

Three Acupoints of Acupressure Improve the Anxiety Level in Cancer Patients based on Types of Cancer Therapy

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ABSTRACT

Background: Cancer and its therapeutic management trigger the multi organs physical disorders that can cause the patient to worry and become anxious about the condition. Three acupoints of acupressure therapy stimulate relaxation of the body and can reduce anxiety. The purpose of this study was to determine the influence of three acupoints of acupressure therapy to improve the anxiety level in cancer patients based on types of cancer therapies.

Methods: This was an intervention study assessment by pre and post treatment. The samples were 30 cancer patients living at the Indonesian Cancer Foundation East Java Branch Surabaya Indonesia, taken by purposive sampling technique based on inclusion criteria. In this study, there were 2 groups, chemotherapy and chemoradiotherapy. The instrument was Beck Anxiety Inventory that was valid and reliable based on the test. Ethical feasibility tests had been carried out. Acupressure therapy was given on acupoints St36, Li4 and Li11. It had been conducted 2 times per week for 4 weeks. Wilcoxon Signed Rank Test was applied to analyze this result with $p < 0.05$.

Results: There was a significant effect of acupressure for improving anxiety levels in both groups with p-value in the chemotherapy group of 0.001 and in the chemoradiotherapy group of 0.002. However, the greatest influence occurred in the chemotherapy group compared to the chemoradiotherapy group.

Conclusions: Acupressure therapy in three acupoints can stimulate relaxation condition, which can decrease the anxiety level for cancer patients with all types of cancer therapies.

INTRODUCTION

Cancer disease and management of cancer therapies such as chemotherapy, radiation, chemoradiotherapy, hormone therapy or combination of several therapeutic treatments can cause the physical impact on several organs of the body [1,2]. Research on 90 cancer patients who received chemotherapy showed that 83.3% had nausea, 78.9% had vomiting, the others had alopecia, anorexia, and peripheral nerves disorders [3]. Chemotherapy has an impact on the chronic pain in cancer patients [4]. Limited physical functions due to cancer disease and its therapy affect psychological function disorders. In the post-therapy, cancer patients also feel anxious and feared of the relapse of cancer at the moderate level [5]. Based on the results of the preliminary survey in 2017 at Indonesian Cancer Foundation East Java Branch Surabaya Indonesia, cancer patients expressed verbal anxiety and there was no special treatment to reduce it.

The highest cancer prevalence in Indonesia is in DI Yogyakarta province reaching 4.9‰. Most cancer patients are women (2.9‰) and in urban areas (2.06‰). Chemotherapy as cancer management reached 24.9%, radiation 17.3% and other therapies 24.1%. The most cancer management is surgery that reached 61.8% [6].

Physical illness is one of the stressors that affect an individual's psychological condition. Physical disorders cause anxiety because it can be threatening the physical integrity and affecting individual's self-concept. Stressful situation can activate the hypothalamo-pituitary-adrenocortical (HPA axis), which causes glucocorticoids secretion. It stimulates on multiple organ systems to redirect energy. Stress responses are inhibited by negative feedback mechanisms such as chronic basal hypersecretion, sensitized stress responses, and adrenal exhaustion. It cause an individual feel anxiety [7].

One of the non-pharmacological therapies that can be done to reduce anxiety in cancer patients is the acupressure therapy. The physical pressure on acupoints is done by using hands, elbows, or a tool. Acupoints

pressure can stimulate sensory nerve cells around the acupressure point which is then forwarded to the spinal cord, mesencephalon, and hypothalamic pituitary complex which are activated to release β -endorphins hormone to provide a sense of calmness and comfort [8]. Acupressure has a significant effect on reducing anxiety levels and this is recommended as a cheap and effective complementary therapy [9]. The purpose of this study was to determine the influence of three acupoints of the acupressure therapy to improve the anxiety level in cancer patients based on types of cancer therapies.

METHODS

Participant

This was an intervention study assessment with pre and post treatment. The population were 42 cancer patients living at the Indonesian Cancer Foundation East Java Branch Surabaya Indonesia. The samples were 30 cancer patients taken by purposive technique sampling based on inclusion criteria consisting of getting chemotherapy or chemoradiotherapy, experiencing anxiety, and willing to follow an acupressure therapy for 4 weeks. Time period for this research on May–June 2018. The instrument was Beck Anxiety Inventory (BAI) with validity test R 0.734–0.880 and reliability test with Cronbach alpha 0.897. It means that the instrument was valid and reliable for measuring anxiety level. Ethical test was conducted by ethical foundation and declared ethical with certificate number 0089/WM12/Q/2018. The research ethical procedures were done through explanation about research purposes, advantages, procedures, and risk, and then the participants signed an informed consent if they agreed to be the participant.

Before the treatment, the participants filled out the BAI questionnaires as a pre-test to assess the initial condition of the participants' anxiety levels. A certified acupressure therapist implemented acupressure to all of participants with on 3 acupoints, St36 (Zusanli) on the tibialis anterior muscle, Li4 (HeGu) on the dorsum of the hand radial to the midpoint of the second metacarpal bone and Li11 (QuChi) on the lateral aspect of the elbow, at the midpoint with the lateral epicondyle of the humerus. Acupressure was done with the fingertips using deep and firm pressure to massage and stimulate acupoints. The techniques were pressing for 5 seconds followed by pressing and rotating for 5 seconds. they were done 3 minutes at each acupoint. They were conducted 2 times a week for 4 weeks. After the treatment, all of participants did the post-test by filling out the BAI questionnaires to assess the final condition of the participants anxiety level's after the therapy. The anxiety level was assessed by comparing the average BAI scores of the post and pre treatments.

If the average BAI score at the post treatment was lower than that at the pre treatment, it indicates that the level of anxiety is lighter. On the contrary, if the average BAI score at the post treatment was higher than that at the pre treatment, it indicates that the level of anxiety is getting higher.

Statistical Analysis

Wilcoxon Signed Rank Test was applied to analyze this result with $p < 0.05$. In this study, the mean used was the mean of pre and post tests. The Wilcoxon sign rank test is useful to determine whether the mean difference between the 2 groups is statistically significant or not. The Z value obtained is compared with the Z table value where if the Z value is greater than the Z table value, then H_0 is rejected.

RESULTS

Table 1. Demographic data of participant

Patient Characteristics	Chemotherapy		Chemoradiotherapy		
	(n=15)	(%)	(n=15)	(%)	
Age	36–45 years old	3	20	1	6.7
	46–55 years old	8	53.3	5	33.3
	56–65 years old	4	26.7	9	60
Sex	Female	11	73.3	12	80
	Male	4	26.7	3	20
Cancer stage	I	1	6.7	0	0
	II	7	46.6	3	20.0
	III	6	40.0	11	73.3
	IV	1	6.7	1	6.7
Length of cancer diagnosed	<1 year	2	13.3	1	6.7
	1–3 years	10	66.7	6	40.0
	4–6 years	2	13.3	3	20.0
	>6 years	1	6.7	5	33.3
Types of cancer	Breast cancer	6	40.0	6	40.0
	Cervical cancer	4	26.7	6	40.0
	Nasopharynx cancer	3	20.0	3	20.0
	Thyroid cancer	2	13.3	0	0

Most participants in chemotherapy group were 46–55 years old (53.3%) and chemoradiotherapy group were 56–66 years old (60%). Both groups were dominated by females, in chemotherapy group 73.3% and chemoradiotherapy group 80%. Based on the cancer stage, most participants in the chemotherapy group suffered from cancer stage II (46.6%) and chemoradiotherapy group cancer stage III (73.3%). Based on length of the cancer diagnosed, both of two groups were dominated by 1–3 years, in chemotherapy group 66.7% and chemoradiotherapy group 40%. Based on types of cancers, both groups were dominated by breast cancer, each of which was 40% (Table 1).

Before the acupressure therapy, the chemotherapy group had the moderate anxiety amounted to 10 participants (66.6%) and the chemoradiotherapy group

had moderate and severe anxiety with the same number of 7 participants (46.6%). After acupressure on acupoints St36, Li4 and Li11, there was a change in anxiety levels in both groups. The chemotherapy group was dominated by the mild anxiety level amounted to 8 participants (53.3%), while the chemoradiotherapy group was dominated by the moderate anxiety level, which amounted to 7 participants (46.6%) (Figure 1).

In the chemotherapy group, most changes were at the moderate anxiety (pre treatment) to mild anxiety (post treatment) of 7 participants, which means that there was decreasing level of anxiety. Meanwhile in the chemoradiotherapy group, there were 2 major changes in anxiety levels from severe anxiety to moderate anxiety and from moderate anxiety to mild anxiety. Each of them consisted of 5 participants (Table 2).

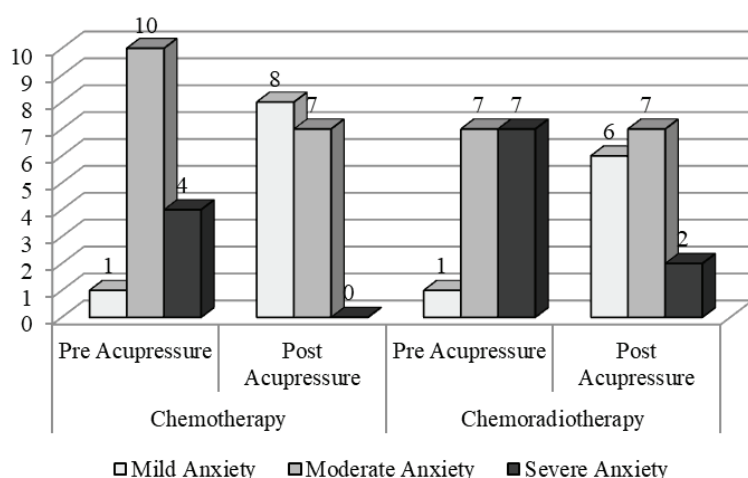


Figure 1. Anxiety level pre and post acupressure therapy based on types of cancer therapy

Table 2. Crosstabs anxiety level in chemotherapy and chemoradiotherapy group pre and post acupressure

Level anxiety	Chemotherapy		Chemoradiotherapy	
	n	%	n	%
Unchanged in severe anxiety	0	0	2	13
Severe anxiety to moderate anxiety	4	27	5	34
Severe anxiety to mild anxiety	0	0	0	0
Moderate anxiety to mild anxiety	7	47	5	34
Unchanged in moderate anxiety	3	20	2	13
Unchanged in mild anxiety	1	6	1	6
Total	15	100	15	100

Table 3. Statistics test between two groups

Group		n	Mean (SD)	Min–Max	Wilcoxon (Z)	p-value
Chemotherapy	Pre acupressure	15	22.4 (6.0)	15.0–32.0	-3.317	0.001
	Post acupressure	15	19.2 (5.9)	15.0–30.0		
Chemoradiotherapy	Pre acupressure	15	24.3 (7.1)	16.0–33.0	-3.162	0.002
	Post acupressure	15	23.2 (7.2)	16.0–33.0		

Table 3 showed that there was decreased mean of anxiety score in both groups. The lower score of anxiety means better level of anxiety and there was a significant effect of acupressure to reduce anxiety score in both of the groups with p value in chemotherapy group $p=0.001$ and Z value -3.317 , and in chemoradiotherapy group $p=0.002$ and Z value -3.162 . It means that there is a significant score decrease of anxiety after the treatment compared to the score before treatment, but the greatest influence occurred in the chemotherapy group.

DISCUSSION

Cancer is a chronic disease that can cause mental disorders such as depression, anxiety, fear, etc. In the previous study, it was found that cancer causes depression of 30% while in other chronic diseases such as diabetes mellitus, it is less than 30% [10]. Another study also confirmed the similar result that the prevalence of serious anxiety reached 44% in cancer patients [11]. One of the psychological symptoms often occurs in cancer patients is a feeling of anxiety about a worsening condition [5]. Cancer patients are anxious when undergoing treatment procedures while waiting for the results of laboratory tests [12] and also when the disease relapses or at the end of life care [13].

Figure 1 shows that before in the acupressure, most participants in chemotherapy group had moderate anxiety level, while in chemoradiotherapy group, most participants were two kinds of anxiety levels, moderate and severe anxiety levels. This is probably due to various factors, such as duration of suffering cancer. In this study, most participants had suffered cancer for 1–3 years, including newly diagnosed cases. This finding had the similarity with another study that cancer patients get high stress levels at the beginning of being diagnosed with cancer of 50.2%, stressed after 6 months after the diagnosis of 51.6%, and stressed after a year of being diagnosed of 40.3%. Those with high stress levels had higher anxiety scores [14]. One study also mentioned the same result that cancer patients who have suffered more than 12 months experienced increased anxiety level [15].

Anxiety in cancer patients also depends on types of cancers. Cancers in the reproductive system affect self-esteem and body image. Prevalence of anxiety and depression is higher on breast and stomach cancer patients [16]. Breast cancer patients experienced anxiety and depression because of the decrease in the self-esteem after mastectomy and the sexual drive [17]. Changes in the body image can disturb the patient's social interactions with other family members and people [11]. In our study, most respondents had cancer in the reproductive system, 40% breast cancer and 40% cervical cancer.

Cancer disease needs some treatments to minimize metastatic. The cancer treatment consists of chemotherapy, radiation, chemoradiotherapy, surgery, and hormonal therapy. The side effects due to by these therapies have a significant impact on the presence of disturbing physical and psychological symptoms. Anxiety is significantly higher in patients undergoing chemotherapy than those who received radiotherapy [18]. In this study on **Figure 1** the chemoradiotherapy group had higher anxiety scores compared to the chemotherapy group, it occurred because of more complex of therapies caused more side effects and it triggered anxiety.

The result on **Table 2** showed that after acupressure on three acupoints, both of the groups a change in anxiety levels that were better than the anxiety levels before acupressure. It is supported by result on **Table 3** that after acupressure on three acupoints, most respondents in both groups had decreased anxiety scores compared to the scores before treatment. In this study, the lower score of anxiety indicates the better anxiety level. The decrease in the anxiety score in this study is caused by an integrative acupressure on three acupoints St36 (Suzanli), Li4 (HeGu), Li11 (QuChi). Based on the result, the most changes occurred in the chemotherapy group. It is assumed that the chemoradiotherapy group had more complex physical disorders which affect anxiety.

In the previous study acupressure on St36 (Suzanli) had various functions among others to reduce glucose level [19], reduced cancer related fatigue [8], reduced nausea vomiting [20], and improved the tidal volumes and index of rapid shallow breathing [21]. While acupressure on Li4 (HeGu) dan Li11 (QuChi) in previous study used for increased skin temperature and decrease blood flow [22], to reduced labor pain and duration during the first stage of labor [23], and improved pain in patients with chronic neck pain [24].

The results of this study add to extent of the function of acupressure on St36 (Suzanli), Li4 (HeGu) and Li11 (QuChi) points which have proven to be effective in improving anxiety in cancer patients. Another study also reported that acupressure on St 36 can reduce the anxiety level and interleukin 6 in patients with the anxiety disorder [25]. Zhao et al. [26] stated that the St 36 acupoint can improve the emotions such as anxiety and stress and treat the psychological or mental disorders.

The previous study also found that to reduce anxiety, acupressure can be done on another acupoint. One study stated that the anxiety score of the patient before undergoing abdominal surgeries can be decreased by acupressure on the third eye and Shen men points [27]. The same study mentioned that acupressure on acupoints GV 29 and HT 7 three times a week for four weeks was able to significantly reduce pressure, anxiety, stress, and general psychological distress in patients with hemodialysis [28]. The study on 32 stage 1-3 breast

cancer patients undergoing chemotherapy, who were given acupressure at P6 point, resulted in decreased anxiety scores [29]. A third heart point (LIV3) is the point of stimulation on acupressure which can result in reduced patient anxiety. Acupressure and energy balance are used to relieve pain, reduce muscle contractions, improve blood circulation status and performance of vital signs, and reduce symptoms of anxiety [30]. P6 points in the spleen meridian and St36 on the meridian stomach are useful to reduce anxiety, while Li4 can also be used to increase mental activity [31]. Acupressure has complex functions to improve the immune system, improve the flow of blood vessels to the heart, and relieve pain, stimulates alpha waves in the brain that cause relaxation and reduce anxiety and depression [32]. Another study confirmed the same result that 54 hemodialysis patients who were given 15 minutes of acupressure 3 times a week for 4 weeks had improvements in the levels of depression, anxiety, stress and general psychological distress [33].

Activation of certain acupoints activates the myelinated nerve fibers which stimulate the hypothalamus and pituitary gland, which causes the release of β -endorphins from the hypothalamus into the spinal fluid and pituitary into the bloodstream [21] and serves to increase serotonin, regulate serum cortisol [34], increase qi circulation, open meridian channels that affect energy and mood, and restore balance of yin and yang [35], stimulate the secretion of neurotransmitters and adrenocorticotrophic hormones [36], modulate physiological responses [37] and become therapeutic response to the autonomic nervous system [38]. Acupressure inhibits the hypothalamic-pituitary-adrenocortical axis to reduce cortisol production that causes a relaxation response [39], thereby reducing anxiety levels. Acupressure has a significant effect on anxiety in cancer patients [9].

The result of this study was unable to represent the larger cancer population because it only has a small number of participants.

CONCLUSIONS

The routine and continuing of acupressure on three acupoints St36 (Suzanli), Li4 (HeGu) and Li11 (QuChi) can effectively reduce the scores of anxiety in chemotherapy and chemoradiotherapy group because it can stimulate the relaxation condition for cancer patients with all types of cancer therapies. However, the greatest influence occurred in the chemotherapy group compared to chemoradiotherapy group.

DECLARATIONS

Competing of Interest

I declare that I do not have any competing interest, especially with the study funder.

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