality of reports of randomized clinical trials: is blinding necessary? *Controlled clinical trials*. 1996 Feb;17(1):1-12. PubMed PMID: 8721797. Epub 1996/02/01. eng.

31. Dodds SE, Pace TW, Bell ML, Fiero M, Negi LT, Raison CL, et al. Feasibility of Cognitively-Based Compassion Training (CBCT) for breast cancer survivors: a randomized, wait list controlled pilot study. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2015 Dec;23(12):3599-608. PubMed PMID: 26275769. Epub 2015/08/16. eng.

32. Samarel N, Tulman L, Fawcett J. Effects of two types of social support and education on adaptation to early-stage breast cancer. *Research in nursing & health*. 2002 Dec;25(6):459-70. PubMed PMID: 12424783. Epub 2002/11/09. eng.

33. Coleman EA, Tulman L, Samarel N, Wilmoth MC, Rickel L, Rickel M, et al. The effect of telephone social support and education on adaptation to breast cancer during the year following diagnosis. *Oncology nursing forum*. 2005 Jul 01;32(4):822-9. PubMed PMID: 15990911. Epub 2005/07/02. eng.

34. Tabrizi FM, Radfar M, Taei Z. Effects of supportive-expressive discussion groups on loneliness, hope and quality of

life in breast cancer survivors: a randomized control trial. *Psycho-oncology*. 2016 Sep;25(9):1057-63. PubMed PMID: 27302306. Epub 2016/06/16. eng.

35. Fukui S, Koike M, Ooba A, Uchitomi Y. The effect of a psychosocial group intervention on loneliness and social support for Japanese women with primary breast cancer. *Oncology nursing forum*. 2003 Sep-Oct;30(5):823-30. PubMed PMID: 12949595. Epub 2003/09/02. eng.

36. Mosher CE, Lepore SJ, Wu L, Austin J, Valdimarsdottir H, Rowley S, et al. Social correlates of distress following hematopoietic stem cell transplantation: exploring the role of loneliness and cognitive processing. *Journal of health psychology*. 2012 Oct;17(7):1022-32. PubMed PMID: 22253329. Pubmed Central PMCID: PMC3760721. Epub 2012/01/19. eng.

37. Sahin ZA, Tan M. Loneliness, depression, and social support of patients with cancer and their caregivers. *Clinical journal of oncology nursing*. 2012 Apr;16(2):145-9. PubMed PMID: 22459523. Epub 2012/03/31. eng.

38. Jaremka LM, Fagundes CP, Glaser R, Bennett JM, Malarkey WB, Kiecolt-Glaser JK. Loneliness predicts pain, depression, and fatigue: understanding the role of immune dysregulation. *Psychoneuroendocrinology*. 2013 Aug;38(8):1310-7. PubMed PMID: 23273678. Pubmed Central PMCID: PMC3633610. Epub 2013/01/01. eng.