Effect of Acupressure on Quality of life, Dyspnea, Sleep and Fatigue among Children with Bronchial Asthma

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Abstract

Background: Acupressure is one of the important non-pharmacological modalities which is effective in enhancing bronchial asthma control**. Aim**: to evaluate the effect of acupressure on quality of life, dyspnea, sleep, and fatigue among children with bronchial asthma **Design:** A quasi experimental research design was utilized in this study. **Setting**: the study was carried out at Pediatric Chest Inpatient Unit at Tanta Main University Hospital. **Sample**: sixty (60) children diagnosed with bronchial asthma aged from 5 to 12 years old. **Tools of the study**: **Tool I:** A structured interview schedule to collect patient's socio-demographic and clinical data. **Tool II**: Health related quality of life that was evaluated by using PROMIS Pediatric Asthma Impact Scale. **Tool III:** Physical health assessment that was measured by using three scales; Pediatric Dyspnea Scale, PROMIS Pediatric Sleep Disturbance Short Form 4a Scale and PROMIS Pediatric Fatigue Short Form 10a Scale. **Results**: The results indicated that the asthma had always impact on 60% of studied children's quality of life 25.0% of them suffered from very high trouble of breathing, asthma interfered with sleep in 61.7% of them and also, 43.3% of the children totally fatigued because of asthma before acupressure sessions while children's quality of life, dyspnea, sleep and fatigue were improved 2 and 4 weeks after acupressure sessions. **Conclusion**: there was a statistically significant improvement in relation to quality of life, dyspnea, sleep and fatigue among studied children at 2 and 4 weeks after acupressure sessions application than before its application. **Recommendations:** Acupressure should be applied into nursing care for children with bronchial asthma.

Keywords: Acupressure, Bronchial Asthma, Children, Dyspnea, Fatigue, Quality of life, Sleep.

Introduction

Bronchial asthma is a chronic inflammatory airway disease that affects usually children and adolescents **(Centers for Disease Control and Prevention 2020).**Currently, there are about 5.1 million children under the age of 18 with asthma. Asthma is more common in male children than female as around 8.4% of male children have asthma, compared to 5.5% of female children **(Ferrante and La Grutta 2018)**.Black children are nearly three times more likely to have asthma compared to white ones. There are several triggers that can make asthma worse , contract muscles of the and increase the mucous production. These triggers include; fumes, viral infections, dust, changes in the weather, grass and, cigarette smoke animal fur and feathers, stress, tree pollen, exercise, certain foods, strong odor soaps and perfumes**(Ding and Bao 2015)**.

Asthma is associated with wheezing, coughing, dyspnea, fatigue, and chest tightness. Dyspnea is the primary symptom of asthma as it is the clinical manifestation of episodic bronchospasm. Fatigue is the second important symptom for children with asthma after dyspnea. Both are disabling symptoms that lead to decline in children's daily functional activities and a significant impairment of their quality of life. Asthma also is characterized by unpredictable attacks that often occur at night and may last for few minutes to several hours **(Yakoutand, Hashem2020, Williams et al., 2016, El-Saadawy 2013).**Nocturnal symptoms cause loss of sleep or decreased quality of sleep, even affect children with controlled asthma. Sleep disruption affects both parents and children life **(Meltzer et al., 2015)**.

The symptoms of asthma can be serious if not properly treated and this places a large burden on affected children and their families, through both reduced quality of life and the financial burden of their treatment. Asthma is a long life disease, consequently, the aim of its management is to achieve good control of symptoms, maintain normal activity levels and minimize future risk of exacerbations **(Global Initiative for Asthma2018)**. The majority of management strategies involve asthma

pharmacotherapy. Asthma medications divided into two main types: reliever medication for rapid resolution of symptoms (commonly short acting β2-agonists) and preventer medication for maintaining reduced airway inflammation (commonly inhaled corticosteroids) **(Bel et al., 2014)**.

Corticosteroids cause undesirable side effects including; immunosuppression, increased risk of respiratory infections such as yeast infections in thrush and also have effects on children's growth due to these medication side effects there has been an increasing interest in the role of acupressure in relieving symptoms of asthma without side effects. It is one of complementary and alternative medicine methods that is used in combination with medical treatment for children with asthma **(Alsac and Polat, 2019)**.

The basic idea underlying acupressure is that disorders are related to the flow of "Qi" which is thought to be the energetic life force moving through the body along a network of pathways called meridians. Acupressure refers to the massage of acupoints and meridians with fingertips or knuckles to release the blocked or deficient Qi as well as reduce excess energy if present **(Stux et al., 2012)**. Acupressure can relax respiratory muscles and improve pulmonary function through producing local and systemic anti-inflammatory effects by activation of the cholinergic anti-inflammatory pathway. Thus, integration of acupressure in the care of children with asthma is needed **(Chi et al., 2020)**.

Parents of children with asthma play a key role in their asthma management. They are considered to be the best judges of the severity of asthma. They are able to recognize their child's particular asthma pattern by careful and frequent observation and they are also familiar with the specific triggering factors that trigger asthma in their children. Parents must have knowledge regarding condition and treatment, understand how to monitor symptoms and respond to changes in the condition. So parental education is important for adherence to treatment regimen and keeps control over asthma **(Abu-Shaheen et al., 2016)**.

Significance of the study:

Bronchial asthma is a global health problem that has a major impact on the children's lifestyle, disturbs everyday of their life, and limits their physical and emotional abilities. Also the disease imposes a significant economic burden on the children's family and the whole society **(Asher et al., 2017)**. Asthma in children is in the top ten conditions affecting Disability Adjusted Life Years (DALYs). It is estimated that the number of DALYs lost due to asthma worldwide is about 15 million per year, which accounts for around 1% of all DALYs lost. The number of DALYs lost due to asthma reflects high prevalence and severity of it **(Cruz 2017)**.

Acupressure is one of the important non-pharmacological modalities which is effective in regulating respiration, increasing oxygen saturation, decreasing fatigue and significantly enhancing asthma control. It can be performed at home by family members, has no cost and is easily implemented. Parents are key persons involved in the care of their children with bronchial asthma and require more time, care and attention from them thus, it is necessary to equip them with innovative evidence in asthma control as well as increase their awareness regarding the efficacy of acupressure as integrative therapy **(Chi et al., 2020,Abu-Shaheen et al., 2016)**.

Aim of the study

The study was conducted to evaluate the effect of acupressure on quality of life, dyspnea, sleep and fatigue among children with bronchial asthma.

Research hypothesis

H^1: The application of acupressure is expected to improve quality of life of children with bronchial asthma.

H^2: The application of acupressure is expected to improve dyspnea of children with bronchial asthma.

H^3: The application of acupressure is expected to improve sleep of children with bronchial asthma.

H^4: The application of acupressure is expected to improve fatigue of children with bronchial asthma.

Subjects and Method

Research design

A quasi experimental research design was utilized in this research to achieve the aim of the study. A quasi-experimental research design using one group (before, two and four weeks) was utilized in the current study. Pretest

and posttest quasi-experimental research design type means that there is testing of a dependant variables (children's quality of life, dyspnea, sleep and fatigue) before ,two and four weeks after intervention with an independent variable(acupressure)

Setting:

The study was carried out at the Chest Inpatient Unit of Tanta Main University Hospital. This unit consists of two wards and each ward contains six beds, one monitor and six flowmeters (one flowmeter beside each bed).

Subjects:

The study subjects compromised a purposive sampling of sixty (60) children diagnosed with bronchial asthma. The inclusion criteria of the study sample include: children aged from 5 to 12 years old, free from any other respiratory disease such as pneumonia or any other associated health such as neurological disorder, heart disease or anemia. The study subjects were selected randomly. The subjects included 60 child subjected to acupressure sessions plus hospital treatment.

Data collection tools

In this research study, data were gathered using three tools. These tools were:

Tool l: A structured interview schedule:

It was created by the researcher to obtain baseline data of studied children .It composed of two main parts:

First part: It included the socio demographic characteristics of the studied children such as: age, gender and residence.

Second part: Studied children's clinical data: as family history of bronchial asthma, past history which included presence of other respiratory or health problems, age at which bronchial asthma started, symptom felt when diagnosed with asthma, pervious hospitalization due to bronchial asthma and all medications prescribed to treat it. In addition to children's present history which included present symptoms, current medications and degree of their asthma.

Tool II: Health Related Quality of Life that was evaluated by using PROMIS Pediatric Asthma Impact Scale:

This tool is disease specific questionnaire for children with asthma **(Cella et al., 2007).**It is used to determine how asthma effect on children aged 5-17 years old. It included 17 items that was covered three domain; restriction of activities, symptoms, and emotional function. There were five items in the domain of activity limitations related to play, sports, and other daily activities. The symptoms domain contained seven items, including coughing, wheezing, tightness in the chest, and nocturnal awakening. There were five corresponding items in the emotional function domain, including being frightened, being scaring or worried, etc. The children were asked to remember the items of these domains in the last 7 days and response to each item from five answers ranged from 0 that was indicated that asthma never had impact on their quality of life to 4 that was indicated that asthma almost always had impact on their quality of life in three domains. Each domain's scores were added up and divided by the total number of elements in that domain. The total score was calculated by adding up and dividing all the scores by 17 as following: never impact (0 - < 1), sometimes impact (1 - < 3) and always impact 3-4

Tool III: Children's Physical Health Assessment:

It was measured by using three scales: Pediatric Dyspnea Scale (PDS), PROMIS Pediatric Sleep Disturbance Short Form 4a Scale, and PROMIS Pediatric Fatigue Short Form 10a Scale

Pediatric Dyspnea Scale (PDS): The subject's symptoms were rated subjectively using this scale. The PDS questions the subject "How much breathing difficulties are you experiencing?" The scale consists of three parts: (1) a faces scale close to the Wong-Baker scale is used to assess an overall sense of wellness or discomfort**(Wong, Backer 2001)**, (2) a "chest tightness" graphic used with permission from the Dalhousie Dyspnea Scale**(McGrath et al., 2005)**,and (3) a series of color-coded descriptions of the intensity of breathing difficulties. The PDS is scored from 1 to 7 where 1 represented "No trouble at all" breathing and 7 represented "Very much trouble." Subjects selected one column of responses based on what most closely matched with their asthma symptoms and a score of 1 to 7 was assigned accordingly

PROMIS Pediatric Sleep Disturbance Short Form 4a Scale (Evans et al., 2019).This scale provides subjective assessment of the child difficulty in falling and staying asleep also presence of any problems during sleeping in the last 7 days. It compromised of four items which was contained statements about the impact of asthma on sleep. Children are asked to recall their sleep experience in the previous week .It is assessed on 5 point rating scale that was ranged from (1) = "never experience sleep disturbance", (2) ="Almost never experience sleep disturbance", (3) ="sometimes experience sleep disturbance",(4) = "Almost always experience sleep disturbance",(5) ="Always experience sleep disturbance(severe and continuous) . The total scores were calculated as following

- Less than 50% = Asthma didn't interfere with sleep.
- 50% to less than 80% =Asthma partially interfered with sleep.
- 80% and more = Asthma totally interfered with sleep.

PROMIS Pediatric Fatigue Short Form 10a Scale (Lai et al., 2013). This scale was administered by child or by the researchers according to child's abilities and age. It measured a child's fatigue during the past week. It was developed for children and adolescents aged 5–17 years and consisted of 10 items (e.g., "I was too tired to do sports or exercise") rated on a 5-point likert scale which was ranged from 1 = never to 5 = almost always. All items load on single latent factor; therefore, hence a total sum score is calculated with higher scores indicating greater fatigue. The total scores were calculated as following:

- Less than 50% = Asthma didn't cause fatigue
- 50% to less than 80% =Asthma partially caused fatigue.
- 80% and more = Asthma totally caused fatigue.

Method

The study was conducted through the following steps:

Administration process:

An official permission was approved from the director of Tanta Main University after explaining the goal of the study, establishing the time for starting the study.

Ethical and legal consideration

The studied children were reassured that the data collected was confidential and would only be utilized for intended purposes of the study. The nature of the research did not cause any harm or pain to the studied children and they were assured that they could leave the study at any moment without any consequences**.**

Content Validity:

The content validity of the study's questionnaires was reviewed by specialists in pediatric nursing and chest disease medicine. Modifications were made in accordance. Content validity index was 98%.

Tools development: Three tools were used for data collection; Tool I: A structured interview schedule. Tool II: Health related quality of life was evaluated by using PROMIS Pediatric Asthma Impact Scale included 17 items that cover three domains activity limitation, symptoms and emotional functions. Tool III: Physical health assessment that had three parts. The first part included Pediatric Dyspnea Scale. Second part included PROMIS Pediatric Sleep Disturbance Short Form 4a Scale and third Part covered PROMIS Pediatric Fatigue Short Form 10a Scale:

Content reliability:

Reliability of the developed tools was examined through the internal consistency. The value of Crombach's alpha coefficient was 0.91 for tool I, 0.90 for tool II and 0.89 for tool III.

A pilot study

It was initially carried out prior to actual data collection phase on six children to check clarity, feasibility and applicability of the tools and identify obstacles that may be found during the data collection process.

Phases of the study: The study was carried out through four phases

1-Assessment phase

- The researchers conducted it on all study participants to obtain baseline data of this study which was consisted of past and present medical history, effect of asthma on quality of life, dyspnea, sleep and fatigue using tool I, II, and III
- The assessment session took about 30-45 minutes for every child in this study.
- Subsequent assessment was done after2 and 4 weeks for studied subject to evaluate their progress.

2- **Planning phase**: A special training of the field of acupressure was obtained by the study researchers.

3- **Implementation phase** (acupressure session for study subjects)

- Children were asked to wear comfortable clothing because tight clothing can obstruct circulation.
- Children were informed to avoid eating big meal or to be full stomach before acupressure session because full stomach inhibits blood flow and might cause nausea.
- Children were informed to avoid ice drinks that extremely cold as they weaken their systems and could counteract the acupressure benefits.
- The treatment room kept warmed and well ventilated when applied the technique.
- The researcher kept her fingernails trimmed fairly short to prevent injury of the children's skin and her hands kept warmed by friction of hands against each other to avoid any discomfort to children.
- During acupressure the application of pressure was in a slow rhythmic manner.
- Accurate allocation of acupoints was determined using thumb or the index on the allocated acupressure points along the lung and kidney meridians (Lung 1 , Lung 2, Kidney 25, Kidney 23, Ren 17, UB13 , UB23, Stomach 10, Kidney 3, Lung 9)

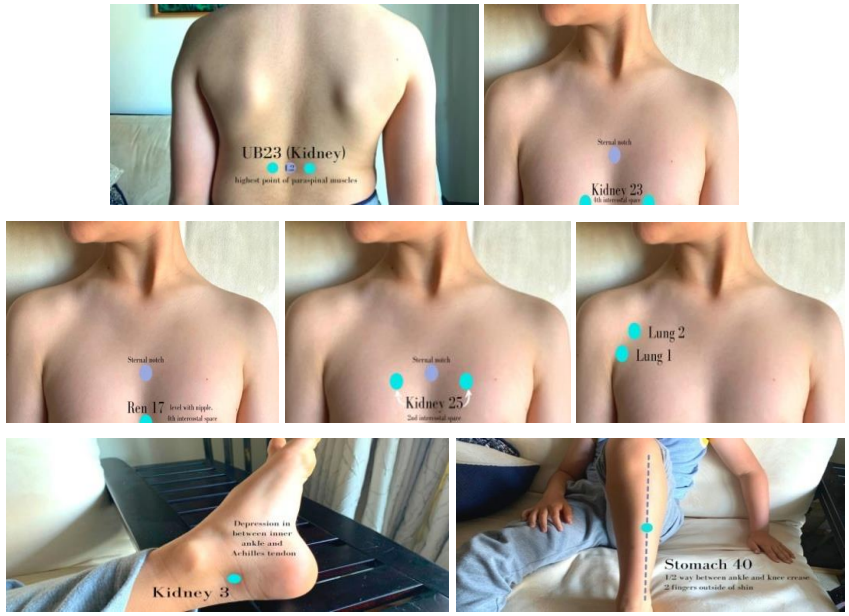

Figure (1): Acupressure points used in this study

- Acupressure sessions were done by the researchers from admission after assessment phase two times daily at morning and afternoon shifts through all staying period in hospital.
- Training was done to all children and their caregiver in hospital and handouts was given with pictures of acupressure points, also the researchers contacted with caregivers through WhatsApp and telephone calls to evaluate studied children's progress.

4-Evaluation phase

- Every child in the study was reevaluated after two and 4 weeks using tool II and III.
- Comparison between the findings before, 2 and 4 weeks after acupressure sessions were carried out using appropriate statistical analysis in order to examine effect of acupressure sessions on quality of life, dyspnea, sleep and fatigue among studied children.
- Data collection started at the beginning of December 2018 and ended July 2019.

Statistical Analysis:

The collected data were cleaned, organized, tabulated. SPSS software version 26 was used to analyze the data (Statistical Package for the Social Sciences, version 26, SPSS Inc. Chicago, IL, USAThe mean, range, and standard deviation for quantitative variables were estimated. The Chi-square test was used to compare two groups and more (2). The t-test was applied to parametric data of Independent Samples to compare the means of two separate groups. The F value of the ANOVA test was determined to compare parametric data that had more than two means. The Pearson's correlation coefficient was used to assess the relationship between the variables (r). P0.05 was used as the threshold for significance for interpreting the results of tests of significance (*). Additionally, P 0.01 was chosen as the threshold for very significant results in significance testing. **(Dawson and Trapp 2001)**

Results

Table (1): shows percentage distribution of the studied children regarding socio demographic characteristics. It was observed that 36.7% of the studied children their age was ranged from (5-> 8) years old and 26.6% aged from (8-> 10) years with a mean age **8.183 ± 2.370**. Regarding their sex, the majority (78.3%) of studied children was male and 21.7% of them were female. This table also showed that 58.3% of studied children were from urban areas.

Table (2): shows the percentage distribution of studied children related to their past history of clinical data. It was observed that 83.3% of studied children didn't have other respiratory problems. This table illustrates that 81.7 % of studied children didn't have other health problems .Regarding age at which bronchial asthma started, it was observed that 51.7% of them their asthma attack started from birth to one year old and 13.3% their asthma attack started from one to two years old.

This table also reveals that 95% of the studied children suffered from cough and 80% of them suffered from dyspnea when diagnosed with bronchial asthma. Regarding pervious hospitalization due to bronchial asthma, it was observed that 26.3% of the studied children were hospitalized more than 10 times. This table showed that all studied children were treated with bronchodilators and mucolytic and 96.7% of them were treated with mucolytic.

Table (3): illustrates percentage distribution of studied children regarding present history of clinical data regarding present symptoms. It was observed that all studied children and 88.3 % of them had cough and chest tightness respectively. Concerning administration of current medication, it was revealed that all studied children administered bronchodilators and 86.7% of them administered antibiotics. This table also illustrates that 48.4% of studied children suffered from severe asthma while 23.3% of them suffered mild asthma.

Table (4): shows percentage distribution of studied children related to health-related quality of life before, 2 and 4 weeks after acupressure sessions. Concerning activity limitation, it was observed that asthma always had impact on activity of 58.4%of studied children before acupressure sessions while 50% of them had no or sometimes impact on activity by asthma 2weeks and 4 weeks after acupressure sessions.

It was found that 58.4% of studied children always had several symptoms of asthma before acupressure sessions while 60.0% and 66.7% of them didn't suffer any symptoms 2 and 4 weeks following acupressure sessions respectively. Also it was observed that asthma always had impact on emotional functioning of 55.0% of studied children before acupressure sessions while 63.3% and 70% of them, their asthma had no impact on their emotional functioning 2 weeks and 4 weeks after acupressure sessions respectively.

Table (5): shows percentage distribution of studied children according to presences of breathing troubles before, 2 and 4 weeks after acupressure sessions. It was observed that 25.0% of studied children suffered from very much trouble of breathing before acupressure sessions while 46.7 % and 73.3% of them did not suffer any trouble at all 2 and 4 weeks after acupressure sessions respectively with highly statistically significant difference P= 0.000.

Table (6): shows percentage distribution of studied children related to presence of sleep disturbance before, 2weeks and 4weeks after acupressure sessions. It was showed 61.7% of studied children their asthma totally interfered with their sleep before acupressure sessions while 68.3% and 85.0% of them their asthma didn't interfere with their sleep 2 and 4 weeks after acupressure sessions respectively with highly statistically significant difference P= 0.000.

Table (7): shows percentage distribution of studied children related to presence of fatigue before, 2 and 4 weeks after acupressure sessions. It was observed that 43.3% of studied children totally fatigued because of asthma before acupressure sessions while 78.4% and 88.4% of them did not suffer from fatigue 2 weeks and 4 weeks after acupressure sessions with highly statistically significant difference P= 0.000.

Table (8): illustrates correlation between studied children's health-related quality of life and presence of dyspnea, sleep disturbance and fatigue. It was found that there were a positive correlations between health related quality of life of studied children and presence of dyspnea, sleep disturbance and fatigue for them before, 2 weeks and 4 weeks after acupressure sessions with r=(**0.890** , **0.521** , **0.271, 0.495** , **0.499, 0.443, 0.280**, **0.523**, **0.390)** respectively.

Table (1): Percentage distribution of studied children regarding their socio demographic characteristics (n=60)

Socio–demographic characteristics	No.	%
Age (years)		
5- > 8	22	36.7
8 - > 10	16	26.6
10 – 12	22	36.7
Range	**5 – 12**	
Mean ± SD	**8.183 ± 2.370**	
Gender		
Male	47	78.3
Female	13	21.7
Residence		
Rural	25	41.7
Urban	35	58.3

Table (2): Percentage distribution of studied children related to their past history of clinical data (n=60)

Studied children's clinical data	No.	%
Presence of other respiratory problem		
Yes	10	16.7
No	50	83.3
Presence of other health problem		
Yes	11	18.3
No	49	81.7
Presence of any family history of bronchial asthma		
Yes	30	50.0
No	30	50.0
Age at which bronchial asthma started		
Birth – > 1 year	31	51.7
1 – > 2 years	8	13.3
2 – 3 years	21	35.0
Symptoms felt when diagnosed bronchial asthma #		
Dyspnea	48	80.0
Cough	57	95.0
Fatigue most of the time	40	66.7
Chest wheezing	46	76.7
Chest tightness	38	63.3
Cyanosis	16	26.7
Others	5	8.3
Pervious hospitalization due to bronchial asthma		
None	18	30.0
Less than 5 times	15	25.0
5 - 10 times	10	16.7
More than 10 times	17	26.3
Treatment taken since diagnosed with bronchial asthma #		

Table (2): Cont.

Bronchodilators	60	100.0
Mucolytics	58	96.7
Corticosteroids	51	85.0
Antibiotics	49	81.7
Don't know	1	1.7

 # More than one answer

Table (3): Percentage distribution of studied children regarding present history of clinical data (n=60)

Present children's' clinical data	No.	%
Present symptoms #		
Dyspnea	46	76.7
Cough	60	100.0
Fatigue most of the time	50	83.3
Chest wheezing	48	80.0
Chest tightness	53	88.3

Table (3): Cont.

Cyanosis	21	35.0
Others	2	3.3
Current medication #		
Bronchodilators	60	100.0
Mucolytics	59	98.3
Corticosteroids	50	83.3
Antibiotics	52	86.7
Stage of asthma		
Mild	14	23.3
Moderate	17	28.3
Sever	29	48.4

 # More than one answer

Table (4): Percentage distribution of studied children related to health-related quality of life (n=60)

Domains of PROMIS Pediatric Asthma Impact Scale	Before		2weeks after		4 weeks after		χ^2 P
	No.	%	No.	%	No.	%	
Activity limitation							
Never impact (0 - < 1)	2	3.3	30	50.0	33	55.0	**97.91 0.0001****
Sometimes impact (1 – < 3)	23	38.3	30	50.0	27	45.0	
Always impact (3 – 4)	35	58.4	0	0.0	0	0.0	

Table (4): Cont.

Range **Mean ± SD**	0.8 – 4 2.80 ± 0.971		0 – 2.2 0.826 ± 0.46		0 – 2.2 0.778 ± 0.47		**F value = 172.17 0.0001****
Symptoms							
Never impact (0 - < 1)	2	3.3	36	60.0	40	66.7	**103.92 0.0001****
Sometimes impact (1 – < 3)	23	38.3	24	40.0	20	33.3	
Always impact (3 – 4)	35	58.4	0	0.0	0	0.0	
Range **Mean ± SD**	0.8 – 4 2.92 ± 1.220		0 – 2.6 0.753 ± 0.53		0 – 2.6 0.730 ± 0.52		**F value = 136.69 0.0001****
Emotional functions							
Never impact (0 - < 1)	1	1.7	38	63.3	42	70.0	**105.30 0.0001****
Sometimes impact (1 – < 3)	26	43.3	22	36.7	18	30.0	
Always impact (3 – 4)	33	55.0	0	0.0	0	0.0	
Range **Mean ± SD**	0.1 – 4 3.05 ± 0.845		0 – 1.4 0.853 ± 0.25		0 – 1.3 0.790 ± 0.25		**F value = 349.73 0.0001****
PROMIS Pediatric Asthma Impact Scale							
Never impact (0 - < 1)	1	1.7	40	66.7	38	63.3	**108.848 0.0001****
Sometimes impact (1 – < 3)	23	38.3	20	33.3	22	36.7	
Always impact (3 – 4)	36	60.0	0	0.0	0	0.0	
Range **Mean ± SD**	0.5 – 4 2.94 ± 0.934		0 – 1.9 0.820 ± 0.35		0 – 1.8 0.776 ± 0.35		**F value = 240.40 0.0001****

**** Highly Statistically significant difference at (P<0.01)**

Table (5): Percentage distribution of studied children according to presence of breathing troubles (n=60)

Dyspnea	before		2 weeks after		4 weeks after		χ^2 P
	No.	%	No.	%	No.	%	
Degree of troubles							
No trouble at all	3	5.0	28	46.7	44	73.3	**136.16 0.0001****
A tiny bit	6	10.0	26	43.3	16	26.7	
A little	10	16.7	6	10.0	0	0.0	
Some	5	8.3	0	0.0	0	0.0	
Quite a lot	13	21.7	0	0.0	0	0.0	
A lot	8	13.3	0	0.0	0	0.0	
Very much trouble	15	25.0	0	0.0	0	0.0	
The mean score							
Range	1 - 7		1 - 3		1 – 2		**F value = 154.76**
Mean ± SD	4.71 ± 1.88		1.63 ± 0.66		1.26 ± 0.44		**0.0001****

**** Highly Statistically significant difference at (P<0.01)**

Table (6): Percentage distribution of studied children related to presence of sleep (n=60)

Sleep Disturbance	before		2 weeks after		4 weeks after		χ^2 P
	No.	%	No.	%	No.	%	
The impact of asthma on sleep							
Asthma doesn't interfere with sleep. (4 – 9)	11	18.3	41	68.3	51	85.0	**85.629 0.0001****
Asthma partially interferes with sleep. (10 – 15)	6	10.0	10	16.7	9	15.0	
Asthma totally interferes with sleep. (16 – 20)	43	61.7	9	15.0	0	0.0	
The mean score							
Range	4 – 20		4 – 17		4 – 12		**F value = 93.882**
Mean ± SD	**16.21± 4.93**		**8.533 ± 4.72**		**6.300 ± 2.30**		**0.0001****

**** Highly Statistically significant difference at (P<0.01)**

Table (7): Percentage distribution of studied children related to presence of fatigue (n=60)

Pediatric Fatigue	before		2 weeks after		4 weeks after		χ^2 P
	No.	%	No.	%	No.	%	
The impact of asthma on child fatigue							
Asthma doesn't cause fatigue. (4 – 24)	12	20.0	47	78.4	53	88.4	**83.096 0.0001****
Asthma partially causes fatigue. (25 – 39)	19	36.7	11	18.3	7	11.7	
Asthma totally causes fatigue. (40 – 50)	29	43.3	2	3.3	0	0.0	
The mean score							
Range	13 - 50		10 - 43		10 - 28		**F value = 145.985**
Mean ± SD	**36.43 ± 10.18**		**15.80 ± 2.67**		**14.33 ± 2.86**		**0.0001****

**** Highly Statistically significant difference at (P<0.01)**

Table (8): Correlation between studied children's health-related quality of life and presence of dyspnea, sleep disturbance and fatigue to studied children (n=60)

Items	Health-related quality of life					
	Before		2 weeks after		4 weeks after	
	R	P	r	P	r	P
Pediatric Dyspnea Scale	0.890	0.0001**	0.495	0.0001**	0.280	0.030*
PROMIS Pediatric Sleep Disturbance Short Form 4a Scale	0.521	0.0001**	0.499	0.0001**	0.523	0.0001**
PROMIS Pediatric Fatigue Short Form 10a Scale	0.271	0.038*	0.443	0.0001**	0.390	0.003*

*** Statistically significant difference at (P<0.05)**
**** Highly Statistically significant difference at (P<0.01)**

Discussion

Acupressure has gained a significant importance over recent years as a complementary therapy for chronic disease such as bronchial asthma. The body has a network of energy channels or meridians similar to a vascular system for the circulation of blood. When the network is disrupted health negatively affected. Therefore acupressure was developed to stimulate the acuapoints or meridians to increase flow of energy. It is safe and effective method that assisting in improving symptoms control and reduce future risks of disease by unblocking interruptions in the body's energy network **(National Cancer Institute Acuepuncture 2012)**. So the current study was conducted to evaluate the effect of acupressure on quality of life, dyspnea, fatigue and sleep among children with bronchial asthma.

The findings of the present study revealed that more than half of the studied children with bronchial asthma were from urban areas (Table 1). This may be due to higher exposure for pest, mold allergen and air pollution in urban areas as traffic related air pollution and energy generation are the main sources of air pollution in urban communities that contribute to increase asthma incidence and morbidity between them. The study was in agreement with (**O'Conner et al., (2018**) who found that multiple factors contribute to the excess asthma burden in children living in urban communities.

As regards activity limitation, it was observed that asthma always had impact on activity of more than half of studied children before acupressure sessions (Table 4). This may be due to the influence of disease process that may affect the energy needed to perform daily activities in addition to children may avoided any activities that could trigger asthma attack especially the bronchial asthma was severe in nearly half of the studied children. The finding was in agreement with (**Frannik et al., 2010)** who found in their study that the most impaired domain of studied children was activity limitation.

It was observed that half and more than half of studied children had no impact on activity by asthma 2 and 4 weeks after acupressure sessions respectively. This could attribute to effectiveness and attractiveness of acuepressureas it was easy to apply bychildren on themselves and by their mothers on them.

Regarding emotional functioning of studied children, it was revealed that asthma always had impact on emotional functioning of more than half of them before acupressure sessions (Table 4). This may due to negative impact offrequent hospitalization because of asthma exacerbations on their emotional status as more than one quarter of studied children was hospitalized more than ten times. Also this finding could attributed to the age of one third of them was ranged from 10 to 12 years, that allows them to be able to have more responsibilities related to their health status which in turn affected their emotional status negatively. This finding was in line with (**Wander et al., 2017)** who found that the emotional functioning was the most affected domain in studied children.

On the other hand, nearly two thirds and more than two thirds of them, their asthma had no impact on their emotional functioning 2 and 4 weeks after acupressure sessions respectively (Table 4). This may due to nearly two thirds and more than two thirds of them didn't suffer from any symptoms of asthma 2 and 4 weeks following acupressure sessions respectively which affect their emotional status positively.

As regards pediatric dyspnea scale, it was observed that there were statistically significant differences regarding presence of breathing troubles among studied children before, 2 and 4 weeks after acupressure sessions (Table 5). This could be attributed to acuepressure which produced respiratory muscle relaxation and improve their pulmonary function that might be beneficial in relieving any breathing troubles. This result was in agreement with (**Lee & Frazier 2011)** who reported that there was a significant improvement in dyspnea among patients with asthma when performing acuepressure with traditional therapy against traditional therapy only.

Regarding presence of sleep disturbance before, 2 and 4weeks after acupressure sessions. It was revealed that nearly two thirds of studied children, their asthma totally interfered with their sleep before acupressure sessions (Table 6). This may be due to symptoms of bronchial asthma that often occurred at night and caused nighttime awakening thereby negatively affected their sleep. This result was in agreement with (**Koinis-Mitchell et al., 2015)** who found that general sleep problems were more frequent in children with poor asthma control. While more than two thirds and most of them their asthma didn't interfere with their sleep 2 and 4 weeks after acupressure sessions respectively. This may be due to the direct effect of acuepressure which promotes comfort and asthma symptoms relief that in turn facilitate the studied children's sleep.

As regards presence of fatigue in studied children before, 2 and 4 weeks after acupressure sessions. It was observed that less than half of themweretotally fatigued because of asthma before acupressure sessions(Table 7). This could be attributed to frequent symptoms of asthma as all and most of them had cough and chest tightness respectively which disturbed their sleep and led to their feeling of fatigue. This was in line with (**Herck et al., 2018)** who found that severe fatigue is present in about two thirds of patients in their study. While more than three quarters and most of them did not suffer from fatigue 2 weeks and 4 weeks after acupressure sessions. This may be due to improvement in their asthma symptoms and sleep after application of acuepressure.This was in agreement with (**Lee & Frazier 2011**) who found that acuepressure might be auseful strategy for the management of multiple symptoms such as dyspnea, fatigue and pain in avariety of patient populations which might improve patients' outcomes.

Conclusion

there was a statistically significant improvement in relation to quality of life dyspnea, sleep and fatigue among studied children at 2 and 4 weeks after acuepressure sessions application than before its application.

Recommendations

- Acuepressure should be applied into nursing care for children with bronchial asthma
- Inservice training programs should be conducted frequently for nurses about the application of acuepressure and its effects on minimizing dyspnea , disturbed sleep and fatigue in children with bronchial asthma
- Implementation of heath educational programs for children with bronchial asthmaandtheir parents about how to perform acuepressure in the early course of disease

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