

Efficacy of Mitchell's Simple Physiological Relaxation Technique in Alleviating Primary Dysmenorrhea

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ABSTRACT

This study was conducted to determine the effect of Mitchell's simple physiological relaxation technique in alleviating pain and tension of primary dysmenorrhea. Twenty five volunteer virgin females suffering from primary dysmenorrhea were selected from students of Faculty of Physical Therapy, Cairo University. Their ages ranged from 18 to 22 years and their body mass index was $\leq 28 \text{ Kg/m}^2$. Each subject had been treated with Mitchell's simple physiological relaxation technique for 30 minute/session, twice daily, 3 times/ week for 4 weeks in addition to daily home routine. Assessments were performed before and after treatment through measuring pain intensity by present pain intensity (PPI) score, pulse rate, respiratory rate and muscle tension (by T.G MYO-feedback 420v). The results showed highly significant ($P < 0.001$) reductions in (PPI) score, pulse rate, respiratory rate and T.G. MYO feed back 420v data after treatment program compared to pre-treatment assessment. Accordingly, it could be concluded that Mitchell's simple physiological relaxation was found to be an effective, non invasive, safe, cheap, easy to perform and successful treatment method in reducing pain and tension of primary dysmenorrhea.

Key words: Mitchell's simple physiological relaxation, primary dysmenorrhea, MYO feed back.

INTRODUCTION

Primary dysmenorrhea is cramping pain in the lower abdomen occurring just before or during menstruation. Its prevalence rates are as high as 90%. It is a common cause of absentessism and reduced quality of life in women^{4,7,14}.

Affected women experienced sharp, intermittent spasm of pain usually centered in suprapubic area. It may radiate to the back of the legs or the lower back and often associated with gastrointestinal and neurological symptoms¹⁷.

Systemic symptoms of nausea, vomiting, diarrhea, fatigue, fever, headache, nervousness, mood changes, backache and breast tenderness are fairly common¹⁹.

Dysmenorrhea is the commonest of all gynaecological symptoms. Its pain is often

intense and cramping and can be crippling and severely incapacitating so that it causes a major disruption of social activities. Painful menstruation is a cycle painful condition that adversely affects the woman's wellbeing for a large part of her life. Pain usually develops within hours of the start of menstruation and peaks as the flow becomes heaviest during the 1st day or two of the cycle^{10,33}.

Muscle tension as a function of sympathetic arousal may play a causal role in a symptomatology of dysmenorrhea. The results suggested that training for muscle tension reduction may reduce dysmenorrhea⁸.

A focused history and physical examination are usually sufficient to make the diagnosis of primary dysmenorrhea. The history reveals the typical cramping pain with menstruation and the physical examination is

completely normal. Secondary causes of dysmenorrhea must be excluded^{6,15}.

The most appropriate first line of therapy in most women with primary dysmenorrhea is non steroidal anti-inflammatory drug which inhibit production and release of prostaglandins which are responsible for the painful uterine contraction and associated systemic symptoms of primary dysmenorrhea^{3,5}.

Oral contraceptives are the 2nd line of therapy unless birth controls is also desired. About 10% of women with primary dysmenorrhea do not respond to medical treatment. In addition, some women have contraindications to these medications. Consequently, researchers have investigated numerous alternative treatment^{9,16}.

For patients who do not obtain complete relief or have contraindications to or side effects from the use of drugs, a non pharmacologic method for relieving pain and tension may be useful as relaxation techniques, massage, acupuncture and transcutaneous electrical nerve stimulation^{18,19}.

Relaxation therapy is an effective intervention for improving immune function, decreasing depression and improving quality of life. Maintenance and continued improvement of immune function and psychosocial variables at 2 months follow-up indicate that relaxation therapy may have long-term effects^{13,20}.

The effect of relaxation training on reducing anxiety and perceived stress among pregnant women was investigated, the findings suggest beneficial effects of relaxation on reducing anxiety and perceived stress in pregnant women. So, teaching relaxation techniques could serve as a resource for improving psychological health of the females^{21,24}.

Mitchell's simple physiological relaxation is a standardized method for management of stress that can be learned within a short time, allows intensive training at home and is widely used especially in the field of obstetrics and gynecology. It is based on physiological principle of reciprocal inhibition and involves diaphragmatic breathing. When one group of muscles acting on a joint is working, the opposing group is obliged to relax^{30,34}.

Mitchell's method of relaxation can be adapted to a number of situations including insomnia, antenatal, labour and postnatal, osteoarthritis of neck and lumbar spine, hypertension and psychiatric patients. As its name implies, it is a relatively simple technique, required less concentration, can be learned within a short time and allows intensive training at home²⁹.

So that, this study was performed to determine the effect of Mitchell's simple physiological relaxation technique in alleviating premenstrual disorder.

SUBJECTS, MATERIALS AND METHODS

Subjects

Twenty five volunteer virgin females suffering from primary dysmenorrhea were selected from students of Faculty of Physical Therapy, Cairo University. Their age ranged from 18-22 years and body mass index $\leq 28\text{Kg/m}^2$. They had no past or present diagnosis of psychiatric illness, no traumatic life events in last 2 months, no history of participation in relaxation training within previous 6 months.

They don't receive any anti-inflammatory or anti-spasmodic drugs during study period.

Informed consent form were signed by each subject before starting the treatment.

Materials

- Weight – height scale was used to measure body weight and height, then body mass index was calculated.
- Cotton and alcohol were used to clean the skin over upper fibers of trapezius before electrodes placement.
- Pillows, cushions and sheets to support body parts in a comfortable relaxed position 2 and to cover the subjects.
- Plinth was used for evaluation and treatment.
- Plusimeter (Tunturi TPM 400 Dc- 6V) was used to measure pulse rate at the beginning and end of treatment program.
- Stop watch was used for adjusting the duration of each relaxation session and to measure the respiratory rate.
- T GMYO- feed back 420v was used before and after the treatment program as an evaluative tool (o program – relaxation mode), through 2 surface electrodes placed over upper fibers of trapezius and another one earth electrode.
- Present pain intensity (PPi) scale was used to assess pain intensity.

Methods

Evaluative procedure:

- Assessment of muscle tension

Two adhesive surface electrodes of T.G. MYO- feed back 420v were placed over the upper fibers of trapezius and the reference electrode was placed over the right shoulder. Then the subject was assumed a comfortable relaxed half lying position with the aid of soft pillow behind her head and small cushions placed under her knees and ankles to support and accommodate her body curves.

T.G. MYO- feed back 420v was then switched on following o program (relaxation mode) and before recording any data, the subject was asked to relax through:

With eyes and mouth were gently kept closed, the subject was asked to display any disturbing thoughts form her mind then she observe and listen to her own unhindered regular breathing (in, out and pause in between them) in order to achieve mental relaxation and then she was asked to observe the feed back signals of T.G. MYO- feed back 420V.

- Pulse rate, respiratory rate, T.G. MYO- feed back 420v data were recorded. These records were repeated again after the end of treatment program.
- Assessment of pain intensity for each subject was done before and after treatment through PPI scale (0-4): 0 = no pain, 1 = mild pain, 2 = moderate pain, 3 = severe pain, 4 = unbearable pain.

Treatment procedure:

She was instructed to assume a comfortable half lying position on a firm surface with using pillows and cushions to accommodate her body curves. She was fully supported and her body parts were relaxed as well as, there was no muscle tension. Her mouth and eyes were gently kept closed.

The voice of the instructor used during relaxation training was smooth and quiet. Gradually reduced in volume as session progressed. After that, she was instructed to perform the following:

- 1- Dragging her jaw downwards inside her mouth. Then, she stopped this action and felt the new position.
- 2- Pressing her tongue downwards in her mouth. Then, she stopped this action and felt it.
- 3- Closing her eyes gently if they were open, keeping her eyelids down, then she stopped

and she was asked to feel and enjoy the peace of darkness.

- 4- Pushing her head downwards against the bed, then stopped this action and noting the bed carried weight of her head.
- 5- Pulling her shoulders towards her feet, feeling the space between her shoulders and her ears, then stopped this action and felt the new position.
- 6- Sliding her elbows sideways away from her body until she reached a comfortable point. Then, she was asked to stop moving and feeling the space between her arms and her body.
- 7- Abducting and extending (stretching and separating) her fingers and thumbs with the palmer surface of both hands rested on the bed. Then, stopping and noting how hands felt, spending one or two moment taking these sensation.
- 8- Breathing slowly and deeply without putting any effort into her breathing or any change in its rhythm.
- 9- Rolling her thighs outwards (external rotation). Stopping, letting her legs settled comfortably and noting how they felt in this position.
- 10- Moving her knees until they were comfortable, adjusting their positions to enhance their comfort. Stopping and registering the sense of ease.
- 11- Planter flexing her feet away from her face being careful not to induce cramp. Stopping and feeling the new position of her feet.
- 12- Pushing her body downwards against the bed. Stopping, then, feeling her body weight being supported and noting the points where her body touch the bed.

13- Thinking of a smoothing action which began above her eye brows, moved up into hair line, continued over the crown of her head and down to the back of her neck.

Enjoying this effect.

Then, she was instructed to slowly return to the active state gradually to avoid fainting. She was asked to open her eyes, being aware of the room, give her limbs a gentle stretches and her body plenty of time to be adjusted to an active state.

This technique was performed for thirty minutes / session, repeated two times daily, three times/ week for 4 weeks. In addition to home routine by using a recorded tape of relaxation instructions to extend the calm state achieved during session to other times of a day.

Statistical analysis

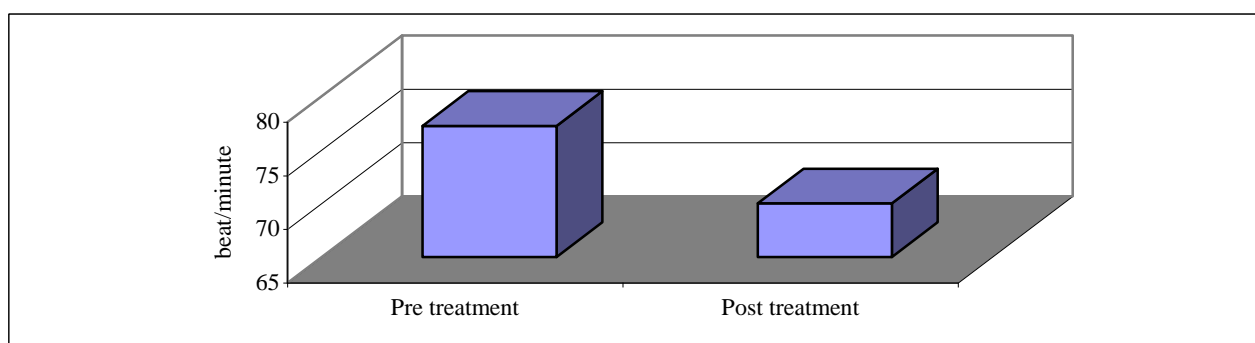
The collected data had been gathered and statistically analyzed. Paired t-test was used to compare between data before starting and after the end of the treatment program. Level of significance was $P < 0.05$.

RESULTS

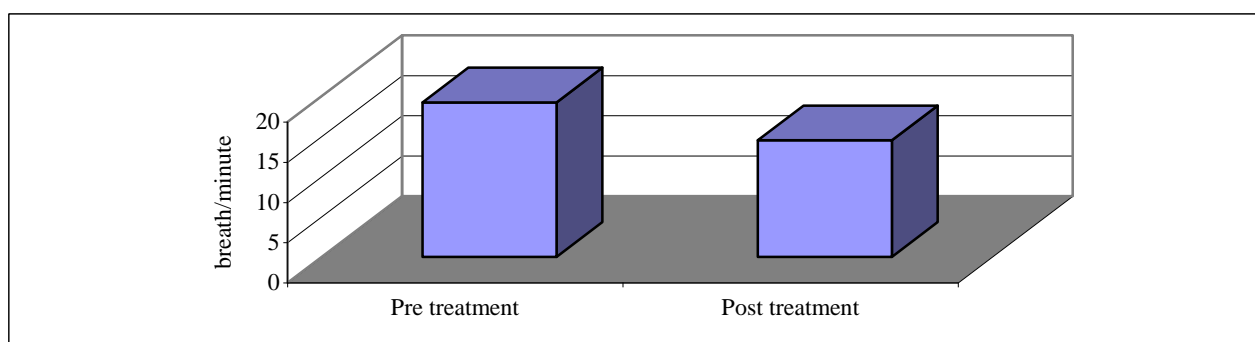
The results of this study revealed that: there were highly significant decrease ($P < 0.001$) in pulse rate, respiratory rate and T.G. MYO- feed back 420v between before and after treatment program (Tables 1,2,3 and Figures 1,2,3). Also, there was a highly significant ($P < 0.001$) decrease in mean values of pain intensity after treatment (Table 4 & Figure 4).

Table (1): Mean values of pulse rate before and after treatment.

| | Pulse Rate (beat/ minute) | |
|-----------------|---------------------------|----------------|
| | Pre treatment | Post treatment |
| Mean \pm SD | 77.23 \pm 4.27 | 70 \pm 3.42 |
| Mean difference | 7.23 | |
| t-value | 8.16 | |
| P-value | < 0.001 | |

**Fig. (1): Mean values of pulse rate before and after treatment.****Table (2): Mean values of respiratory rate before and after treatment.**

| | Respiratory rate (breath / minute) | |
|-----------------|------------------------------------|-----------------|
| | Pre treatment | Post treatment |
| Mean \pm SD | 19.2 \pm 1.73 | 14.5 \pm 1.83 |
| Mean difference | 4.70 \pm 1.14 | |
| t-value | 10.86 | |
| P-value | < 0.001 | |

**Fig. (2): Mean values of respiratory rate pre and post treatment.****Table (3): Mean values of T.G. MYO feed back 420v before and after treatment.**

| | T.G. MYO feed back 420v (μ v) | |
|-----------------|------------------------------------|-------------------|
| | Before treatment | After treatment |
| Mean \pm SD | 280.30 \pm 79.6 | 102.5 \pm 19.93 |
| Mean difference | 177.8 | |
| t-value | 12.8 | |
| P-value | < 0.001 | |

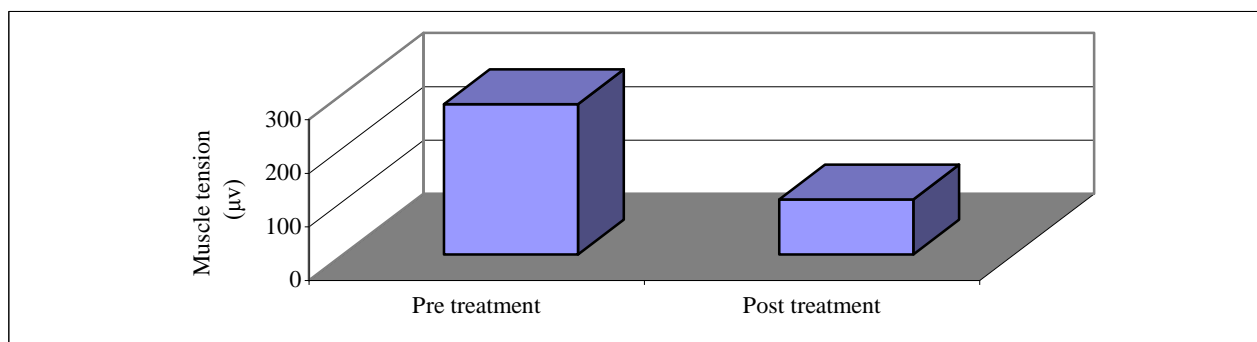


Fig. (3): Mean values of T.G. MYO feed back 420v before and after treatment.

Table (4): Percentage of pain intensity before and after treatment.

| | PPi Scores | | | |
|-----------------|------------------|----|-----------------|----|
| | Before Treatment | | After Treatment | |
| | No. | % | No. | % |
| No pain | - | - | 10 | 40 |
| Mild pain | 2 | 8 | 9 | 36 |
| Moderate pain | 3 | 12 | 6 | 24 |
| Severe pain | 15 | 60 | - | - |
| Unbearable pain | 5 | 20 | - | - |
| Mean \pm SD | 2.92 \pm 0.591 | | 0.84 \pm 0.4 | |
| Mean difference | 2.08 | | | |
| t-value | 18.45 | | | |
| P-value | P<0.001 | | | |

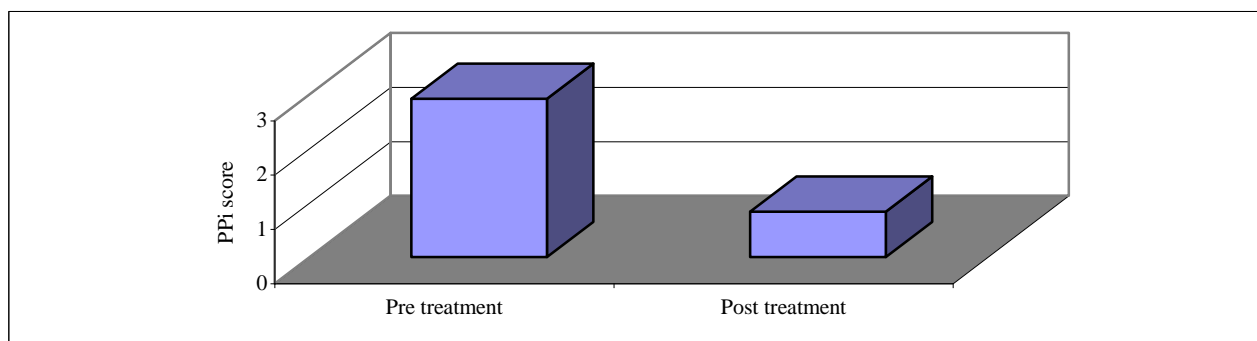


Fig. (4): Mean values of PPi scores before and after treatment.

DISCUSSION

There is a significant portion of female population who exhibit severe pain with associated symptoms during menstrual period resulting in varying levels of impairment of personal and social functions and absenteeism

from work and inability to perform daily routine^{1,22}.

Patients with primary dysmenorrhea may benefit from non pharmacologic intervention as education about the disorder, lifestyle changes, nutritional adjustments, stress management and regular aerobic exercise^{2,23}.

This study was designed to determine the effectiveness of Mitchell's physiological relaxation technique in alleviating pain and tension in primary dysmenorrhea.

The measurement of pain intensity, pulse rate, respiratory rate and T.G. MYO feed back 420v data had been collected before starting treatment and after 4 weeks after the end of treatment program.

Concerning the changes occurred in pulse rate, the results showed a highly significant decrease ($P < 0.001$). The decrease was 7.23 beat/ minute than base line mean value.

This result is agree and confirmed by Sivasankaran et al. (2006)³¹, who examined the effects of yoga and mediation on hemodynamic and laboratory parameters and found significant reduction in pulse rate.

The reduction in pulse rate could be attributed to a suggestion of an additional linkage between neural centers controlling both breathing and pulse rate²⁵ and to the effect of relaxation in promoting parasympathetic activity²⁶.

Concerning respiratory rate, the results of this study showed a highly significant reduction ($P < 0.001$) by 4.70 breath / minute than baseline mean value.

This is in agreement with Paul et al. (2003)²⁷ who reported a significant reduction in respiratory rate in healthy subjects after practicing relaxation technique.

The reduction in pulse rate and respiratory rate could be also attributed to the fact that breathing is considered as a key for relaxation, it is associated with increased parasympathetic activity and reduction in sympathetic activity²⁸.

Regarding to data obtained from T.G. MYO feed back 420v in this study. The results showed a highly significant reduction ($P < 0.001$). the decrease was 177.8 μ v less than

base line mean value. This was in agreement with Goodale et al. (1990)¹², who conduct a randomized trial of 46 women with primary dysmenorrhea and they found a percentage of change about 58% in the patients who received relaxation training.

Regarding to (PPi) score, the results showed a highly significant ($P < 0.001$) reduction than the baseline mean value (mean difference was 2.08).

These results were documented by Barbara (1995)² who found a significant reduction ($P < 0.05$) in pain, anxiety and depression in the 1st 4 weeks of post partum period after participating in a relaxation training program.

Accordingly, this reduction could be attributed to decrease in neuromuscular activity during relaxation leading to decreased proprioceptive input to the hypothalamus which accordingly decrease activity of sympathetic nervous system and decrease state of excitability of cerebral cortex³².

Also, these results were agree with Rosenzweings et al. (2003)²⁹ who stated that pain, tension, anxiety, confusion, coping skills had been significantly reduced on medical students after performing relaxation technique and this is in agree with Mizuno et al., (1999)²⁴ who found that general illness, confusion, social dysfunction had been reduced after practicing relaxation training.

Finally, it could be concluded that Mitchell's simple physiological relaxation technique showed highly significant reductions in pain intensity, pulse rate, respiratory rate and T.G. MYO feed back 420v. So, it was found to be an effective, non invasive, safe, cheap, easy to perform and successful treatment method in reducing pain and tension of primary dysmenorrhea.

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المخلص العربي

فاعلية أسلوب ميتشل للاسترخاء الفسيولوجي البسيط في تخفيف عسر الطمث الأولي

إن الهدف من هذه الدراسة هو معرفة تأثير أسلوب ميتشل للاسترخاء الفسيولوجي البسيط في تخفيف الألم والتوتر المصاحبان لعسر الطمث الأولي . وقد أجريت الدراسة على خمس وعشرين فتاة متطوعة من طالبات كلية العلاج الطبيعي، جامعة القاهرة، تعانين من عسر الطمث الأولي . وقد تراوحت أعمارهن من 18 : 22 سنة ومعدل كتلة الجسم > 28 كجم/متر² . وقد تم علاج كل فتاة باستخدام أسلوب ميتشل للاسترخاء الفسيولوجي البسيط لمدة 30 دقيقة لكل جلسة ، مرتان يوميا ، 3 مرات أسبوعيا لمدة 4 أسابيع بالإضافة إلى برنامج منزلي يومي. وتضمنت القياسات المسجلة قياس شدة الألم ومعدل ضربات القلب والتنفس والاسترخاء المقاس بالتغذية الرجعية وأوضحت النتائج أن هناك انخفاض ذو دلالة معنوية عالية في شدة الألم ومعدل ضربات القلب والتنفس ومعدل الاسترخاء المقاس بجهاز التغذية الرجعية بعد برنامج العلاج عما قبله. وقد أسفرت النتائج أن أسلوب ميتشل للاسترخاء الفسيولوجي البسيط كان وسيلة فعالة وأمنة ، غير مكلفة، سهلة الأداء وبسيطة وناجحة لتخفيف الألم والتوتر المصاحبان لعسر الطمث الأولي .

الكلمات الدالة : أسلوب ميتشل للاسترخاء الفسيولوجي البسيط ، عسر الطمث الأولي، التغذية الرجعية للعضلة .