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Research Paper

Effectiveness of the Combination of Therapeutic Chest Massage and Hot Compress on Chest Pain Among Patients with Chronic Bronchitis: A Nurse-Led Pilot Study

Medical Science

KEYWORDS : Therapeutic chest massage, hot compress, chronic bronchitis, effectiveness, chest pain

Nwozichi Chinomso U — Department of Adult health Nursing, School of nursing, Babcock University, Ogun State, Nigeria

Ojewole Foluso O — Department of Adult health Nursing, School of nursing, Babcock University, Ogun State, Nigeria

ABSTRACT

BACKGROUND: Chronic bronchitis is a major disease in the developing country which is associated with severe chest pain making effective management of its pain very important to nurses. Many researches have been conducted on the effectiveness of massage in pain management but none has reported its effectiveness in managing chest pain in patient with chronic bronchitis especially when combined with hot compress.

MATERIAL AND METHOD: This was a quasi-experimental study to assess the effectiveness of the combination of therapeutic chest massage with hot compress in the management of chest pain in chronic bronchitis. A total of 34 patients were involved in this study. This study was conducted within one week among in-patients who were newly admitted to the pulmonary ward. Due consent was gained from the patient after extensive explanation had been made. Each patient's pre-intervention pain levels were assessed with a scale. Hot compress was applied to each participant's chest early in the morning for 15 minutes followed by therapeutic massage to the chest. Their post intervention pain levels were assessed based on their perceived change in pain levels on the same scale. Participants' pre and post-intervention pain levels were analyzed and chi square test of independence (post hoc test) was used to assess the difference between the pre-intervention and post-intervention pain levels (critical value = -1.96). Chi square test was also conducted to test for difference between the pre and post intervention pain levels as well as test for a relationship between the post-intervention pain levels and their smoking status. P value <0.05 was considered significant.

RESULT: Findings showed a significant difference existing between the pre intervention chest pain levels and post intervention chest pain level at $\chi 2$ (p value) of 17.944 (<0.001). A significant reduction of chest pain after the intervention was reported by participants.

CONCLUSION: This is an indication that the combination of warm compress and chest massage is therapeutic in the management of chest pain in chronic bronchitis

INTRODUCTION

Highly effective pain management has been one of the key areas where nursing profession has been relevant. Medical Massage is a controversial term in the massage profession[1]. Many use it to describe a specific technique while others use it to describe a general category of massage and many methods such as deep tissue massage, myofascial release and trigger point therapy as well as osteopathic techniques, and many more can be used to work with various medical conditions. Massage was first discovered as a complementary therapy in China and later in India and Egypt[2]. Massage can be applied to single or multiple body parts or to the entire body on single or multiple occasions. Many researchers have developed strong interest in assessing its effectiveness in pain management, and most studies have shown improvement in pain outcomes[3][4][5][6]. A study conducted by Cutshall and colleague showed a significant reduction in pain, anxiety and tension levels among cardiac surgical patient after massage[7]. Le Blanc-Louvry and his team conducted a research on effectiveness of massage therapy and found out that there was a decrease in post-operative pain and ileus after mechanical massage of the abdominal wall[8]. So many other studies in true experimental and quasi experimental designs have shown a positive effectiveness of massage on pain levels[9][10][11][12]. The effects massage on chest pain level is not a well-known technique and most studies and the combination of hot compress with chest massage in chest pain management has not been well explored. Chest pain is a major clinical manifestation of chronic bronchitis. Despite the growing popularity of massage, there is little support for its effectiveness in management of chest pain in chronic bronchitis especially when combined with heat application. Heat therapy is also a major tool in pain management, though its knowledge is not popular yet. Whereas cold therapy produces blood vessel constriction in localized tissues to decrease swelling and relax skeletal muscles, heat therapy facilitates the healing process by producing blood vessel dilation, thereby enhancing local blood flow decreasing edema, increasing tissue temperature and producing pain relief.

OBJECTIVES

1. To assess the effectiveness of the combination of therapeutic chest massage and hot pack application
2. To evaluate the difference between pre and post intervention level of pain
3. To assess the relationship between participants' smoking status and their post intervention pain levels.

HYPOTHESES

1. There will be no significant difference between pre and post intervention pain level
2. There will be no significant relationship between the smoking status of participants and their post intervention pain levels

METHODOLOGY

This is a quasi-experimental (non-randomized pre-post intervention) study assessing the effectiveness of the combination of therapeutic chest massage (TCM) with hot compress on chest pain levels among patient with chronic bronchitis. A total of 34 patients were involved in this study. This study was conducted within one week among in-patients who were newly admitted to the pulmonary ward. Due consent was gained from the patient after extensive explanation was made.

INCLUSION CRITERIA:

1. Patient who were recently admitted to the pulmonary ward
2. Patient with confirmed diagnosis of chronic bronchitis
3. Patient who were willing to participate

EXCLUSION CRITERIA

1. Patient without a confirmed diagnosis
2. Patients with multiple diagnosis
3. Patient admitted for more than 4 days

PROCEDURE

At the time of the study, patients' socio-demographic data such as age, gender, smoking status and educational background were collected. Patients were given adequate information regarding how to express their pain levels using the scale of 0-5, 0 indicating no pain, 1 indicating mild pain, 2 indicating moderate pain, 3 indicating severe pain, 4 indicating excruciating chest pain. Each patient's pain levels were assessed with this scale. Hot compress was applied to each participant's chest early in the morning for 15 minutes followed by therapeutic massage to

the chest. Their pain levels of participants were assessed based on their perceived change in pain levels on a scale of 1-3, I indicating pain reduction, 2 indicating no change in pain levels and 3 indicating increase in pain levels.

METHOD OF DATA ANALYSIS

There demographic data were analysed to produce a descriptive statistics of frequency and percentage. There pre and post-intervention pain levels were analyzed and chi square test of independence (post hoc test) was used to assess the difference between the pre-intervention and post-intervention pain levels (critical value = -1.96). Chi square test was also conducted to test for difference between the pre and post intervention pain levels as well as test for a relationship between the post-intervention pain levels and their smoking status. P value < 0.05 was considered significant.

RESULTS

Table 1 on selected demography of participants n=32

Variables	frequency(%)	SD
AGE		
20-29	2(5.9)	1.363
30-39	3(8.8)	
40-49	6(17.6)	
50-59	14(41.2)	
60 and above	9(26.5)	
GENDER		
Male	27(79.9)	0.41
Females	7(20.6)	
SMOKING STATUS		
Non smoker	8(23.5)	0.43
Smoker	26(76.5)	
EDUCATION		
Illiterate	22(64.7)	0.97
Literate	12(35.3)	

Table 1 above shows the demographic variables of participants. Majority of the participants were between the ages of 50-59, 79, males (79.9), smokers (76.5) and illiterate (64.7)

Table 2: Standardized test assessing the relationship between the pre-intervention and post-intervention pain levels. (critical value = -1.96)

			Post intervention pain level		Total
			reduced pain	pain remains same	
Pre intervention pain level	mild pain	Count	4	0	4
		Expected Count	2.8	1.2	4.0
		Std. Residual	.7	-1.1	
	moderate pain	Count	20	4	24
		Expected Count	16.9	7.1	24.0
		Std. Residual	.7	-1.2	
	severe pain	Count	0	6	6
		Expected Count	4.2	1.8	6.0
		Std. Residual	-2.1	3.2	
Total		Count	24	10	34
	Expected Count		24.0	10.0	34.0

From table 2 above, When converted to a z-score, the standardized residual (-2.1) was smaller than the critical value (-1.96), supporting that the intervention was effective in producing a reduction in pain levels.

Table 3: Chi Square test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.944[a]	2	.000
Likelihood Ratio	19.567	2	.000
Linear-by-Linear Association	13.855	1	.000
N of Valid Cases	34		

The probability of the chi-square test statistic (χ^2 = 17.944) was p<0.001, less than the alpha level of significance of 0.05. The null hypothesis that there is no significant difference existing between pre-intervention pain levels and post intervention pain level is rejected. Therefore we accept that the combination of therapeutic chest massage with hot pack application is effective in reducing chest pain among patient with chronic bronchitis.

Table 4: relationship between smoking status and post intervention pain levels

VARIABLE	Post intervention pain level		Total
	Reduced pain	pain remains	
Non smoker	7	1	8
Smoker	17	9	26
Total	24	10	34

Table 5: Chi Square test showing the relationship between smoking status of participants and their Post intervention pain level

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.441[a]	1	.230
Continuity Correction[b]	.573	1	.449
Likelihood Ratio	1.624	1	.203
Fisher's Exact Test			
Linear-by-Linear Association	1.399	1	.237
N of Valid Cases	34		

From table 5 above, the probability of the chi-square test statistic (χ2 = 17.944) was p 0.230, greater than the alpha level of significance of 0.05. The null hypothesis that there is no significant difference existing between smoking status and post intervention pain level is accepted. Therefore we accept that the post-intervention pain level of participants did not depend on their smoking status.

DISCUSSION

Massage therapy has been advocated for long in healthcare. This pilot study has shown that the combination of therapeutic chest massage with hot pack application can be an important measure to manage chest pain among patient with bronchitis. A growing body of research shows massage therapy can be an effective part of pain relief and management. Several studies have proved this [3][4][5][6], none has examined its effectiveness in chest pain among people with chronic bronchitis. From table 1 above, majority of the participants were males which is an evidence that chronic bronchitis is more prevalent among male. Studies conducted by other researchers have also supported this finding[13].. There is also a relationship between smoking and prevalence of chronic bronchitis. This is also supported by several researches[13][14][15]. Majority were illiterate indicating that chronic bronchitis is found among the less educated[15]

The post hoc test showed in table 2 indicated that if the standardized residual (-2.1) is converted to a z-score, it was smaller than the critical value (-1.96), supporting that the intervention was effective in producing a reduction in pain levels. From table 3, The parametric test conducted using chi square test showed a significant difference existing between the pre intervention chest pain levels and post intervention chest pain level at χ2 (p value) of 17.944 (<0.001). This is an indication that the combination of warm compress and chest massage is therapeutic in the management of chest pain in chronic bronchitis. Table 5 showed a chi square test assessing if there is a relationship between the smoking status of participants and their post intervention levels. Findings showed that the probability of the chi-square test statistic (χ2 = 17.944) was p 0.230, greater than the alpha level of significance of 0.05 which means that pain relief after intervention was not dependent on their smoking status. This is not in line with findings of other studies which showed a clear relationship between smoking status of patients and relief of exacerbation in COPD[16]

This study was delimited by the small sample size which reduc-

es the generalizability of the findings and its effective application to the management of chest pain in chronic bronchitis. Also as part of the limitations, pain level assessment is subjective making it really difficult to to be assessed by another person. Therefore the values applied in data analysis are as they were expressed by the patient and we could not question what they feel as pain.

CONCLUSION , RECOMMENDATIONS AND IMPLICATION FOR NURSING

Chronic bronchitis patient are faced with chest pain ranging from mild to severe. In some cases in could be excruciating. This pilot study provides an insight regarding the effective management of chest pain with the combination of hot compress and therapeutic chest massage in chronic bronchitis. If this therapy is confirmed by future studies, it may have a significant role to play clinically. Nurses can adopt this simple technique in order to relieve chest pain experienced by patient with acute and chronic bronchitis.

Competing interest

We do not have any competing or conflicting interest to declare.

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