Effect of Alternate Nostril Breathing on Pain Level among Heart Failure and Renal Failure Patients

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Abstract

Background: Heart failure and renal failure patients have many problems as pain, muscle cramps and fatigue; alternate-nostril breathing is a type of breathing practice that has beneficial effects on pain level in healthy and diseased people. **Aim:** Was to evaluate the effect of alternate nostril breathing exercise on heart failure and renal failure patients' pain level. **Design**: Quasi-experimental comparative design was utilized in this study to achieve the aim of this study. **Setting**: The study was conducted in cardiac care unit and hemodialysis unit at Benha University Hospital. **Sample**: Purposive sample (70 heart failure patients &70 renal failure patients) was included in this study. **Tools**: Two tools were used, tool I: Patients' interview questionnaire and tool II: Visual analogue pain scale. **Results**: There were highly statistical significant differences in pain level between pre ANB intervention as compared to after 1 month and 3 months intervention among heart failure and renal failure patients as (p≤0.001). **Conclusion:** Alternate nostril breathing exercise has been shown to be effective on heart failure & renal failure patients' pain level while renal failure patients' pain level have been shown higher improvement. **Recommendations**: Hospitals are recommended to implement the alternate-nostril breathing exercise alongside other treatments to improve heart failure & renal failure patients' pain level as well as, for other patients with chronic illness

Key Words: Alternate nostril breathing, Patients' pain, Heart failure patients, Renal failure patients.

Introduction

Heart failure means that the heart is unable to pump blood around the body properly. It usually occurs because the heart has become too weak or stiff; it does not mean the patient heart has stopped working but it just needs some support to help it work better. It occurs due to coronary heart disease, high blood pressure, angina, atherosclerosis or congenital heart disease. The main symptoms include breathlessness after activity or at rest, feeling tired, insomnia, dizziness and swollen ankle or legs. Treatment for heart failure usually aims to control the symptoms for as long as possible and slow down the progression of the condition by lifestyle changes and taking prescribed medication (**Chicco & Jurman, 2020**).

Renal failure is one of the widespread diseases where progressive nephron loss arises as a result of the deterioration of renal function in which one or both of the kidneys can no longer work on; the disease is characterized by a decrease in the amount of permanent glomerular filtration. It occurs due to autoimmune kidney diseases, certain medications, severe dehydration or urinary tract obstruction. Those patients usually suffer from fatigue, trouble concentrating, muscle cramps, insomnia, poor appetite, headache, hypertension, arrhythmia and swelling. A

recent research is directed at applying non-pharmacological alongside medication traditional methods for managing such chronic complaints **(Hamed & Abdel Aziz, 2020)**.

Alternate nostril breathing (ANB) is a simple exercise and a yogic breath control practice help to relax the body and mind, reduce anxiety, pain and promote overall well-being, it involves breathing through one nostril at a time while closing the other nostril manually, the basis of alternate-nostril breathing is controlling breath with focused attention. It is done at any time and place that feels most comfortable but preferring doing it in the morning or evening. It is best done on an empty stomach and shouldn't be done if patient is very sick or congested or during driving and doing anything else that needs focused attention **(Naik, Gaur & Pal, 2018)**.

Nurses should understand the nonpharmacological benefits of alternate nostril breathing exercise combined with pharmacological treatment in both heart failure and renal failure patients such as alternate nostril breathing exercise to enhance patient participation in exercise to improve patients' condition, should receive in-service education on the technique of recent modalities methods in improving patients' quality of life, reduce pain level, fatigue and improve patients' comfort **(Jahan et al., 2020)**

Significance of the study

Heart failure disease is one of the major health problems in both developed and developing countries. This disease is the first leading cause of death in the world and the prevalence is estimated to continually increase up to 23.3 million in 2030 **(Nirmalasari et al., 2020)**.

Chronic kidney disease (CKD) affects between 8% and 16% of the population worldwide, more prevalent in low and middle income than in high income countries. Pain is common in renal failure and heart failure so; alternate nostril breathing exercise increases blood circulation as well as muscles relaxation **(Chen, Knicely & Grams., 2019)**

Previous studies have supported the use of ANB exercise because it improves a variety of health-related outcome measures effectively; it has beneficial effects on fatigue, reducing pain and increase muscle strength in healthy and diseased people and these symptoms present in both heart and renal failure patients. ANB has more importance and becoming acceptable to the public and the scientific community so the current study aimed to investigate whether alternate nostril breathing exercise improves pain level in heart and renal failure patients **(Dutta, et al., 2022)**.

As well as from the clinical experience observation situation, the researcher noticed that there are many health problems accompanied with heart and renal failure patients at Benha University Hospital as fatigue, pain, decrease cardiorespiratory function and the total number of patients admitted at both cardiac and hemodialysis units at the last three years (2020, 2021, 2022) were approximately (566, 480, 458) and (1271, 623, 487) patients respectively **(Statistical office in Benha University Hospital, 2022)**. So the current study conducted to evaluate the effect of alternate nostril breathing exercise on heart failure and renal failure patients' outcomes.

Research aim:
The aim of this study was to evaluate the effect of alternate nostril breathing exercise on heart failure and renal failure patients' pain level.

Research hypothesis:
Patients' pain level could be significantly decreased after application of the alternate nostril breathing exercise than before.

Subjects and Method:

Design:

Quasi-experimental comparative design was utilized to achieve the aim of this study.

Research setting:

This study was conducted in cardiac care unit (CCU) and hemodialysis unit at Benha University Hospital, Qalyubia Governorate, Egypt. The CCU locates in the third floor of the medical building. Hemodialysis Unit locates in second floor of the medical building.

Subjects:

Purposive sample of 70 HF conscious adult patients & 70 RF conscious adult patients, their age ranged from 20- 60 years old from both sexes during the time of data collection who are able to communicate and agree to participate in this study, using the following equation n=$\frac{n \times p(1-p)}{[N-1 \times (d^2 \div z^2)]+p(1-p)}$ **(Sharma, et al., 2020)**.

The inclusion criteria:

Patients that able to implement the alternate nostril breathing exercise- Free from mental illness -Free from neuromuscular diseases - Free from serious lung problems as pulmonary fibrosis -Free from severe asthma attack.

The exclusion criteria:

-Patients with severe systemic disorders - Patients with communication disorders - Patients with nasal pathology-Chronic smokers -Patients with malignant hypertension -Patients with vertebral deformities.

Tools for data collection

Tool I: Patients' interview questionnaire: It aimed to assess personal and medical data, adapted from **(Pretto, et al., 2020, Karadag & Baglama, 2019**, **& Suhardjono, et al., 2019)**. It included two parts as the following:

Part one: Concerning personal data for patient including age, sex, marital status, level of education, occupation and residence. It contained 6 questions.

Part two: Regarding patients' medical data including diagnosis, complain, length of the disease, patients' present and past medical & surgical history. It included 8 questions.

Tool II: Visual Analogue Pain Scale: It was used to assess patients' level of pain, adopted from **(Mar, 2020)**. It included 6 items.

Scoring system: The scale evaluate the level of pain and varies from 0 (No pain), 1-3 (Mild pain), 4-6 (Moderate to Severe), 7-9 (Very severe) and 10 (Worst pain possible)

Tools validity:

The face and content validity of the tools were checked by five experts in the field of medical surgical nursing from the faculty of nursing, Benha University, the consensus among experts regarding the tools was between 98% to 100% for most items

Reliability of tools:

Internal consistency reliability of all items of the tools was assessed to assure that the tools were reliable before data collection. The researcher used test – retest methods to test the internal consistency of the tools, by administration of the same tools to the same subjects under similar condition on two different occasions.

Ethical considerations:

This study was conducted after primary approval obtained from Ethics Committee of Faculty of Nursing, Benha University. Then, official permission was obtained from medical director and head of Cardiac Care Unit and Hemodialysis Unit at Benha University Hospital. The researcher assured patients that all collected data would be absolutely confidential and used only for their benefit and for the purpose of the study and that they had the right to withdraw at any time without any consequences.

Pilot study:

A pilot study was conducted on **10%** of the study sample (7 patients with heart failure and 7 patients with renal failure) of the total studied

patients. No modifications were done so the patients involved in the pilot study were included in the main study sample.

Field work:

Data collection:

The data collection process was performed over a period of six months, started from January till the end of June 2023. The study was conducted through the following four phases: Assessment phase: During this phase, the researcher assessed heart and renal failure patients by using tools of data collections. Planning phase: The patients' booklet developed by the researcher regarding alternate nostril breathing exercise. Implementation phase: The researcher attended three days/week, divided the HF into 10 subgroups and RF patients into 10 subgroups, each group contained seven patients in every session and the technique implementation was carried out for each group through the conduction of three sessions during their hospital stay and the booklet was given to them to guide them in ANB practice. Evaluation phase: The posttest was done by using the same study tools of the pretest for patients after 1 month and 3 months of using ANB exercise to determine the effect of alternate nostril breathing exercise technique.

Statistical analysis:

The collected data organized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version 25 for windows, running on IBM compatible computer. Descriptive statistics were applied (e.g. frequency, percentages, mean and standard deviation). Qualitative variables were compared using qui square test (x2) as the test of significance, and paired (t) test was used to compare between quantitative variables. Correlation coefficient test (r) was used to test the correlation between studied variables. Reliability of the study tools was done using Cronbach's Alpha. A significant level value was considered when $p < 0.05$ and a highly significant level value was considered when $p < 0.01$. No statistical significance difference was considered when $p > 0.05$.

Results:

Table (1) shows that, the mean age of the heart failure and renal failure patients were 43.72 ± 8.64 and 40.78 ± 9.49 respectively, while 51.4% of HF patients were females and 61.4% of RF patients respectively were males respectively, 68.6% and 64.3% of them respectively were married, 52.9% and 51.4% of them attained an intermediate education, 47.1% and 38.6% of them respectively didn't work. In addition, 70% and 64.3% of them lived in village respectively. The findings revealed that there were no statistical significant differences between heart failure and renal failure patients in relation to all personal data (P value> 0.05).

Table (2) shows that, 72.9% & 42.9% of the heart failure and renal failure patients had the disease for more than 2 years, 60% & 72.9% of them respectively had other diseases, from those 78.6% & 80% respectively had a surgical history. In addition 70% & 78.6% of heart failure and renal failure patients respectively hadn't a family history to the disease. The findings revealed that there were statistical significant differences between heart failure and renal failure patients in relation to length of the disease (P value< 0.05).

Table (3) shows that there were highly statistical significant differences regarding patients pain level between pre ANB intervention as compared to after 1 month and 3 months intervention among both HF & RF patients ($p < 0.001$). In addition the mean score of pain for HF patients was $6.57\pm.843$, $4.68\pm.956$ & $3.34\pm.478$ respectively as

compared to 5.11±1.399, 4.02±1.372 & 2.58±.842 pre ANB, after 1 month and after 3 months among RF patients respectively. It is apparent that pain level among HF patients is higher than RF patients.

Figure (1) illustrates that total pain level in HF was improved from severe pain 65.7% pre ANB intervention to 34.3% after 1 month then to 0.0% after 3 months of ANB intervention, as compared to 8.6%, 31.4% & 0.0% pre ANB intervention, after 1 month and after 3 months of ANB intervention among RF patients as patients' pain level improved from very severe pain to severe pain after 1 month of ANB so severe pain

percentage increased in this phase. It is apparent that pain level among HF patients is higher than RF patients.

Table (4) Multivariate linear regression analysis in this table reveals that pain level among studied patients with heart failure was best predicted by gender and length of disease (p= 0.002* & 0.001* respectively), accounting for 0.349 % of the variance of pain level as well as was best predicted among studied patients with renal failure by having other diseases and length of disease (p=.008* and 0.015* respectively), accounting for 0.102% of the variance of pain level through the follow-up phase.

Table (1): Distribution of the studied patients regarding their personal data (N=140).

Patients' personal data	Heart failure (N=70)		Renal failure (N=70)		X^2	p-value
	No	%	No	%		
Age (in year)						
20 - < 30	4	5.7	9	12.9	5.428	.143
30 - < 40	19	27.1	27	38.6		
40 - < 50	23	32.9	16	22.9		
50 - 60	24	34.3	18	25.7		
Min –Max	23 - 58		25 - 58			
Mean ±SD	43.72 ± 8.64		40.78 ± 9.49			
Gender						
Male	34	48.6	43	61.4	.029	.866
Female	36	51.4	27	38.6		
Marital status						
Single	4	5.7	7	10.0	3.486	.323
Married	48	68.6	45	64.3		
Widow	16	22.9	12	17.1		
Divorced	2	2.9	6	8.6		
Educational level						
Don't read and write	10	14.3	11	15.7	.901	.825
Read and write	10	14.3	7	10.0		
Intermediate education	37	52.9	36	51.4		
University education	13	18.6	16	22.9		
Occupation						
Office work	16	22.9	18	25.7	1.065	.587
Manual work	21	30.0	25	35.7		
Don't work	33	47.1	27	38.6		
Residence						
Rural	49	70.0	45	64.3	.518	.472
Urban	21	30.0	25	35.7		

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Table (2): Distribution of the studied patients regarding their medical data (N=140).

Patients' medical data	Heart failure (N=70)		Renal failure (N=70)		X^2	p-value
	No	**%**	**No**	**%**		
Length of the disease					12.95	.002*
< 1 year	9	12.9	20	28.6		
1-2 years	10	14.3	20	28.6		
> 2 years	51	72.9	30	42.9		
Have other diseases						
Yes	42	60.0	51	72.9	2.594	.107
No	28	40.0	19	27.1		
What's disease	(N=42)		(N=51)			
Diabetes mellitus	17	40.5	12	23.5		
Hypertension	15	35.7	18	35.3		
Lung diseases	5	11.9	14	27.5		
Liver diseases	5	11.9	7	13.7		
Have surgical history						
Yes	55	78.6	56	80.0	0.043	.835
No	15	21.4	14	20.0		
Type of surgery	(N=55)		(N=56)			
Cardiac catheterization	42	76.4	0	0.0		
Cardiac stent	13	23.6	14	25.0		
Kidney stone surgery	0	0.0	28	50.0		
Ureteral dilatation	0	0.0	14	25.0		
Family history						
Yes	21	30.0	15	21.4	1.346	.246
No	49	70.0	55	78.6		

Table (3): Distribution of the studied patients regarding pain level pre and post intervention (N=140).

Patients' pain level	Pre				After 1 month				After 3 month			
	Heart failure		Renal failure		Heart failure		Renal failure		Heart failure		Renal failure	
	No	%	No	%	No	%	No	%	No	%	No	%
Mild	0	0.0	0	0.0	0	0.0	42	60.0	46	65.7	54	77.1
Moderate	0	0.0	42	60.0	46	65.7	6	8.6	24	34.3	16	22.9
Severe	46	65.7	6	8.6	24	34.3	22	31.4	0	0.0	0	0.0
Very severe	24	34.3	22	31.4	0	0.0	0	0.0	0	0.0	0	0.0
Mean ±SD	6.57±.843		5.11±1.399		4.68±.956		4.02±1.372		3.34±.478		2.58±.842	
t/p-value	7.46/0.000**				3.28/0.001 **				6.53/0.000**			

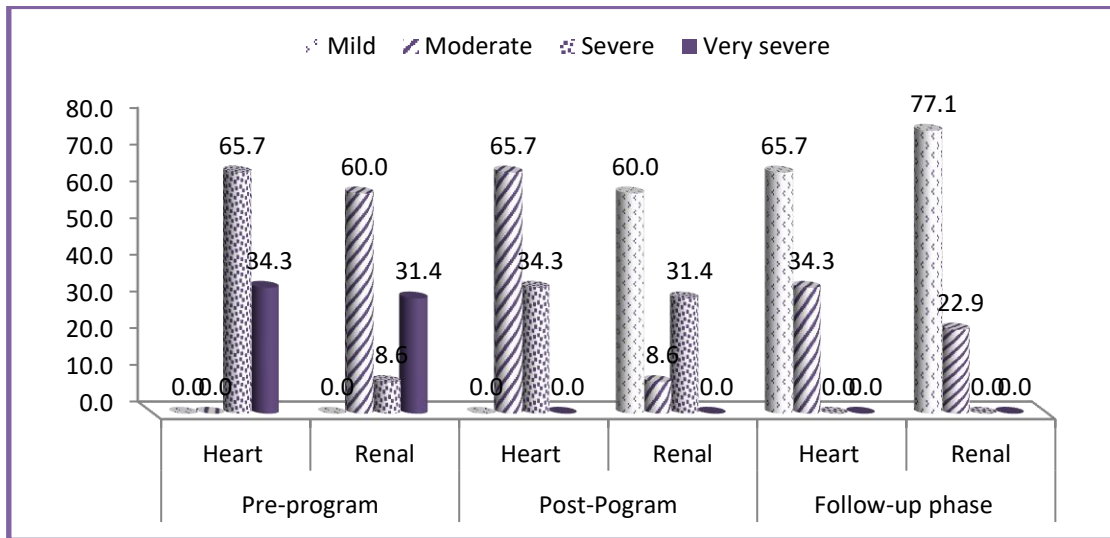**Independent t test was used**   ****highly significance P<0.001**

Figure (1): Percentage distribution of the studied patients regarding their total pain level pre and post intervention (N=140).

Table (4): Multiple Linear Regression Analysis for Predictor Variables of total pain level among the studied patients post three months of ANB intervention (n=140)

Predictor variables	Heart failure					Renal failure				
	Standardized Coefficients		Unstandardized Coefficients			Standardized Coefficients		Unstandardized Coefficients		
	B	SEB	Beta	t	Sig.	B	SEB	Beta	t	Sig.
(Constant)	.734	2.378		.309	.758				-.553	.582
Age	.013	.008	.226	1.494	.141	.022	.014	.251	1.569	.122
Gender	.353	.107	.372	3.287	.002*	.154	.205	.092	.750	.456
Have other diseases	-.217	.112	-.223	-1.939	.057	.638	.232	.339	2.754	.008*
length of the disease	-.527	1.854	-.385	-3.325	.001*	.532	.412	.539	2.014	.015*
Have surgical operation	-.179	.149	-.155	-1.202	.234	.100	.272	.048	.368	.714
Heart rate	.001	.008	.008	.075	.940	-.006	.015	-.048	-.407	.685
Respiratory rate	.008	.057	.015	.145	.885	.029	.073	.047	.394	.695
Systolic BP	-.001	.019	-.008-	-.039	.969	.093	.054	.693	1.736	.088
Diastolic BP	.025	.041	.125	.616	.540	-.120	.073	-.651-	-1.630	.108
Regression=	Adjusted R^2=.349 =.000**			p value		Adjusted R^2 =0.102 0.074			p value=	

Dependent Variable: Visual Analogue Pain score   (**) Highly significant statistically
(*) Significant statistically (B): Beta Co-Efficient   (SEB): Standard Error

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Discussion

Heart failure and renal failure diseases have become the most common health problems in both the developing and the developed countries. Alternate nostril breathing (ANB) is recognized as the most beneficial complementary and alternative therapy, it improves symptoms of anxiety, depression, pain, fatigue, enhances cardiorespiratory system, and psychological states, ANB help in treatment of cardiovascular diseases and renal failure diseases with the pharmacological treatment. Healthcare professionals play a crucial role to implement non-pharmacologic intervention in caring for heart and renal failure patients to improve patients' condition (**Chandrababu, et al., 2019**).

Regarding age, results of the present study revealed that more than one third of heart failure patients' age ranged between fifty to sixty years old with mean age (43.72 ± 8.64) years. The reason for this may be due to heart failure is common in middle and old age than young age. This finding is in line with a study carried out by **Mahdavikian, et al., (2021)** about "Comparing the effect of aromatherapy with peppermint and lavender essential oils on fatigue of cardiac patients" in Iran revealed that more than half of heart failure patients were 50-65 years old.

While more than one third of renal failure patients were aged from thirty to less than forty years old with mean age (40.78 ± 9.49) years, this result is incongruent with **Hamed & Mohamed (2020)** in a study about " Effect of deep breathing exercise training on fatigue level among maintenance hemodialysis patients" in Alexandria, Egypt revealed that more than half of the renal failure patients' age was between 50-60 years old.

Regarding gender, the results of the present study revealed that more than half of heart failure patients were females, these results disagree with **Azeez, et al., (2021)** who studied "Effect of short-term yoga-based-breathing on peri-operative anxiety in patients undergoing cardiac surgery" in India and reported that more than half of heart failure patients were males.

While more than half of renal failure patients were males, these results agreed with **Kharbteng, (2020)** who conducted a study about "Effectiveness of a breathing training program on quality of life in patients with predialysis chronic kidney disease" in India and noted that more than half of renal failure patients were males.

In relation to patient' marital status, the results of the present study revealed that more than half of both heart failure and renal failure patients were married, these results agree with **Dionne-Odom, et al., (2020)** who performed a study about "Effects of a telehealth early palliative care intervention for family caregivers of persons with advanced heart failure" in Birmingham and concluded that the majority of heart failure patients were married. Also, this result agrees with **Sanad, (2023)** who stated in their study entitled "Effect of progressive muscle relaxation technique on sleep quality among hemodialysis patients" in Iran who mentioned that the majority of renal failure patients were married.

As regard to educational level, the educational level, the present study findings revealed that more than half of both heart failure and renal failure patients attained an intermediate education; this may be due to that the study was conducted in the Governmental Hospital which accommodates great numbers of patients with low socioeconomic levels with low educational level. This result is in the same line with **Girgin, et al., (2021)** in a study about "The Effect of pulmonary rehabilitation on respiratory functions, and the quality of life,

following coronary artery bypass grafting" in Turkey who revealed that the majority of heart failure patients attained an intermediate education.

Also, similar finding was founded by **Rahimimoghadam, et al., (2019)** who conducted a study entitled "Pilates exercises and quality of life of patients with chronic kidney disease" in Iran and concluded that the majority of renal failure patients attained an intermediate education.

Concerning the occupation, results of the present study showed that more than one third of both heart failure and renal failure patients didn't work, this is congruent with a previous study done by **Than, et al., (2019)** about "Knowledge, use of complementary alternative medicine and health-related quality of life among cardiovascular disease patients" in Malaysia who revealed that the majority of studied patients were un employed. On the other hand, this result disagrees with **Lazarus, (2019)** who done a study entitled "Effectiveness of education and exercise on quality of life among patients undergoing hemodialysis" in Oman and showed that the majority of the patients have skilled work.

Regarding residence, results of the present study found that more than half of both heart failure and renal failure patients lived in rural areas and this might be related to that this study was conducted at Benha University Hospital which serves the surrounding areas and the majority of them are rural areas. This finding is in the same line with **Bakitas, et al., (2020)** in the study entitled "Effect of an early palliative care telehealth intervention vs usual care on patients with heart failure" in New York who showed that more than half of patients lived in rural areas. Also these results are consistent with **Sanad, (2023)** who revealed that more than half of patients lived in rural areas.

Regarding the length of the disease, results of the present study revealed that about three quarters of heart failure patients had the disease for more than two years because they need hospitalization due to deterioration of the disease, these results are on the same line with **Kavalieratos, et al., (2022)** in the study entitled "Primary palliative care for heart failure provided within ambulatory cardiology" in Emory who found that the majority of heart failure patients had the deteriorative degree of the disease for more than 2 years. While more than two fifth of renal failure patients had the disease for more than two years. But this result is incongruent with study done by **Sanad, (2023)** who reported that the majority of renal failure patients had the disease from 6 months to 1 year.

Concerning having other diseases, results of the present study revealed that more than half of heart failure and about three quarters of renal failure patients had other diseases as chronic disease affects negatively on other systems on the body, this result comes in the same line with **Hossein Pour, et al., (2020)** in their study about "The effect of inspiratory muscle training on fatigue and dyspnea in patients with heart failure" in Iran who reported that the majority of heart failure patients had other diseases. Also these results agree with **Kharbteng, et al., (2020)** who mentioned that the majority of renal failure patients had comorbidities. This result disagrees with **Al Salmi, et al., (2021)** who done a study entitled "Kidney disease-specific quality of life among patients on hemodialysis" in Oman and mentioned that less than half of the patients had comorbidities.

In relation to patient having a surgical history, results of the present study revealed that more than three quarters of both heart failure and renal failure patients had a surgical history, these results disagree with a study done by **Devi, et al., (2020)** about

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"Effectiveness of music on anxiety and physiological parameters among pre-operative patients undergoing coronary artery bypass grafting", in India who revealed that the majority of heart failure patients didn't have a surgical history, also these results are consistent with a study conducted by **Guo, et al., (2021)** titled "Impact of chronic renal failure on surgical outcomes in patients with infective endocarditis" in Michigan who reported that the majority of renal failure patients had a surgical history.

Finally regarding patient having a family history to the disease, the results of the present study revealed that more than two thirds of heart failure and more than three quarters of renal failure patients hadn't a family history to the disease because it isn't most commonly caused by heredity, these results disagree with **Chandrababu, et al., (2019)** who conducted a study entitled "Effect of pranayama on anxiety and pain among patients undergoing cardiac surgery" in India and showed that more than half of heart failure patients had a family history to the disease, but these results are the same line with **Nagib, et al., (2023)** in the study entitled "What is the prevalence of chronic kidney disease among hypertensive non-diabetic Egyptian patients attending primary healthcare?" in Ain Shams, Egypt who revealed that the majority of renal failure patients hadn't a family history to the disease.

Regarding pain level of heart failure and renal failure patients, the results of the present study revealed that there were highly significant statistical reduction in pain level 1 month, 3 months post ANB intervention as compared to pre ANB intervention among both HF & RF patients as breathing exercise techniques leads to muscle relaxation so relieve patients' pain, this finding may be attributed to ANB intervention is simple, easy to be learned by any person. These results are supported with

Hany, et al., (2019) in a study entitled "Effect of deep breathing technique on severity of pain among postoperative coronary artery bypass graft patients" in Fayoum, Egypt who illustrates that deep breathing techniques reduce the severity of HF pain level.

On the same line with **Nipa, et al., (2021)** in the study entitled "Deep breathing relaxation exercise for reducing anxiety of patients under hemodialysis treatment" in Indonesia who revealed that breathing techniques reduce pain level of renal failure patients post breathing exercise intervention

Concerning multiple linear regression analysis for predictor variables of total pain level among the studied patients post three months of ANB intervention, the results of the present study revealed that pain level among heart failure patients was best predicted by gender and length of disease as by increasing disease duration, the symptoms increase among patients, this finding was correspondent to **De Bellis, et al.,(2020)** who done a study entitled "Gender-related differences in heart failure: beyond the "one-size-fits-all" paradigm" in Italy and showed that the sex impact on the various heart failure syndromes and symptoms.

Also, these results agree with **Del Buono, et al., (2019)** in a study entitled "Exercise intolerance in patients with heart failure" in Italy and revealed that there is a regression between pain level and length of disease of heart failure patients.

Regarding multiple linear regression analysis for predictor variables of total pain level among renal failure patients, the results of the present study revealed that pain level was best predicted by having other diseases and length of disease this may be because having other diseases lead to deterioration in body organs, these results supported with **Sarıaslan & Kavurmacı, (2020)** in a study entitled "Evaluation of healthy lifestyle behaviors and

affecting factors of hemodialysis patients" in Turkey and reported that there is a regression between pain level, presence of another chronic disease and length of disease of renal failure patients.

Conclusions:

Based on the findings of the current study, it can be concluded that:

- Applying of alternate nostril breathing exercise was very effective on improving heart failure and renal failure patients' pain level post ANB application as compared to pre ANB application that supported the study hypothesis, while have been shown higher improvement among renal failure patients compared to heart failure patients.

Recommendations:

-Hospitals are recommended to implement the alternate-nostril breathing exercise alongside other treatments to improve heart failure & renal failure patients' pain level as well as, for other patients with chronic illness.

-Replication of the study using a larger probability sample from different geographical areas to attain more generalizable results.

- Further studies may be needed to assess effect of using different non-pharmacological methods on improvement of HF & RF patients' pain level.

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تأثير تطبيق التنفس الأنفي المتبادل على مستوى الألم لدى مرضى فشل القلب ومرضى الفشل الكُلوي

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التنفس الأنفي المتبادل هو تمرين تنفس فعال, له فوائد علاجية على وظائف القلب والجهاز التنفسي لكل من الأصحاء ومرضى فشل القلب والفشل الكُلوي، لذلك هدفت هذه الدراسة إلى تقييم تأثير تمارين التنفس الأنفي المتبادل على مستوى الألم لدى مرضى فشل القلب والفشل الكُلوي: تم استخدام تصميم دراسة مقارنة شبه تجريبية لتحقيق هدف هذه الدراسة. المكان: تم إجراء هذه الدراسة في وحدة رعاية القلب ووحدة الغسيل الكُلوي بمستشفى بنها الجامعي, اشتملت عينة الدراسة على 70 مريض قلب و 70مريضا فشل كلوي من المرضى البالغين من كلا الجنسين الذين تتراوح أعمارهم بين 20-60 سنة؛ خلال فترة الدراسة. تم استخدام أداتين لجمع البيانات. الأولي: إستبيان مقابلة شخصية الأداة الثانية: مقياس تقييم الألم. النتائج: أوضحت الدراسة أن هناك فرقاً إحصائياً كبيرا بين درجة الألم لدى مرضى فشل القلب والفشل الكُلوي قبل ممارسة تمارين التنفس الأنفي المتبادل وبعد شهر من ممارستها و كذلك بعد ثلاثة أشهر من ممارسة التمارين.الاستنتاج: تمارين التنفس الأنفي المتبادل فعاله في تحسين درجة الألم لمرضى فشل القلب والفشل الكُلوي بعد ممارسة التمارين مقارنة بما قبل ممارستها. وواوصت الدراسة بإدراج ممارسة تمارين التنفس الأنفي المتبادل في خطة الرعاية التمريضية لمرضى فشل القلب والفشل الكلوي في المراحل الأولى من تشخيص المرض، حتى يتم تحسين مستوى الألم للمرضى.