

EFFECT OF VOJTA METHOD ON QUALITY OF LIFE IN PATIENTS WITH CHRONIC NON-SPECIFIC LOW BACK PAIN

Walaa M. Hamed^{1*} ; Amal H. Ibrahim² and Amr S. Shalaby³

1- Teaching assistant at Department of Basic Sciences, Faculty of Physical Therapy, Modern University for Technology and Information Egypt.

2- Professor of Physical Therapy, Basic Sciences Department, Faculty of Physical Therapy, Cairo University, Egypt

3- Lecturer of Physical Therapy, Basic Sciences Department, Faculty of Physical Therapy, Cairo University, Egypt

1*Email - Dr-walaamohamed@hotmail.com

Key Words: Vojta method, quality of life, chronic non-specific low back pain.

ABSTRACT:

Background: Vojta is a neurophysiological method used to obtain reflex responses in muscles following stimulation of particular activation zones

Objective: This study was designed to determine the impact of Vojta method on quality of life in chronic non-specific low back pain. **Method:** 40 patients (19 males and 21 females), Their mean \pm SD age, weight, height and BMI were 26.45 ± 4.75 years, 67.15 ± 7.72 Kg, 171.1 ± 8.09 cm and 22.94 ± 1.92 kg/m² respectively. and chronic non-specific low back pain were recruited in the study and randomly assigned into two equal groups. Both groups received twelve sessions for four weeks. Group "A" received conventional TENS and hot application, Group "B" received conventional TENS and hot application in addition to Vojta method. **Results:** Within-group comparisons revealed that post-treatment Oswestry Low Back Pain Disability Index (ODI) scores in both groups were significantly lower than pre-treatment scores ($p > 0.001$). In pre-treatment scores, there was no substantial difference between groups ($p > 0.05$), but post-treatment scores of both groups indicated a significant decrease in group B's ODI. **Conclusion:** We concluded that Vojta method is a safe and effective modality, and had superior improvements on quality of life in chronic non-specific low back pain compared to traditional physical therapy treatment .

INTRODUCTION

Nearly 90% of the patients presenting to primary care have a complain of chronic non-specific low back pain, that compel them to seek physiotherapy intervention for their low back pain.⁽¹⁾

Quality of life (QOL) is the Person and societal well-being, which includes both negative and positive aspects of life.⁽²⁾ Being a pivotal

concern in life, multitude of aspects in life might impact or be impacted by different aspects of QOL including physical health, family, education, jobs, income, safety, and protection, as well as rights, religious values, and the environment.⁽³⁾ Health-related quality of life HRQOL is a measurement of QOL and its affection as a consequence to health issues.⁽⁴⁾

Chronic non-specific low back pain (CNLBP) has an impact on Health Related Quality of Life (HRQL) in a variety of life domains, including physical and mental well-being, social relationships, and functional capacity.⁽⁵⁾ HRQL has become a valuable outcome in health care that can provide an estimate of how the disease influences people's lives and how they manage to live with CNLBP, and is currently used as a measure of treatment efficacy. It is important to assess the quality of life of people with CNLBP in order to set care goals and develop a treatment plan that is focused on tracking the progression of the disease.⁽⁶⁾

Vojta "Dynamic Neuromuscular Stabilization (DNS)" reflex locomotion is a neurophysiological approach for obtaining reflex responses in back muscles following stimulation of specific activation zones.⁽⁷⁾

Vojta reflex locomotion's concept is basically based on preserving postures through isometric muscle contractions during point stimulation, that result in consistent muscle contraction patterns and stimulation of muscles, joints, and tendons. Furthermore, Exteroceptors and enteroceptors are connected to the Vojta reflex locomotion, which acts as a source of afferent stimulation to the CNS.⁽⁸⁾

In Vojta technique, the therapist administers goal-directed pressure to defined zones on the patient's body. Regardless of the patient's age, such stimuli lead automatically and involuntarily to two movement complexes, reflex creeping and reflex rolling.⁽⁹⁾

MATERIAL AND METHODS

Study Design

This study is a pre-test post-test randomized controlled study design that was conducted at the outpatient clinic, Faculty of Physical Therapy, Modern University for Technology and Information from May 2020 to February 2021 to determine the impact of Vojta method on quality of life in chronic non-specific low back pain.

G*POWER statistical software (version 3.1.9.2; Franz Faul, Universitt Kiel, Germany) was used to calculate sample size prior to the analysis. The appropriate sample size for this study was N=40, with observed power equal to 0.8, according to sample size estimates.⁽¹⁰⁾

Subjects:

Forty patients (19 male and 21 female), complaining of CNLBP were recruited and randomly assigned into two equal groups, control group (A) and experimental group (B). All patients signed a written consent form before engaging in the study. Their mean \pm SD age, weight,

height and BMI were 26.45 ± 4.75 years, 67.15 ± 7.72 Kg, 171.1 ± 8.09 cm and 22.94 ± 1.92 kg/m² respectively.

Study recruitment eligibility:

42 patients who met the current study's inclusion requirements were evaluated for recruitment eligibility; two patients were removed from the study because they refused to participate. The remaining 40 patients of the eligible candidates, were randomized to either of the study groups. All recruited patients at the beginning of the study completed the study and their data had been collected and analyzed using parametric testing.

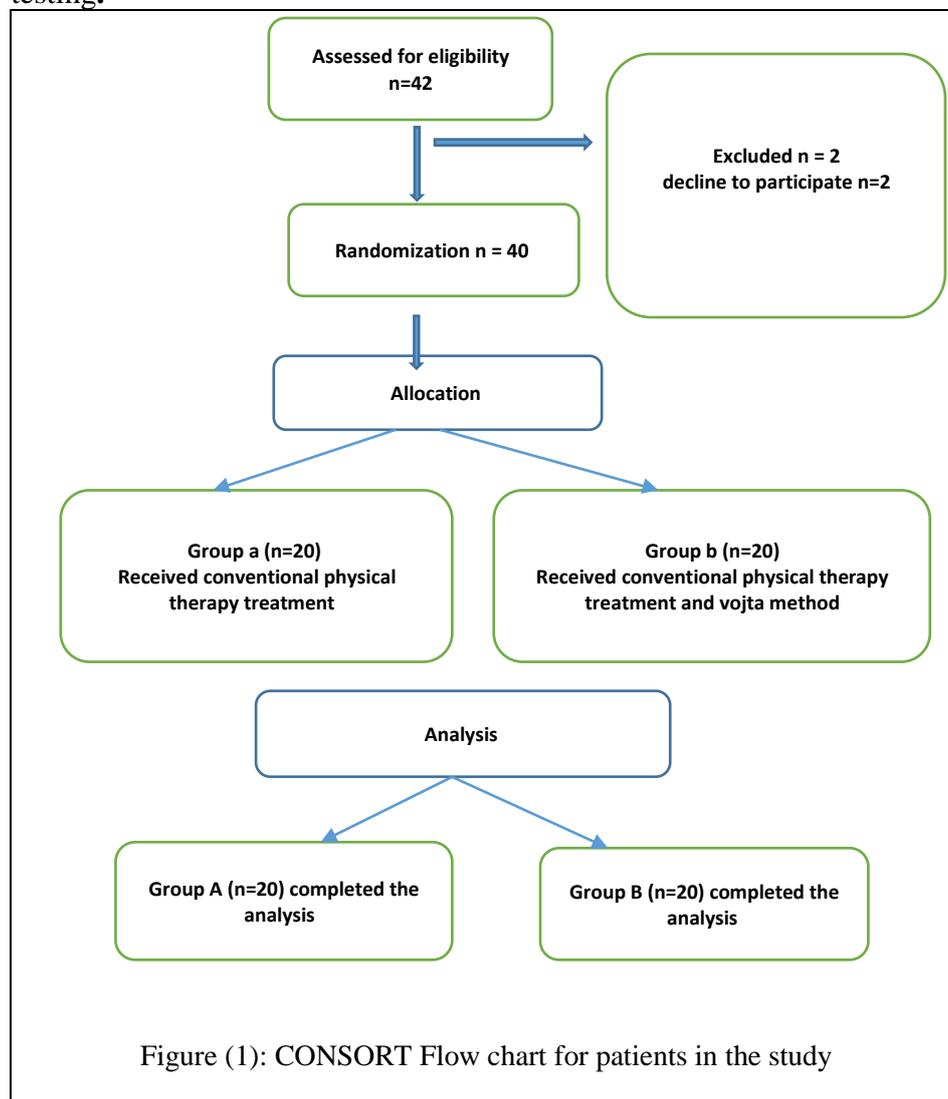


Figure (1): CONSORT Flow chart for patients in the study

Randomization

Simple randomization was done using sealed envelope method before recruiting patients in the study. Patients meeting all inclusion criteria were instructed to select one of the 40 sealed envelopes. Each of the sealed envelopes included a slip of paper with either the letter (A) or (B) which refer to the group the patient is assigned to.

Group A: included twenty patients who received conventional treatment of back pain for three sessions per week for four weeks which consisted of conventional TENS for 20 minutes and hot packs for 10 minutes. The total duration of the treatment session was 30 minutes.

Group B: included twenty patients who received conventional treatment of back pain in addition to Vojta method for three sessions per week for four weeks. The total duration of the treatment session was 40 minutes.

Outcome measures**Oswestry Low Back Pain Disability Index (ODI)**

The Oswestry Low Back Pain Disability index is critical instrument used by researchers and disability evaluators to assess patients' long-term functional disability and quality of life. The test regarded as the 'gold standard' method for determining low back functional outcome.⁽¹¹⁾ Each scale object is a six-point scale, with the first statement denoting 0 and the last denoting 5, The results of the completed 10 sections of the questionnaire were used to calculate the overall score. The final result is a ranking of 50.⁽¹²⁾

Interpretation of scores

A score of 0% to 20% on the questionnaire indicates that the patient has no disabilities and is capable of performing most daily activities. Aside from recommendations on lifting, sitting, and exercise, there is usually no treatment recommended. Patients with scores of 21% to 40% have mild impairment, meaning they have more pain and trouble performing tasks of daily life such as sitting, lifting, and standing. It is more difficult for them to travel and socialise, and they may be unable to work. Personal hygiene, sexual activity, and sleeping patterns are unaffected, and the patient can normally be treated with minimal intervention. Scores of 41%-60% indicate severe disability, implying that pain is the patient's main source of distress and that daily activities are significantly impacted. These patients need to be helped. Patients with scores of 61 percent to 80 percent are disabled, and their back pain

affects every aspect of their lives, necessitating positive action. Scores ranging from 81 percent to 100 percent indicate that these patients are either bed-bound or exaggerating their symptoms. ⁽¹³⁾

Interventions

a) Conventional physical therapy program:

- **Conventional TENS**

Conventional high frequency TENS was applied using four electrodes on the back with pulse duration of 60e 100 μ sec. frequency of (80 Hz) and total treatment time of 20 min. ⁽¹⁴⁾

- **Hot Packs**

Hot packs were applied on the back region for 10 minutes. ⁽¹⁵⁾

b) Vojta method

Every patient in group B was asked to assume the starting position for this technique. He or she lie prone on an examination table, shoulders kidnapped, elbows flexed to around 80-90 degrees, and forearms dangling over the table's edge. ⁽¹⁶⁾

In the postural location "reflex creeping," pressure-like stimulation of the calcaneus and anterior superior iliac spine (ASIS) was performed. The subject is in the starting position, with the head turned 30 degrees and assisted on the frontal eminence, and the cervical spine extended passively. ⁽¹⁷⁾

The patient was instructed to the flex the glenohumeral joint of the face side to more than 120° and less than 135°, with maintaining 30° of abduction with elbow flexed 45° and supported on medial epicondyle, as support point. ^(17, 18)

On the occipital side, the upper extremity, as well as hand and fingers, was free to travel around the trunk. The lower extremity on occipital side was lying supported on the medial femoral epicondyle with hip and knee joints flexed. ⁽¹⁸⁾

Statistical analysis

To compare subject characteristics between classes, descriptive statistics and an unpaired t-test were used. The sex distribution between groups was compared using Chi-squared. The Shapiro-Wilk test was used to ensure that the data had a normal distribution. To determine group homogeneity, Levene's test for homogeneity of variances was used. To compare the mean ODI values between the two classes, an unpaired t-test was used. For each category, a paired t-test was used to compare pre- and post-treatment scores. For all statistical analyses, the significance level was set at p 0.05. The statistical package for social

studies (SPSS) version 22 for Windows was used for all statistical analysis (IBM SPSS, Chicago, IL, USA)

Outcome

Characteristics of the subjects:

This research enlisted the participation of forty patients. The subject characteristics of groups A and B were shown in Table 1. The mean age, weight, height, BMI, and sex distribution did not significantly differ between the two groups ($p > 0.05$).

Table 1: Shows the differences in subject characteristics between groups A and B:

	Group A	Group B	P-value
	Mean \pm SD	Mean \pm SD	
Age (years)	26.45 \pm 4.75	26.05 \pm 4.6	0.78
Weight	67.15 \pm 7.72	68.85 \pm 8	0.49
Height	171.1 \pm 8.09	172.75 \pm 7.45	0.5
BMI (kg/m ²)	22.94 \pm 1.92	23.04 \pm 1.76	0.85
Females/males	10/10	11/9	0.75

SD, Standard deviation; p value, Probability value

Effect of Vojta method on ODI:

- *Within group comparison:*

In both groups A and B, the ODI post-treatment scores were significantly lower than the pre-treatment scores ($p > 0.001$). Group A had a 20.22 percent decrease in ODI, while group B had a 35.56 percent decrease. (Table 2).

- *Between groups comparison:*

Pre-treatment, there was no substantial difference in ODI between the two groups ($p > 0.05$). When the ODI of groups B and A were compared after treatment, group B had a significantly lower ODI than group A ($p 0.01$).

Table 2: Shows the mean ODI of groups A and B before and after treatment:

ODI (%)	Group (A)	Group (B)	MD	t- value	p value
	Mean \pm SD	Mean \pm SD			
Pre treatment	49 \pm 8.28	49.89 \pm 9.02	-0.89	-0.32	0.74
Post treatment	39.09 \pm 8.83	32.15 \pm 7.89	6.94	2.61	0.01
MD	9.91	17.73			
% of change	20.22	35.56			
t- value	17.21	22.98			
	$p = 0.001$	$p = 0.001$			

SD stands for standard deviation; MD stands for mean difference; and p-value stands for significance level.

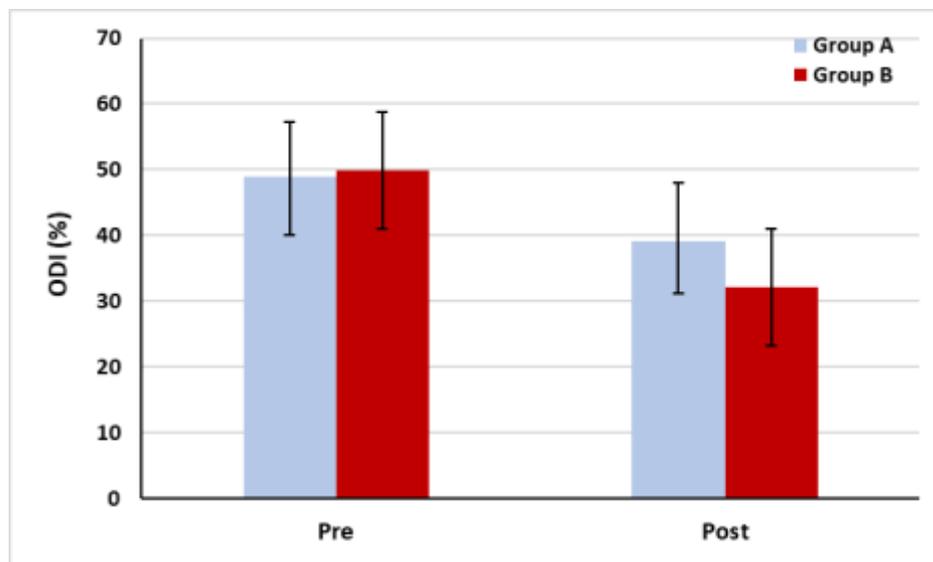


Figure (2). Group A and B mean ODI before and after treatment.

DISCUSSION:

The aim of this research was to see how the Vojta approach affected the quality of life of patients with chronic non-specific low back pain. According to our findings, post-treatment ODI in groups A and B decreased statistically significantly as compared to pre-treatment ODI.

The findings of the current study agree with those of **Juárez-Albuixech et al.**, who concluded that the Vojta procedure and TENS were effective in treating lumbosciatica. However, when the Vojta technique was used alone, patients indicated that their suffering, weakness, and degree of flexibility had all improved⁽¹⁹⁾

Moreover, **Son**, in conclusion explained the improvement in postural control efficiency to be attributed to the activation of trunk muscles and deep muscles of the spine during Vojta reflex locomotion application that regulate trunk stability and increase spinal rotation force.⁽²⁰⁾

Lozinska et al., in their study have reported that using Vojta technique can restore proper movement patterns and hence minimize the manifestations of discomfort in low back pain (LBP), and eventually help LBP patients to improve their gait and hence their functional abilities . In addition to being effective in improving back pain, Vojta technique is thought to have a conservative and long-lasting pain relief effect since it stimulates the muscles to regain normal contraction pattern and muscular balance, through stimulating autochthonous muscles, abdominal muscles

and pelvic floor muscles, which help to sustain muscle tropism and axial extension of the spine. ⁽²¹⁾

The study of **Jung et al.**, comparing Vojta method versus neuro-developmental treatment (NDT) as per Bobath approach, has shown better impact of Vojta method on muscle activation that is attributed to the specifically guided motor reactions to the activated reflexes. ⁽⁸⁾

Ewa et al., The concept that dynamic neuromuscular stabilization reflex locomotion or Vojta technique elicit reflex responses in muscles after stimulation of unique activation zones, explains the permanent long term improvement in back pain symptoms. ⁽⁹⁾

The basic principle of Vojta reflex locomotion, according to **Vojta**, is the maintenance of postures by isometric muscle contraction during point stimulation, resulting in consistent muscle contraction patterns and stimulation of muscles, joints, ligaments, and tendons. Furthermore, exteroceptors and enteroceptors are believed to be involved in Vojta reflex locomotion. ⁽⁷⁾

Hok et al. discovered that the reflex locomotion elicited by Vojta therapy is associated with specific changes in cortical and subcortical brain activity during the stimulation and voluntary motor task performance before and after the procedure as compared to the sham treatment. ⁽²²⁾

Sanz-Esteban et al. found that the Vojta group had greater activation in the right frontal perisylvian and insular cortex, bilateral basal ganglia, thalami, cerebellum, and brainstem. These areas are responsible for balance and motor control, participating in the planning and execution of voluntary movements, improvement of movement, posture and motor control can surely positively affect self-esteem and quality of life. ⁽²³⁾

In normal adults, **Ha, S et al.** found that using the Vojta method to stimulate the breast zone increases activation of the transversus abdominis (TrA) and diaphragm while inhibiting activation of the External abdominal oblique (EO). ⁽¹⁶⁾

Study Limitation

The limitations of this study were a lack of opportunity for further long-term treatment.

Conclusion

We concluded that the Vojta approach is a safe and reliable modality that has superior improvements in quality of life in patients with chronic non-specific low back pain as compared to traditional intervention alone, based on the scope and results of this research.

Recommendations

Further studies are required with a larger sample, longer post-treatment follow-up, and using ultrasonography and electromyography to

explain the possible mechanisms.

Source of funding

Nil.

Conflict of interest

The authors have no conflicts of interest.

Author's contributions

W.M.H came up with the concept, performed the analysis, and arranged the data. A.H.I. was in charge of the clinical assessment and the statistical analysis. A.S.S. gathered the literature and helped write the first draught. The manuscript's content and similarity index is the responsibility of all contributors.

Acknowledgment

The authors express their gratitude to all of the study participants for their cooperation.

REFERENCES

- 1-Kashyap, N. ; J. Kumari ; W. Ahmad and S. Kumar (2019). Study of Autonomic Functions in Patients with Non-Specific Low Back Pain. *International Journal of Contemporary Surgery*, 7(1): 26-30.
- 2-Gregory, D.; J. Ron; P. Geraldine; W. Michael and et al., (2009). "Quality of Life". *Dictionary of Human Geography* (5th ed.). Oxford: Wiley-Blackwell. ISBN 978-1-4051-3287-9 back pain, and those without. *Clinical Biomechanics*, 53:22-30.
- 3-Hancock, P.A. and C.G. Drury (2011). Does human factors/ergonomics contribute to the quality of life?. *Theoretical Issues in Ergonomics Science*, 12(5): 416-426.
- 4- Ferrans, C. E. (2005). Definitions and conceptual models of quality of life. In J. Lipscomb, C. C. Gotay, & C. Snyder (Eds.), *Outcomes assessment in cancer: Measures, methods, and applications* (p. 14–30). *Cambridge University Press*.
- 5- Post, M. (2014). Definitions of quality of life: what has happened and how to move on. *Topics in spinal cord injury rehabilitation*, 20(3): 167-180.
- 6- Leme, M.D.O.P. ; S.L.K. Yuan ; M.O. Magalhães ; S.F. de Meneses, and A.P. Marques (2019). Pain and quality of life in knee osteoarthritis, chronic low back pain and fibromyalgia: a comparative cross-sectional study. *Reumatismo*, 71(2): 68-74.
- 7 –Vojta, V. and A. Peters (2007). *The Vojta Principle*. Berlin, Heidelberg, Springer-Verlag. Yeziarski RP, Culberson JL, Brown PB 1980 Cells of Origin of Propriospinal Connections to Cat Lumbosacral Gray as Determined with Horseradish Peroxidase. *Experimenta Neurology*, 69: 493-512

- 8- Jung, M.W. ; M. Landenberger ; T. Jung ; T. Lindenthal and H. Philippi (2017). Vojta therapy and neurodevelopmental treatment in children with infantile postural asymmetry: a randomised controlled trial. *Journal of Physical Therapy Science*, 29(2): 301-306.
- 9-Ewa, G. ; J. Huber ; A. Kulczyk ; J. Lipiec and M. Sobieska (2017). An attempt to explain the Vojta therapy mechanism of action using the surface polyelectromyography in healthy subjects: A pilot study 10.1016/j.jbmt.2017.07.002
- 10-Faul, F. ; E. Erdfelder ; A. Buchner and A.G. Lang (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods*, 41(4):1149–60.
- 11- Mousavi, S. J. ; M. Parnianpour ; H. Mehdian ; A. Montazeri and B. Mobini (2006). The Oswestry disability index, the Roland-Morris disability questionnaire, and the Quebec back pain disability scale: translation and validation studies of the Iranian versions. *Spine*, 31(14): E454-E459.
- 12-Davidson, M. and J. Keating (2005). Oswestry disability questionnaire (ODQ). *Aust J Physiother*, 51(4): 270.
- 13- Fairbank, J.C. and P.B. Pynsent (2000). The Oswestry Disability Index. *Lippincott Williams & Wilkins, Inc.*, 25(22):2940-2953.
- 14-Buchmuller, A. ; M. Navez ; M. Milletre-Bernardin ; S. Pouplin ; E. Presles ; M. Lantéri-Minet and J.P. Camdessanché (2012). Value of TENS for relief of chronic low back pain with or without radicular pain. *European Journal of Pain*, 16(5): 656-665.
- 15-French, S.D. ; M. Cameron ; B.F. Walker ; J.W. Reggars and A.J. Esterman (2006). A Cochrane review of superficial heat or cold for low back pain. *Spine.*, 31(9): 998-1006.
- 16-Ha, S. and Y.H. Sung (2016). Effects of Vojta method on trunk stability in healthy individuals. *Journal of Exercise Rehabilitation*, 12(6):542.
- 17-Bauer, H. ; G. Appaji and D. Mundt (1992). VOJTA neurophysiologic therapy. *The Indian Journal of Pediatrics*, 59(1): 37-51.
- 18-Józwiak, S. and J. Podogrodzki (2010). Application and comparison of NDT-Bobath and Vojta methods in treatment of selected pathologies of the nervous system in children. *Przegląd lekarski*, 67(1): 64-66.

- 19-Juárez-Albuixech, M.L. ; O. Redondo-González ; I. Tello ; S. Collado-Vázquez and C. Jiménez-Antona (2020). Vojta Therapy versus transcutaneous electrical nerve stimulation for lumbosciatica syndrome: A quasi-experimental pilot study. *Journal of Bodywork and Movement Therapies*, 24(1): 39-46.
- 20-Son, H.J. (2000). *Das vojta-prinzip*. 2nd ed. Seoul: Daehakseolim
- 21-Łozińska, P. ; D. Wójtowicz ; P. Wdowiak and Dziuba-Słonina (2019) A. Changes in kinematic parameters during walking in adults with low back pain subjected to Vojta therapy. A pilot study. *Physiotherapy Quarterly*, 27(2): 22-28.
- 22-Hok, P. ; P. Hlušík ; M. Kutín ; J. Opavský ; A. Grambal ; Z. Tüdös and P. Kaňovský (2014). Changes in brain activation after therapeutic stimulation using Vojta therapy: Controlled study. *Clin Neurophysiol*, 125(5): e34.
- 23-Sanz-Esteban, I. ; R. Cano-de-la-Cuerda ; A. San-Martín-Gómez ; C. Jiménez-Antona ; E. Monge-Pereira ; C. Estrada-Barranco and J.I. Serrano (2021). Cortical activity during sensorial tactile stimulation in healthy adults through Vojta therapy. A randomized pilot controlled trial. *Journal of NeuroEngineering and Rehabilitation*, 18(1): 1-13.

تأثير طريقه فويتا على جودة الحياه في المرضى الذين يعانون من الام أسفل

الظهر المزممه الغير محدد

ولاء محمد حامد¹ ، امال حسن ابراهيم² ، عمرو سعدالدين محمد شلبي³

1- معيد بقسم العلوم الاساسيه كلية العلاج الطبيعي، الجامعه الحديثه للتكنولوجيا والمعلومات.

2- استاذ العلاج الطبيعي، قسم العلوم الاساسيه، كلية العلاج الطبيعي، جامعة القاهرة.

3- مدرس العلاج الطبيعي، قسم العلوم الاساسيه، كلية العلاج الطبيعي، جامعة القاهرة.

نبذه مختصره

خلفيه : فويتا هي عباره عن طريقه فسيولوجيه عصبيه تستخدم للحصول على استجابيه انعكاسيه من العضلات بعد تنبيه بعض المناطق المحفزه .

الهدف : تحديد تأثير طريقه فويتا علي جوده الحياه في مرضى الالام اسفل الظهر المزمم .

الطريقه : قد اجرية هذه الدراسه على 40 شخص (19 رجل و 21 امراه) يعانون من الالام اسفل الظهر المزمم تم اختيارهم وتعيينهم بطريقه عشويه في مجموعين بالتساوى . وقد بلغ متوسط العمر والوزن والطول ومؤشر كتلة الجسم المتوسطه 26.45 ± 4.75 سنه، 67.15 ± 7.72 كجم، 171.1 ± 8.09 سم، 22.94 ± 1.92 كجم / متر مربع. وقد حصلت كل

مجموعه علي 12 جلسه لمدته اربع اسابيع .المجموعه (ا) حصلت علي تحفيز كهربائي عبر الجلد وكمادات ساخنه وحصلت المجموعه (ب) علي تحفيز كهربائي عبر الجلد و كمادات ساخنه اضافا الي طريقه فويتا .

النتائج : كشفت المقارنات بين المجموعات ان درجه اوسويتري مؤشر العجز لألام اسفل الظهر بعد العلاج في كلتا المجموعتين كانت اقل بكثير من درجه ما قبل العلاج .قبل العلاج لم يكن هناك فرق كبير بين المجموعات لكن المحصله بعد العلاج في المجموعتين اشارات الي انخفاض كبيرفي المجموعه (ب).

الخلاصه : طريقه فويتا امنه وفعاله وقد سببت تحسن اعلي في جوده الحياه في المرضي الذين يعانون من الالام اسفل الظهر المزمئه مقارنة بالطريقه التقليديه للعلاج .

الكلمات الداله : طريقه فويتا - جوده الحياه - الالام اسفل الظهر المزمئه