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Effect of Acupressure on Dyspnea and Fatigue among Patients with Chronic Obstructive Pulmonary Disease

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Abstract
Background: Chronic obstructive pulmonary disease (COPD) is a leading public health concern worldwide. Dyspnea and fatigue considered the most common health problems among the COPD patients. Although pharmacologic management of COPD is of proven benefit, but it does not help all patients, therefore the **aim** of the current study was to examine the effect of acupressure on dyspnea & fatigue among patients with chronic obstructive pulmonary disease. **Methodology**: A quazi – experimental design was utilized to accomplish this study, the sample of 40 adult male and female patients were recruited and randomly assigned equally into study or control group, the control group received the traditional management while study group received traditional management plus acupressure, the study conducted at chest unit and two medical units in Kasr Al-Aini hospital. Five tools were utilized to collect data included socio-demographic data sheet, The University of California at San Diego (UCSD) Shortness of Breath Questionnaire, Fatigue severity scale (FSS), respiratory rate and O2 saturation sheet and 6 minute walk distance (6MWD). Patients in both groups observed for four weeks. **Results:** The study results concluded that there was a statistical significant difference between study and control group in relation to dyspnea by the end of the 4th week and respiratory rate & oxygen saturation by the end of the 2nd & 4th week. However, there was no statistical significant difference between the two groups in relation to fatigue and 6 MWD test. **Conclusion**: the study results concluded that acupressure may be effective as an adjuvant therapy to the traditional management for COPD patients to improve dyspnea, respiratory rate and oxygen saturation, while acupressure has no significant effect on fatigue or to improve distance of patients walk. **Recommendation**: Prospective study should be designed to determine the stability of the effect of acupressure as an adjuvant to control dyspnea. In addition, further studies may be needed with different acupressure points may be recommended to treat fatigue among those patients.
Keywords: acupressure, COPD, fatigue, dyspnea.

1. Introduction

Chronic obstructive pulmonary disease (COPD) is a leading public health concern and is one of the most important causes of morbidity and mortality worldwide (World Health Organization, 2008). Despite efforts of reducing, the prevalence of COPD remains high. More than 52 million individuals suffer from COPD all over the world (Ibrahim, 2011 & Mannino & Buist, 2007). In addition, the burden of COPD is expected to increase, such that by 2020, it will be the fifth leading cause of lost disability-adjusted life years worldwide (Uronis, Currow & Abernethy, 2006). COPD, as a dangerous disease, leads to loss of productivity, disability and interfere with quality of life. A prospective comparison between patients with end stage COPD and lung cancer indicated that patients with COPD had significantly worse activities of daily living and physical, social, emotional functioning as well as health-related quality of life (HRQoL) than patients with lung cancer (Habraken et al., 2011 & Booth, Silvester & Todd, 2003). Dyspnea and fatigue are the two most common symptoms experienced by patients with COPD (Abdel Raouf & AlSebaee, 2011).

Regarding dyspnea, a study done on 131 participants with COPD, found that 84% of the studied sample experienced severe dyspnea, while 59% had at least one daily episode of dyspnea. Dyspnea is the most common cause of patients with COPD seeking medical help, but only 39 % obtained relief using prescribed treatment (ChiWu et al., 2004). Additionally, quality of life (QoL) of these patients diminish most often as a result of dyspnea, as ninety-five percent of patients reported that breathlessness was their most significant debilitating symptom (Uronis, Currow & Abernethy, 2006). Moreover, dyspnea related fear is associated with worse 6 minute walk distance (6MWD) and perceived functional limitations (Janssens et al., 2011). Conventional methods of alleviating dyspnea by modifying the disease begin to fail and it becomes more difficult to optimize comfort (Uronis, Currow & Abernethy, 2006). Further studies have confirmed the predominance of this symptom along with significant problems with fatigue, pain, anxiety, panic, poor sleep and depression (Seamark et al., 2004).

Fatigue considered the second symptom in importance for patients with COPD after dyspnea (Baltzan et al., 2011). It is one of the most prominent disabling symptoms in COPD (Theander & Unosson, 2004). It is strongly associated with depression (Al-Shair et al., 2009), decline in daily functional activity, and substantial impairment in quality of life (Arne et al, 2009). In addition, COPD patients with fatigue have been shown to be less

physically active and more exercise intolerant (Al-shair et al., 2011). Unfortunately fatigue is viewed by the health professionals as something that cannot be changed as it is part of the disease process. Thus, fatigue is rarely treated medically (Tsay, 2004).

Although pharmacologic management of COPD is of proven benefit, but it does not help all patients (Vickers et al., 2005). In addition, the side effects of pharmacotherapy may actually exacerbate respiratory effort and increase respiratory muscle weakness. As well as, the very costly of management in terms of time, space, staff, and equipment (ChiWu et al., 2004). Therefore, it is recommended to examine other modalities for effective management of symptoms such as dyspnea and fatigue to improve individual quality of life and reduce health care costs (American Pain Society, 2012).

Nonpharmacological treatments have evolved rapidly as an essential part of COPD therapy. They are especially important as complementary interventions in severe or very severe disease, when there is loss in function, a reduction in quality of life and when psychological impairments further complicate the disease (Clini & Ambrosino, 2008). Acupressure as one of the oldest nonpharmacological treatments was developed in China from nearly 5000 years ago. It was used as a therapeutic modality for treating disease and discomfort by unblocking interruptions in the body's energy network. According to Eastern medicine, the body has a network of energy channels or meridians, similar to the vascular system for the circulation of blood. When the network is disrupted, health suffers; therefore, acupressure was developed to stimulate the acupoints on meridians to increase the flow of energy (National Cancer Institute, 2012). Acupressure may be an effective intervention for a wide variety of symptoms such as dyspnea, fatigue and pain (Jones et al., 2008). Forty-three studies examined the efficacy of acupressure for symptom management, majority of these investigators (84%) concluded that acupressure was effective for symptom management in adults with a variety of disorders and conditions (Lee & Fan, 2009). Thus the purpose of the current study was to examine the effect of acupressure on dyspnea & fatigue among patients with chronic obstructive pulmonary disease.

2. Significance of the study

COPD increases worldwide, it is the 4th leading cause of death, and WHO predict that it will be the 3rd leading cause of death by the year 2030 (Ibrahim, 2011). Dyspnea and fatigue are the most distressing symptoms of this illness, and significantly impair both functional performance and quality of life (Abdel Raouf & AlSebaee, 2011& Rivera-Fernandez et al., 2006). In consequence, pharmacological interventions alone often do not relieve dyspnea and fatigue adequately and patients are left with distressing symptoms, furthermore the use of drugs to treat these distressing symptoms are sometimes limited as they cause adverse effects and doses need to be titrated carefully (Bausewein et al., 2011). Therefore, nonpharmacological treatments such as acupressure which used as an adjuvant to pharmacological interventions, have gained in popularity to relieve these distressing symptoms.

Acupressure is safe, noninvasive, pain free, easy to self – administer and has been demonstrated to be without adverse effects. Moreover, it enhances a patients' sense of control over their condition, and improve QoL as well as cost effective (Clini & Ambrosino, 2008). Hence, it is an innovative idea to involve patients in their own plan of care to play a major role in relieving their distressing symptoms by using their own hands through acupressure.

3. The aim of the study

The aim of the study was to examine the effect of acupressure on dyspnea & fatigue among patients with chronic obstructive pulmonary disease.

4. Research Hypotheses

In order to accomplish the aim of this research, the following hypotheses were suggested

H1: The mean dyspnea scores will be significantly lower among study group who will receive traditional management plus acupressure than control group who will receive traditional management only.

H2: The mean fatigue scores will be significantly lower among study group who will receive traditional management plus acupressure than control group who will receive traditional management only.

H3: The mean respiratory rate will be significantly lower among study group who will receive traditional management plus acupressure than control group who will receive traditional management only.

H4: The mean oxygen saturation scores will be significantly higher among study group who will receive traditional management plus acupressure than control group who will receive traditional management only.

H5: The mean 6MDW test scores will be significantly higher among study group who will receive traditional management plus acupressure than control group who will receive traditional management only.

5. Methodology

5.1 Research design

A quazi – experimental design was utilized to conduct the research aim. Polit & Beck (2011) pointed out that Quasi – experimental design can examine the cause and effect relationship between studied variables**.** So, it is congruent with the research purpose because it can examine the impact of intervention (acupressure) on the dependent variables (dyspnea & fatigue among COPD), as well as it is applicable to the clinical setting.

5.2 Setting

The study was conducted in two medical departments and the chest department at Kasr – Al Aini hospital affiliated to the Cairo University.

5.3 Sample

A sample of 40 adult male and female patients were recruited according to the following inclusion criteria (1) patients diagnosed with COPD, (2) patients rate in the Visual Analogue Scale of dyspnea on 4 or more. While the exclusion criteria were (1) patients with liver diseases, heart disease, lung cancer or severe anemia (Hb is less than 6gm/dl). Patients were randomly equally assigned into control or study group. The control group received traditional management (O2 & drugs: bronchodilators; expectorant; antibiotics if needed) while, study group received traditional management plus acupressure.

5.4 Tools

The following tools were used to collect data pertinent to this study:

1- socio-demographic data sheet: was developed by the researcher, it covers patients related data regarding to age, gender, current occupation, level of education & smoking history.
2- The University of California at San Diego (UCSD) Shortness of Breath Questionnaire: is a 24-item self-report measure of the severity of breathlessness while completing daily tasks, such as walking, climbing stairs, eating, and bathing. The items had scores ranging from 0 – 5, the patient is instructed to circle a number from 0 to 5 based on his condition. A lowest value (0) indicates no dyspnea while a highest value (5) indicates severe dyspnea. The UCSD has an excellent internal consistency whereas Cronbach's alpha was .94. In addition Content validity by four panels of experts from medical surgical staff members was done. The tool is available for free to be used.
3- Fatigue severity scale (FSS): is a method of evaluating the impact of fatigue on life & severity of fatigue. The FSS questionnaire contains 10 items, nine out of them had 1 – 7 scores, the patient is instructed to read each statement and circle a number from 1 to 7, based on how accurately it reflect the extent to which the patient agree or disagree that the statement applies to him. A lowest value (1); indicates strong disagreements with the statement, whereas a highest value (7) indicates strong agreement. The overall fatigue is measured by the 10^{th} question 100 mm VAS. Modification was performed and content validity was done by four panels of experts from medical surgical faculty staff members. In addition Cronbach's alpha for reliability of the entire instrument was 0.86. The tool is available for free to be used.
4- Respiratory rate & O_2 saturation sheet: it was used to record the respiratory rate, in addition, a pulse oximetry was used to measure the oxygen saturation in a finger.
5- Six minute walk distance (6MWD): it measures the distance an individual is able to walk over a total of six minutes on a hard, flat surface. The goal is for the individual to walk as far as possible in six minutes. The individual is allowed to self-pace and rest as needed as they traverse back and forth along a marked walkway. Heart rate, blood pressure and oxygen saturation were measured before and after the test. It is the most reliable measure to use for the COPD patients.

5.6 Ethical consideration

Permission to conduct the proposed study was obtained from the heads of the departments. Prior to conducting the study, each potential subject was fully informed with the purpose and nature of the study, and then oral informed consent was taken from the participants. In addition, the researcher emphasized to each subject that participation in the study is entirely voluntary; anonymity and confidentiality were assured through coding of data, yet, withdrawal from the study is permitted as it is one of their rights. Each subject was assured that the intervention used in this study (acupressure) is safe, noninvasive, can be self administered and has no harmful effect on patients. In order to apply the principle of fairness in management, the control group of the study sample were received a session about the acupressure and how to apply it at the end of the data collection time.

5.7 Pilot study

A pilot study was conducted on 7 patients at the medical department. These patients were excluded from the study sample. The objectives of the pilot study were: to evaluate the content of the tools, to ensure clarity, relevancy, objectivity and feasibility. Almost all items were clearly understood and the responses were found appropriate. Modifications were done in the final form of the tools. The result of the pilot study confirmed that the study is feasible.

5.8 Procedure

Patients meeting the inclusion criteria were approached individually, then they were asked to rate their level of dyspnea on the VAS (score from 0 – 10). Those patients rated on number 4 or more were recruited in the current study. Patients were randomly and equally assigned to the study and control group. The socio-demographic data sheet, the UCSD shortness of breath questionnaire, FSS, respiratory rate, oxygen saturation and 6 min walk distance were filled out in order to determine the baseline information for both groups in the 1st interview, Patients in the study & control group were followed up for 4weeks. Table (1) describes the data collection plan.

Table (1): The plan for data collection

tools	Study group			Control group		
	Baseline	After 2 weeks	After 4 weeks	Baseline	After 2 weeks	After 4 weeks
Socio demographic	✓			✓		
UCSD questionnaire	✓	✓	✓	✓	✓	✓
FSS scale	✓	✓	✓	✓	✓	✓
Respiratory rate & O2 saturation sheet	✓	✓	✓	✓	✓	✓
6MWD test	✓		✓	✓		✓

For the study group, the acupressure technique started since 1st interview and performed 3 sessions/ week, the researcher applied 2 acupressure sessions per week for the patient, approximately every 2 - 3 days, and the 3rd one was self administered by the patient. Patients in the study group were taught how to apply the acupressure technique; so that they can self administer acupressure whenever needed but at least once per week (except the B 13 (Feishu) acupressure points because it is in the back) . In addition to the teaching sessions, each patient was provided by brochure that includes the sites of acupoints and step by step instruction on how to perform the acupressure technique. Further guidance for the patient was provided to help them to self administer the technique in the third session as marking the patient's skin on the acupressure points with a marker.

In order to apply the principle of fairness in management, the control group received a session about the acupressure and demonstration was done by the end of the data collection time, brochures were also available for them. Data collection phase was conducted over a period of 10 months.

5.8.1 Acupressure Technique

1- Acupressure was applied by pressing in circular movements on the acupoint with the thumb finger first in clock wise and then anti-clock wise direction. The finger must remain at the same point on the skin and be moved in small circles.
2- The patient was asked to perform breathing exercise during acupressure session.
3- The duration of each session ranged between 20 – 25 min \ session, cosseting of 3 min of massage for neck and each shoulder to free the Qi and blood and 3 min for each acupoints to apply acupressure.
4- Patients were instructed to apply acupressure during any exacerbation of symptoms.
5- Seven acupoints were used in the current study which were: P6 (neiguan), St 36 (Zusanli), Cv 22 (Tiantu), B 13 (Feishu), Du 14 (Dazhui), L 1 (Zhongfu) & L 10 (Yuji).

5.9 Data analysis plan

Upon completion of data collection, each answer sheet was coded and scored manually. Data was summarized using descriptive statistics as well as inferential statistics. The descriptive statistics included frequency & percentage distribution, means & standard deviation. Inferential statistics included t-test, ANOVA & chi – square. Data was revised, coded, analyzed and tabulated by the researcher using the statistical package for social studies (SPSS) version 16. The level of significance was fixed at the 5 % level ($P < 0.05$).

5.10 Limitation of the study

Studied sample attrition frequency was high because of patients' discharge, so it was hardly to find same patients for more than a month; this explained the researcher rationale of following up the patients for one month only.

6. Results

Finding of this study will be presented in two sections 1) description of the study subjects' characteristics & 2) differences in mean scores of dyspnea, fatigue, respiratory rate, oxygen saturation & 6MWD between study and control group along the study period.

N.B.: (N.S. means not significant).

6.1. Description of the study subjects' characteristics:

Table (2): Socio-demographic variables among control and study groups (N: 40).

Variables	Control (n:20)		Study (n:20)		p-value
	No.	%	No.	%	
Age:					
30-	3	15	2	10	N.S.
40-	7	35	9	45	
50	6	30	6	30	
60-	4	20	3	15	
Education:					
Illiterate	11	55	12	60	
Primary	0	0	1	5	N.S.
Secondary	1	5	3	15	
Bachelor	8	40	4	20	
Occupation:					
worker	12	60	11	55	
Employee	7	35	4	20	N.S.
Did not work	0	0	3	15	
housewife	1	5	2	10	
History of smoking:					
Yes	18	90	18	90	N.S.
No	2	10	3	10	
Still smoking					
Yes	6	30	8	40	N.S.
No	14	70	12	60	

Table (2) shows that the age range of the studied sample was 30 – 60 years. More than half of the control and study group were illiterate (55% & 60% respectively), while (40% & 20%) had bachelor degree in the control and study group respectively. In addition, (60% & 55%) of the control and study group were laborers, while (35% & 20%) had office work among control and study group respectively. Ninety percent of both study and control group had a history of smoking, moreover (30% & 40%) of the control and study groups respectively reported that they are currently smoking. The studied sample was homogenous in relation to socio-demographic characteristics as there were no statistical significant differences between study and control group in relation to socio-demographic variables.

Figure 1: The mean age of the study and control group (N: 40)

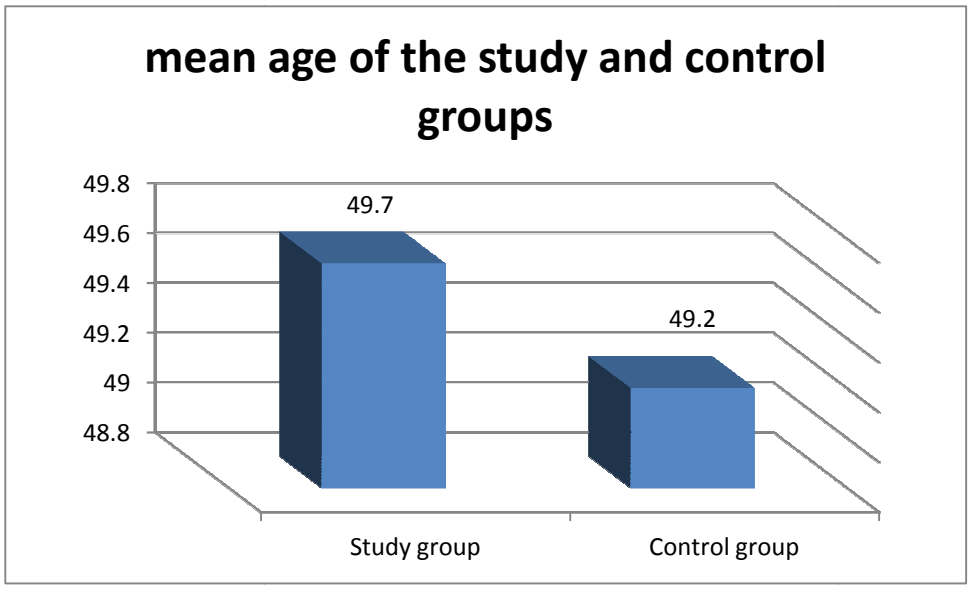
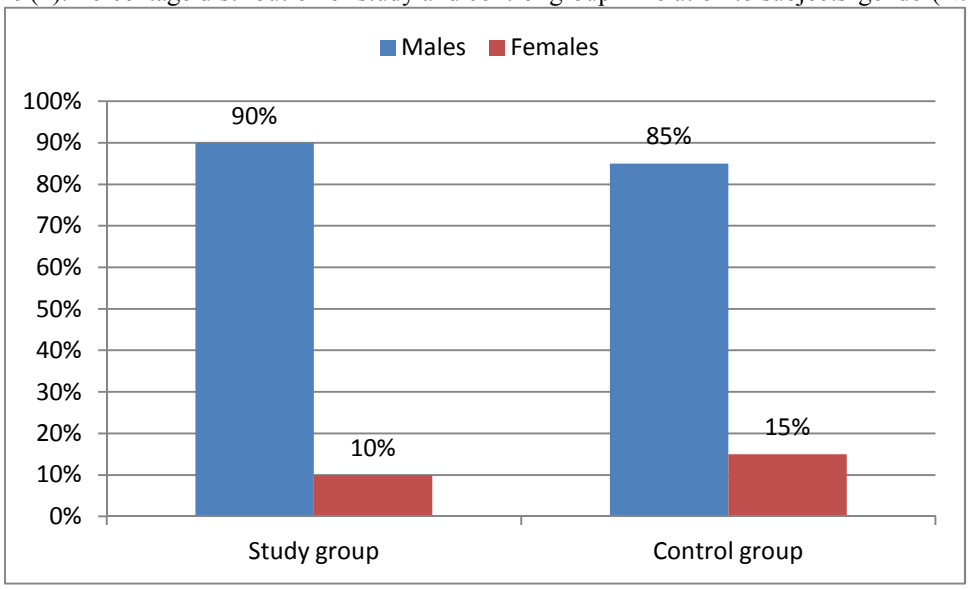


Figure (1) illustrated that the study and control group had approximately equal mean of age (49.7 $\pm$ 8.4 and 49.2 $\pm$ 9.9 respectively), with no statistical significant difference between them.

Figure (2): Percentage distribution of study and control group in relation to subjects' gender(N: 40).



Finger (2) shows that (90%) in the study group and (85%) in the control group were males. There was no statistical significant difference between study and control group in relation to gender.

6.2. Differences in mean scores of dyspnea, fatigue, respiratory rate, oxygen saturation & 6MWD between study and control group along the study period.

Table (3): Comparison of mean scores between study and control group in relation to dyspnea in the three observational periods (N: 40).

Observational periods	Control (n:20) X ± SD	Study (n:20) X ± SD	t-test	p-value
Base line	76.8 ± 16.4	77.9 ± 16.7	0.216	N.S
After 2 weeks	75.4 ± 18.6	74.4 ± 20.1	0.163	N.S
After 4weeks	78.6 ± 21.4	50 ± 31.1	3.38	.01
ANOVA test p-value	.019 N.S	8.399 .001		

Table (3) shows that there was statistically significant difference between study and control group at the 4th week interval (t-test 3.38, with p-value .01), in addition there was a statistical significant difference among three readings of the study group (ANOVA, 8.399, with p-value, .001). While there was no statistical significant difference among the control group in the three readings.

Table (4): Comparison of mean scores between study and control group in relation to fatigue in the three observational periods (N: 40).

Observational periods	Control (n:20) X ± SD	Study (n:20) X ± SD	t-test	p-value
Base line	30 ± 7.6	34.2 ± 16.2	1.05	N.S
After 2 weeks	30.8 ± 8.1	34.4 ± 16.6	0.871	N.S
After 4weeks	33.7 ± 9.5	30.2 ± 17	0.795	N.S
ANOVA test p-value	1.030 N.S	.398 N.S		

Although, the mean scores of fatigue decreased among the study group from 34.2 at base line to reach 30.2 by the end of 4th week, and the mean scores increased among the control group from 30 at baseline to reach 33.7 by the end of the 4th week, but there was no statistical significant difference either between study & control groups or within the group along the three readings.

Table (5): Comparison of respiratory rate mean between study and control group in the three observational periods (N: 40).

Observational periods	Control (n:20)	Study (n:20)	t-test	p-value
	X ± SD	X ± SD		
Base line	24.4± 1.6	24.9 ± 2.3	1.057	N.S
After 2 weeks	23.6 ± 1.3	22.6 ± 1.2	2.728	.013
After 4weeks	23.2 ± 1.6	21.7 ± .67	4.88	.000
ANOVA test p-value	2.621 . N.S	23.38 .000		

Table (5) shows that there was a statistical significant difference between study and control group by the end of 2nd week (t-test: 2.728 & p-value: .013) & by the end of the 4th week (t-test: 4.88 & p-value: .000). In addition, there was a statistical significant difference among study group, while there was no statistical significant difference among control group along the study period.

Table (6): Comparison of mean scores between study and control groups in relation to oxygen saturation in the three observational periods (N: 40).

Observational periods	Control (n:20)	Study (n:20)	t-test	p-value
	X ± SD	X ± SD		
Base line	90 ± 1.3	89.2 ± 2	1.519	N.S
After 2 weeks	89.1 ± 1.6	90.8 ± 1.9	3.06	.01
After 4weeks	88.6 ± 2.1	90.7 ± 1.9	3.6	.001
ANOVA test p-value	4.852 .011	4.221 .020		

Table (6) shows that there was a statistical significant difference between study and control group by the end of 2nd week (t- test: 3.06 & p-value: .01) & 4 weeks (t- test: 3.6 & p-value, .001) intervals. In addition, there was a statistical significant difference among study group (ANOVA: 4.221 with p – value: .020) and control group (ANOVA: 4.852 with p – value: .011) along the study period.

Table (7): Comparison of mean scores between study and control groups in relation to 6MWD test in the two observational periods (N: 40).

Observational periods	Control (n:20)	Study (n:20)	t-test	p-value
	X ± SD	X ± SD		
Base line	240 ± 54.9	240.4 ± 54.7	0.023	N.S
After 4weeks	238.9 ± 52.8	267.5 ± 62.5	1.563	N.S
t- test p-value	0.064 N.S	1.458 N.S		

Regarding the 6MWD, the mean of the 6MWD meter increased among the study group from 240.4 meter at the baseline to reach 267.5 meter by the end of the 4th week, while the mean of meters walked decreased among the control group from 240 meter at the baseline to be 239.8 meter by the end of the 4th week. Despite of this, there was no statistical significant difference either between study and control groups or among the group along the study period.

7. Discussion

The demand for complementary therapies amongst chronic disease patients has gained significant momentum over recent years especially acupressure because it is safe effective method of treatment, with no side effect profile, which in part adds to its popularity amongst patients (Filshie, 2010). Therefore, the current study was conducted to examine the effect of acupressure on dyspnea & fatigue among patients with chronic obstructive pulmonary disease.

The study was done on forty COPD patients equally divided into study and control group, the mean age of the whole studied sample was 49.4. This result go in accordance with a more recent meta-analysis of studies from several countries published between 1990 and 2004, the studies reported that average age among adults with COPD is above 40 years (Halbert, 2006). The majority of the studied sample were

males and had history of smoking, this high prevalence among males most likely due to the historically higher prevalence of smoking among them, a study done by Thompson & St-Hilaire (2010) supported the result of the current study and concluded that COPD was found to be more prevalent in smokers and males.

In relation to dyspnea, the current study concluded that the mean scores of dyspnea decreased significantly in the study group in comparison to the control group. This might indicate that dyspnea was significantly improved in the study group who received traditional management plus acupressure when compared with control group who received only traditional management. In fact, the underling mechanism by which acupressure can improve

dyspnea is not clear, but the researcher may suggest that acupressure produces muscle relaxation and promote feeling of comfort as well, this muscle relaxation also occurs for respiratory muscles. Moreover, respiratory muscle relaxation promotes comfort as well as anxiety and tension relief which might play a role of beneficial effect on dyspnea.

Two studies were performed on acupressure concluded that there was significant improvement in dyspnea among patients with COPD & asthma with performing acupressure with traditional therapy against traditional therapies only (Lee & Frazier, 2011 & Filshie, 2010). Another study done by Maa et al. (2007) found that acupressure significantly improved dyspnea and health related quality of life in patients with bronchiectasis when compared with a standard care group (medication and chest physiotherapy). However, a study done by Vickers et al. (2005) did not come with the same line with the current study findings which used acupuncture technique for dyspnea in cancer patients. The study concluded that the acupuncture had no effect in comparison to placebo for dyspnea in patients with cancer. In recent research study done by Suzuki, et al. (2012) on the effect of acupuncture among patients suffer from dyspnea with chronic obstructive pulmonary disease concluded that acupuncture is a useful adjunctive therapy in improving both dyspnea on exertion and 6-minute walk test.

As regards to fatigue, it was expected that when dyspnea improve in the study group fatigue also will improve, but the study result showed that there was no statistical significant difference in fatigue either among study and control group or between them. This finding can be interpreted in the light of the fact that fatigue is a multi factorial phenomenon, patients may suffer from fatigue because of pain, dietary impairment, and/or anxiety from hospital admission or disease consequences, therefore, it may need more than one intervention and it may be not correlated with dyspnea relief only. Another possible explanation that fatigue is not an easy health problem to treat it, as it might need relatively long time to be relived, so the patients may need more time to apply acupressure in order to gain the effect of acupressure on fatigue relief. Although the current study found no effect of acupressure on fatigue relief, two studies contradicted this result such that study by Harris et al. (2005) who investigated the effect of acupressure treatment administered daily for three days on fatigue among a university students, they found that acupressure significantly decreased fatigue. Additionally Molassiotis et al. **(**2007) reported that acupressure reduced fatigue in cancer patients when compared with a placebo group that received acupressure at an inappropriate location.

Regarding respiratory rate, the study results shows that there was a statistical significant difference between study and control group by the end of the 2^{nd} & 4^{th} week with lower mean rate in the study group than control group. The study result was supported by a study done by Tsay et al. (2005) on COPD patients, it was found that 12 minutes of daily acupressure for 10 days improved respiratory rate, dyspnea, anxiety, blood pressure and heart rate when compared with a placebo group.

Regarding O_2 saturation, the results revealed that there was a statistical significant difference between study and control group by the end of the 2^{nd} & 4^{th} week with higher mean scores in the study group than control group. This indicates that study group had better oxygen saturation than control group. In addition, there was a statistical significant difference among control group between the three readings with decreased mean score along the study period indicating that O_2 saturation get worse along the research period among control group. While the mean score of O_2 significantly increased along the research period indicating that O_2 saturation improved among the study group. The possible explanation of O2 saturation improvement may be contributed by the dyspnea improvement and other possible suggestion that relaxation of respiratory muscles may improve the respiration process as respiratory muscle tensions may hinder the of rib cage movement. A study done by ChiWu et al. (2004) come into the same vein and supported the study results which found that acupressure was effective in improving pulmonary function and oxygen saturation when compared with a placebo group that received acupressure at an inappropriate location in patients with COPD.

In relation to 6MWD test, the mean distance of walk before acupressure administration was approximately 240 meter walks in both study and control group. By the end of the 4^{th} week, the control group had 238.9 meter walks and study group 267.5 meter. A study done by Casanova et al. (2007) on the 6-min walking distance for COPD patients found that the mean of 6MWD test was 388 meter. A second study conducted by Cote et al. (2007) examine the effect of Supplemental O2 on 6MWD on a sample of 121 COPD patients, found that the mean of 6MWD before the supplementation was 312 meter and after intervention was 377 meter. Another study done by Rejbi et al. (2010) that examine changes in six-minute walking distance during pulmonary rehabilitation in patients with COPD concluded that 6MWD before rehabilitation was 504 meter and after rehabilitation was 620 meter. Finally ChiWu et al. (2004) in the study on effectiveness of acupressure in improving dyspnea in COPD reported that the mean of 6MWD was 200 meter among the acupressure group. It is apparent from the previous discussion that there was a great variation on 6MWD measurements of the COPD patients, it could be explained as that the 6MWD may be depend on many variables such as, patient's age, severity of disease, co-morbidities such as anemia, general health of the patients or degree of dyspnea, so there were many correlates that can affect the 6MWD measurements and outcomes.

Moreover, the study result revealed that there was no statistical significant difference either among control or study group or between them in relation to 6MWD. This finding may be explained as patients still suffer from fatigue as well as the resulting influence of the disease process that may affect the energy needed to walk, additionally, the mean age of the studied sample was closed to 50 years may interfere with their walking abilities, however, Stahl (2011) reported that levels of physical activity decrease with age. The study finding contradicting with Lee & Frazier (2011) who concluded that acupressure was effective in improving 6MWD when compared with a placebo group in COPD patients. However, Maa et al. (2003) who studied the effect of acupuncture or acupressure on quality of life of patients with asthma concluded that acupressure had no statistical significant effect on 6 MWD test when compared with the control group and the acupuncture group.

8. Conclusion

The aim of the current study was to examine the effect of acupressure on dyspnea & fatigue among patients with COPD. The findings concluded that study group has statistically significant improvement in relation to dyspnea, respiratory rate and oxygen saturation than the control group. While, there was no statistical significant improvement in relation to fatigue and 6 minute walk distance test between the two groups. Finally, the research results supported the 1st, 3rd &4th research hypotheses, while the research findings fail to support the other two (2nd & 5th).

9. Recommendation

Based upon the findings of the study, the following recommendations are concluded:

1- Prospective study should be designed to determine the stability of the effect of acupressure as an adjuvant to control dyspnea
2- Replicate the study in other fields and for other patients population with different diagnosis who also suffer from dyspnea such as asthmatic patients, and those with lung cancer.
3- Include the alternative measures in general & acupressure in particular in the nursing curriculum and nursing education as it is the coming measures used for patients' care because most of them are inexpensive, safe and easy to learn.
4- It is also recommended to teach the patients how to perform acupressure in the early course of the disease in order to restore energy.
5- Further studies may be needed using different acupressure points may be recommended to treat fatigue among those patients.

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