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## EFFECT OF MOTHERS' IMPLEMENTING PROGRESSIVE MUSCLE RELAXATION TECHNIQUE ON ANXIETY AND SLEEP QUALITY AMONG CHILDREN WITH COVID-19

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### ABSTRACT

**Background:** COVID-19 was experienced by children led to anxiety and sleep problems and affected their sleep quality. Progressive muscle relaxation implementation can help to promote quality of sleep and decrease anxiety. **Aim:** To determine the effect of mothers' implementing progressive muscle relaxation techniques on anxiety and sleep quality among children with COVID-19. **Subjects and method:** **Design:** A quasi-experimental research design was utilized in this study. **Setting:** The study was conducted at pediatric chest diseases outpatient clinic at Sohag University Hospital, El-zehor, El-Mabra, and Alhamyate Hospitals in Port Said City, and a Home visit was done for follow-up. **Subjects:** A convenient sample of 50 children diagnosed with COVID-19 and their mothers were randomly divided into two groups, from a total population of 376 children and their mothers within six months. **Tools:** Three tools were used: Tool (I): A structured interview schedule Tool (II) Spielberger State Anxiety Scale for Children, Tool (III) Pittsburgh Sleep Quality Index Scale. **Results:** the children's age was between 5- < 10 years. There were significant differences and improvements related to anxiety level and quality of sleep mean scores between the two groups post-implementation of the relaxation technique. **Conclusion:** Progressive muscle relaxation technique implementation was an effective and safe non-medical intervention used for improving anxiety level and quality of sleep among children diagnosed with COVID-19. **Recommendations:** Providing Training program for mothers and their children regards progressive muscle relaxation technique to reduce anxiety and improve sleep quality among children with COVID-19.

**Keywords:** Anxiety, Children with COVID-19, Sleep quality, Progressive muscle relaxation.

## **INTRODUCTION**

A coronavirus pandemic disease (COVID-19) was started in Wuhan in 2019 which spread quickly around the world. COVID-19 considered a respiratory infectious disease which transmitted from person to another person through different transmission routes and causes high morbidity and mortality rate that led to anxiety and sleep disturbances (Lu, Stratton, & Tang, 2020).

Excessive anxiety can cause physical and psychological health problems for children and be associated with negative behaviors and make them unable to cope with the disease and may inhibit their recovery (Li, Chan, Wong, Kwok, & Lee, 2014 and Rice, Glasper, & Keeton, 2018). Quality of sleep is fundamental and important for the human body and physiological activity because poor sleep can affect all body systems (Acosta, 2019).

Children who are diagnosed with COVID-19 must be treated in isolation even in home isolation and through clinical observation, which may develop sleep disturbances and affected their anxiety level and sleep quality after isolation and treatment (Rajeswari & SanjeevaReddy, 2019).

When anxiety and sleep quality are impaired causes many sleep problems and other psychiatric disorders (Boergers, Hart, Owens, Streisand, & Spirito, 2017). This disease can cause children to have sleep disturbances due to the separate ratio from their parents, relatives, and friends (Acosta, 2019). From experience in the nursing care of COVID19 patients, it was observed that too difficult to fall in sleeping and wake up easily which may affect the prognosis of children's health regarding COVID-19 patients (Kai, Ying, Duozhi, Lin, & Wang, 2020).

A progressive muscle relaxation technique (PMRT) is considered one of the non-pharmacological interventions to relieve these problems; it reduces stress by its effect on mental and physical conditions (Frederiksen, O'Toole, & Mehlsen, 2017). Progressive muscle relaxation is considered the easiest one to be learned by children and administered; it's inexpensive, available at any time, self-induced by the patient, and not causes side effects. It can increase the body's immunity and well-being through endorphins release (Krupinska & Kulmatycki, 2014).

It depends on the principle that muscle tension leads to irritating thinking (Cougler, Wilver, & Day, 2020) which helps the body and mind to relieve any tension. Progressive muscle relaxation can improve the quality of sleep in children with pneumonectomy. It is easy to learn, does not require a specific time and place, and does not need special equipment. It helps to balance the sympathetic nervous system by relaxing the body, decreasing blood pressure, improve blood circulation, and maintaining muscle relaxation (Aksu, Erdogan, & Ozgur, 2018).

Pediatric nurses have an important role as teachers and advisors in educating service users and caregivers, in establishing progressive muscle relaxation program training. Providing health education and facilitating the development of other multidisciplinary team members. Nursing management regarding COVID-19 should focus on preventing the spread of infection. They should teach mothers' to apply the ideal hand washing technique, follow social distance, use the disinfectant materials such as alcohol, avoid shaking hands, put a tissue when coughing or sneezing on the mouth and nose, and wearing a mask to prevent the infection transmission. Also, educating the mothers to encourage the child not to touch the eyes, nose, and mouth, about appropriate hand washing after contact with others, sneezing, or coughing and they should be discouraged from sharing towels, washcloth, and get a separate bottle for each family member (WHO, 2020).

Community health nurses act as a counselor, educator, and advisor for mothers and their children through a home visit. Also, psychiatric health nurses play an important role in providing emotional support for the patient, especially with COVID-19. There is a lack of researches that evaluates the effect of progressive muscle relaxation on anxiety level and sleep quality among children with COVID in Egypt. So, the researchers conducted this study to determine the effect of progressive muscle relaxation on anxiety and sleep quality among children with COVID-19

### **Significance of the study**

There is an increased flow rate of children with COVID-19 in Egyptian 2020. Mothers face challenges, as they attempt to balance the needs of their children and worried about corona virus-related anxiety and sleep disturbances on their health during COVID-19 (Ministry of Health and Population in Egypt "MOHP", 2020). Anxiety and sleep disturbances can be managed by two methods; using non-

pharmacological methods such as progressive muscle relaxation technique, reflexology, relaxation, and using pharmacological methods (Stefanac & Nesbit, 2007).

## **AIM OF STUDY**

Determine the effect of mothers' implementing progressive muscle relaxation technique on anxiety and sleep quality among children with COVID-19

Research hypotheses:

1: Children with COVID-19 who receive mothers' implementing progressive muscle relaxation technique, their anxiety level will be expected to reduce than children who do not.

2: Children with COVID-19 who receive mothers' implementing progressive muscle relaxation technique, their sleep quality will be improved than children who do not.

## **SUBJECTS AND METHOD**

### **Research design:**

A quasi-experimental research design was used in this study.

### **Setting:**

This study was conducted at the Pediatric Chest diseases Outpatient Clinic of Sohag University Hospital, and Port Said hospitals (El-zehor, El-Mabra and Almasaha Albahary which is affiliated with health insurance.

The mentioned hospitals were selected due to high flow rate of children, as it serves the biggest region of population.

### **Subjects:**

A convenient sample of 50 children with COVID-19 and their mothers, from a population of 376 child and their mothers within six months, from the beginning of August 2020 till to the end of January 2021. They were randomly assigned into two equal groups with and without progressive muscle relaxation using simple random sampling. Study group: Consist of twenty-five children and their mothers' who have

received muscles relaxation technique in addition to routine care. Control group: Consist of twenty-five children and their mothers' who received routine care only.

**Inclusion criteria included:**

- Children aged 6-15
- Free from chronic disease

**Exclusion criteria included:**

Children are suffering from chronic illness, mental, physical illness, and injury.

**Tools of data Collection:**

Three tools were used to collect data for the current study as the following:

**Tool I: A structured interview:**

It was developed by researchers after reviewing the related literature (Ferendiuk, Biegańska, & Kazana, 2019, WHO, 2020, and Ministry of Health and Population in Egypt "MOHP", 2020) and research studies to assess demographic characteristics of mothers and their children which included two parts:

**Part (1):** Demographic characteristics of mothers as age, educational level, occupation, and residence.

**Part (2):** Demographic characteristics of children as sex, age, birth order, and educational level.

**Tool (II): State-Trait Anxiety Inventory for Children**

It was developed by Spielberger (1970) to measure transitory anxiety state in children their ages from 6 to 15 years. It consists of 20 sentences related to children feeling at a particular time. Scale statements are categorized under five subscales (sadness, worry, fear, uncertainty, and anxiety). Children were instructed to respond according to how they felt about their surgeries. Children respond to the scale by selecting one from the three alternatives (rarely, sometimes, and often). Response categories were assigned values of one, two, and three.

**Scoring system:**

Total scores are a summation of the item scores; the total scores were 60. For statistical purposes, scores ranged from 20 to 30 were considered low anxiety, 30–40,

indicating average; 40–50, indicating above average; and 50–60 suggesting a very high level of anxiety.

Tool III: The Pittsburgh sleeps quality index scale (PSQI) (Buysse, Reynolds, & Monk, 1989).

The PSQI was used to evaluate sleep quality before and after the intervention (Carpenter & Rykowski, 1998). The scale was developed by Buysse and collaborators to measure the quality of sleep and to help discriminate between individuals who experience poor sleep versus individuals who sleep well. The scale has several domains, which include subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The scale has two parts: 19 self-rated questions, utilized to rate the scale, and five questions rated by a bed partner. The scale can also be given by a clinician or research assistant. Most of the items are organized in multiple-choice questions and are brief and easy to understand and answer. The PSQI questions are rated from 0 = no difficulty to 3 = severe difficulty, generating scores that correspond to the domains of the scale. The scores range from 0 to 21 and the authors suggest that a score >5 be considered as a significant sleep disturbance. Time to complete PSQI scale: 5–10 min. The reliability of the scale is considered good with Cronbach's alpha of 0.83 for the total score. Test-retest reliability is also considered good. The validity of PSQI has been described by the authors as good with a sensitivity of 89.6% and a specificity of 86.5% of patients versus control subjects.

#### **Validity of the tool:**

The face validity was done and tested by a board of five experts in pediatric nursing, psychiatric nursing field, and community health nursing field. Content Validity Index (CVI) was 0.96.

#### **Reliability of the tool:**

The Reliability of the first tool was assessed through Cronbach's alpha test  $\alpha = 88\%$  and the reliability coefficients'  $\alpha$  between items of STAIC was 0.86.

#### **Field work:**

##### 1-Preparatory phase:

Official approval was done and obtained from the ethical committee of Faculty of Nursing and through an issued letter from the Dean of Faculty of Nursing,

Sohag University, and Port Said University Hospital to conduct this study and the directors of pediatric chest diseases outpatient clinic affiliated to Sohag University Hospital and El-zehor, El-Mabra, and Alhamyate Hospitals in Port Said City, Egypt.

**A pilot study:**

The pilot study was conducted on 10% of the children (5 children) to ensure the clarity and testing of the feasibility of the research process and needed modifications were carried out to develop the final form of the tools. Children included in the pilot study were involved in the current study.

**Implementation phase:**

Procedure of data collection:

- Before conducting the study, an exploratory visit was done to the selected setting to evaluate the rate of admission and suitable time for collecting data.
- Data were collected within six months from the beginning of August 2020 till the end of January 2021.
- Researchers attended the previously mentioned setting for collected data one day per week (Saturday), from 9 am to 11 am.

**Assessment:**

The researchers interviewed each child and his/her mother individually for about 30 minutes; the researchers explained the aim of this study as well as written consent was obtained from them then demographic, State-Trait Anxiety Inventory, and sleep quality index scale were collected from the child and his/her mother for two groups

**Intervention:**

In the study group:

- the researchers interviewed each child and his/her mother individually for about 2 hours according to the children and their mothers' level of understanding and comfort; the researchers explained the purpose of the study as well as oral consent was obtained from them then demographic, State-Trait Anxiety Inventory, and sleep quality index scale were collected from the child and his/her mother was collected from them with the application of the progressive muscle relaxation technique.

- The children and their mothers were randomly assigned into two equal groups, study and control groups (twenty-five subjects in the study group who received progressive muscle relaxation and routine care and twenty-five subjects in the control group who received the routine care only).
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- The training session was conducted on 2 mothers /day. The sessions were performed in the training unit with the permission of the responsible supervisor nurse at the selected hospital.
- Teaching methods included group discussion, demonstration and re-demonstration, models, and pictures (progressive muscle relaxation technique).
- In the current study, the questionnaire was distributed two times; pre and post the intervention
- Participants have followed the researcher's instructions at the home. Continuation of doing exercises was followed by phone calls.
- In the study group implementation of each child and his/her mother on progressive muscle relaxation technique started after the sleep quality index scale pre-test was completed.
- The researchers gave information to the subjects in the study group individually about the progressive muscle relaxation technique (Cooke, 2013).
- The subjects in the study group were informed to empty their bladder and be in a convenient position (sitting or lying). Progressive muscular relaxation was done using the Jacobson method by contracting and relaxing selected groups of muscles until total relaxation was achieved. In the intervention group, the subjects were asked to lie on their side with their legs fairly bent (no to put pressure on any of the muscles) and in a relaxed position with closed eyes and a combination of Jacobson relaxation technique and Benson's technique (deep breaths with mental imagery) was performed for 30 minutes in a room. In the technique, the body muscles were divided into eight parts and during performing the technique, an active muscle contraction for 5 seconds and then release of the same muscles for 30 seconds (tension/rest) was implemented.
- Muscle contraction and release were as follows: right foot, left foot, right hand, left hand, stomach and back, chest and the shoulders, face, head, and scalp. This technique was performed in the presence of the researcher by playing a CD which had already been recorded and prepared for all the subjects of the



intervention group. The participants were advised by the researchers to perform the technique every day, two times /day in the morning and the night under the supervision of the researchers.

- After the relaxation implementation, the researchers demonstrated each step of the progressive muscle relaxation technique then asked the children and their mothers to re-demonstrate it. The researchers then asked the children and their mothers to re-demonstrate all the steps and repeat the technique three to four times until the children and their mothers master it.
- The researchers were distributing the designed manual booklet to each participant to clarify how to apply the relaxation technique.

**The control group:**

- Participants received routine care only as evaluation of the physical health, administration of prophylactic medications, adequate and safe sleep of the children without application of the technique.

Designed manual booklet about progressive muscle relaxation: This booklet was contained the illustrative colored pictures and the main points of each training session

**Title:** Effect of progressive muscle relaxation technique on anxiety level and quality of sleep among children.

**General objective:** To determine the effect of the relaxation technique implementation on anxiety and sleep quality among children diagnosed with COVID-19.

**Specific objectives:**

- To assess anxiety level and sleep quality among children diagnosed with COVID-19 pre-intervention.
- To implement progressive muscle relaxation through mothers' education (intervention)
- To assess anxiety level and sleep quality among children diagnosed with COVID-19 post-intervention.

**Outlines of the booklet:**

- 1- Knowledge about progressive muscle relaxation technique (Meaning, technique, causes, and importance).

- 2- Sleep quality among children
- 3- Steps of massage technique demonstration.
- 4- Mothers' role at home with their children regarding progressive muscle relaxation.

**Evaluation phase:**

- In both study and control groups, the researchers reassess anxiety and the sleep quality levels after one week of progressive muscular relaxation technique intervention for children during a home visit in follow-up by trained children and mothers by using tool II and tool III.

**Ethical considerations:**

The purpose of the study was clarified to children and their mothers. Oral consent was obtained from mothers to conduct the study. The researchers informed the participants that, the study was voluntary, they were allowed to refuse to participate and they had the right to withdraw at any time, without giving any reason. Moreover, they were assured that their information would be confidential.

**Statistical analysis:**

Data entry was performed using SPSS for Windows, version 20. Descriptive statistics were presented in the form of frequencies and percentages for qualitative variables and mean and SDs for quantitative variables. Differences between the two means tests (t-test) were used. Comparison of qualitative parameters was done using Chi-square ( $\chi^2$ ) test. Pearson's correlation coefficient (r) test was used to assess the degree of association between two sets of variables. Statistical significance was considered at P-value  $<0.05$ .

**RESULTS:**

**Table (1):** Showed that (71%) of the studied mothers were aged  $\leq 25$  years. (44%) of them had elementary education levels and (68%) of mothers were housewives.

**Figure (1):** Illustrated that (69%) of mothers were living in urban areas and (31%) of them were living in rural areas.

In the **table (2)** a total of 50 children participated in the current study, 58% were female. Concerning age/years, 79 % of them their age were between 5- < 10. Additionally, 62% of children were at the preparatory educational level.

**Table (3):** highlighted that the total mean score of STAIC among the studied children before using the progressive muscle relaxation technique intervention was  $42.4 \pm 5.2$  and decreased to  $23.4 \pm 1.2$  in the intervention group compared to  $39.73 \pm 5.06$  in the control group following one-week progressive muscle relaxation technique intervention. Significant differences were found between the total mean score of anxiety in the pretest and after the progressive muscle relaxation technique intervention in both groups ( $P=0.0001$ ).

**Figure (2):** Showed that 23% of the studied children in the pretest intervention group had high anxiety on STAIC, whereas the level changed to low anxiety level among 73% of them after progressive muscle relaxation technique intervention

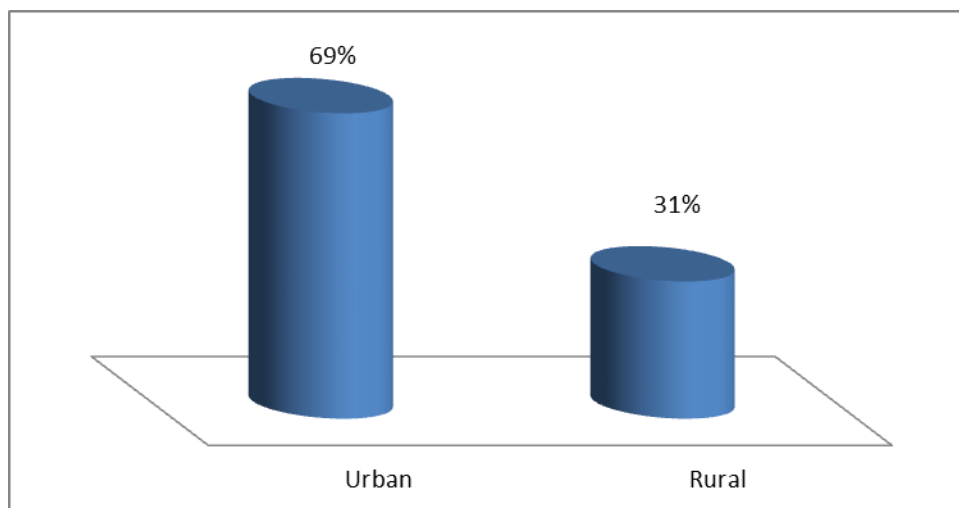
**Table (4):** Revealed that there were no differences found between the scores of sleep quality (PSQI) among intervention and control group before intervention ( $P=0.838$ ) while, statistically significant differences were found after the intervention ( $P<0.001$ ). The scores of quality of sleep in the intervention group were less than that in the control group post the progressive muscle relaxation technique ( $7.31 \pm 2.62$  &  $9.83 \pm 5.07$ ) respectively.

**Table (5):** Showed that a significant relation was detected between progressive muscle relaxation in both groups and all variables of the demographic data of studied mothers ( $P<0.001$ ).

**Table (6):** Illustrated that a significant correlation was found between children's progressive muscle relaxation and their age and educational level ( $r=0.355$   $p=0.013$  &  $r=0.374$   $p=0.0061$ ). On contrary, there was no statistically significant correlation observed between the children's progressive muscle relaxation scores and their gender ( $r=0.107$   $p=0.452$ ).

**Table (1):** Percentage distribution of studied mothers in both groups regarding their demographic characteristics (n=50)

Items	No.	%
Mother ' age in years		
≤25 years	36	71.0
>25 years	14	29.0
Mother ' education		
Illiterate	8	16.0
Elementary	22	44.0
Higher	20	40.0
Occupation		
Employee	8	32.0
Housewife	17	68.0

**Figure (1):** Mothers distribution regarding their residence (n=50)

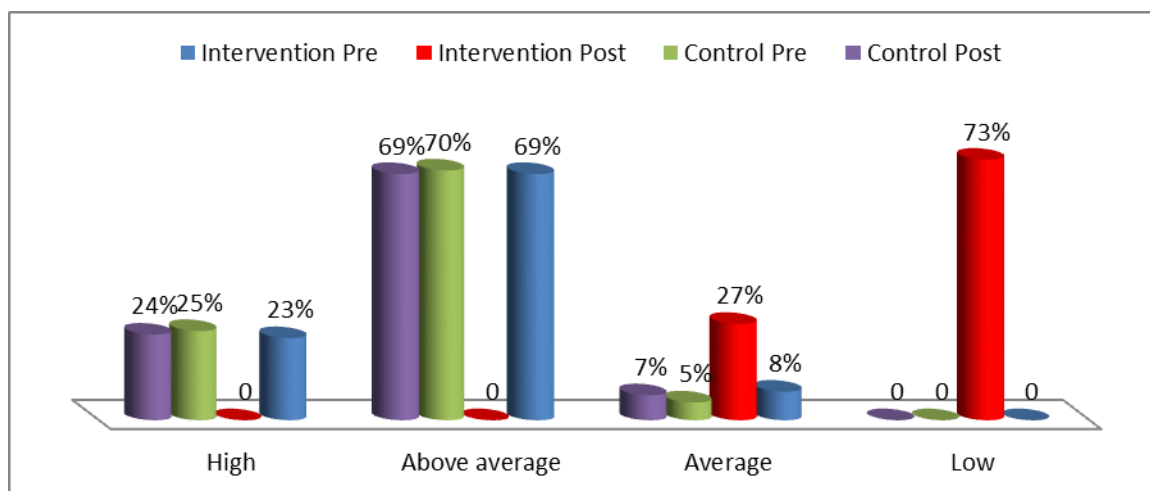
**Table (2):** Percentage distribution of the studied children in both groups regarding demographic data (n=50)

Item	No.	%
Gender :		
- Male	21	42
- Female	29	58
Age:		
- 5- < 10	40	79.0
- 10 ≤ 15	10	21.0
Educational level:		
- Primary level	9	18.0
- Preparatory level	31	62.0
- Secondary level	10	20.0

**Table (3):** Comparison between the mean score of STAIC in the studied groups pre and post-progressive muscle relaxation intervention (n=50)

Items	Study group (25)	Control group (25)	P-value
The total mean score of STAIC (pretest)	42.4±5.2	40.09±5.04	0.837
The total mean score of STAIC (posttest)	23.4±1.2	39.73±5.06	P<0.001**

\*Statistically significant level at  $P < .0001$



**Figure (2): Percentage distribution of anxiety level of the studied children in both groups before and after progressive muscle relaxation intervention (n=50)**

**Table (4): Mean differences between pre/post-progressive muscle relaxation intervention regarding sleep quality in the control and study groups**

Sleep quality	Study group (25)	Control group (25)	P-value
Before the intervention	10.36 ±3.84	10.09±5.54	0.838
After the intervention	7.31±2.62	9.83±5.07	P<0.001**

\*Significance at 0.001 levels

**Table (5):** Association between progressive muscle relaxation technique knowledge and the studied mothers' demographic data in the control and study groups (n=50)

Item	Progressive muscle relaxation				X2	P-value
	The Study group (25)		The control group (25)			
	No.	%	No	%		
Mother ' age in years						P<0.001**
≤25 years	18	71.0	19	74	76.2	
>25 years	7	29.0	6	26		
Women ' education						P<0.001**
Illiterate	4	16.0	1	5	66.8	
Elementary	11	44.0	15	60		
Higher	10	40.0	9	35		
Occupation						P<0.001**
Employee	8	32.0	9	37	53.3	
Housewife	17	68.0	16	63		
Residence						P<0.001**
-Rural	8	31.0	7	30	50.6	
-Urban	17	69.0	18	70		

\*Significance at 0.000 levels

**Table (6):** Correlation between progressive muscle relaxation technique and demographic data of the studied children (n=50)

Personal data of children (n=50)	A progressive muscle relaxation technique	
	r	P
Gender	-0.107	0.452
Age	-0.355	0.013*
Educational level	-0.374	0.0061*

**DISCUSSION:**

Relaxation technique as progressive muscle relaxation are effective methods that help for coping with anxiety and improve sleep quality, it can be performed after simple and brief training. Jacobson progressive muscle relaxation technique is very easy to learn and is considered one of the best complementary therapies which can easily be learned and inexpensive and do not require special equipment (Alwan, Zakaria, Abdul Rahim, Abdul Hamid, & Fuad, 2018).

The current study results indicated that the scores of STAIC among the studied children have been decreased in the study group after one week of the technique intervention. The result indicates the positive effects of relaxation techniques upon the reduction of anxiety levels among children. This result is agreed with De, Naccarato, & Cibelli, (2019), who studied "The effectiveness of relaxation technique and interactive guided imagery as a pain-decreasing intervention in patients with cancer" and reported that progressive relaxation intervention can decrease anxiety level. Meyer, Keller, & Woller, (2016) in their study about progressive muscle relaxation which reduces the migraine frequency and normalizes amplitudes of contingent negative variation and found that the observation group's means scores were less than those of the control group.

The current study findings highlighted that nearly one-quarter of the children in the pretest study group had high anxiety on STAIC, whereas the level changed to low anxiety level among more than two-thirds of them after relaxation technique intervention. This may be indicated the importance of implementing the relaxation technique that can lead to anxiety minimizing.

These findings are supported by Park, Yim, & Lee, (2019) conducted a study about progressive muscle relaxation intervention to decrease dental anxiety and reported that relaxation technique intervention can effectively minimize the anxiety and the tension of dental patients (Li, Chan, Wong, Kwok, & Lee, 2018).

Similarly, Xiao, Deng, & Zhang, (2020) studied progressive muscle relaxation intervention effects regarding negative emotions and sleep quality in patients with COVID-19 and stated that progressive muscle relaxation improved the anxiety level and quality of sleep in patients with COVID-19 during isolation.



The results of this study indicated that the quality of sleep score in the study group was less than that of the control group after intervention. This result indicates the positive effect and importance of the relaxation technique on improving the quality of sleep among children. This result agreed with the study by Seyedi, Gholami, & Azargoon, (2018) who done a study about "the effect of relaxation technique on the relieving fatigue and promoting quality of sleep in patients diagnosed with chronic obstructive pulmonary disease" and pointed out that progressive muscle relaxation can promote sleep. anxiety level decreasing after the intervention may be related to the that the anterior and hypothalamic nucleus is balanced which cause a reduction in the sympathetic nervous system activity that leads to prevention of adverse impacts of stress and anxiety levels, and cause an increase in body relaxation (Ferendiuk, Biegańska, & Kazana, 2018).

Also, other researches about the benefits of progressive muscle relaxation regarding anxiety among females (Wilczyńska, Łysak-Radomska, & Podczarska-Głowacka, 2019), prenatal anxiety (Rajeswari, & SanjeevaReddy, 2019), quality of sleep among patients with fractures (Xie, Deng, & Zhang, 2016), and early breast cancer among female patients (Gok, Karadas, & Izgu, 2016) is agreed with the results of this study.

The results of Annal, Boris, Erik, & Markus, (2014) conducted a study regarding sleep disturbances that occurred among children, adolescents, and adults diagnosed with psychomotor impairment: impact on sleep and found that relaxation technique has a good effect on promoting quality of sleep and anxiety minimizing among patients. This is related to progressive muscle relaxation which can make the body relaxed, which can effectively decrease and relieve anxiety and promote quality of sleep (Liu, Chen, Wu, Lin, Wang, & Pan, 2020).

On other hand, this result disagrees with Masih, Dimmock, & Guelfi, (2019) who done a study about the effect of this technique post-exposure to an acute stressor on subsequent energy intake and found that no significant difference was detected between the groups regarding the practice of progressive muscle relaxation. Also, Hasanpour-Dehkordi, Solati, & Tali, (2019) who studied the effect of relaxation technique in addition to analgesic on anxiety status and pain in surgical patients and

found that no method was effective. The disagreement may be related to differences in the study group.

The results of this study indicated that there was a significant relationship was found between progressive muscle relaxation in both groups and variables of the demographic data of studied mothers ( $P < 0.001$ ). This may be explained by that younger and low educational mothers' level had insufficient knowledge and difficulty to understand the progressive muscle relaxation technique quickly than educated mothers, while the educated mothers may have easy understand the knowledge than no educated mothers about progressive muscle relaxation.

The findings of the current study revealed that a statistically significant relation was found between children's progressive muscle relaxation and their age and educational level. Regarding the age of the studied children, this may explain that children with young age don't have sufficient knowledge about the disease which causes more anxiety for them and is considered the main reason for their sleep quality disturbance.

## **CONCLUSION:**

Depending upon the results of the current study and the study hypothesis it was concluded that progressive muscle relaxation technique has a positive effect on reducing anxiety level and improving sleep quality among children with COVID-19 as a non-pharmacological, inexpensive, and alternative medicine method.

## **RECOMMENDATIONS:**

From the previous findings the following recommendations are suggested: -

1-Encourage training programs for pediatric nurses departments about the utilization of progressive muscle relaxation techniques are recommended.

2-Future research includes replication of the current study on a large group. Use progressive muscle relaxation technique on management with other methods and compare it.

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## تأثير تطبيق الأمهات لتقنية استرخاء العضلات التقدمية على القلق وجودة النوم بين الأطفال

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## الخلاصة

يعانى الأطفال من COVID-19 مما أدى إلى القلق ومشاكل النوم وأثر على نوعية نومهم. يمكن أن يساعد تنفيذ استرخاء العضلات التدريجي في تعزيز جودة النوم وتقليل القلق. هدفت الدراسة إلى تحديد تأثير تطبيق الأمهات لتقنيات استرخاء العضلات التقدمية على القلق ونوعية النوم بين الأطفال المصابين بـ COVID-19. التصميم: تم استخدام تصميم بحث شبه تجريبي في هذه الدراسة. اماكن جمع العينة: أجريت الدراسة في العيادة الخارجية لأمراض الصدر للأطفال بمستشفى جامعة سوهاج ومستشفيات الزهور والمبرة والحامية بمدينة بورسعيد ، كما تمت زيارة منزلية للمتابعة. العينة: تم تقسيم عينة ملائمة من 50 طفلاً تم تشخيص إصابتهم بـ COVID-19 وأمهاتهم بشكل عشوائي إلى مجموعتين ، من إجمالي عدد السكان البالغ 376 طفلاً وأمهاتهم في غضون ستة أشهر. الأدوات: تم استخدام ثلاث أدوات: (I): أداة جدول المقابلات المنظمة (II) مقياس القلق لولاية Spielberg للأطفال ، أداة (III) مقياس مؤشر جودة النوم في بيتسبرغ. النتائج: كان عمر الأطفال ما بين 5 - 10 سنوات. كانت هناك اختلافات كبيرة وتحسينات تتعلق بمستوى القلق ونوعية النوم يعني الدرجات بين المجموعتين بعد تنفيذ تقنية الاسترخاء. الخلاصة: كان تطبيق تقنية استرخاء العضلات التدريجي كمدخل غير طبي فعال وآمن يستخدم لتحسين مستوى القلق ونوعية النوم بين الأطفال الذين تم تشخيص إصابتهم بـ COVID-19. التوصيات: تقديم برنامج تدريبي للأمهات وأطفالهن يتعلق بتقنية استرخاء العضلات التدريجي لتقليل القلق وتحسين جودة النوم بين الأطفال المصابين بـ COVID-19.

**الكلمات المرشدة :** القلق ، الأطفال المصابون بـ COVID-19 ، جودة النوم ، استرخاء العضلات التدريجي.