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Effect of acupressure on management of dyspnea and quality of life in palliative care patients

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ABSTRACT

Background and purpose: Management of dyspnea is important in patients diagnosed with lung cancer. The aim of the study was to determine the effect of acupressure on dyspnea level and quality of life in palliative care patients with dyspnea symptoms.

Material and Methods: This randomized controlled experimental study was conducted with 57 experimental and 58 control patients hospitalized in the palliative care unit between May 2023 and January 2024. Data were collected using the Modified Borg Scale (MBS), and FACIT-Pal (Functional Assessment of Chronic Illness Therapy-Palliative care) Quality of Life Scale. In the study, acupressure was applied to the dyspnea acupressure points (Lu1, Lu10, P6) for 3 minutes, twice a day, every day for 14 days in the experimental group. Standard care was administered as control.

Results: In the study, when the MBS scores of the patients in both groups were compared, it was found that the MBS score of the experimental group after acupressure application on Day 1 (4.553± 1.189 vs. 5.224±1.351), Day 7 (3.907±1.211 vs. 5.581±1.074) and Day 14 (3.048± .973 vs. 5.357±.983) was statistically significantly lower than the control group ($p<0.001$). In addition, when the MBS scores of the experimental group were compared before and after acupressure within the group on Days 1, 7 and 14, it was determined that there was a statistically significant decrease ($p<0.001$). In the study, it was found that the FACT-PAL scores of the experimental group were higher than the control group on Day 14 (137.583±13.627 vs. 123.333±10.116, $p=0.006$). On Day 14, the respiratory rate of the experimental group after acupressure application was statistically significantly lower than the control group (21.365±3.652 vs. 23.166±4.477).

Conclusions: The results of this study show that acupressure reduces vital signs (oxygen saturation, heart rate, respiratory rate, systolic and diastolic blood pressure), dyspnea, and improves quality of life in palliative care patients.

Introduction

Dyspnea is an important symptom frequently seen in lung cancer, negatively affecting the well-being of patients, and preventing daily life activities, including personal care needs [1]. Therefore, management of dyspnea is important in patients diagnosed with lung cancer. Dyspnea is a common complaint in patients presenting with primary or metastatic lung involvement, with a rate of 37-51 %. The frequency varies depending on the type and stage of cancer [2,3]. The frequency increases even more in patients receiving palliative care, with a rate of 57-90 % [3–6].

Dyspnea can develop at any stage of the disease, but it is more common in the last period of life [7]. Different studies have reported that the frequency of dyspnea in patients receiving palliative care with a diagnosis of lung cancer is 57-90 %, 60 % in esophageal cancer, and 46 % in breast cancer [2,3,5–7]. One study has shown that 65 % of palliative care patients die with dyspnea in the last three months of their lives [4]. There may be many factors that trigger the development of dyspnea in

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palliative care patients. In addition to primary or metastatic lung involvement, antineoplastic treatment, thoracic irradiation, obstruction caused by a mediastinal tumor, pleural effusion, and pulmonary embolism may also cause the development of dyspnea. In addition, dyspnea in these patients may be due to existing chronic obstructive pulmonary disease, pulmonary embolism, hepatomegaly, ascites, anemia at a level that affects the patient's breathing, cachexia, anxiety, or thoracic surgery [8]. Regardless of the cause, dyspnea is one of the important complaints that negatively affects the patient's quality of life and reminds them of death. Since dyspnea is a multifaceted subjective condition that

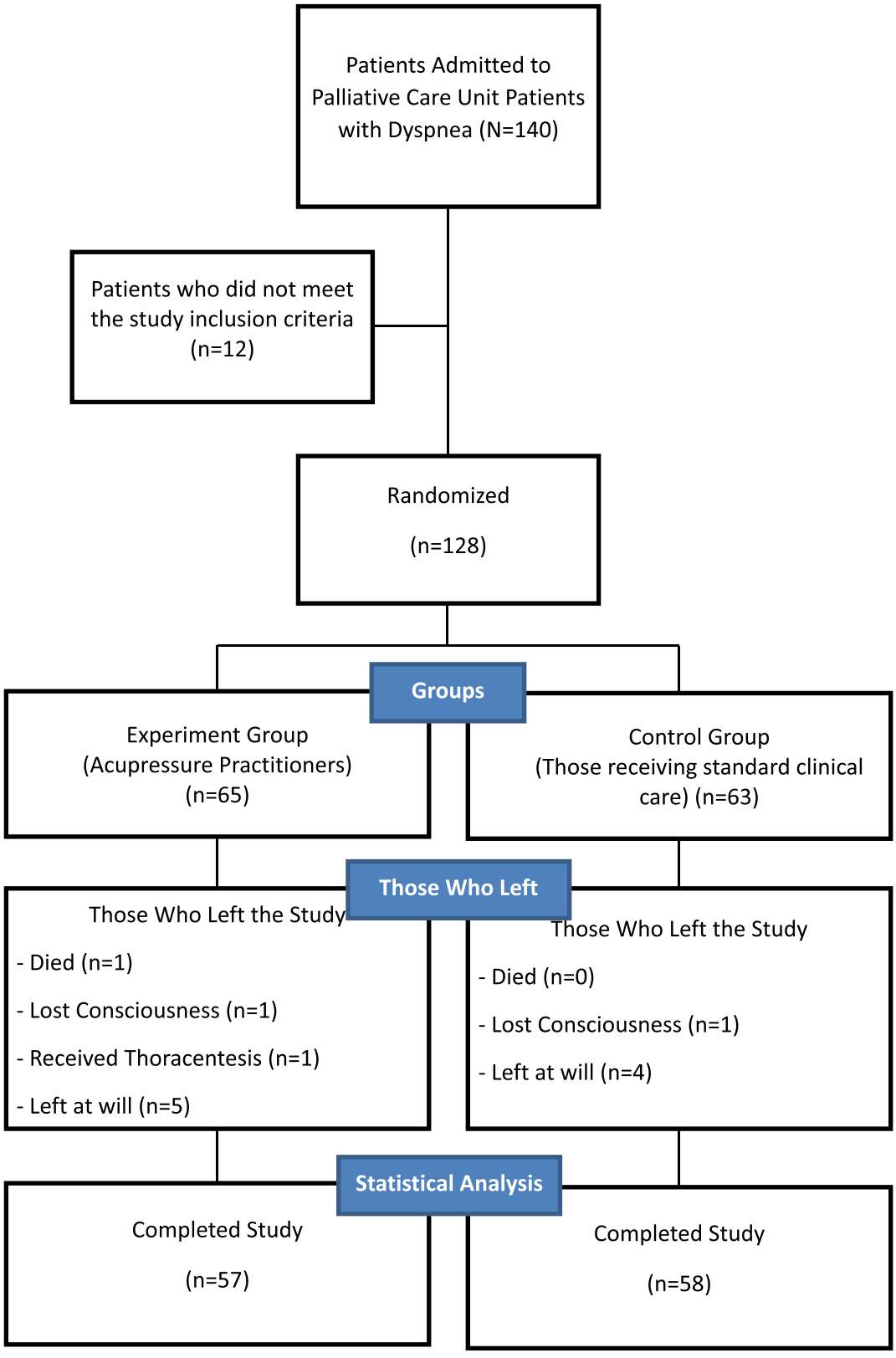

Fig. 1. Consort flow diagram.

affects the patient physiologically, psychologically, socially and environmentally, its comprehensive diagnosis and early planning of effective approaches to its management are important for patients to complete a good palliative care process [9,10].

Complementary and integrative methods used for dyspnea symptoms include acupuncture, acupressure, visualization techniques, herbal treatments, nutritional support, stress management, relaxation techniques, exercise, breathing training and psychotherapy, etc. There are studies in the literature showing that acupuncture and acupressure are effective in controlling dyspnea symptoms in various disease groups [11,12].

Acupressure is an integrated method that involves applying physical pressure to acupuncture points on the body surface with the hand, elbow or various tools. This non-invasive, easy to apply and safe method can be applied by patients on their own with good counseling [11].

Reducing dyspnea and the psychological stress that causes dyspnea is important for symptom management [10]. It has been reported that acupressure application has significant effects, especially in dyspnea that develops with exertion [12]. It is seen that the studies on the subject are not sufficient in terms of quantity and quality in order to be able to give recommendations to patients and that high-powered, well-planned studies are needed.

The aim of this study was to determine the effect of acupressure applied to three acupoints (Lu1, Lu10, P6) on the arm and chest for 14 days, twice a day, for 3 minutes (min) on each point, on the level of dyspnea and quality of life in palliative care patients with dyspnea complaints.

Method

Type of the Study: The study was conducted using a randomized controlled experimental study design.

Variables of the study

Independent Variable: Socioeconomic and disease-related characteristics (age, gender, diagnosis, length of hospital stay, etc.).

Dependent Variable: Dyspnea level, vital signs and quality of life scores.

Place and Time of the Study: The study was conducted in the Palliative Care Unit of a Chest Diseases and Chest Surgery Hospital in Istanbul/Turkey. The data of the study were collected between May 2023 and January 2024.

The Universe and Sample of the Study: The universe of the study consisted of adult palliative care patients with dyspnea in the palliative care unit. The sample consisted of patients who met the inclusion criteria and volunteered to participate in the study. The sample size was calculated using the G*Power 3.1 software. Based on a medium effect size ($d = 0.5$), a significance level (alpha) of 0.05, and a statistical power ($1-\beta$) of 0.80, the minimum required sample size was determined to be 55 participants per group. To account for potential attrition, recruitment continued until 57 participants were included in the experimental group and 58 in the control group. Despite a dropout rate slightly above 5 %, a post-hoc power analysis showed that the study remained statistically well-powered (Fig. 1).

Inclusion criteria for the study

Patients with;

- 18 years of age or older,
- Basic literacy,
- Complaints of moderate and severe dyspnea (dyspnea score of 3 or more on a scale of 0-10 in the Modified Borg Scale evaluation)
- Hgb$\geq$8 mg/dl
- $SpO_2\geq$ %90
- an ECOG Performance score of $\leq$3 were included in the study.

Exclusion criteria from the study

- Those with a fever of 38ºC or above in the last 24 hours
- Anyone with any cognitive, affective or verbal problems that prevent them from communicating
- Having psychiatric illness
- Having an infectious disease during the work period
- Patients who underwent thoracentesis due to pleural effusion before the study started.
- Patients with existing muscle disease were not included in the study.

Data collection tools used in the research

Participants were assigned to experimental and control groups according to a randomization list previously prepared by the researchers. Before being assigned to a group, individuals who would participate in the study were interviewed and informed about the study and their consent was obtained. Participants were randomly assigned to experimental and control groups using a computer-generated randomization list created by an independent researcher who was not involved in data collection or analysis. The randomization list was prepared in advance using a block randomization method to ensure equal group sizes. Allocation concealment was maintained by placing group assignments in sealed, opaque, sequentially numbered envelopes, which were opened only after obtaining informed consent. The envelopes were handled and opened by a research assistant not involved in the intervention or outcome assessment, ensuring that the assignment process was unbiased and strictly adhered to the pre-established sequence.

To ensure standardization in group allocation, when both an experimental and a control group participant were assigned to the same room during randomization, the subsequent eligible patient was selected instead, to minimize the risk of contamination. The researcher who performed the interventions and collected the outcome data was different from the researcher responsible for data entry and statistical analysis. However, due to the nature of the intervention, blinding of the researcher delivering the intervention was not feasible, as the acupressure technique could not be administered without awareness of group assignment.

In the first stage of data collection, all patients were asked to fill out the Patient Identification Form, Dyspnea Severity Measurement-Borg Scale and FACIT - Pal (Functional Assessment of Chronic Illness Therapy-Palliative care) Quality of Life Scale. In addition, the patients' respiratory rate, rhythm, blood pressure and heart rate were evaluated.

Intervention

The experimental group received acupressure twice a day for 14 days, 3 minutes per point, on three acupoints (Lu1, Lu10, P6) on the arm and chest by the researchers. The experimental group received acupressure was administered alongside standard care. The control group received only standard care, without any additional interventions. Standard care includes the administration of supplemental oxygen to ensure adequate oxygenation and relieve respiratory symptoms, the timely delivery of prescribed medications based on the patient's clinical needs, and positioning the patient in a semi-Fowler position to improve respiratory mechanics, facilitate pulmonary function, and enhance comfort. The respiratory rate, rhythm, blood pressure, heart rate and Borg Scale Score of the experimental group were assessed and recorded before and after acupressure for 14 days. The vital signs of the control group were recorded once a day at the same time every day for 14 days. The FACIT-Pal Quality of Life Scale was applied to both groups on the 1st, 7th and 14th days of the study.

Patient identification form

The form prepared by the researcher includes seven questions addressing patients' personal and clinical characteristics, such as age, gender, educational level, marital status, medical diagnosis, and the presence of co-existing chronic illnesses. Additionally, the form was developed by the researchers based on a thorough review of the relevant literature [3,6].

Modified borg scale (MBS)

The MBS was first developed by Gunnar Borg in 1970 to measure the effort spent during physical exercise. The scale was revised in 1982 and became a scale consisting of 12 items that diagnose the severity of dyspnea according to their degrees [13]. As the scores on the scale increase, the severity of dyspnea increases. The MBS has been widely used in clinical settings, including palliative care, to assess respiratory symptoms. Given that the sample of the current study included adult palliative care patients with dyspnea, the scale was considered appropriate for this population.

Functional assessment of chronic illness therapy- palliative care (FACIT – Pal)

The validity and reliability of the scale, developed by David Cella and colleagues in 1993 [14], were validated by Lyons and colleagues in 2009 [15] with palliative care patients. This assessment tool, used to evaluate the quality of life of palliative care patients, consists of a total of 46 statements and 5 sub-dimensions. The total score ranges from 0 to 184. previous studies have demonstrated that the Turkish version of the scale has high reliability and validity in palliative care populations, with a total Cronbach's alpha of 0.932 and subscale values between 0.732 and 0.860.[16] These results support the suitability of the FACIT-Pal-TR as a tool for assessing quality of life in Turkish patients receiving palliative care, including those experiencing dyspnea. Cronbach's alpha for the total scale found to be 0.697 for this sample. This supports the applicability of the scale in the current research context.

Analysis and evaluation of data

Chi square test was used to ensure homogeneity of the experimental and control groups, t test or Wilcoxon for dependent groups in pre-test and post-test measurements, t test or Mann Whitney U analysis in independent groups for comparison of paired groups, Variance analysis or Kruskall Wallis Analysis for comparison of multiple groups, Cronbach alpha for internal validity, Kurtosis and Skeness coefficient analyses for normality distribution of data were used.

Ethical principles of the research

Ethical permission was obtained from Istanbul Kent University Scientific Research and Publication Ethics Committee with the decision number E-10420511-050-22565 (date: 2 May 2023; number: 2023/04). In addition, detailed information about the research was given to the patients constituting the sample of the study, and their verbal and written consent was obtained.

Results

Demographic and clinical variables

There was no statistically significant difference between the patients randomized into experimental (n=57) and control (n=58) groups in terms of age (65.789±9.444 vs. 67.172±10.417), gender (male 82.5 % vs. 84.5 %), marital status (married 86.0 % vs. 86.2 %), education level (secondary education and above 19.3 % vs. 29.3 %), smoking status (quit 70.2 % vs. 77.6 %), diagnosis (lung cancer 68.4 % vs. 75.9 %) and accompanying chronic disease (present 61.4 % vs. 65.5 %) (p>0.05) (Table 1).

Dyspnea level

In the study, when the MBS scores of the patients in both groups were compared, it was found that the MBS score of the experimental group after acupressure application on Day 1 (4.553± 1.189 vs. 5.224±1.351), Day 7 (3.907±1.211 vs. 5.581±1.074) and Day 14 (3.048± .973 vs. 5.357±.983) was statistically significantly lower than the control group (p<0.001) (Table 2). In addition, when the MBS scores of the experimental group were compared before and after acupressure within the group on Days 1, 7 and 14, it was determined that there was a statistically significant decrease (p<0.001) (Table 2).

Quality of life level

In the study, when the FACT-PAL scores of the patients in both groups were compared before and after acupressure application, there was no statistically significant difference between the experimental and control groups on the 1st and 7th days (p>0.05). However, on the 14th day, the FACT-PAL scores of the experimental group were found to be higher than the control group (137.583±13.627 vs. 123.333±10.116, p=0.006), (Table 3). In addition, when the FACT-PAL scores of the experimental group were compared before and after acupressure within the group on the 1st, 7th and 14th days, it was determined that there was no statistically significant difference (p=0.158), (Table 3).

Vital signs

In the study, when the effect of acupressure application on the vital signs of the patients in both groups was examined, there was no statistically significant difference between the respiratory rate averages of the experimental and control groups on the 1st and 7th days (p>0.05). However, on the 14th day, the respiratory rate of the experimental

Table 1
Distribution of personal and disease related features.

	Groups Experiment (n=57)	Control (n=58)	Test Value	*p*
Avg±Ss Avg±Ss				
Age	65.789±9.444	67.172 ±10.417	-.745[a]	.458
Gender n (%) n (%)				
Female	10 (17.5)	9 (15.5)	0.086[b]	0.806
Male	47 (82.5)	49 (84.5)		
Marital Status				
Married	49 (86.0)	50 (86.2)	.001[b]	1.000
Single	8 (14.0)	8 (13.8)		
Educational Status				
Illiterate	10 (17.5)	10 (17.2)	1.650[b]	.438
Elementary	36 (63.2)	31 (53.4)		
Middle School or Higher	11 (19.3)	17 (29.3)		
Smoking Habit				
Smokes	9 (15.8)	8 (13.8)	1.037[b]	.596
Does not smoke	8 (14.0)	5 (8.6)		
Quit	40 (70.2)	45 (77.6)		
Diagnosis				
Lung Cancer	39 (68.4)	44 (75.9)	1.488[b]	.475
COPD	17 (29.8)	12 (20.7)		
Prostate Cancer	1 (1.8)	2 (3.4)		
Comorbidity Chronic Illness				
Present	35 (61.4)	38 (65.5)	.210[b]	.647
Not Present	22 (38.6)	20 (34,5)		

[a] T Test in independent groups.
[b] Pearson Chi-Square test

Table 2
Comparison of MBS scores of the groups.

	Experiment Group(n=57)				Control Group (n=58) *Avg±Ss*	Test value
	Pre-Application *Avg±Ss*	Post-Application *Avg±Ss*	Difference *Avg±Ss*	Test value *p*		≠*p*
MBS Score						
Day 1	5.910±1.239	4.553± 1.189	1.357±.903	11.246[b] **.000**	5.224±1.351	-2.808[a] **.006**
Day 7	5.511±1.297	3.907± 1.211	1.604±.929	11.322[b] **.000**	5.581±1.074	-6.782[a] **.000**
Day 14	4.561±1.119	3.048± .973	1.512±.778	12.437[b] **.000**	5.357±.983	-10.746[a] **.000**

[a] T Test in independent groups
[b] Paired Samples Test
≠: Result of comparison of post-application Experiment Group and Control Group

Table 3
Effects of acupressure on quality of life - FACT-PAL.

Total Score	Groups		Test Value
	Experiment *Avg±Ss*	Control *Avg±Ss*	*p*
Day 1	130.588±15.108	132.928±17.669 [c]	-.358 [a] .739
Day 7	128.866±23.600	124.222±13.299 [d]	-1.430 [a] .155
Day 14	137.583±13.627	123.333±10.116 [e]	-2.692 [a] **.006**
Test Value	2.028[b]	8.382 [b] (c>e)	
p	0.158	0.001	

[a] T Test in independent groups, [b]Repeated Measure Anova Test

group after acupressure application was statistically significantly lower than the control group (21.365±3.652 vs.23.166±4.477), (p=0.048). In addition, when the respiratory rate average scores of the experimental group before and after acupressure were compared within the groups on the 1st, 7th and 14th days, a statistically significant difference was determined (p<0.05), (Table 4).

In the study, when the oxygen saturation levels of the patients in both groups were compared before and after acupressure application, there was no statistically significant difference between the experimental and control groups on the 1st and 14th days (p>0.05). However, on the 7th day, it was found that the saturation level of the experimental group after acupressure was higher than the control group (97.279±2.003 vs. 95.627±2.952, p=0.003), (Table 4). In addition, when the oxygen saturation levels of the experimental group were compared before and after acupressure within the group on the 1st and 7th days, it was determined that there was a statistically significant increase (p<0.001), (Table 4).

In the study, when the heart rate of patients in both groups was compared before and after acupressure application, there was no statistically significant difference between the experimental and control groups on the 1st and 7th days (p>0.05). However, on the 14th day, the heart rate of the experimental group was lower than the control group (87.097±15.130 vs. 94.452±12.755, p = 0.019). In addition, when the heart rate of the experimental group was compared before and after acupressure on the 1st and 14th days, it was determined that there was a statistically significant decrease (p<0.001), (Table 4).

In the study, when the systolic blood pressure levels of the patients in both groups were compared before and after acupressure application, it was determined that there was a statistically significant difference between the experimental and control groups on the 7th and 14th days (p<0.05). In addition, when the systolic blood pressure levels of the experimental group were compared before and after acupressure within the group on the 1st, 7th and 14th days, it was determined that there was a statistically significant decrease (p<0.05), (Table 4). In the study, when the diastolic blood pressure levels of the patients in both groups were compared before and after acupressure application, there was no statistically significant difference between the experimental and control groups in all measurements (p>0.05). When the diastolic blood pressure levels of the experimental group were compared before and after acupressure within the group on the 7th and 14th days, it was determined that there was a statistically significant decrease (p<0.05), (Table 4).

Discussion

The present study demonstrated a statistically and clinically significant improvement in dyspnea symptoms following acupressure application, as evidenced by reductions in Modified Borg Scale (MBS) scores. The within-group decreases in MBS scores in the experimental group (1.357 on Day 1, 1.604 on Day 7, and 1.512 on Day 14) surpass the established minimal clinically important difference (MCID) of 0.9 units for the Borg dyspnea scale in patients [17], and also meet the threshold of 1 unit considered clinically significant in previous studies. [18] These findings highlight the potential utility of acupressure as a non-pharmacological intervention for symptom management in palliative care. Although the observed increase in SpO_2 (~1.7 %) did not reach the commonly accepted MCID of ±4 percentage points [19], the improvement in subjective dyspnea perception reflects a meaningful enhancement in patient comfort, which is of primary concern in palliative settings.

Dyspnea is defined as difficulty in breathing or experiencing shortness of breath and can be seen in both acute and chronic forms. This condition can often be accompanied by psychological symptoms such as anxiety and depression, as well as symptoms such as rapid breathing (tachypnea) and decreased physical capacity. Dyspnea is the most common and most challenging symptom, especially in chronic lung diseases. The treatment approaches for both acute and chronic forms differ and can seriously affect the quality of life of patients [20]. The current study demonstrated that acupressure significantly reduced dyspnea severity in palliative care patients. These findings are in line with previous studies investigating the physiological and psychological effects of acupressure in patients with chronic respiratory conditions. Similar to the findings of the current study, a single-blind randomized controlled experimental study conducted by Doğan and Taşçı (2020)[21] to determine the effects of acupressure on the quality of life and dyspnea levels in individuals with lung cancer was performed with acupressure applied to the experimental group. Acupressure was performed using the P6-Lu1-Lu10 acupuncture points on the hand, forearm and chest, and a total of 56 sessions of acupressure were applied twice a day for 4 weeks. The control group received standard care. As a result of the study, it was reported that 4 weeks of acupressure application showed a significant decrease in the dyspnea levels of the participants and also significant increases in their quality of life. Similarly, in a study conducted by Wu et al., 2007,[22] with COPD patients, acupressure applied to points GV14, CV22, UB13, UB23 and LU10 for 16 minutes daily for four weeks had

Table 4
Effects of acupressure on vital signs.

	Experiment Group (n=57)					Control Group (n=58) *Avg±Ss*	Test Value
	n	Pre-Application *Avg±Ss*	n	Post-Application *Avg±Ss*	n Difference	Test value *p*		ǂ*p*
Respiration Rate								
Day 1		24.982±5.368		23.178±4.801	1.804±2.323	5.810[b] **.000**	24.465±5.054	-1.393[a] .166
Day 7		24.953±4.995		23.069±4.929	1.884±1.802	6.854 [b] **.000**	23.465±4.671	-.382 [a] .704
Day 14		23.292±3.861		21.365±3.652	1.927±1.902	6.485 [b] **.000**	23.166±4.477	-2.005 [a] **.048**
Oxygen Saturation (%)								
Day 1		95.535±2.853		96.392±2.598	-0.857±1.920	-3.340 [b] **.002**	95.672±2.886	-.241 [a] .810
Day 7		96.395±2.001		97.279±2.003	-0.884±1.348	-4.296 [b] **.000**	95.627±2.952	3.035 [a] **.003**
Day 14		95.268±5.113		96.756±4.768	-1.488±6.881	-1.384 [b] .174	95.500±2.297	1.534 [a] .129
Heart Rate (minute)								
Day 1		94.428±16.383		92.607±15.898	1.821±4.156	3.279 [b] **.002**	93.431±15.653	.100 [a] .920
Day 7		91.790±19.753		90.558±15.987	1.232±7.702	1.049 [b] .300	93.744±14.123	-.979 [a] .330
Day 14		92.536±14.265		87.097±15.130	5.439±4.873	7.146 [b] **.000**	94.452±12.755	-2.397 [a] **.019**
Systolic Blood Pressure								
Day 1		123.750±20.258		119.625±16.851	4.125±8.255	3.739 [b] **.000**	120.982±15.433	.847 [a] .399
Day 7		119.790±15.221		115.860±14.850	3.930±8.441	3.053 [b] **.004**	67.139±6.563	19.677 [a] **.000**
Day 14		116.756±12.322		112.975±12.484	3.780±4.430	5.464 [b] **.000**	119.476±11.529	-2.465 **.016**
Diastolic Blood Pressure								
Day 1		70.892±11.813		69.303±10.313	1.589±6.457	1.842 [b] .071	69.534±10.082	.719 [a] .474
Day 7		69.023±9.236		65.837±7.489	3.186±6.161	3.391 [b] **.002**	67.139±6.563	1.201 [a] .233
Day 14		69.170±7.169		66.487±6.993	2.682±5.298	3.242 [b] **.002**	67.142±5.973	-.459 [a] .647

[a] T Test in independent groups, [b]Paired Samples Test
ǂ: Result of comparison of post-application Experiment Group and Control Group

positive effects on lung function, oxygen saturation, six-minute walking distance, dyspnea and state anxiety compared to the placebo group (Wu et al., 2007). In two separate studies conducted by Maa et al. on patients with bronchiectasis and asthma, it was concluded that acupressure applied to points LU1, LU5, LU10, ST36 and ST40 for 2.5-10 minutes daily for eight weeks significantly improved dyspnea and respiratory health-related quality of life compared to standard treatment (medication and chest physiotherapy) [23,24]. In a separate study, Tsay et al. observed that 12 minutes of daily acupressure on LI4, PC6, and HT7 points for 10 days improved dyspnea, anxiety, blood pressure, heart rate, and respiratory rate in COPD patients compared to a placebo group that received handholding and massage [25]. Studies have shown that acupressure can reduce sympathetic nerve stimulation, dyspnea, and anxiety symptoms, including those using mechanical ventilation for a long time [22–25]. Consistent with these findings, the present study adds novel evidence by focusing on palliative care patients a population that has been less frequently studied in acupressure literature. Unlike prior studies that mostly focused on cancer or COPD patients in earlier disease stages, this study provides evidence for the short-term benefit of acupressure in a population with advanced illness and complex symptom burden. According to the ESMO Clinical Practice Guideline, acupuncture and acupressure are beneficial in the short term to reduce dyspnea symptoms in cancer patients [26]. Therefore, the results of the current study are both consistent with and complementary to the existing literature, while also highlighting the potential for acupressure to be integrated into holistic, supportive care approaches in palliative settings. The results of studies investigating the effect of acupressure on dyspnea support the effectiveness of this method. The current study shows that acupressure reduces the severity of dyspnea in palliative care patients in the short term. These findings are in line with the literature suggesting that acupressure has a multidimensional effect on physiological and psychological symptoms. These findings can be explained by the fact that acupressure stimulates the hypothalamus and pituitary gland by manual pressure on acupuncture points, releases β-endorphin free radicals, and causes changes in the levels of endogenous opioids (such as endorphins and encephalins) or stress-related hormones (such as adrenocorticotropic hormone) [21]. Respiratory symptoms, especially dyspnea, play a significant role in the quality of life of palliative care patients, particularly those with lung cancer, where acupressure practice has been explored as a supportive intervention. The quality of life of these patients varies depending on the severity of symptoms such as chronic cough, shortness of breath, air hunger, anxiety, and chest pain [27]. Various studies have shown that respiratory symptoms, especially shortness of breath, are an important factor in the assessment of quality of life and that treatment of disease symptoms has the potential to improve quality of life [21,28,29]. In the present study, a significant improvement in quality of life was observed on day 14 in patients receiving acupressure compared to the control group, highlighting the potential of acupressure to enhance well-being in palliative care settings. These findings align with Doğan and Taşçı (2020) [21], who reported improvements in quality of life and dyspnea relief among lung cancer patients following acupressure interventions. Moreover, prior research has indicated that acupressure reduces dyspnea and improves quality of life in patients with advanced lung cancer and mesothelioma [30]. Supporting this, a recent meta-analysis by Wang et al. (2024) [31] demonstrated that acupressure significantly improved quality of life in COPD patients (MD = -3.20, 95 % CI: -3.92 to -2.49, $p < .0001$), emphasizing the accumulating evidence for this non-pharmacological approach.

The absence of significant differences in quality of life on days 1 and 7 suggests that the effects of acupressure develop gradually over time. This temporal aspect supports the notion that a sustained intervention period may be necessary for physiological and psychological benefits to manifest fully, as highlighted in the meta-analysis by Wang et al. (2024) [31]. Such findings underscore the importance of continuous application of acupressure for optimal outcomes.

One of the important results of our study was that acupressure application increased oxygen saturation, improved respiratory rate, heart rate and blood pressure values compared to the control group and brought them closer to normal levels. To our knowledge, no prior studies have specifically examined the effects of acupressure on vital signs in palliative care patients, marking this as a novel contribution of our research. Studies with different sample groups have also reported that acupressure has positive effects on vital signs. In a randomized sham-controlled experimental study conducted on coronary angiography patients, it was reported that acupressure reduced vital signs compared to sham application [32]. It was stated that reiki and acupressure reduced pain and anxiety and slightly improved vital signs compared to the control group in patients undergoing percutaneous coronary intervention [33]. Collectively, these findings, consistent with our results, indicate that acupressure has the potential to modulate vital signs and improve patient outcomes. However, it is important to note that although statistically significant differences were observed between experimental and control groups in this study, all vital sign values remained within clinically stable ranges. These results gain further importance considering the close relationship between vital signs, sympathetic nervous system activity, and overall hemodynamic balance. The physiological effects of acupressure may stem from its ability to rebalance sympathetic and parasympathetic nervous system activity, suggesting a mechanism by which acupressure can act as an important complementary therapy, especially in managing vital sign alterations linked to anxiety and stress.

In terms of feasibility, five patients in the experimental group chose to withdraw from the study after it began, none of whom reported dissatisfaction with or adverse reactions to the acupressure intervention. Among the remaining participants, all acupressure sessions were completed fully and as scheduled, with no sessions missed or modified in duration. Minor timing adjustments were made when necessary to accommodate routine nursing procedures (e.g., IV medication administration or hygiene care), but this did not impact adherence. The intervention was administered by a nurse researcher familiar with the clinical setting, who reported no difficulty performing the intervention and observed no side effects. These results suggest that acupressure is a feasible, acceptable, and well-integrated intervention in the palliative care context, without imposing additional burden on nursing staff.

Limitations of the study

There are some limitations to this study. The first of these is that the study was conducted only with patients in the palliative care unit and in a single center. The participants in the study had different diagnoses. There was no group that received sham or placebo treatment. However, due to the nature of the intervention, blinding of the researcher delivering the intervention was not feasible, as the acupressure technique could not be administered without awareness of group assignment. This lack of blinding is acknowledged as a limitation of the study, particularly in relation to the potential for bias in subjective outcome assessments. There were difficulties in long-term follow-up due to the high mortality rate in patients in the palliative care unit (patients dying, being admitted to intensive care, etc.). Another difficulty was that the patients in the sample did not accept to participate in the study due to their pain and shortness of breath. In addition, since the vital signs evaluated in the study can be affected by many factors (disease status, anxiety, ambient temperature, patient position during measurement), the fact that these factors could not be fully controlled is another limitation of the study. The analyses were conducted per-protocol without applying an intention-to-treat (ITT) approach, which may have led to an overestimation of the intervention effect.

Conclusions

The results of this study show that acupressure reduces vital signs (oxygen saturation, heart rate, respiratory rate, systolic and diastolic blood pressure), dyspnea and improves quality of life in palliative care patients. Acupressure allows patients to relax and unwind, while allowing nurses to take a holistic approach in the care process. In light of the findings, nurses should be encouraged to evaluate all aspects of palliative care patients and use the acupressure method, which is easily applicable, low-cost, non-invasive and effective, especially in areas with limited resources such as palliative care. Acupressure has the potential to be a complementary method to conventional approaches such as drug therapy and physical therapies in the management of both acute and chronic dyspnea. It can be used to improve the quality of life of individuals, especially in palliative care, where symptom management is at the forefront. However, it is important that these practices are implemented by health professionals in accordance with standard protocols and that patient-based approaches are adopted. In addition, most studies on acupressure are limited to small sample groups and short-term follow-ups. Further research is recommended on long-term effects, applicability in different patient groups, and the influence of individual factors (age, disease severity, etc.).

CRediT authorship contribution statement

Vildan Kocatepe: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Dilek Yıldırım:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Methodology, Investigation, Funding acquisition, Formal analysis. **Özlem Oruç:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Zahide Aksoy:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Methodology, Investigation, Funding acquisition, Data curation.

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