

Colegiul de redacție

Redactor șef: Ciobanu Doriana (Oradea, Romania)
Redactor șef adjunct: Lozincă Izabela (Oradea, Romania)

Colectivul editorial - membri naționali

Conf. univ. dr. Ianc Dorina - Universitatea din Oradea, FEFS
Conf. univ. dr. Ciobanu Doriana – Universitatea din Oradea, FEFS
Lect. univ. dr. Chiriac Mircea – Universitatea din Oradea, FEFS
Lect. univ. dr. Emilian Tarcău - Universitatea din Oradea, FEFS
Asist.univ. drd. Deac Anca - Universitatea din Oradea, FEFS

Colectivul editorial - membri internaționali

conf. univ.dr.Sayed Tantawy –Universitatea Ahlia, Cairo, Egipt
conf. univ.dr. Dalia Kamel –Universitatea de Fizioterapie, Cairo– Egipt

Comisia de peer review

» **Membri Internaționali**

Hermann van Coppénolle – prof.univ.dr.,
Faculty of Physical Education and Physiotherapy,
K.U. Leuven, Belgium
Croitoru Gheorghe MD - prof. univ. dr., USMF
“Nicolae Testemițanu” catedra de ortopedie,
traumatologie și chirurgie de campanie, Chișinău,
Rep. Moldova
Cseri Juliana MD – prof.univ. dr., University of
Debrecen, Medical and Health Science Center,
Faculty of Public Health, Department of
Physiotherapy,Hungary
Jeff G. Konin–prof.univ.dr. ATC, PT, & Vice
Chair, Department of Orthopaedics & Sports
Medicine University of South Florida; Executive
Director Sports Medicine & Athletic Related
Trauma (SMART) Institute
Daniel Courteix – prof.univ.dr. Universitatea
Blaise Pascal - Clermont Ferrand, UFR - Sciences
et Techniques des Activités Physiques et Sportives
(STAPS); École Doctorale Sciences de la Vie,
Santé, Agronomie, Environnement, Franța
Ali Cimbiz –prof. univ.dr. – Universitatea Zirve
Uni, Facult of Health Science, Gaziantep-Turkey
Ugur Cavlak - prof. univ.dr.- Pamukkale
University, Denizli, Turkey.Director of School of
Physical Therapy. School of Physical Therapy and
Rehabilitation
Filiz Altug- conf.univ.dr. –Universitatea
Pamukkale, School of Physical Therapy and
Rehabilitation. KınıklıKampusu
Nilüfer Çetisli Korkmaz–
conf.univ.dr.Universitatea Mustafa Kemal, Școala
de Fizioterapie și Recuperare

» **Membri Naționali**

Vasile Marcu – prof. univ. dr., Universitatea din
Oradea
Bălțeanu Veronica – prof.univ. dr. Universitatea
din Iași
Mirela Dan – prof. univ.dr. Universitatea Vasile
Goldiș, Arad
Georgescu Luminița – prof.univ.dr.
Universitatea din Pitești
Ciucurel Constantin – prof.univ.dr.
Universitatea din Pitești
Pasztai Zoltan - conf. univ. dr. Universitatea din
Oradea
Lozincă Isabela - conf. univ. dr. Universitatea
din Oradea
Șerbescu Carmen - conf. univ. dr. Universitatea
din Oradea

Revista poate fi accesată on-line, pe adresa de web: www.revrokineto.com

*Persoane de contact: **Ciobanu Doriana:** Mobil: 0722 187589/ E-mail: doriana.ciobanu@yahoo.com*

***Lozincă Izabela:** Mobil: 0747 057/304/ E-mail: ilozinca@yahoo.com*

UNIVERSITATEA DIN ORADEA
Str. Universității nr.1, 410087, ORADEA
Facultatea de Geografie, Turism și Sport
Departamentul de Educație Fizică, Sport și Kinetoterapie
Telefoane: 04-0259-408148; 04-0259-408164; 0722-384835
Fax: 04-0259-425921

Editorial Board

Editor in chief: Ciobanu Doriana (Oradea, Romania)

Copy-reader: Lozincă Izabela (Oradea, Romania)

National members

Assoc. Prof. Ph.D. Ianc Dorina - University of Oradea, FEFS

Assoc. Prof. Ph.D. Ciobanu Doriana - University of Oradea, FEFS

Lecturer Ph.D. Chiriac Mircea – University of Oradea, FEFS

Lecturer Ph.D. Tarcău Emilian - University of Oradea, FEFS

Junior lecturer Deac Anca - University of Oradea, FEFS

International members

Assoc. Prof. Sayed Tantawy - Ahlia University, Cairo, Egypt

Assoc. Prof. Dalia Kamel - Physical Therapy-Cairo University- Egypt

Review Board

» **Internațional Members**

Hermann van Coppennolle – Professor, Ph.D, Faculty of Physical Education and Physiotherapy, K.U. Leuven, Belgium

Croitoru Gheorghe MD - Prof. Ph.D, USMF “Nicolae Testemițanu”, Department of Ortopedic, traumatology and surgery, Chișinău, Rep. Moldova

Cseri Juliana MD – Professor, Ph.D, University of Debrecen, Medical and Health Science Center, Faculty of Public Health, Department of Physiotherapy, Hungary

Jeff G. Konin – Ph.D, ATC, PT, Associate Professor & Vice Chair, Department of Orthopaedics & Sports Medicine University of South Florida; Executive Director Sports Medicine & Athletic Related Trauma (SMART) Institute

Daniel Courteix – prof. Ph.D. University Blaise Pascal - Clermont Ferrand, UFR - Sciences et Techniques des Activités Physiques et Sportives (STAPS); École Doctorale Sciences de la Vie, Santé, Agronomie, Environnement, France

Ali Cimbiz - professor, Ph.D. - Zirve University, Faculty of Health Science, Gaziantep-Turkey

Ugur Cavlak - prof. Ph.D. - Pamukkale University, Denizli, Turkey. Director of School of Physical Therapy. School of Physical Therapy and Rehabilitation

Filiz Altug- assoc. prof., Ph.D - Pamukkale University, School of Physical Therapy and Rehabilitation. Kınıklı Kampusu

Nilüfer Çetisli Korkmaz –assoc. prof. Ph.D. Mustafa Kemal University, School of Physical Therapy and Rehabilitation

» **Național Members**

Vasile Marcu – Professor. Ph.D, University of Oradea

Bălțeanu Veronica – Professor. Ph.D, University from Iași

Mirela Dan – Professor. Ph.D, University Vasile Goldiș, Arad

Georgescu Luminița – Professor Ph.D. University of Pitești

Ciucurel Constantin – Professor Ph.D, University of Pitești

Pasztaï Zoltan - Assistant Prof. Ph.D, University of Oradea

Lozincă Isabela - Assistant Prof. Ph.D, University of Oradea

Șerbescu Carmen - Assistant Prof. Ph.D, University of Oradea

Journal website: www.revrokineto.com

Contact persons: **Ciobanu Doriana**: Mobil: 0722 187589/ e-mail: doriana.ciobanu@yahoo.com,

Lozincă Izabela: Mobil: 0747 057/304/ e-mail: ilozinca@yahoo.com

UNIVERSITATEA DIN ORADEA

Str. Universității nr.1, 410087, ORADEA

Facultatea de Geografie, Turism și Sport

Departamentul de Educație Fizică, Sport și Kinetoterapie

Telefoane: 04-0259-408148; 04-0259-408164; 0722-384835/ Fax: 04-0259-425921

CUPRINS / CONTENT

| | |
|---|-----------|
| INTRARATER AND INTERRATER RELIABILITY OF ABDOMINAL DRAWING-IN TEST IN ASYMPTOMATIC INDIVIDUALS/ EVALUAREA GRADULUI DE ÎNCREDERE INTERGRUP ȘI INTRAGRUP A TESTULUI DE VACUUM ABDOMINAL, LA PACIENȚII ASIMPTOMATICI | |
| <i>Jogani Khushali Dilipbhai, Bid Dibyendunarayan, Thangamani Ramalingam A.</i> | 5 |
| AN EXERCISE PROGRAM ADAPTED FOR HAEMOPHILIA PATIENTS/ ADAPTAREA UNUI PROGRAM DE EXERCITII FIZICE PENTRU PACIENTII HEMOFILICI | |
| <i>Lavinia Maria Hoge, Elena Doina Mircioaga</i> | 17 |
| IMMEDIATE EFFECTIVENESS OF RELAXATION IN MANAGEMENT OF CHRONIC LOW BACK PAIN/ EFICIENȚA IMEDIATĂ A UNUI PROGRAM DE RELAXARE ÎN MANAGEMENTUL DURERII LOMBARE CRONICE | |
| <i>Nishat Khan, Khatri SM</i> | 23 |
| ASPECTE PRIVIND INCIDENȚA TRAUMATISMELOR MUSCULO-SCHELETALE LA JUCĂTORII DE BASCHET: PREVENȚIE ȘI RECUPERARE SOME ASPECTS REGARDING THE PREVALENCE OF MUSCULAR-SKELETAL INJURIES IN BASKETBALL PLAYERS PREVENTION AND REHABILITATION | 30 |
| <i>Elena Doina Mircioagă, Lavinia Maria Hoge, Mircioagă Alexandra</i> | 30 |
| THE INFLUENCE OF AQUATIC GYMNASTICS PROGRAMS ON CHILDREN WITH DISABILITIES/ INFLUENȚA PROGRAMELOR DE GIMNASTICĂ DESFĂȘURATE ÎN MEDIUL HIDRIC ASUPRA COPIILOR CU DIZABILITĂȚI | |
| <i>Chera Ferario Bianca, Plăstoi Camelia</i> | 38 |
| INTEGRAREA PERSOANELOR CU DIZABILITATI PRIN ACTIVITĂȚILE EDUCAȚIEI NON-FORMALE - CERCETAȘIA INTEGRATION OF DISABLE PEOPLE THROUGH NON-FORMAL EDUCATION ACTIVITIES - SCOUT | |
| <i>Dana Ioana Cristea</i> | 45 |

THE EFECT OF A PHYSICAL ACTIVITY PROGRAM ON THE HEALTH RELATED FITNESS AND QUALITY OF LIFE ON A FEMALE STUDENT GROUP FROM ORADEA

EFFECTUL UNUI PROGRAM DE ACTIVITATE FIZICĂ ASUPRA CONDIȚIEI FIZICE RAPORTATE LA SĂNĂTATE ȘI A CALITĂȚII VIETII LA UN GRUP DE STUDENTE DIN ORADEA

| | |
|---|-----------|
| <i>Klara Nagy, Carmen Șerbescu, Doriana Ciobanu</i> | 50 |
| RECOMANDĂRI PENTRU AUTORI | 59 |
| RECOMMENDATIONS FOR THE AUTHORS | 62 |
| TALON DE ABONAMENT..... | 65 |

INTRARATER AND INTERRATER RELIABILITY OF ABDOMINAL DRAWING-IN TEST IN ASYMPTOMATIC INDIVIDUALS**EVALUAREA GRADULUI DE ÎNCREDERE INTERGRUP ȘI INTRAGRUP A TESTULUI DE VACUUM ABDOMINAL, LA PACIENȚII ASIMPTOMATICI**

*Jogani Khushali Dilipbhai¹, Bid Dibyendunarayan²,
Thangamani Ramalingam A.³*

Key words: transversus abdominis (TrA), pressure biofeedback unit (PBU), reliability.

Cuvinte cheie: transvers abdominal (TrA), unitate de presiune cu biofeedback (PBU), grad de încredere.

Introduction

The TrA stabilizes the back and back pain adversely affects the activation and endurance capacity of TrA. TrA is local and deepest muscle and abdominal drawing in test by PBU provides an indirect way of evaluating endurance capacity of TrA muscle activity which is often used by clinicians and researchers.

Aim. This is across-sectional study to investigate the intra-rater and inter-rater reliability of Abdominal drawing-in test (ADIT) in asymptomatic individual.

Methods. Sixty asymptomatic subjects were randomly selected for the study. The ADIT was measured for each subject with PBU by the two raters for inter-rater reliability and by one of the rater after a gap of seven days for intra-rater reliability. All the subjects were previously taught and compensations were corrected.

Results. The study demonstrated intra-class correlation coefficient (ICC) with standard error of mean (SEM) of 0.944 and 0.69725 for inter-rater reliability and 0.910 and 0.85814 for intra-rater reliability. A Bland-Altman limit of agreement has also confirmed that inter-rater and intra-rater were within the limits of agreement in 95% of occasions.

Conclusions. ADIT has high inter-rater and intra-rater reliability in asymptomatic individuals.

Introducere

Transversul abdominal stabilizează spatele iar durerea lombară inversează activarea și rezistența transversului abdominal. Transversul este un mușchi profund iar testul de vacuum abdominal cu PBU oferă o modalitate indirectă de evaluare a rezistenței transversului abdominal, fiind adeseori folosit de clinicieni și cercetători.

Scop. Este un studiu transversal având ca scop investigarea gradului de încredere al testului de vacuum abdominal (ADIT) la indivizii asimptomatici.

Metode. Șaizeci de subiecți asimptomatici au fost selectați randomizat pentru acest studiu. ADIT s-a măsurat pentru fiecare pacient cu PBU de către doi evaluatori pentru gradul de încredere intergroup și după o săptămână s-a efectuat reevaluarea de către un singur evaluator pentru tastarea intragrup. Toți subiecții au fost învățați anterior manevra corectă și compensațiile corectate.

Rezultate. Studiul a demonstrat un coeficient de corelație intra-clasă (ICC) cu o eroare standard (SEM) 0.944 și 0.69725 pentru gradul de încredere intergroup și 0.910 și 0.85814 pentru gradul de încredere intragrup. Limita Bland-Altman a confirmat că valorile intergroup și intragrup sunt în gradul de încredere în 95% din situații.

Concluzii. ADIT are un grad mare de încredere intergroup și intragrup la pacienții asimptomatici.

¹ MPT (Musculoskeletal Sciences)

² MPT(Ortho), PGDSPT

Corresponding Author: *dnbid71@gmail.com*; Mobile: 09427139711.

Department of Physiotherapy, Sarvajanic College of Physiotherapy, Veer Narmad South Gujarat University, Surat-395003, Gujarat, INDIA

³ BPT, MSc(Psy), PGDRM, Department of Physiotherapy, Sarvajanic College of Physiotherapy, Veer Narmad South Gujarat University, Surat-395003, Gujarat, INDIA

Introduction

Low back pain is one of the most common health problems and creates a substantial personal, community, and financial burden globally. [1-3] Low back pain was defined as pain limited to the region between lower margins of 12th rib and gluteal folds with or without leg pain (sciatica). [4] Lumbar spine is more mobile than the thoracic spine but stability is also a very important feature of the lumbar spine. For load transfer stability is required throughout the entire range of motion and this is provided by the active system i.e. muscles. [5].

Bergmark has categorized the trunk muscles into local and global muscle systems based on their main mechanical roles in stabilization. Anatomically, the deep muscles of the local system are capable of making a major contribution to spinal stability, being closer to the center of rotation of the spinal segments and, with their shorter muscle lengths, they are ideal for controlling intersegmental motion. [6] The smaller intersegmental muscles, such as the intertransversarii and interspinales, may not predominate as mechanical stabilizers but have a proprioceptive role instead. Overlapping multisegmental muscles linking adjacent lumbar vertebrae and the sacrum, such as the lumbar multifidus, have the capacity to, and have been shown to be efficient in stabilizing the spinal segment. [7,8] The TrA has also shown to contribute to this function of segmental stability. [9]

These muscles could be dysfunctional in back pain patients. The local muscles may not be able to maintain prolonged or sustained muscle contraction in order to protect continuously any unstable spinal segments, which could leave the low back pain patient vulnerable to persistent strain and pain. [9]

Cholewicki & McGill's model not only highlighted the prime role of local muscles in spinal stabilization at high loads, it also pointed to the importance of the local system in providing spinal support during low-load activities requiring only low muscle forces. [10] When the TrA contracts bilaterally it produces a drawing-in of the abdominal wall, resulting in an increased pressure within the abdominal cavity [11] and an increase in tension in the thoracolumbar fascia. [12] The concept behind the strengthening of local system is to create stiffness in the spine before load is placed on it, thus controlling mid-range or neutral zone of the inter-vertebral joints. Control of this mid-range helps decrease shear forces and compression during movement and spinal loading. When working properly, the local intrinsic musculature fires before the actual motion of an extremity or trunk. Weaknesses of these muscles decrease the person's ability to control joint neutral position during movement or under load and hence can lead to spinal instability.

Tools have been designed to measure a person's ability for recruitment of the TrA muscle. It has been divided into clinical test and laboratory test. Clinical test involves the recruitment by palpation [13] and by PBU. [14] But palpation test will be subjective so it requires skill of physiotherapist. Moreover with PBU, objective measurement can be done.

Laboratory test includes ultrasound imaging measures from a pressure sensor, EMG and surface electromyography. [15] Most of the studies that have measured the activity of the deep abdominal wall muscles used fine-wire electromyography. However, this type of assessment is invasive, painful, uncomfortable, and expensive and may present the risk of infection. [16]

Test should be done with teaching the patients in four point kneeling and then test should be conducted in prone lying with PBU (Stabilizer, Chattanooga, USA). [17] It is a reliable and valid clinical instrument for assessing deep abdominal muscle function, and has been used to develop a method for the careful monitoring of lumbar stabilization. [18,19]

Once the patient has contracted the TrA then endurance can be checked by maintaining the contraction and holding it for 10s upto maximum of 10 repetitions [20]. The outcome measure used is **Performance index (PI)**. Performance index can be defined as activation score (pressure level the subject is able to achieve)*number of successful repetitions. The outcome measure was developed by Jull [19] in which endurance of deep cervical muscle was measured using PBU.

Hence it is used to measure the endurance of TrA.

Among all of the reliability studies, two studies. [21,22] were available evaluating the reliability in asymptomatic individuals. These studies have evaluated only intra-rater reliability and even sample size was small. And among all the studies [21-24] available on asymptomatic individuals and chronic back pain patients, they have measured only recruitment of TrA and there is lack of literature measuring the endurance of TrA. The systematic review done by Lima *et al.* [25] has said that the measurement properties of PBU for TrA activity are yet to be answered.

Purpose

The purpose of this study is to test the intra-rater and inter-rater reliability of ADIT in asymptomatic individual by using Performance Index as outcome measure.

Material and Methods

In this study, 60 asymptomatic subjects were studied. Sample size was calculated based on test-retest designs, and agreement between the raters. According to that if assumptions kept as the observed R will be 0.80 or greater with a lower 1-sided 95% confidence interval i.e. CI=0.10 (i.e., R acceptable ≥ 0.70). Therefore 55 subjects are required. And with 5% drop out rate, total of 59 subjects are required. Thus, total 60 subjects were evaluated with no drop outs [26, 27].

Inclusion criteria included: (a) Age: 18 to 25 years; (b) Both males and females; & (c) Body mass index ≤ 24 . Exclusion criteria included: (a) History of back pain or current back pain; (b) Pregnancy; (c) Menstruation on the test days; (d) Any trauma to lower back; (e) Any abdominal wall or spinal surgeries; (d) Confirmed serious pathologies; (e) Inability to contract the abdominal muscles; (f) Pressure reduction of less than 3 mmHg; (g) Inability to lie in prone; & (h) Cardiovascular or respiratory problem.



Figure 1: Pressure Biofeedback Unit



Figure 2: Stop Watch

The PBU is a reliable and valid clinical instrument for assessing deep abdominal muscle function, and has been used to develop a method for the careful monitoring of lumbar stabilization [18, 19]. It is also utilized in previous studies for measuring the activation of TrA.

The PBU is a simple pressure transducer consisting of a three-chamber air-filled pressure bag, a catheter and a sphygmomanometer gauge. The pressure bag has 16.7×24 cm in size and made from non-elastic material. The sphygmomanometer scale ranges from 0 mmHg to 200 mmHg, with 2 mmHg intervals on the scale. The accuracy of the apparatus is described as ± 3 mmHg. Movement or change in position causes volume changes in the pressure bag, which is registered by this device (28). The outcome measure used is Performance Index (PI) [29].

Performance index can be defined as activation score (pressure level the subject is able to achieve) * number of successful repetitions. Successful repetitions means maintaining the activation score by 10s hold.

Procedure

Subjects were selected from the one nursing and two physiotherapy colleges of Surat city. According to the inclusion and exclusion criteria, 20 subjects were obtained from each college by using systematic random sampling.



Figure 3: Raters scoring the Performance Index for Inter-Rater Reliability.



Figure 4: Rater scoring the Performance Index for Intra-Rater Reliability

Measurements were obtained by the two physiotherapists in order to test the inter-rater reliability of ADIT. Measurements were taken by the same physiotherapist on two different days with seven days interval for intra-rater reliability[30]. Both the raters (who were pursuing Master of Physiotherapy program) had practiced sufficiently before doing it on the subjects. All the subjects were examined through the screening test and signed the written informed consent form. The study was approved by the Institutional Ethical Committee of the Sarvajanic College of Physiotherapy.

The process was as follows:

- All the participants received basic information about the function of TrA, as well as about the procedure of testing and training the TrA muscle contraction and both raters were present during the actual test was conducted.
- All subjects were instructed to fast for 2 hours prior to testing (including water), empty the bladder immediately before the tests and not perform abdominal exercises prior to the tests[21] well in advance.
- For both inter- and intra- rater scoring, participants and raters had adopted the same clinical, temporal and environmental conditions to avoid external influences or internal errors during the period of data collection.
- First of all, the subjects were taught in four point kneeling position, standing and sitting position. Four-point kneeling, sitting and standing positions were used in order both to identify substitution strategies and to start the learning of correct TrA contraction from positions easier than the prone position to be used in the test as in relaxed abdomen the TrA is more in its lengthened position during the contraction. After the patient has learned enough and is able to do than the test was conducted in prone.
- The patient lies prone with the arms by the side, head fully relaxed in the designated mould so that the neck was straight and relaxed with the head in the midline with the lower limbs positioned with the feet off the plinth and the PBU is placed under the abdomen with the navel in the centre and the distal edge of the pad in line with the right and left anterior superior iliac spines.
- The pressure pad is inflated to 70 mmHg and allowed to stabilize. This pressure has been identified to be that which inflates the pad sufficiently to detect changes in position of the abdominal wall but is comfortable and does not press into the abdominal contents. According to Richardson and Jull [9], this tool was designed to monitor movement of the

abdominal wall by measuring a change in pressure during abdominal hollowing. At rest, small deviations of the indicator on the pressure dial will be evident with abdominal movement during normal respiration, and thus it is essential to identify the point about which the level fluctuates.

- Before the actual data collection was commenced in this study, pilot study with ten subjects was conducted.
- Participants were instructed to breathe mainly using the abdominal wall and then inflatable bag was adjusted to 70 mmHg again.
- The patients were instructed to breathe in and out and then without breathing in, to perform the test with the verbal instruction given by the rater as follows 'Draw in your abdominal wall without moving your spine or pelvis and hold for 10 s while breathing normally'.
- Deep inspiration was avoided. And after the contraction was achieved, patient had breath normally between the contractions. The ability to contract the muscle results in pressure reduction from 4 to 10 mmHg which was recorded by the pressure gauge of PBU. [17]
- After one successful completion of one episode of contraction, participants were instructed to relax their whole body fully, especially the abdomen, before each contraction and sufficient brief period of rest was given to the subject before the procedure is repeated up to 10 times to test the endurance of TrA. The amount of holding time was measured using the stop watch.
- Possible compensation to be avoided were identified as: (a) Contraction with visible co-contraction of other muscles for example: gluteus, quadriceps, back muscles; (b) Tilting of pelvis or flexing of spine; (c) Pressure reduction of 0 mmHg; & (d) Increase in pressure from baseline.

The above procedure was developed by Richardson *et al.* [9] The test was terminated when the subjects were not able to contract further and if the subjects experienced fatigue during the succeeding contractions and that score was recorded by the raters. The data was calculated using the performance index [29] (activation score*number of successful repetition). Activation score is the amount of pressure level the subject is able to achieve. For each of the pressure level the subjects achieved, 10 s hold was to be maintained for the successful repetition. Both the raters recorded the score on the scoring sheet. Both raters were prohibited from exchanging information to remain blinded to the score taken by each other. This procedure was followed for inter-rater reliability.

The subjects were not told the scores that they achieved during first test so as avoid bias on the results of performance level of the subjects, and the procedure was repeated after seven days and data thus obtained was used to calculate for intra-rater reliability. The same testing procedure and equipment was used for all the subjects.

Results

In this study, total 60 asymptomatic subjects (females=57 and males=3) were studied. Table 1 shows the demographic data of all the subjects.

Table 1: Demographic data of subjects

| Subjects | Mean | SD |
|-----------------|-------|-------|
| Age (years) | 20.40 | 1.669 |
| Height (meters) | 1.53 | 0.068 |
| Weight (kg) | 49.77 | 5.973 |

Table 2 shows the descriptive statistics as mean and standard deviation with minimum and maximum values for performance index of ADIT.

Table 2: Descriptive statistics

| Rater | N | Minimum | Maximum | Mean | SD |
|------------------|----|---------|---------|-------|--------|
| Rater 1 | 60 | 4 | 46 | 13.58 | 10.887 |
| Rater 2 | 60 | 4 | 76 | 14.08 | 12.473 |
| Retest (Rater 1) | 60 | 4 | 60 | 13.63 | 12.094 |

Table 3 shows the intra-class correlation coefficient (ICC) for the inter-rater reliability taken by the rater 1 and rater 2 along with confidence interval (CI) with a p value < 0.05. The ICC value shows very high reliability.

Table 3: ICC (Inter-rater reliability) with CI

| ICC (inter-rater) | CI(lower) | CI(upper) |
|--------------------|-----------|-----------|
| 0.944 | 0.906 | 0.966 |

Table 4 shows the intra-class correlation coefficient (ICC) for the intra-rater reliability taken by the rater 1 twice along with confidence interval (CI) with a p value < 0.05. The ICC value shows very high reliability.

Table 4: ICC (intra-rater reliability) with CI

| ICC (intra-rater) | CI (lower) | CI(upper) |
|-------------------|------------|-----------|
| 0.910 | 0.850 | 0.946 |

Figure 9 shows the Bland Altman limits of agreement between the two raters (raters).

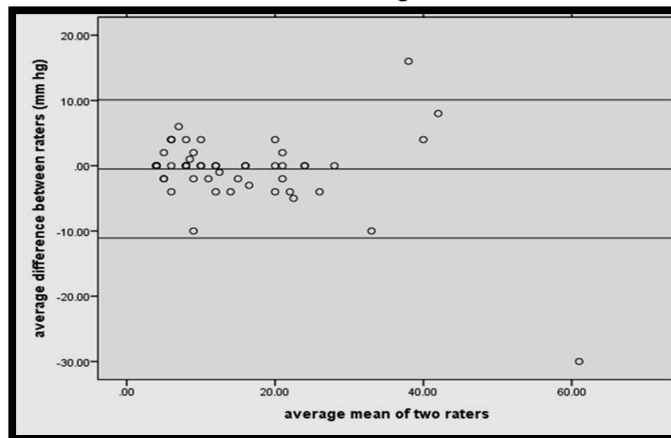


Figure 9: Bland-Altman limits of agreement analysis between two raters

The Bland-Altman chart is a scatter plot with the difference of the two measurements for each sample on the vertical axis and the average of the two measurements on the horizontal axis.

Three horizontal reference lines are superimposed on the scatter plot - one line at the average difference between the measurements, along with lines to mark the upper and lower control limits of plus and minus 1.96*sigma, respectively, where sigma is the standard deviation of the measurement differences. If the two methods are comparable, then differences should be small, with the mean of the differences close to 0 (31). It shows reasonable agreement between the raters as most of the values fall in $M \pm 2SD$ ($p < 0.05$). It indicates high reliability.

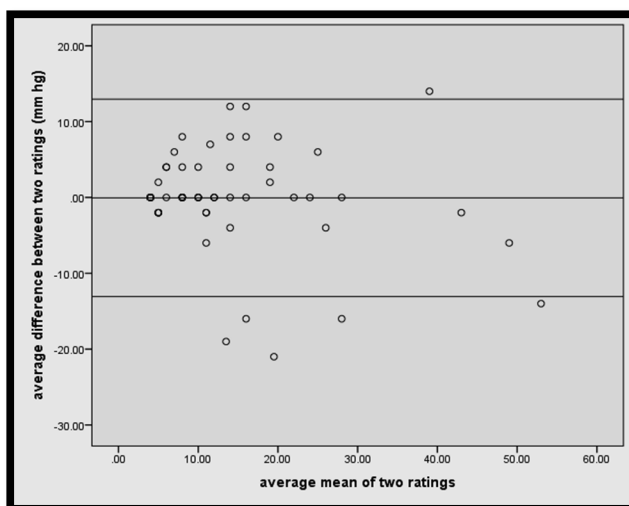


Figure 10: Bland-Altman limits of agreement analysis between scores taken by the same rater twice

It shows reasonable agreement as most of the values fall in $M \pm 2SD$ ($p < 0.05$).

The standard error of measurement (SEM) is a measure of absolute reliability; the smaller the SEM the more reliable the measurements (32, 33). The SEM value calculated for variability in measurements between the two raters is 0.69725 which is very small; whereas the variability in measurements of same raters is 0.85814 which is very small. Thus these measurements are reliable.

Table 5: Standard error of measurement (SEM) values

| | Variability in measurements between two raters | Variability in measurements of same raters |
|-------------------------------|--|--|
| Standard error of measurement | 0.69725 | 0.85814 |

The true SEM value for variability in measurements between two raters ($0.69725 \times 1.96 = 1.36661$) suggests that any individual value lies within the range of ± 1.36661 PI from their measured value. The true SEM value for variability in measurements of the same raters ($0.85814 \times 1.96 = 1.6819544$) suggests that any individual value lies within the range of ± 1.6819544 PI from their measured value.

Table 6: True Standard error of measurement (SEM) values

| | Measurements between two raters | Measurements of same raters |
|------------------------------------|---------------------------------|-----------------------------|
| True Standard error of measurement | 1.36661 | 1.6819544 |

The smallest real difference (SRD) value for variability of measurements between the two raters ($1.96 \times \sqrt{2} \times SEM = 1.932$) and between the measurements taken by the same rater ($1.96 \times \sqrt{2} \times SEM = 2.378$) is claimed to be capable of representing the “real” change but these values cannot simply be generalised to symptomatic populations.

Table 7: Smallest real difference (SRD) values

| | Measurements between two raters | Measurements taken by same raters |
|--------------------------|---------------------------------|-----------------------------------|
| Smallest real difference | 1.932 | 2.378 |

Discussion

In this cross-sectional study, which aimed at measuring the intra and inter-rater reliability of ADIT in asymptomatic individuals by use of pressure biofeedback, the reliability estimates ranged from satisfactory to excellent for both intra-rater and inter-rater conditions. The use of pressure biofeedback for the evaluation of subjects with and without low back pain or for providing the feedback for the rehabilitation of patients with low back pain has been increased. In clinical practice, it is common for patients to be evaluated several times by the same or by different examiners. Therefore, it is important to know the reproducibility of measures and instruments used by the same examiner on different occasions as well as by different examiners. [34]

Is found in this study, the intra class correlation coefficient for the inter-rater reliability between the two raters is 0.944 and for intra-rater reliability is 0.910. The study by Lima *et al* [23] found the intra class correlation coefficient of 0.76 for inter-examiner reliability and 0.74 for intra-rater reliability. The study done by Von Garnier *et al* [24] reported low inter-observer reliability of 0.47 and ICC of 0.81 for intra-rater reliability. Costa *et al* [21] in their study reported moderate reliability with ICC of 0.58. The study done by Storheim *et al* [22] reported low intra-observer reliability. The ICC of present study cannot be compared to any other studies as the outcome measure used was different than the other studies.

The discrepancy of values existing among the studies may be due to methodological differences between studies, such as sample sizes, study participants, different criteria for the test, and standardization of breathing during the tests and different methods of statistical analysis. The difference between the values can be due to the different population taken i.e. study by Lima *et al*[23] recruited chronic non specific low back pain patients and study by Von Garnier *et al*[24] recruited the subjects who had with and without low back pain. The present study targeted asymptomatic individuals, and even the studies by Storheim *et al*[22] and Costa *et al*[21] recruited asymptomatic individuals.

Storhiem *et al.* [22] used coefficient of variation for reliability analysis whereas in the present study and the studies by Lima *et al.* [23], Von Garnier *et al.* [24], Costa *et al.* [21] used ICC for reliability analysis. This might be the one possible reason for low intra-observer reliability.

In this study, both the examiners had practiced sufficiently before application of test; and equipment and testing conditions had been used were same throughout for all the subjects.

Similarly the studies conducted by Lima *et al.* [23], Storheim *et al.* [22], and Costa *et al.* [21], also maintained uniform testing conditions but then too conflicting results were found between the previous studies. This was likely due to different criteria was adopted for the each study as to how the pressure data was collected. While Richardson *et al.* [9] collected a pressure reduction of 4-10 mmHg for 10 s, Costa *et al.* [21] and Storheim *et al.* [22] recorded the maximum pressure reduction of at least 2 s within a period of 8-10 s. In contrast, Von Garnier *et al.* [24] performed their data collection using a set of four criteria that participants would have to fulfill for the correct TrA muscle contraction: continuous breathing, absence of muscle substitution maneuvers, appropriate muscle contraction checked by palpation test and a pressure reduction of at least 1 mmHg for 4 s within a period of 10 s.

This study is in accordance with the criteria by Richardson *et al.* [9] who collected a pressure reduction of 4-10 mmHg for 10 s and repeating the procedure for 10 times. This was the main target of the study which focused on testing the reliability of the endurance of TrA while the studies mentioned above targeted the reliability of activation of TrA.

There was also conflicting results in all the studies because some studies evaluated only peak of contraction in certain period of time while some studies targeted specific pressure reduction within stable period of time. The outcome measure used in this study was **performance index** which is not being used in any other studies.

Though the reliability of abdominal drawing-in test reported high reliability for intra and inter rater, there was poor contractile capacity of TrA for some individuals as performance index

for some subjects were as low as 4 mmHg while the contractile capacity for some subjects were good but only few of the subjects were able to complete the test for 10 times which indicated good endurance capacity of that individuals. The possible reason could be as this study targeted the normal healthy populations and populations which consist of allied health professionals who may have higher degree of body awareness and coordination skills than sedentary populations.

It can also be said that pressure reduction is different in subjects with low back pain and in asymptomatic individuals because individuals with back pain have difficulty in performing correct recruitment of TrA so therefore this emphasizes that the study to be done in homogenous group of population.

Standardization of breathing was utmost important for the proper recruitment of TrA because this muscle is most active towards end of expiration and due to its anatomical location.

Lafound *et al.* [35] found that there are significant differences between pressure measurements collected during breathing and apnea, with higher values observed during normal breathing. Participant without guidance with regards to normal breathing have a tendency to contract TrA with apnea. [18] Thus to minimize the error, pressure measurements should be collected at the end of expiration which was maintained in the present study. While Storhiem *et al.* [22] did not standardized breathing during the study.

Standardization of protocol is also very much necessary for the proper result of inter- and intra-rater reliability. In the present study the subjects were positioned in same way for all subjects, on hard surface. The studies by Costa *et al.*[21], Storheim *et al.*[22] had small sample size and only one study by Von Garnier *et al.* [24] conducted a pilot study. To analyze the clinometric properties of assessment tools, it is recommended that samples should include at least 50 individuals, or a pilot study should be performed prior to the sample size calculation which was done in the present study [36].

In all test situations there is a learning effect that may improve test results of the re-test. [37] The choice of seven days between tests was made to limit the learning effect. A time interval between tests of 7 days was mentioned in studies of Lima *et al.* [23], Storheim *et al.* [22], Costa *et al.* [21]. The time period between repetitions of the measures should be long enough to avoid memorization of data by examiners, but short enough to ensure that there were no clinical changes in the participants. It is recommended that 1 or 2 weeks would be ideal, but there may be reasons for the choice of another interval. [36] Subjects were told not to exercise the TrA muscle during the seven-day period between tests.

In this study, the findings of Bland-Altman limits of agreement showed excellent inter-rater agreement between the raters (limits of agreement (LOA) = 10.08 to -11.08 mmHg) indicating that measures related to the rater 1 were in agreement with the rater 2 in 95% of occasions. Similarly, we found excellent intra-rater agreement (LOA) = 12.9 to -13.06 mmHg), which means that measures relating to first test were in agreement with the second test in 95% of occasions. Similar results were found by Lima *et al.*[23] who also reported excellent agreement between the raters; and same rate on two separate occasions.

As this study targeted the reliability of endurance of TrA in asymptomatic individual this result cannot be generalized to back pain patients. Moreover Rothstein (38) claimed that measurement errors may be higher in patient groups than in healthy people owing to pain and dysfunction. Richardson *et al.*[9] claim that many patients need a long period of practice to learn an effective contraction of the TrA muscle, and the studies of Hodges *et al.*[14] and Cairns *et al.*[18] conclude that subjects with low back pain have severe problems with conducting the abdominal drawing-in action and reduce the pressure measured by the PBU.

This might indicate even lower reproducibility in patients than in normal subjects. As the study by Lima *et al.* [23] have established a successful result of pressure reduction of 4 mmHg in chronic non specific low back pain, taking this into account the reliability of endurance of TrA can be studied before using it in intervention strategies.

This study also found SEM of 0.69725 mmHg for inter-rater and 0.85814 mmHg for intra-rater reliability. The true SEM for inter rate is 1.36 mm of Hg and intra rate is 1.68 mm of

Hg which suggest the absolute measurement error of PBU. The SRD for inter-rater and intra-rate is 1.932 and 2.378 which suggest that there should be a small difference of these values so as to say that “real” change has occurred.

The study by Lima *et al.* [23] has found the SEM and SRD value but that values are for the activation of TrA. There is no normative data in literature available for the endurance of TrA so the result of the present study cannot be compared.

The scoring of inter-rater reliability was taken by both the raters together so that duration of contraction or fatigue has homogenous effect on all subjects and moreover to avoid the effect of fatigue on the performance level of the subjects. If the scores were taken at different times, than it would have been difficult to decide that scores were result of true performance of the subject; or, had fatigue affected the level of performance of subject.

The accuracy of PBU device is ± 3 mmHg[17] which can cause random error in subjects and to avoid that same; contact of abdomen and inflatable bags should be maintained identical during both test and retest. There were much compensation that could have occurred but this was minimized during the practice sessions of all subjects. This study supports the use of ADIT as an objective measure to assess the TrA endurance.

Conclusion

The inter-rater and intra-rater reliability of ADIT is ‘very high’[39] in asymptomatic individuals. Thus it can be used as an objective measure to assess the endurance of TrA.

However the studies should be conducted on patient populations to generalize the results.

If the results show low endurance capacity of TrA, than appropriate rehabilitative measures can be implemented.

Limitations

It is possible to monitor the activity of global muscles by observation, but it is less accurate. So EMG analysis would have been more appropriate. Absolute blinding of the raters was not possible. To minimize the error on performance results of subjects, both the raters didn’t discuss anything during the recording of the scores.

Conflict of Interest: None declared.

Authors’ Contribution:

JKD performed review of literature and collection of data; BD drafted the manuscript, designed and coordinated the study; TRA performed the statistical analysis, interpretation of data and review of manuscript.

Acknowledgements

We deeply thank Dr. M. T. Rangwala (Director, Sarvajanik College of Physiotherapy, Surat), Ms. Vijaya Ghaskadhvi, Director of T&TV Nursing College, Surat and Mr. Anjan Desai, Principal I/c of SPB College of Physiotherapy, Surat for their support and all the participants of the study for their cooperation. Also we acknowledge the help extended by Ms. Nidhi Chhabra [PT].

References

- [1] Andersson GB. Epidemiology of low back pain. *Acta orthopaedica Scandinavica Supplementum*. 1998; 281:28-31.
- [2] Dionne CE, Dunn KM, Croft PR. Does back pain prevalence really decrease with increasing age? A systematic review. *Age and ageing*. 2006; 35(3):229-34.
- [3] Deyo RA, Cherkin D, Conrad D, Volinn E. Cost, controversy, crisis: low back pain and the health of the public. *Annual review of public health*. 1991;12:141-56.
- [4] Manek NJ, MacGregor AJ. Epidemiology of back disorders: prevalence, risk factors, and prognosis. *Current opinion in rheumatology*. 2005;17(2):134-40.

- [5] Winkel D. Diagnosis and Treatment of spine: Nonoperative Orthopaedic Medicine and Manual therapy. Gaithersburg: Aspen; 1996.
- [6] Panjabi M, Abwni K, Duranceau J, Oxland T. Spinal stability and intersegmental muscle forces. A biomechanical model. Spine 1989.
- [7] Bogduk N. Clinical anatomy of lumbar spine and sacrum. Edinburgh: Churchill Livingstone; 1997.
- [8] Crisco JJ, Panjabi MM. The intersegmental and multisegmental muscles of the spine: a biomechanical model comparing lateral stabilising potential. Spine. 1991;7:793-9.
- [9] Richardson C, Jull G, Hodges P, Hides J, Panjabi M. Therapeutic Exercise for spinal segmental stabilization in Low back pain. Scientific Basis and Clinical Approach. 1 ed: Churchill Livingstone; 1999.
- [10] Cholewicki J, McGill SM. Mechanical stability of the in vivo lumbar spine: implications for injury and chronic low back pain. Clinical biomechanics. 1996;11(1):1-15.
- [11] Cresswell AG, Grundstrom A, A T. Observations on intra-abdominal pressure and patterns of abdominal intra-muscular activity in man. Acta Physiologica Scandinavica. 1992;144:409-18.
- [12] Tesh KM, ShawDunn L, Evans JH. The abdominal muscles and vertebral stability. Spine. 1987;12:501-8.
- [13] Hodges PW, Richardson CA. Altered trunk muscle recruitment in people with low back pain with upper limb movement at different speeds. Archives of physical medicine and rehabilitation. 1999;80(9):1005-12.
- [14] Hodges P, Richardson C, Jull G. Evaluation of the relationship between laboratory and clinical tests of transversus abdominis function. Physiotherapy research international : the journal for researchers and clinicians in physical therapy. 1996;1(1):30-40.
- [15] Ferreira ML, Ferreira PH, Latimer J, Herbert RD, Hodges PW, Jennings MD, et al. Comparison of general exercise, motor control exercise and spinal manipulative therapy for chronic low back pain: A randomized trial. Pain. 2007;131(1-2):31-7.
- [16] Costa LO, Maher CG, Latimer J, Hodges PW, Shirley D. An investigation of the reproducibility of ultrasound measures of abdominal muscle activation in patients with chronic non-specific low back pain. European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society. 2009;18(7):1059-65.
- [17] Chattanooga-Group-Inc. Stabilizer Pressure Biofeedback. Operating instructions. Hixson 2005.
- [18] Cairns MC, Harrison K, Wright C. Pressure Biofeedback: A useful tool in the quantification of abdominal muscular dysfunction? Physiotherapy. 2000;86(3):127-38.
- [19] Richardson CA, Jull GA. Muscle control-pain control. What exercises would you prescribe? Manual therapy. 1995;1(1):2-10.
- [20] Richardson C, Jull G, Hodges P, Hides J, Panjabi MM. Therapeutic Exercise for spinal segmental stabilization in Low back pain. Scientific Basis and Clinical Approach: Churchill Livingstone; 1999.
- [21] Costa LO, Costa Lda C, Cancado RL, Oliveira Wde M, Ferreira PH. Short report: intra-tester reliability of two clinical tests of transversus abdominis muscle recruitment. Physiotherapy research international : the journal for researchers and clinicians in physical therapy. 2006;11(1):48-50.
- [22] Storheim K, Bo K, Pederstad O, Jahnsen R. Intra-tester reproducibility of pressure biofeedback in measurement of transversus abdominis function. Physiotherapy research international : the journal for researchers and clinicians in physical therapy. 2002;7(4):239-49.
- [23] Lima PO, de Oliveira RR, de Moura Filho AG, Raposo MC, Costa LO, Laurentino GE. Reproducibility of the pressure biofeedback unit in measuring transversus abdominis muscle activity in patients with chronic nonspecific low back pain. Journal of bodywork and movement therapies. 2012;16(2):251-7.
- [24] Von Garnier K, Koveker K, Rackwitz B, Kober U, Wilke S, Ewert T, et al. Reliability of a test measuring transversus abdominis muscle recruitment with a pressure biofeedback unit. Physiotherapy. 2009;95(1):8-14.
- [25] De Paula Lima PO, de Oliveira RR, Costa LO, Laurentino GE. Measurement properties of the pressure biofeedback unit in the evaluation of transversus abdominis muscle activity: a systematic review. Physiotherapy. 2011;97(2):100-6.
- [26] Zou GY. Sample size formulas for estimating intraclass correlation coefficients with precision and assurance. Statistics in medicine. 2012;31(29):3972-81.

- [27] Walter SD, Eliasziw M, Donner A. Sample size and optimal designs for reliability studies. *Statistics in medicine*. 1998;17(1):101-10.
- [28] Chattanooga G. Stabilizer pressure bio-feedback. Operating instructions. Hixson: Chattanooga Group Inc. 2005.
- [29] Jull G, Barrett C, Magee R, Ho P. Further clinical clarification of the muscle dysfunction in cervical headache. *Cephalalgia : an international journal of headache*. 1999;19(3):179-85.
- [30] Currier DP. *Elements of Research in Physical Therapy*. 3 ed: Lippincott Williams and Wilkins; 1990.
- [31] Martin Bland J, Altman D. Statistical methods for assessing agreement Between two methods of clinical measurement. *The Lancet*.327(8476):307-10.
- [32] Atkinson G, Nevill AM. Statistical methods for assessing measurement error (reliability) in variables relevant to sports medicine. *Sports medicine (Auckland, NZ)*. 1998;26(4):217-38.
- [33] De Vet HC, Terwee CB, Knol DL, Bouter LM. When to use agreement versus reliability measures. *Journal of clinical epidemiology*. 2006;59(10):1033-9.
- [34] Portney LG, Watkins MP. *Foundations of Clinical Research: Applications to Practice*: Prentice Hall; 1999.
- [35] Lafond D, Dimmock M, Champagne A, Descarreaux M. Intrasession reliability and influence of breathing during clinical assessment of lumbar spine postural control. *Physiotherapy theory and practice*. 2009;25(3):218-27.
- [36] Terwee CB, Bot SD, de Boer MR, van der Windt DA, Knol DL, Dekker J, et al. Quality criteria were proposed for measurement properties of health status questionnaires. *Journal of clinical epidemiology*. 2007;60(1):34-42.
- [37] Thomas J, Nelson J. *Research Methods in Physical Activity*. IL: Human Kinetics Books; 1990.
- [38] Rothstein J. *Measurement in Physical Therapy*. New York: Churchill Livingstone; 1985.
- [39] Venturni C, Andre A, prates A, Giacomelli B. Reliability of two evaluation methods of active range of motion in the ankle of healthy individuals. *Acta Fisiatr*. 2006; 13(1):39-43.

AN EXERCISE PROGRAM ADAPTED FOR HAEMOPHILIA PATIENTS

ADAPTAREA UNUI PROGRAM DE EXERCITII FIZICE PENTRU
PACIENTII HEMOFILICI*Lavinia Maria Hoge⁴, Elena Doina Mircioaga⁵*

Key words: hemophilia, physical effort, exercise program, health

Abstract

Introduction. Currently it is considered that health has some very important dimensions - physical, mental, social - and each contributes to the welfare condition of a person. In order to preserve good health, a person must examine each of these dimensions and guide themselves in the sense that is permitted not only to live a long time, but to remain healthy as long as possible.

Material and methods. The study was conducted on a sample of 200 subjects grouped into two groups of equal size, patients with hemophilia A and B (50%) and a control group (50%). With the World Health Organization survey Quality of Life (WHOQOL 100) scales were measured overall health and the environment.

Results. The results are statistically significant, $p < .01$, $p < .05$. This means that there are differences between the non-hemophiliacs and hemophiliacs, hemophiliacs have a lower level of quality of life, compared to non-hemophiliacs.

Conclusions. Hemophilia puts its mark on the general quality of life, and the health perception is deeply affected to patients from the study batch compared to the one from the healthy subjects batch.

Cuvinte cheie: hemofilie, efort fizic, exerciții fizice, sănătate

Rezumat

Intruducere. În prezent, se consideră că sănătatea are unele dimensiuni foarte importante - fizice, mentale, sociale - și fiecare contribuie la starea de bunăstare a unei persoane. Pentru a păstra o sănătate bună, o persoană trebuie să examineze fiecare din aceste dimensiuni și să se ghideze în sensul că, este permis nu numai de a trăi o lungă perioadă de timp, dar să rămână sănătos, atâta timp cât este posibil.

Material și metode. Studiul a fost efectuat pe un eșantion de 200 de subiecți, grupați în două grupuri egale, pacienți cu hemofilie (50%) și un grup de control (50%). Pentru evaluarea stării generale de sănătate a subiecților luați în studiu s-a folosit Scala WHOQOL 100.

Rezultate. Rezultatele sunt semnificative statistic, $p < .01$, $p < .05$. Acest lucru înseamnă că există diferențe între non-hemofilici și hemofilici, hemofilicii au un nivel mai scăzut al calității vieții, în comparație cu non-hemofilici.

Concluzii. Hemofilia își pune amprenta asupra calității generale a vieții, iar percepția stării de sănătate este profund afectată la pacienții lotului de studiu în comparație cu cea a lotului de subiecți sănătoși clinic.

Introduction

Hemophilia is a rare disease with a potential invalidating evolution. Under the terms of an appropriate treatment, the life expectancy of patients is normal, their social integration is really good, the number of complications is minimal or absent, and the quality of life is unaffected. In the absence of prompt and appropriate therapy in terms of quality and quantity has consequences both physically and psychologically: a high degree of chronic psoriasis arthropathia requiring orthopedic and surgical treatment; the decrease in muscular strength and joint mobility which has as a consequence a poor social integration of the adult hemophiliacs; post-transfusion infectious

⁴ Lecturer, psychologist, "Victor Babeș" University of Medicine and Pharmacy Timișoara, România, Psychology, **Corresponding author:** Phone: +0745042035; E-mail address: laviniahoge@yahoo.com

⁵ Associate professor, "Victor Babeș" University of Medicine and Pharmacy Timișoara, România, Physical Education and Sport, Phone: +0723427876, E-mail address: doinamircioaga@yahoo.ro

complications that decrease the life expectancy of patients; numerous and prolonged hospitalizations, followed by frequent absences from school or work; impairment of social integration of patients and their family members; family life of patients being harmed; the patients necessity for long term financial support [1,2].

The literature indicates prophylaxis for improving the health of patients with hemophilia. Research has shown that active people have fewer problems with bleeding compared to those who practice sport and have a higher weight than normal.

Because it is a hereditary disease, hemophilia can not be prevented. Also, will consult a specialist in creating a model of exercise for people with hemophilia. Practicing cautiously daily physical exercise increases muscle strength and help prevent bleeding. It is important to prevent joint bleeding as it can lead to severe disabilities.

Aim

The present study aims to assess some dimensions of quality of life of hemophilia patients and adapt an exercise program specific to this category of patients in order to improve health and life.

Hypothesis

The general health of haemophilia patients is lower than that of the healthy population.

Material and methods

The study was conducted on a sample of 200 subjects grouped into two groups of equal size. The clinical study group (50%) is made out of patients with hemophilia A and B are in the records and treatment of the Clinical Assessment and Recovery Centre "Cristian Serban" from Buzias. The control group (50%) is made up of people without hemophilia, which are in different public institutions, and their selection was made in accordance with the criteria established for the whole study group. The clinical batch consists of 100 people with hemophilia A and B, with ages between 16 and 45 years, while the control group is made up of 100 people without hemophilia.

With the World Health Organization survey Quality of Life (WHOQOL 100) scales were measured overall health and the environment. The results obtained were used to adapt a special exercise to increase the quality of life and improving health.

The environment domain has the following components: safety and physical security, family environment, financial resources, health and social care (accessibility and quality), the opportunity to acquire new information and skills, participation in possibilities for recreation/spending free time, physical environment (pollution, noise, traffic, climate), transport.

Results

We used Levene test for testing homogeneity of variance. The result is statistically significant, which indicates that dispersions are heterogeneous [3], $F(5, 194) = 3.939$, $p < .01$.

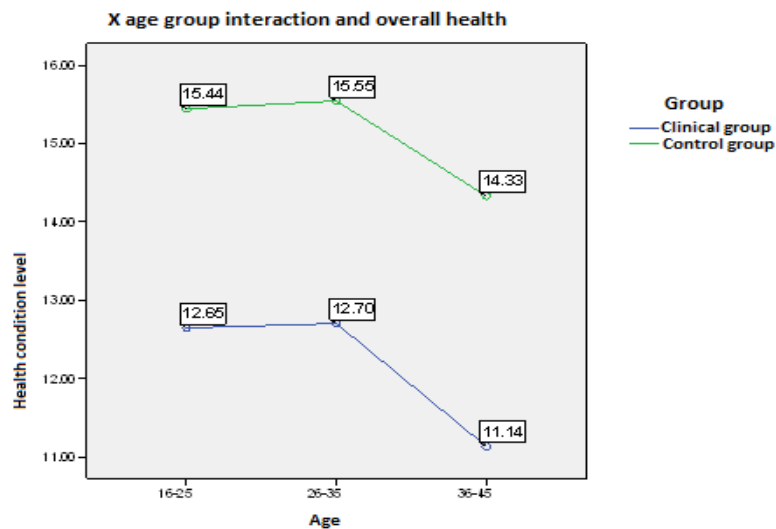


Fig.1. Interactive graphics - X age group and general health

Of the three ratios F only one is statistically significant: $F(1, 194) = 31.099, p < .001$ ($M = 12.33$ versus $M = 15.40$). This means that there are significant statistical differences between the non-hemophiliacs and hemophiliacs, hemophiliacs have a lower level of overall quality of life, compared to non-hemophiliacs, due to the fact that the main effect for batches (hemophiliacs versus non-hemophiliac) is statistically significant [Fig. 1].

Assessing the general state of the quality of life consists in highlighting the effect that different pathological events have on the patient's life, taking into account the personal satisfaction and participation in social life.

The importance of subjective assessment of general condition of quality of life is recognized [4] demonstrating thus, significant differences existing both between patients and healthy population, and between the one made by the doctor and the patient [5].

Low score, within the scope of the overall quality of life, is because subjects self evaluate their overall health as being precarious and, moreover, consider that there is a possibility that their condition will worsen.

To test the homogeneity of variance on the environment, Levene test indicates a statistically significant result, which shows that the dispersions are heterogeneous [idem], $F(5, 194) = 2.487, p < .05$ [Fig. 2].

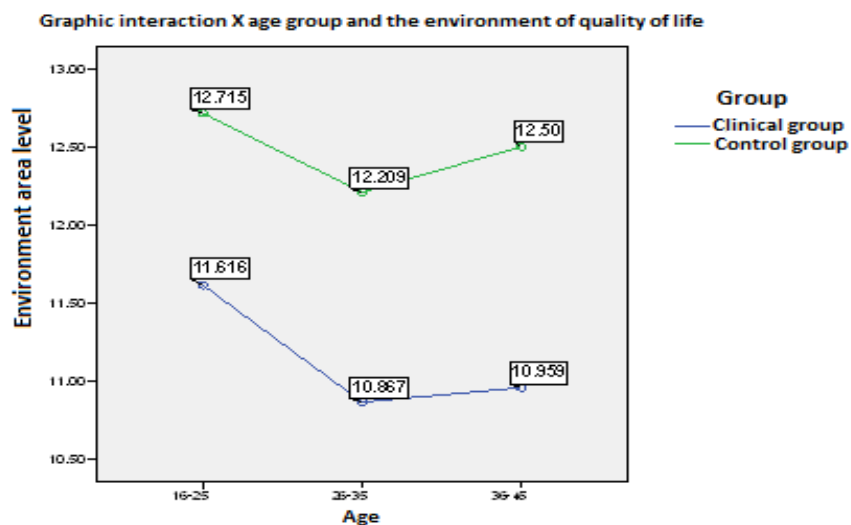


Fig. 2. Interactive graphics - the age group X and environment quality of life

Of the three F reports both main effects are statistically significant: F „lot” [F(1, 194)= 36,159, $p < .001$], i.e. F "age" [F(2, 194)= 5,491, $p < .01$]. This means that there are significant statistical differences between the non-hemophiliacs and hemophiliac, hemophiliacs have a lower level of quality of life on the environmental domain, compared to non-hemophiliacs, due to the fact that the main effect for batches (hemophiliacs versus non hemophiliacs) is statistically significant (M= 11,49 versus M= 12,16).

The effect of the age variable over the social relations domain variable of the quality of life is statistically significant F(2, 194)= 5,491, $p < .01$. This means that significant differences between the three age groups in hemophiliacs were found (M=11,61 for 16-25 years, M=10,86 or 26-35 years and M=10,95 for 36-45 years), compared to non-hemophiliacs (M=12,71 for 16-25 years, M=12,20 for 26-35 years and M=12,50 for 36-45 years). Taking into account the fact that the variable has three stages, and that F is a general test, type omnibus, to observe what differences are significant we resort to post hoc comparisons. Whereas dispersions are heterogeneous and groups deeply uneven, the Games-Howell test is the most suitable procedure for calculating the specific differences between the three age groups [idem].

Discussions

As with other chronic conditions, in the case of hemophilia, the appropriate treatment is not used for curing the disease, but for maintaining a normal lifestyle, free from suffering and for stopping the evolution towards deficiency, disability or handicap.

Of course, along with proper treatment, other important factors are involved like cultural, familial, socio-demographics, education and training, economic level of the country, the accessibility to care, safety and physical security, everyone's ability to acquire new skills and to use them [6].

In the absence of a substitutive treatment any injury can be fatal, with adverse consequences on the quality of life, and it is expected that the hemophiliac patients to live with the feeling of insecurity.

A disabled person needs certain conditions, and expectations are high in this regard, limited financial resources do not provide the comfort they need, all things putting their mark on the quality of life.

Health and social care system explore the opinion towards the medical and social systems which benefit the person, quality and availability, satisfying the expectations and needs. The medical and social services access, support from the community and from the authorities are evaluated.

The subjects of the clinical lot assess unfavorable they access and quality of medical services and social protection, which leads to statistically significant differences between the two groups.

The absence of adequate therapeutic means, specialized centres for the treatment of hemophilia where multidisciplinary teams, is responsible for the decrease in compliance to treatment and quality of life.

Participation in the opportunities for recreation/leisure examine the possibility and willingness to participate in various recreational and leisure activities (sports, reading, spending free time). The questions include ability, opportunity and pleasure to carry out recreational activities.

Statistically significant differences between the two groups studied, show that either the possibilities of recreation and spending their free time are reduced, either the unfavorable medical conditions (presence of hemophiliac arthropathy and the increased risk of bleeding) do not allow such activities.

There are statistically significant differences between hemophiliacs and non-hemophiliacs in the general field of the quality of life, due to the fact that the main effect for batches (hemophiliac versus non-hemophiliacs) is statistically significant: F „lot” F(1, 194)= 31,099, $p < .001$ (M= 12,33 versus M= 15,40).

The low score, within the domain of overall quality of life, is due to the fact that subjects are auto-assessing their overall health situation as being poor and, moreover, consider that there is a possibility that their condition will worsen.

Statistically significant differences are found between hemophiliacs and non-hemophiliacs on the environment domain, the main effect for batches (hemophiliacs versus non-hemophiliacs) being statistically significant F „lot” [F(1, 194)= 36,159, p < .001], respectively F „age” [F(2, 194)= 5,491, p < .01].

Furthermore, there are statistical significant differences in terms of quality of life on the environment domain between individuals from the three age groups, meaning that those in the age group 16-25 years tend to have a higher level of environmental concern compared those in the 26-35 year group (Games-Howel = 0,79, p<.01), as well as compared to those from the 36-45 years group (Games-Howel = 0,97, p<.01). And in terms of quality of life in the domain of environment between individuals in the age group 26-35 years and those from the 36-45 years group (Games-Howel = 0,18, p>.05), there are no statistically significant differences.

In this study, we started from the idea of measuring the quality of life of patients through comparison with hemophilic population healthy. At the same time, we propose a program of physical exercises necessary for a healthy life, exercises tailored for this category of patients.

Exercises

Toning the extensor flexor muscle groups and of the elbow: Isometric contractions, alternating left-right, subsequent simultaneously;

-Maintaining, but also trying to increase joint mobility in the joints: elbow flexion bilateral triple achievement-extensions (fist-elbow-shoulder), originally from the right upper limb, later to the left; this is done initially passive, and then active. You can try and oppose a minimum resistance.

-Toning knee extensor muscle groups, especially the quadriceps: Isometric contractions, initially at the level of the quadriceps muscle, then at the right level subsequently left quadriceps, at the same time.

Triple flexion-extension-active at the level of the affected limb, in preparation for thus lower limb we operated to support the weight of the body when it will move to re-educate with orthostatism and to the achievement of the first stages of walking;

-Flexion-extension of the ankle joint and the left hip (with the knee extended), passive, later passive-active, with the aim of preparing both his left leg, and the catchment area for motion;

- Foot pedaling movements, very important for the realization of walking;

- Walking with the help of the frame, with progressive loading of the affected limb; ideal viewing of walking in the mirror;

exercises at the climbing frame: with supportive hands on the climbing frame and support on the lower limb, do curls-extensions of the affected knee;

- Without support, under the supervision of the physical therapist;

easy, permanent mobilization of all joints; It is preferable for the active mobilization and even minimal active resistance;

- Practice of therapeutic swimming;

- Travelling huge distances and not at a pace slightly; as is indicated on the second half of the route to use a crutch on the side of the limb in order not to overburden the operated knee.[9]

Conclusions

Research results supports the hypothesis postulated, respectively the overall health of hemophilic patients is lower than that of valid individuals.

As it can be seen, hemophilia affects every person. For this reason a program for a healthy lifestyle is imposed as to increase the quality of life.

People with coagulation disorders live all around the value of world. Professionals from hemophilia centers play an important role in the critical moments from the patients' lives, giving them the essential tools to help them improve their lives, to actively participate to treatment and to be able to manage the disease.

References

- [1] Sava F. (2004) *Data analysis in psychological research. Statistical methods complementary*
- [2] Slevin, M.L. (1988), *Who should measure quality of life, the doctor or the patients?*, 109-112;
- [3] Pearlman, R.A., et al. (1988), *Quality of life in chronic diseases: perception of elderly patients*;
- [4] Luchtman-Jones, L., et al. (2006), *Consideration in the evaluation of haemophilia patients for short term prophylactic therapy*, pag. 82-86
- [5] Beeton, K., Cornwell, J. Alltree J. (1988). Muscle rehabilitation in haemophilia. *Haemophilia*, 4:532-537.
- [6] Rodriguez-Merchan, E.C., (1996). Effects of haemophilia on articulation of children and adults. *Clin Orthopedics Related Res*, 328:7-13;
- [7] Mircioaga E.D., [2013]. *Profilaxia traumatismelor musculo-scheletale la sportivi*, Editura Eurostampa, Colecția Pantanassa, Timișoara, ISBN 978-606-569-689 -1.

IMMEDIATE EFFECTIVENESS OF RELAXATION IN MANAGEMENT OF CHRONIC LOW BACK PAIN

EFICIENȚA IMEDIATĂ A UNUI PROGRAM DE RELAXARE ÎN MANAGEMENTUL DURERII LOMBARE CRONICE

Nishat Khan⁶, Khatri SM⁷

Key words: Non-specific Chronic Low Back Pain, Relaxation, Guided Imagery, Mindfulness of Breathing.

Cuvinte cheie: durere lombară nespecifică, relaxare, imaginație ghidată, conștientizarea respirației

Abstract

Introduction. One in three people suffer from chronic low back pain frequently associated with quality of life and high levels of psychological risks. Psychosocial factors appear to play a larger prognostic role than physical factors in low back pain. Relaxation has found to be effective in reducing symptoms in a variety of population including anxiety, cancer, Alzheimer's. However very few studies have been done to find out the effect of relaxation on chronic pain, hence this study aims to find the immediate effectiveness of relaxation in management of chronic low back pain.

Method. 72 Participants with Non-specific Chronic Low Back Pain meeting the inclusion and exclusion criteria were given two sessions of relaxation. Pre and post intervention scores were measured on first and second day. First day, any one of the relaxation technique was administered to the patient and then post intervention scores were noted. The second relaxation technique was given to the patient and post scores were noted.

Results. Pre intervention the mean baseline scores of Guided Imagery and Mindfulness of Breathing in terms of PPT, VAS, Systolic Blood Pressure, and Diastolic Blood Pressure showed extremely significant improvement ($p < 0.0001$). Participants after receiving Guided Imagery showed no significant difference in Pulse Rate ($p = 0.06$) while participants after receiving Mindfulness of Breathing showed significant difference in terms of Pulse Rate ($p = 0.021$).

Conclusion: Guided Imagery and Mindfulness of Breathing are effective and can be utilized as an adjunct in the treatment of Non-Specific Chronic Low Back Pain.

Rezumat

Introducere. Unul din trei oameni suferă de durere lombară cronică, frecvent asociată cu reducerea calității vieții și riscuri psihologice. În durerea lombară, factorii psihologici par să aibă un rol prognostic mai mare decât factorii fizici. S-a demonstrat că relaxarea este eficientă în reducerea simptomelor la o mare varietate de persoane, incluzând anxietate, cancer, Alzheimer. Cu toate acestea, doar câteva studii au ca scop demonstrarea efectului relaxării în durerea lombară cronică. Prin urmare, acest studiu dorește să scoată în evidență efectul imediat al relaxării în managementul durerii lombare cronice.

Metode. 72 de subiecți cu durere lombară nespecifică au întrunit criteriile de includere sau de excludere. Ei au participat la 2 ședințe de relaxare. Scorurile pre și postintervenție s-au măsurat în prima și a doua zi. În prima zi s-a aplicat tehnica de relaxare și s-au notat scorurile postintervenție A doua tehnică de relaxare s-a aplicat a doua zi, după care s-au notat scorurile la evaluarea finală.

Rezultate. Valorile medii preintervenție pentru imaginația ghidată și conștientizarea respirației, în termeni de PPT, VAS, tensiune arterială sistolică și diastolică au arătat o îmbunătățire semnificativă ($p < 0.0001$). După aplicarea imaginației ghidate, nu au prezentat o diferență semnificativă a pulsului ($p = 0.06$), în timp ce participanții care au urmat metoda conștientizării respirației au demonstrat diferențe semnificative a ratei pulsului ($p = 0.021$).

Concluzie: Imaginația ghidată și conștientizarea respirației sunt eficiente și pot fi folosite ca metodă adjuvantă în tratamentul durerii lombare cronice nespecifice.

⁶ postgraduate student, B.P.T, M.P.T(Ortho), Dr. A. P. J. Abdul Kalam College of Physiotherapy, Pravara institute of Medical Sciences, Loni, Tal: Rahata, Dist: Ahmednagar, Maharashtra State, India 413 736

Corresponding Author: Nishat H Khan; e-mail: khannishat036@gmail.com, contact number: 07066899264.

⁷ B.Ph T, M.P.T(Ortho), Ph.D, Dr. A. P. J. Abdul Kalam College of Physiotherapy, Pravara institute of Medical Sciences, Loni, Tal: Rahata, Dist: Ahmednagar, Maharashtra State, India 413 736

Introduction

For literally hundreds of years, the back has been a symbol of strength and a focus of stress.[1] Pain or discomfort can happen anywhere in the back, the most common area affected is lower back, and this is because the lower back supports most of the body's weight. Low back pain represents cause of one of the most common medical problems and a major cause of disability. Researchers suggest a 50% to 70% chance of any one adult suffering from low back pain during their lifetime with a prevalence of about 18% - 20%. [2] In USA, Back pain is the most common cause of activity limitation in people younger than 45 years of age, second most frequent reason for visits to physicians, the fifth ranking cause of admission to hospital and third major cause of surgical procedure.[3]

The International Association for the Study of Pain (IASP) defines lumbar spinal pain as “pain perceived as arising from anywhere within a region bounded superiorly by an imaginary transverse line through the tip of the last thoracic spinous process, inferiorly by an imaginary transverse line through the tip of the first sacral spinous process, and laterally by vertical lines tangential to the lateral borders of the lumbar erectors spinae.” Sacral spinal pain is defined as “pain perceived as arising from anywhere within a region bounded superiorly by an imaginary transverse line through the tip of the first sacral spinous process, inferiorly by an imaginary transverse line through the sacrococcygeal joints, and laterally by imaginary lines passing through the posterior superior and posterior inferior iliac spines.” Low back pain is considered to arise from both the lumbar and sacral locations.[4]

The low back pain can be categorized according to the “diagnostic triage” into three divisions as Specific spinal pathology, Nerve root pain/radicular pain, Non-specific low back pain.[5] On basis of duration, low back pain can be classified as acute, sub-acute and chronic. In acute low back pain, the duration of pain is in between 0 and 6 weeks, in sub-acute the duration of low back ache is 6 and 12 weeks and in chronic the duration is more than 12 weeks. Chronic low back pain can further be classified as early phase, intermediate and late phase. [6]

Nonspecific low back pain is the most common type of back pain. About 19 in 20 cases of sudden-onset low back pain are classed as nonspecific. It is called nonspecific because there is no specific problem or disease that can be identified as the cause of the pain. In some cases the cause may be a sprain of a ligament or muscle, minor problem with a disc, or a minor problem with a small facet joint between two vertebrae. It may develop immediately after lifting something heavy, or after an awkward twisting movement. The severity of the pain can range from mild to severe. The pain is usually eased by lying down flat. It is often made worse if you move your back, cough, or sneeze. So, nonspecific low back pain is mechanical in the sense that it varies with posture or activity. [7]

There has been growing recognition that pain is a complex perceptual experience influenced by a wide range of psychosocial factors, including emotions, social and environmental context, social-cultural background, the beliefs, attitude and the biological factors.[8] The pharmacological treatment for low back pain begins with maximum recommended doses of Non inflammatory anti-steroidal drugs and acetaminophen followed by other adjunctive medications. Physical therapy includes patient's education about the condition and a combination of stretching, strengthening exercises, manual therapy and modalities like ice, heat, TENS, ultrasound to treat pain. Coping skills are extremely important in management of chronic low back pain. Chronic pain affects all areas of life. Pain affects mood and mood affects the individual's ability to cope up. [9]

In 1995, Ryman defined relaxation as ‘a state of consciousness and release from tension, anxiety and fear’.[10] Relaxation strategies have been used for centuries as integral components of major philosophical, theological and therapeutic traditions. The relaxation response is defined as the response that is the opposite of the “fight-or-flight” or stress response. It is characterized by the following: decreased metabolism, heart rate, blood pressure, and rate of breathing; a decrease or “calming” in brain activity; an increase in attention and decision-making functions of the brain; and changes in gene activity that are the opposite of those associated with stress. [11]

The Imagery technique has been used for a century-but research about the efficacy of the technique did not surface until the 70's from the medical profession. Guided Imagery also defined as a "range of techniques, from simple visualization and direct imagery-based suggestion through metaphor and storytelling". [12]

In 1990 Guy Claxton defined Mindfulness as "Mindfulness is simply the knack of noticing without comment whatever is happening in your present experience".[13] In most cases chronic low back pain is a psychosomatic condition in which a real physical problem exists but psychological factors play important role in determining the experience of problem. Relaxation has found to be effective in reducing symptoms in a variety of population including anxiety, phobias, headaches, substance abuse, hypertension, fibromyalgia, asthma, cancer, Alzheimer's. [14]

However very few studies have been done to find out the effect of relaxation on chronic pain, hence this study aims to find the immediate effectiveness of relaxation in management of chronic low back pain.

Material and method

The study design used was experimental study. The study included participants who fulfilled the inclusion and exclusion criteria in the study. Non Probability type of convenient sampling was done in this study. No efforts were made regarding blinding of therapist or patient. 91 male and female participants within 30-60 years of age were referred to Orthopaedic Physiotherapy Department, Pravara Rural Hospital, Loni, Taluka – Rahata, District-Ahmednagar, Maharashtra state, India-413 736 from February 2015 – December 2015 with a clinical diagnosis of Non Specific Chronic Low Back Pain(> 12 weeks) and who were willing to participate in the study were included in the study. Participants were excluded if they had recent trauma/ recent surgeries, acute low back pain, gastrointestinal disorders, cardiac conditions, psychotic symptoms, involved in other psychological or pharmacological intervention, epilepsy, vertigo and those with full stomach. [15][16]

Intervention

The intervention was performed for 2 days. Participants received a one day session of first relaxation technique for 10 minutes and one session of second technique on the next day for 10 minutes. All the participants were in a single group. Pre and post intervention scores were measured on day one and day two. On day one Pressure pain threshold, Visual analogue scale, Blood pressure and pulse rate was measured before the intervention.

The Pressure Pain Threshold (PPT) was assessed with pressure algometer. Blood pressure and pulse rate was assessed with the help of Digital blood pressure monitor. The study included two types of relaxation techniques, on the first day any one of the relaxation technique was administered to the participants and then post intervention scores were noted. On day two pre- intervention scores were assessed. The second relaxation technique was given to the participant and post scores were noted. Participants were then guided to take conventional physiotherapy once the intervention was over.

Procedure for Guided Imagery: To begin with the technique, participants were told to be in comfortable position. Once the body is completely relaxed, allow visualization relaxation to begin. Participants were told to imagine that they were walking towards the shore, walking through a beautiful path, instructed to hear the waves and try to smell the beach, feel the cool breeze blowing through the trees. Participants were made to imagine that they are walking towards the water and were made to feel the water touching their toes, see the waves approaching them. Then instructions were given to open their eyes, stretch their muscles, become alert and refreshed, and filled with energy. [17]

Procedure for Mindfulness of Breathing: Participants were in meditation posture with the back erect. Patients were instructed to be in comfortable position in chair, allowing hands to rest comfortably, loosen any tight clothing that restricts stomach. Gently close your eyes. Instructions were given to take two or three deeper breaths from your diaphragm, letting the air flow all the

way into stomach, without any push or strain, and then flow gently back out again. Let breathing find its own natural, comfortable rhythm and depth. Focus attention on the feeling of your breath as it comes in at the tip of nose, moving through the back of throat, into lower diaphragm, and back out again, letting stomach rise and fall naturally with each breath. Participants were guided to stay focused on their breath and away from the noise, the thoughts, the feelings, the concerns that may usually fill their mind. Observe the process of the mind. Gently return attention to the breath if mind becomes caught in thoughts. Instructions were given to silently in their mind, count “one” on inhalation and “one” on exhalation. Do it up to ten for 10 minutes.[18]

Outcomes

The following were the outcome measures used in this study: PPT (Pressure Pain Threshold), VAS (Visual Analogue Scale), Blood Pressure and Pulse Rate.

Data analysis

Analysis was done on the basis of data obtained pre and post intervention using PPT, VAS, Blood pressure and Pulse Rate. Data was analyzed using Graph Pad InStat Trial Version 13.3. Descriptive statistics for all outcome measures were expressed as mean, standard deviations and test of significance such as t test. The confidence interval was set as at 95% and data was considered statistically significant with $p < 0.05$ and highly significant with $p < 0.01$

Results

A total of ninety-one participants were screened, of which eighty three participants met the inclusion criteria. Out of these, seventy four participants agreed to participate in the study. However, two participants dropped out during the intervention, as they stayed away from hospital and found it difficult to travel. Thus there were 72 participants in total who received two sessions of relaxation. The mean age of participants was 44.97 ± 9.00 years. The average age of females was 44.98 ± 9.00 years and for males was 44.96 ± 9.20 years. The gender ratio was 49:23 (49 females and 23 males). The mean BMI of participants was $24.75 \pm 1.99 \text{ kg/m}^2$.

In participants with Guided Imagery, comparing the pre and post values for PPT, VAS, Systolic BP, Diastolic BP it was observed that the mean difference was extremely significant ($p < 0.0001$). Pre and post values for pulse rate it was observed that this mean difference was not significant ($p = 0.06$).

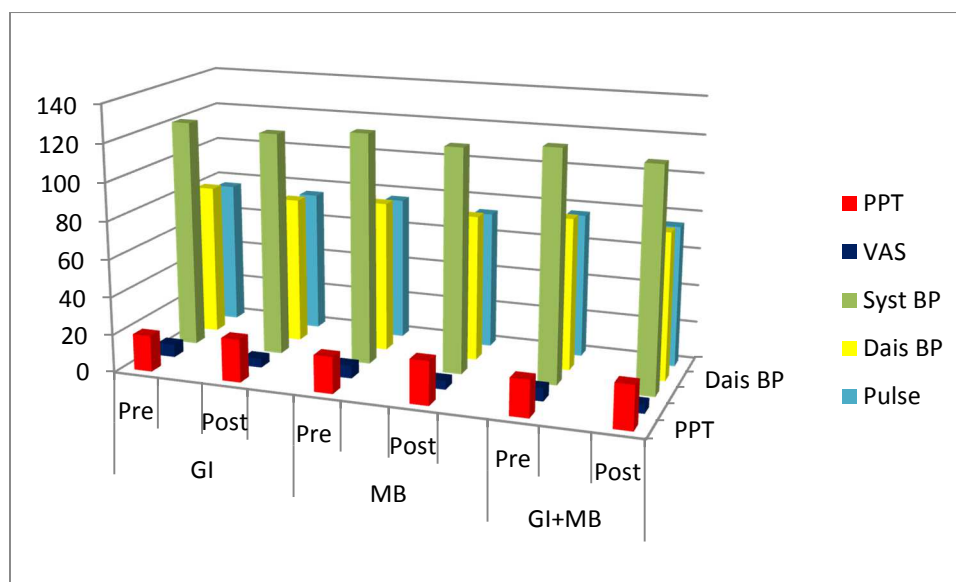
In participants with Mindfulness of Breathing, comparing the pre and post values for PPT, VAS, Systolic BP, Diastolic BP it was observed that the mean difference was extremely significant ($p < 0.0001$). Pre and post values for pulse rate it was observed that this mean difference was significant ($p = 0.0213$)

On comparing pre and post values for PPT, VAS and Diastolic Blood Pressure in participants with Guided Imagery and Mindfulness of Breathing, it was observed that this difference was extremely significant ($p < 0.0001$). The pre and post mean difference for systolic and diastolic Blood Pressure was very significant ($p = 0.041$) while pulse rate was observed to be non-significant ($p = 0.052$) (Table 1) (Graph 1)

Table 1: Values for Mean, Standard Deviation, t & p value.

| | | GI | | | MB | | | GI + MB | | |
|-------------|------|-------------|-------|---------|-------------|-------|----------|-------------|-------|----------|
| | | Mean± SD | T | p value | Mean ± SD | t | p value | Mean±SD | t | p value |
| PPT | Pre | 19.20±4.49 | 11.85 | p<0.001 | 19.43±4.81 | 12.87 | p<0.0001 | 19.60±4.57 | 14.74 | p<0.0001 |
| | Post | 22.07±4.7 | | | 23.21±4.55 | | | 23.17±4.39 | | |
| VAS | Pre | 6.69±1.251 | 19.43 | p<0.001 | 6.85±1.436 | 16.21 | p<0.001 | 6.806±1.10 | 22.93 | p<0.0001 |
| | Post | 4.786±1.10 | | | 4.79±1.326 | | | 4.786±1.04 | | |
| Systolic BP | Pre | 121.29±6.91 | 3.61 | p=0.02 | 122.29±7.12 | 4.96 | p<0.0004 | 121.89±6.04 | 2.96 | p=0.004 |

| | | | | | | | | | | |
|--------------|------|-------------|------|---------|-------------|------|----------|-------------|-------|----------|
| | Post | 118.71±6.91 | | 006 | 118.56±8.29 | | 1 | 117.40±13.5 | | 1 |
| Diastolic BP | Pre | 80.68±6.8 | 4.58 | p<0.001 | 80.19±5.69 | 5.76 | p<0.0001 | 80.53±6.27 | 5.576 | p<0.0001 |
| | Post | 78±7.04 | | | 77.32±5.72 | | | 77.89±5.89 | | |
| Pulse Rate | Pre | 76.31±8.36 | 1.85 | p=0.067 | 76.43±8.02 | 2.35 | p=0.0213 | 76.44±7.63 | 1.97 | p=0.052 |
| | Post | 75.29±7.48 | | | 75.04±7.9 | | | 74.76±10.88 | | |



Graph 1: PPT, VAS, BP, Pulse Rate in GI, MB, GI+MB

Discussion

Chronic pain is both physically and psychologically noticeable. Pain is often associated with stress, depression, anxiety. Stress lowers the pain tolerance and hence techniques such as relaxation help the mind and body to relax so that it can alleviate stress, thus helping the chronic pain to feel better.[19]Kingston J et al., investigated the effect of mind on pain tolerance, psychological well-being and physiological activity stated that pain tolerance significantly increased in the mindfulness condition only. There was a strong trend indicating that mindfulness skills increased in the mindfulness condition, but this was not related to improved pain tolerance. Interestingly, there is some evidence suggesting that higher levels of mindfulness could be linked to decreased pain perception and to an overall better functioning. [20]

Intensity of pain perceived by participants was measured by Visual Analogue Scale. When your body remains in a stress state for long time, emotional or physical damage may occur. The over riding tenet in all theories regarding low back pain is that psychological and emotional factors cause some type of physical change resulting in back pain. Pain is regulated by nervous system. The brain inhibits the pain signal but if the body is under constant stress, the brain's ability to filter pain is affected adversely and this contributes to increase in pain. Relaxation relieves pain or keeps it from getting worse by reducing tension in the muscles. Relaxation techniques are used in order to divert the attention away from pain. A study evaluated the effects of guided imagery on pain, function, and self-efficacy in 48 people with fibromyalgia.

Functional status and self-efficacy for managing pain were significantly improved in the guided-imagery group, compared with the usual-care group. There were, however, no significant improvements or differences in pain between the two groups on pain scores.

When a situation is perceived as challenging, the brain immediately responds via the spinal ganglia, by stimulating the adrenal medulla to release catecholamines such as adrenaline and noradrenaline into the bloodstream. The function of these neurotransmitters is to prepare the organs for action in a manner which has been known as the 'fright/flight/fight' response. It is characterized by increase in heart rate and redistribution of blood from the viscera to the voluntary muscles. Blood pressure and respiratory rate are also increased, alertness and sensory awareness are heightened and muscle tension is raised. Relaxation aims to counteract the effects of sympathetic activity by promoting the action of parasympathetic nature of two parts of the autonomic nervous system. It causes reductions in heart rate, breathing rate, oxygen consumption, blood pressure and blood lactate.

The last thirty years of mind body cardiac research shows that Guided Imagery for heart health to improve heart rate, blood pressure, heart rate variability associated in reducing arterial plaque. [21] Prof Hughes in a study found that patients with Mindfulness group gave lower readings for both systolic and diastolic blood pressure. The systolic blood pressure decreased by almost 5 mmHg and diastolic reading decreased by 2 mmHg. Researches from Ohio claim that Mindfulness training can lower blood pressure to such an extent that it could prevent or delay the need for drug intervention. [22]

National Center for Complementary and Alternative Medicine states the goal of techniques such breathing relaxation is to decrease your heart rate and stress levels by stabilizing CO₂ levels in your blood, maximizing oxygen levels in your blood, increasing oxygen saturation in cells, and lowering your blood pressure and pulse rate all of which will lower the concentration of stress hormones in your body and activate the PSNS. [23]

Conclusion

Guided Imagery and Mindfulness of Breathing are effective and can be utilized as an adjunct in the treatment of Non-Specific Chronic Low Back Pain. Limitations of the study were that it included more number of female participants and there was no follow up done for long duration.

Acknowledgement

I would like to thank Dr. Subhash Khatri, Principal, Dr APJ Abdul Kalam College of Physiotherapy, Loni for his guidance, consistent encouragement, wisdom and patience. I thank all the participants for their tolerance and co-operation.

Limitations

Limitations of the study were that it included more number of female participants and there was no follow up done for long duration. One of the major limitation in the study was some of the participants might have forced their mind to do the imagery.

Future Research

Future study could be conducted with a long term follow up in larger sample size consisting of equal number of males and female participants. Also, study should be aimed at finding out the effectiveness of relaxation techniques given in groups to participants with Nonspecific Low Back Pain.

References

- [01] Derebery VJ, Tullis W. (1986) Low back pain exacerbated by psychosocial factors. *West J Med.*:5:144:574-579.
- [02] Donatelli Robert, Wooden Micheal. (2010) *Orthopaedic Physical Therapy*. Philadelphia: Fourth edition. Churchill Livingstone
- [03] Andersson BJ Gunnar. (1999) *Epidemiological features of chronic low back pain*. *Lancet.*: 354:581-585.

- [04] *** (2012) *Back and Neck pain*. Feb. Available at:
<https://medtextfree.wordpress.com/2012/02/09/27-back-and-neck-pain/> accessed on 2/10/2015.
- [05] Aoraksinen O et al. (2004) *European guidelines for management of chronic non-specific low back pain* [Internet]. Nov. Available at:
www.backpainurope.org/web/files/WG2_Guidelines.pdf accessed on 4/5/2015.
- [06] Khatri S. (2013) *Basics Of Orthopedic Physiotherapy*. New Delhi: Jaypee Brothers Medical Publishers Ltd
- [07] Non-specific Lower Back Pain in Adults. (2015) Available on:
<http://patient.info/health/nonspecific-lower-back-pain-in-adults> accessed on 10/9.
- [08] Turk Dennis, Okifuji Akiko. (2002) Psychological factors in chronic pain. *Journal of Consulting and Clinical Psychology*.: 70(3): 678–690.
- [09] *** (2015) *Chronic Low Back Pain*. North American Spine Society Public Education Series. Available at:
http://www.knowyourback.org/Documents/chronic_lbp.pdf accessed on 3/01/2015.
- [10] Payne A. Rosemary. (2003) *A Practical Handbook for the Health Care Professional: Relaxation Techniques*. Philadelphia: Second Edition. Elsevier Science limited,.
- [11] Benson H. (2011) *The Relaxation Revolution*. Available at: <https://experiencelife.com/wp-content/uploads/11/The-Relaxation-Revolution.pdf> accessed on 6/6/2015.
- [12] Perez A. *The use of Progressive relaxation and Guided Imagery Techniques with Forgiveness in treating trauma related sexual abuse*. Available at:
<http://www.esextherapy.com/dissertations/Alicia%20Perez%20The%20Use%20of%20Progressive%20Relaxation%20and%20Guided%20Imagery%20Techniques%20with%20Forgiveness%20in%20Treating%20Trauma%20Related%20Sexual%20Abuse.pdf>
- [13] Harris R. (2007) *Acceptance and commitment therapy (ACT). Introductory workshop Handout 2007*. Available at:
<http://www.thehappinesstrap.com/upimages/2007%20Introductory%20ACT%20Workshop%20Handout%20-%20Russ%20Harris.pdf> accessed 8/5/2015.
- [14] Gavian Margaret. (2014) *The effects of Relaxation and Gratitude intervention on stress outcomes*. 2011 September. Available at: www.conservancy.umn.edu accessed on 04/12/
- [15] Elton D, Burrows G, Stanley G. Relaxation (1978) *The Physiotherapist and the Psychiatric Patient. The Australian Journal of Physiotherapy*. Decemeber; 4 : 183-186.
- [16] *** (2015) *Cautions/ Contraindications – Relaxation. Stress Management for Health Course*. Available at: <http://stresscourse.tripod.com/id41.html> accessed on 28/4
- [17] *** (2015) Candi Raudebaugh. Inner Health Studio. Coping skills and Relaxation Resources. Accessed at: <http://www.innerhealthstudio.com/guided-imagery-scripts.html> accessed on 4/5
- [18] Kristelar. L. Jean, In Lehrer P. , Woolfolk R.L, Sime W.E. (2007) *Principles and Practice of Stress Management : Mindfulness Meditation*. 3rd Edition. New York: Guilford Press ;.
- [19] Bressert S. (2008) *Can Relaxation technique help chronic Pain?* [Internet] [Jan 2007] [updated jan 2013]. Available at: <http://psychcentral.com/blog/archives/> accessed on 30/10/2015.
- [20] Kingston J ,Chadwick P, Meron D, Skinner TC (2007). A pilot randomized control trial investigating the effect of mindfulness practice on pain tolerance, psychological well-being, and physiological activity. *J Psychosom Res. March*; 62(3) : 297-300.
- [21] *** (2015) *Meditation for Hearth Health & Cardiac Fitness* [Internet]. Available at:
<http://www.healthjourneys.com/Main/Home/Heart-Health/> accessed on 15/10/2015.
- [22] *** (2013) *Mindfulness training helps lower blood pressure* [Internet]. October. Available at:
<http://www.medicalnewstoday.com/articles/267528.php> accessed on 16/10/2015.
- [23] *** (2013) *The Science of Stress Heart Rate and Breathing*. Oct. Available at:
<http://www.mybasis.com/blog/2013/10/the-science-of-stress-heart-rate-and-breathing/> accessed on 18/10/2015.

ASPECTE PRIVIND INCIDENȚA TRAUMATISMELOR MUSCULO-SCHELETALE LA JUCĂTORII DE BASCHET. PREVENȚIE ȘI RECUPERARE

SOME ASPECTS REGARDING THE PREVALENCE OF MUSCULAR-SKELETAL INJURIES IN BASKETBALL PLAYERS. PREVENTION AND REHABILITATION

Elena Doina Mircioagă⁸, Lavinia Maria Hogeă⁹, Mircioagă Alexandra¹⁰

Key words: basketball, training, injury, prevention, rehabilitation

Cuvinte cheie: baschet, antrenament, traumatism, prevenție, recuperare

Abstract

Introduction. A traumatic event, no matter of the cause, can be a crucial moment from a sportsman's life.

Aim. This paperwork aims to emphasize the efficiency of a prophylaxis exercise program, in the decreasing of muscular-skeletal traumatic events, in basketball players.

Material and methods. 48 basketball players were enrolled in the study (36 boys and 12 girls), age between 18-38 years old, practicing basketball between 6-16 years. Study was developed within a period of 3 competition years.

Results. After implementing some prophylaxis exercise programmes during training sessions of basketball players, in the second period of the study, the following outcomes came out: the results comparison get from the two periods of the study emphasized a decreased incidence of muscular-skeletal injuries, in the second period versus first period. In basketball players, there was a decreasing of knee traumatic injuries ($p=0,02$ $\alpha=0,05$), in the second period versus first period. Referring to the distribution of traumatic events according to the place on the field of basketball players, the incidence of traumatic events decreased in the second period in all players, no matter of their place on the field. According to gender, there are significant differences only for the segment „hand-palm-fist”, in the second period, meaning that the number of traumatic events in women is lower than in males ($p=0,028$; $\alpha=0,05$).

Conclusions. After the implementation within the training sessions of an exercise program, the incidence of muscular-skeletal traumatic events decreases in the second period in all segments.

Rezumat

Introducere. Indiferent de cauza ei o accidentare poate fi un moment de răscruce în viața unui sportiv.

Scop. Lucrarea de față dorește să scoată în evidență eficiența unui program profilactic de exerciții, în reducerea incidenței traumatismelor musculo-scheletale, la baschetbaliști.

Material și metode. Lotul studiat este reprezentat de 48 sportivi baschetbaliști (36 băieți și 12 fete), cu vârsta cuprinsă între 18-38 ani, vechime în sport 6-16 ani) Studiul s-a derulat pe o perioadă de 3 ani competiționali.

Rezultate. În urma implementării unor programe de exerciții profilactice în cadrul antrenamentelor baschetbaliștilor în perioada a II a studiului au rezultat următoarele: prin compararea rezultatelor obținute în cele două perioade de timp studiate, s-a evidențiat scăderea frecvenței traumatismelor musculo-scheletale, în a doua perioadă comparativ cu prima perioadă. La baschet a scăzut semnificativ numărul de traumatisme de la nivelul genunchiului ($p=0,02$ $\alpha=0,05$), în a-II a perioada față de prima perioadă.

Referitor la distribuția traumatismelor în funcție de postul ocupat în teren al jucătorilor de baschet, numărul de traumatisme a scăzut în perioada a II-a la toți jucătorii, indiferent de postul jucat. În funcție de gen, diferențele sunt semnificative doar pe segmentul „mână-palmă-pumn”, pentru perioada a II-a, în sensul că numărul traumatismelor la femeii este mai scăzut decât la bărbați ($p=0,028$; $\alpha=0,05$).

Concluzii. În urma introducerii în antrenamentele sportivilor a programului de exerciții incidența traumatismelor musculo-scheletale a scăzut în perioada a II-a la toate segmentele.

⁸ conf.univ.dr. Associate professor, "Victor Babeș" University of Medicine and Pharmacy Timișoara, România, Physical Education and Sport,

Corresponding author: Phone: +0723427876, E-mail address: doinamircioaga@yahoo.ro

⁹ lecturer, psychologist, "Victor Babeș" University of Medicine and Pharmacy Timișoara, România, Psychology, Phone: +0745042035; E-mail address: laviniahogeaa@yahoo.com

¹⁰ lecturer "Victor Babeș" University of Medicine and Pharmacy Timișoara, România, Physical Education and Sport +0724408072, E-mail address: alexia_tenis21@yahoo.com

INTRODUCERE

Baschetul este un joc sportiv, colectiv (5 jucători în teren și 12 pe foaia de arbitraj care pot participa la joc) în care aparatul locomotor este intens utilizat atât în momentele de intensitate maximală cât și submaximală. În jocul de baschet sunt caracteristice săriturile frecvente la panou, opririle bruște și schimbările de direcții care solicită mult articulațiile genunchilor și ale gleznelor. [1]

Solicitarea aparatului locomotor este asimetrică, momentele de prindere, dribling și pasarea mingii sau de aruncare la coș fiind caracterizate prin intervenția membrelor superioare simultan cu mișcările ciclice sau aciclice ale membrelor inferioare (sărituri, fente) și cu acționarea segmentului cefalic în cu totul alt ritm, în scopul derutării adversarului și a eliminării posibilităților acestuia de a anticipa mișcarea. În timpul jocului, apar toate cele trei tipuri de solicitări amintite: anaerobă alactacidă, anaerobă lactacidă și aerobă. Din aceste motive, în jocul de baschet, accidentele sunt frecvent întâlnite, în special entorsele de gleznă și de genunchi, (care nu rareori determină leziuni de menisc) și leziuni musculare, de la elongații până la rupturi musculare fibrilo-fasciculare sau chiar totale. [2,3,4]

Studiul pleacă de la premisa că, incidența crescută a traumatismelor în rândul baschetbaliștilor de performanță investigată, se datorează unor factori ce pot fi măcar în parte, contracarați prin introducerea în programul de antrenament al sportivilor a unor programe de exerciții având ca obiectiv prevenirea traumatismelor și reducerea numărului de accidentări.

Scop

Stabilirea incidenței, frecvenței, și localizării în funcție de segmentul afectat, a traumatismelor musculo-scheletale, la sportivii baschetbaliști cuprinși în studiu. Elaborarea și implementarea unor programe de exerciții profilactice.

Material și metode

Studiul bibliografic, observația, metoda statistică – matematică, metoda grafică, Metoda anchetei (chestionarului) – respectiv chestionarul de anamneză (anamneza medico-sportivă) –

În cadrul prelucrării statistice, s-a procedat la :

- compararea valorilor medii: s-a utilizat în acest scop testul "t" (Student) pentru perechi de loturi independente și nivelul de semnificație (risc) de 0,05 (5%) și testul "F" pentru compararea a mai mult de doua loturi (modelul ANOVA).
- regresia și corelația statistică: în acest scop, s-a utilizat regresia lineară și coeficientul de corelație lineară r (Pearson).
- s-a utilizat testul Z. [5,6]

Determinarea cauzelor accidentărilor s-a realizat prin cumularea informațiilor de la examenul și testele precompetiționale precum și din examinarea și interogarea jucătorilor accidentați

Metode de prevenire a traumatismelor sportive:

În antrenamentele sportivilor luați în studiu, a fost introdus, în mod organizat un program coerent și complex de exerciții, focalizat pe grupele musculare și articulațiile implicate în actele motrice specifice jocurilor sportive și probelor atletice practicate. Exercițiile au fost selectate punând accent pe echilibrarea musculară, creșterea mobilității articulare, ameliorarea elasticității musculo-ligamentare. [7,8]

Baschet

Lotul studiat este reprezentat de 48 sportivi (36 băieți și 12 fete) cu vârsta cuprinsă între 18-38 ani, vechime în sport 6-16 ani. Studiul s-a derulat pe o perioadă de 3 ani competiționali când s-a reușit urmărirea îndeaproape a sportivilor baschetbaliști.

Tabel 1. Media, deviația standard și eroarea standard a mediei pentru toți parametrii numerici (vârstă, vechime în sport, talie, greutate, IMC, numărul maxim de traumatisme înregistrate de un sportiv pe un segment și numărul total de traumatisme înregistrate de un sportiv la toate segmentele

| Parametru studiat | Ramura sportivă | N | Medie | Deviație std. | Eroare std. | Interval 95% confidență medie | | Min. | Max. |
|--|-----------------|----|--------|---------------|-------------|-------------------------------|-------------------|-------|-------|
| | | | | | | Limită inferioară | Limită superioară | | |
| VÂRSTĂ VECHIME TALIE GREUTATE | Baschet | 48 | 23,33 | 3,19 | 0,46 | 22,41 | 24,26 | 19 | 32 |
| | Baschet | 48 | 10,58 | 2,66 | 0,38 | 9,81 | 11,35 | 6 | 16 |
| | Baschet | 48 | 189,64 | 12,94 | 1,87 | 185,88 | 193,39 | 163 | 211 |
| | Baschet | 48 | 83,28 | 17,03 | 2,46 | 78,34 | 88,23 | 55 | 122 |
| IMC Nr.maxim de traumatisme pe același segment/sportiv | Baschet | 48 | 22,92 | 2,47 | 0,36 | 22,20 | 23,64 | 17,80 | 28,75 |
| | Baschet | 48 | 1,42 | 0,54 | 0,08 | 1,26 | 1,57 | 1 | 3 |
| Nr.total de traumatisme la toate segmentele/sportiv | Baschet | 48 | 2,73 | 1,11 | 0,16 | 2,41 | 3,05 | 1 | 6 |
| | | | | | | | | | |

În perioada a II- a de studiu în antrenamentele sportivilor a fost introdus în mod organizat un program coerent și complex de exerciții, focalizat pe grupele musculare și articulațiile implicate în actele motrice specifice jocurilor sportive atât în încălzire cât și în refacerea postefort, în scopul prevenirii și a creșterii performanței sportive.

PROGRAM DE ANTRENAMENT

Programul a constat în :

1. Exerciții de antrenament, nespecifice, pentru menținerea condiției fizice
2. Exerciții de încălzire specifice fiecărui sport
3. Exerciții pentru dezvoltarea forței
4. Stretching
5. Refacerea postefort

- **Încălzirea** - 10 minute de alergare (alternând variantele de alergare) al. pas adăugat, al. pas încrucișat, al. cu spatele în direcția de alergare.
- **Stretching** (pentru regiunea cervicală spate, trunchi, mușchii antebrațelor brațelor, umerilor, exerciții pentru musculatura și articulațiile membrelor inferioare, se pot executa individual și cu partener).

Stretching static pentru toate segmentele -10 minute -individual.

Stretching dinamic – încălzire specifică pentru fiecare ramură sportivă -10-12 minute –colectiv.

Complex de exerciții pentru încălzirea generală alcătuit din 12 exerciții și s-au efectuat în fiecare zi la începutul antrenamentului.

Exerciții de antrenament nespecific pentru menținerea condiției fizice:

1 - exerciții specifice școlii alergării și săriturii (joc de gleznă, alergare cu genunchii sus, alergare cu pendularea gabei la șezută, pas săltat, pas sărit), 2x30m, p. 30 sec.

2 - sărituri în depărtat cu mâinile deasupra capului, sărituri înainte –înapoi 2x10 sărituri, înclinări laterale, aplecări, îndoiri, extensii ale trunchiului, rotații ale trunchiului, 2x8 repetări, p 10 – 15 sec ;

3- sărituri din ghemuit cu extinderea membrelor inferioare, contracția musculaturii abdominale, 2x8 repetări, p 10 – 15 sec .

Exerciții de încălzire specifice fiecărui sport, utilizate pentru încălzirea specifică după exercițiile de încălzire generală.

Ele servesc la localizarea încălzirii în zonele corpului ce sunt folosite predominant în cadrul activității sportive respective. Exemplu:

- Baschet – dribling, pase, aruncări la coș .

Exerciții pentru dezvoltarea forței .

Acest program a fost realizat o dată pe săptămână, incluzând exerciții isotonice și izometrice. Se va efectua alternativ cu programul specific de forță A și B

- exerciții pentru brațe –împins din culcat cu 20-30 kg 3 x10 repetări ;
- aruncat de la piept cu bara de 20 kg 2x10 repetări ;
- împins de la ceafă cu 20 kg 2x10 repetări;
- ridicări laterale cu gantere de 3-4 kg 2x10 repetări ;
- pase cu mingea medicinală pentru întărirea musculaturii degetelor,
- aruncări de deasupra capului la perete sau la partener cu mingea medicinală de 1 kg pentru dezvoltarea vitezei (forței) de execuție a brațului în atac (volei) și șutului la poartă (handbal) 3x15-20 aruncări,
- împingeri de la piept cu mingea medicinală de 3-4 kg, 3x15 repetări (baschet) genuflexiuni cu 30-40 kg pt.dezvoltarea forței picioarelor.

Obiective:

Dezvoltare musculaturii membrelor inferioare, a spatelui, a abdomenului, a centurii scapulo-humerale și a membrelor superioare.

Grupe de exerciții :**A . Pentru extensorii membrelor inferioare:**

- Ridicări pe vârfuri cu îngruieri de 70- 80 % din posibilitățile max. 6-7 serii x 4-5 repetări-pauză 3’;
- Culcat pe spate: împingerea barei cu picioarele cu 100-110% din posibil. max. 6 x 4 - 4’ pauză;
- Genuflexiuni cu 80-90 % din posibilitățile max. – 5 x 5 – 3’ pauză.

Pentru musculatura spatelui:

- Aplecare la orizontală cu bara de 30-40 kg. și îndreptarea trunchiului : 4 x 7
- Răsucirea trunchiului cu bara de haltere de 25 kg, pe umeri, până aproape de limita posibilităților: 5 X 10;
- Înclinări laterale cu haltera pe umeri: 6 X 5 ;

Exerciții pentru articulația scapulo-humerală, cot, pumn, degete:

- Rotări ample ale Br. X 15-20;
- Rotări din articulația pumnului în ambele sensuri, cu închiderea-deschiderea lor 10-20;
- Br. întinse deasupra capului și încrucișate, apăsarea palmelor spre exterior: 20-30’’;
- Presiunea palmelor și a degetelor pe diferite suprafețe plane până la limita mobilității: 20’’

Exerciții pentru articulațiile gleznei și genunchilor:

- Apăsarea cu palmele spre interior și exterior a artic. genunchiului: 8-10’’;
- St cu picioarele încrucișate cu sprijinirea tălpilor pe partea exterioară
- Genuflexiuni lente până în șezând și revenire în poziția de plecare X10-12’’
- St. într-un picior : ridicarea celuilalt picior la piept –menținere; 15-20’’
- St. pe un P. tracțiunea labei P.până la limita mobilității : menținere 15-20’’

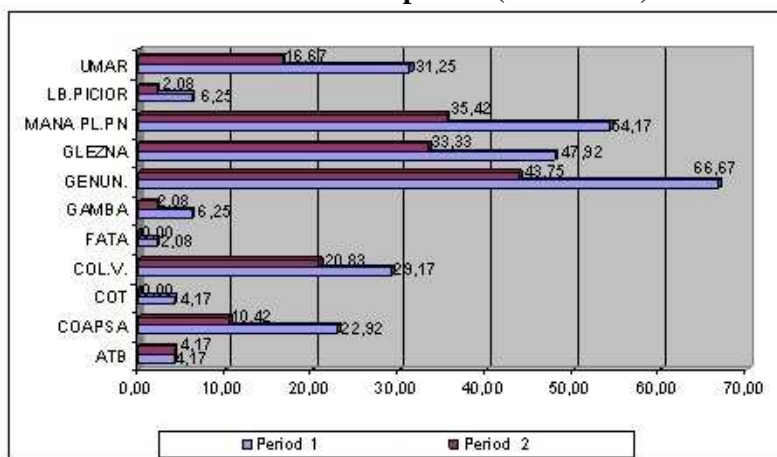
B. Exerciții pentru articulația coxo-femurală și a coloanei vertebrale:

- Treceți lente de pe un P. pe celălalt prin fandări laterale X10-12;
- St. cu fața la scara fixă , cu un P. sprijinit pe o șipcă la niv. șoldului : aplecarea Tr. peste P. de sprijin spre sol și peste piciorul sprijinit pe șipcă,
- St. cu o latură spre scara fixă , cu un picior sprijinit pe scara, celălalt pe sol aplecarea alternativă la un P. și la celălalt X8-10 aplecări pe fiecare P
- Fandat înainte : răsucirea Tr. spre înapoi pe P. din față: 10-20’’;
- Șezând: apucarea labei P. și tracțiunea ei spre cap: menținere 10-20’’
- Atârnat la bara fixă: menținere 20-30’’;
- St. pe omoplați cu P. la verticală sau peste cap: 30-50’’. [7,8]

S-a înregistrat numărul de traumatisme survenite și segmentele traumatizate în prima perioadă de timp, comparativ cu perioada a doua, după care am trecut la analizarea, compararea, interpretarea și reprezentarea grafică a rezultatelor.

Rezultate

REPREZENTAREA GRAFICĂ A TRAUMATISMELOR, PE SEGMENTE, LA BASCHET
 BASCHET N = 48 sportivi (12 F+36 M)



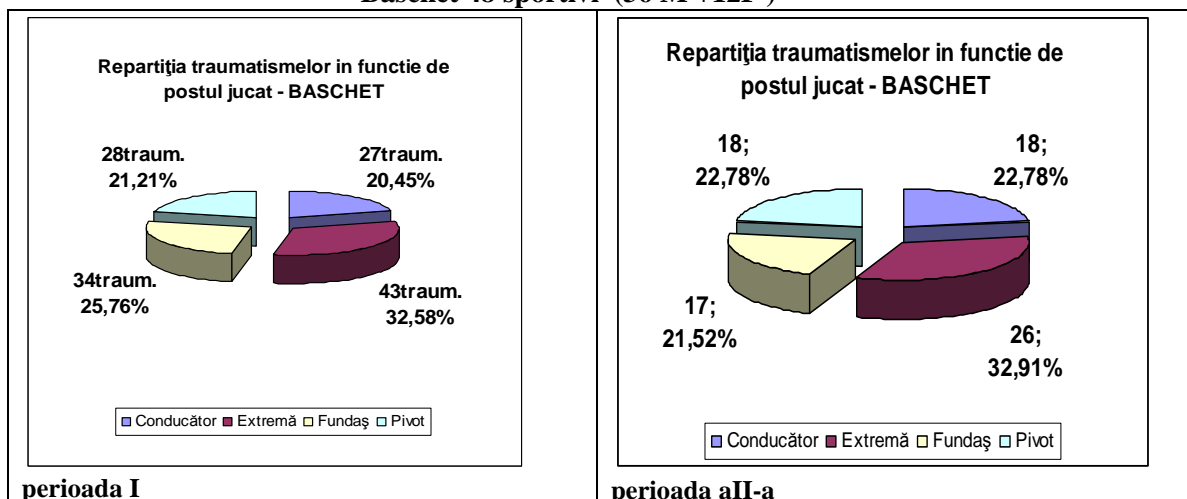
Grafic 1. % traumatisme total. Distribuția procenuală a traumatismelor înregistrate de subiecți, indiferent de sex, pe segmente, raportată la numărul sportivilor din ramura respectivă, comparativ pe cele două perioade de timp luate în studiu

Tabel 2. Comparații ale procentelor de traumatisme între cele două perioade de timp pe segmente

| SEGMENTE CU TRAUMATISME | Comparații ale procentelor de traumatisme între cele două perioade de timp. Valoarea p și semnificația |
|-------------------------|--|
| | BASCHET |
| ATB | 0,304 ^{ns} |
| COAPSĂ | 0,085 ^{ns} |
| COT | 0,237 ^{ns} |
| COL.V. | 0,24 ^{ns} |
| FAȚĂ | 0,5 ^{ns} |
| GAMBĂ | 0,304 ^{ns} |
| GENUN. | 0,02 ^s |
| GLEZNĂ | 0,106 ^{ns} |
| MÂNĂ PL.PN | 0,05 ^{ns} |
| LB.PICIOR | 0,304 ^{ns} |
| UMĂR | 0,075 ^{ns} |

REPARTIȚIA TRAUMATISMELOR IN FUNCTIE DE POSTUL JUCAT IN TEREN

Baschet 48 sportivi (36 M +12F)



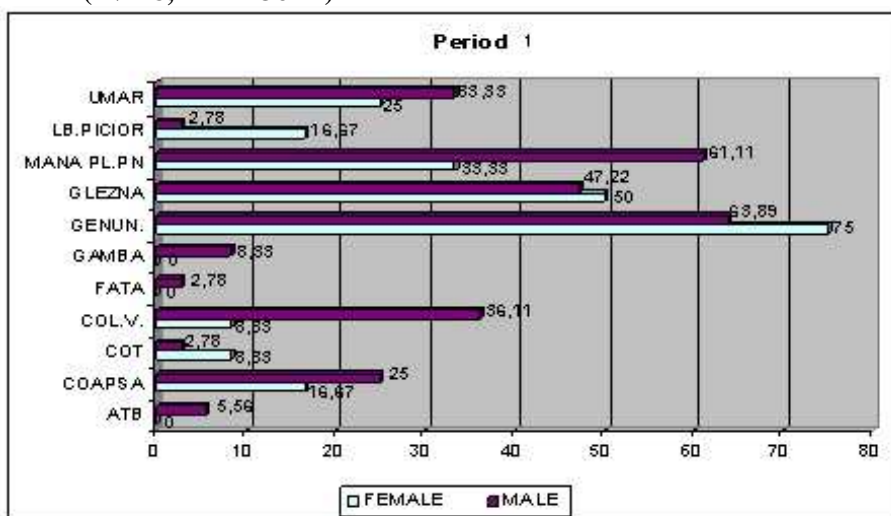
perioada I

perioada aII-a

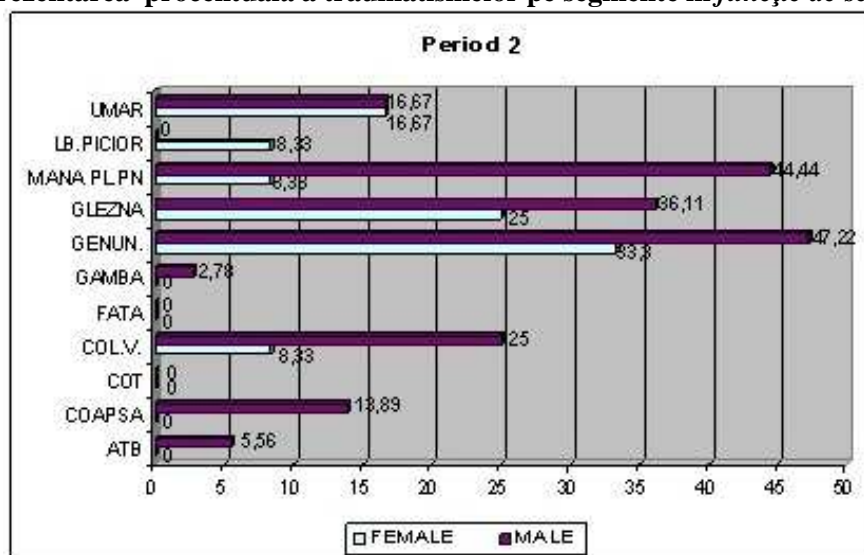
Grafic 2. Repartitia traumatismelor in functie de postul jucat in teren

Reprezentarea procentuală a traumatismelor pe segmente în funcție de sex (F- M), raportată la numărul de sportivi și sportive, comparativ pe cele două perioade studiate.

B A S C H E T (N=48, 12 F+ 36 M)



Grafic 3. Reprezentarea procentuală a traumatismelor pe segmente în funcție de sex perioada 1



Grafic 4. Reprezentarea procentuală a traumatismelor pe segmente în funcție de sex perioada 2

Rezultatele comparațiilor între numărul de traumatisme la femei și bărbați (BASCHET) pe segmente sunt introduse în tabelul următor sub forma de valori p și semnificații.

Tabel 3. Comparații între numărul de traumatisme la femei și bărbați (BASCHET) pe segmente

| TESTUL Z | Perioada 1 | Perioada 2 |
|----------|---------------------------|---------------------|
| | Valoare p și semnificație | |
| ATB | 0,5 ^{ns} | 0,5 ^{ns} |
| COAPSĂ | 0,421 ^{ns} | 0,207 ^{ns} |
| COT | 0,5 ^{ns} | 0,9 ^{ns} |
| COL.V. | 0,071 ^{ns} | 0,206 ^{ns} |
| FAȚĂ | 0,5 ^{ns} | 0,9 ^{ns} |
| GAMBĂ | 0,365 ^{ns} | 0,5 ^{ns} |
| GENUN. | 0,362 ^{ns} | 0,306 ^{ns} |

| | | |
|-----------------|---------------------|---------------------|
| GLEZNĂ | 0,434 ^{ns} | 0,362 ^{ns} |
| Mână palmă-pumn | 0,09 ^{ns} | 0,028 ^s |
| LABA PICIOR | 0,15 ^{ns} | 0,28 ^{ns} |
| UMĂR | 0,429 ^{ns} | 0,327 ^{ns} |

Diferențele sunt semnificative doar pe segmentul „mână-palmă-pumn”, pentru perioada a II-a, în sensul că numărul traumatismelor la femei **este mai scăzut** decât la bărbați ($p=0,028$; $\alpha=0,05$).

Comparații între parametrii (vârstă, talie, greutate) ramurilor sportive studiate cu date din literatura de specialitate

Pentru a compara valorile vârstelor, taliei și greutății între lotul studiat și literatura de specialitate s-a aplicat testul de semnificație parametric t-Student nepereche și am obținut rezultatele:

Tabel 4. Comparații între parametrii (vârstă, talie, greutate) ramurilor sportive studiate cu date din literatura de specialitate (FEMININ)

| Ramura sportivă | Parametri | Lot studiat | Literatura de specialitate | Valoare p și semnificație |
|---|-----------|-------------|----------------------------|---------------------------|
| Baschet (N ₁ =12 N ₂ =133) | Vârstă | 22,17±1,59 | 22,29±4,22 | 0,848 ^{ns} |
| | Talie | 171,08±5,63 | 174,79±7,89 | 0,003 ^s |
| | Greutate | 62,83±5,49 | 71,18±10,54 | <0,001 ^s |

N1 – reprezintă numărul de sportivi din lotul studiat

N2 - reprezintă numărul de sportivi din literatura de specialitate [5,6,8]

Din rezultatele scrise în tabelul de mai sus reies următoarele:

Baschetbalistele au **talia** semnificativ scăzută față de talia medie a baschetbaliștilor, prezentată în literatura de specialitate ($p=0,003$; $\alpha=0,01$)

Baschetbalistele au **greutatea** semnificativ scăzută față de greutatea medie a baschetbaliștilor, prezentată în literatura de specialitate ($p=0,001$; $\alpha=0,01$)

Tabel 5. Comparații între parametrii (vârstă, talie, greutate) ramurilor sportive studiate cu date din literatura de specialitate (MASCULIN)

| Ramura sportivă | Parametri | Lot studiat | Literatura de specialitate | Valoare p și semnificație |
|---|-----------|--------------|----------------------------|---------------------------|
| Baschet (N ₁ =36 N ₂ =133) | Vârstă | 23,72±3,5 | 25,11±3,17 | 0,012 ^s |
| | Talie | 190,57±33,52 | 196,89±25,7 | 0,181 ^{ns} |
| | Greutate | 90,1±13,75 | 94,49±11,25 | 0,031 ^s |

N1 – reprezintă numărul de sportivi din lotul studiat

N2 - reprezintă numărul de sportivi din literatura de specialitate [5,6,8]

Din rezultatele scrise în tabelul de mai sus reies următoarele:

Baschetbaliștii sunt semnificativ mai tineri față de vârsta medie a baschetbaliștilor, prezentată în literatura de specialitate ($p=0,012$); $\alpha=0,01$)

Baschetbaliștii au greutatea semnificativ scăzută față de greutatea medie a baschetbaliștilor, prezentată în literatura de specialitate ($p=0,031$; $\alpha=0,05$)

Discuții

Prin compararea rezultatelor obținute în cele două perioade de timp studiate, s-a evidențiat scăderea frecvenței traumatismelor musculo-scheletale, în **perioada I** de timp, comparativ cu **perioada a II-a**. În urma introducerii în antrenamente a programului de exerciții pentru prevenirea accidentelor, **incidența traumatismelor musculo-scheletale a scăzut** în perioada a II-a la toate segmentele (**grafic nr.1**)

- genunchi 22,92% ,
- mână-palmă-pumn, 18,75%,
- umăr și gleznă cu 14,59% ,
- coapsă 12,50%

- **restul segmentelor având o pondere sub 10%.**

În ceea ce privește distribuția traumatismelor în funcție de postul ocupat în teren, al jucătorilor de baschet, observăm din reprezentarea grafică (**grafic nr. 2**) următoarele:

A scazut numărul de traumatisme în perioada a II-a la toți jucătorii, indiferent de postul jucat în teren.

În funcție de postul jucat, ponderea traumatismelor a fost :

Perioada 1

Locul 1. Jucătorii de extremă au prezentat un număr de 43 traumatisme reprezentând (32,58%) din totalul traumatismelor.

Locul 2. Jucătorii de pe postul de fundași au prezentat un număr de 34 traumatisme reprezentând (25,76%) din totalul traumatismelor.

Locul 3. Jucătorii de pe postul de pivot au prezentat un număr de 21 traumatisme reprezentând (21,21%) din totalul traumatismelor.

Locul 4. Jucătorii de pe postul de coordonator au prezentat un număr de 20 traumatisme reprezentând (20,45%) din totalul traumatismelor.

Perioada 2

Locul 1. Jucătorii de extremă au prezentat un număr de 26 traumatisme reprezentând (32,91%) din totalul traumatismelor în baschet.

Locul 2. Jucătorii de pe postul de pivot și fundași au prezentat un număr de 18 traumatisme reprezentând (22,78%) din totalul traumatismelor.

Locul 3. Jucătorii de pe postul de coordonator au prezentat un număr de 17 traumatisme reprezentând (21,52%) din totalul traumatismelor.

Majoritatea leziunilor traumatice survenite s-au datorat contactului direct cu adversarul, al durității și agresivității nejustificate din teren și a contactului și loviturilor cu mingea.

Cauzele producerii acestor traumatisme sunt :

Încălzirea insuficientă, nivelul de pregătire necorespunzător al sportivilor accidentați, terenul de joc neadecvat, carențe de calciu și magneziu, de asemenea lombalgile de efort apărute în urma suprasolicitării, se datorează unei biomecanici greșite în ceea ce privește tehnica și biomecanica specifică probelor atletice și ramurilor sportive cuprinse în studiu.

Concluzii

Cunoașterea traumatismelor și determinarea cauzelor acestora, prevenirea și recuperarea sportivilor pentru reluarea activității de performanță reprezintă elemente esențiale în creșterea performanței sportive.

Prin introducerea în cadrul procesului de antrenament a programului de exerciții profilactice, a metodelor de gimnastică articulară, masaj, stretching, exerciții pentru creșterea forței musculare, s-au redus substanțial cazurile de accidentări prin suprasolicitare în cadrul loturilor studiate.

Referințe bibliografice

- [1]. Rinderu E.T. (1999) Incidența și profilaxia traumatismelor sportive la nivelul articulației gleznei și genunchiului în cadrul unei echipe de baschet feminin; Simpozion internațional, *Conditionarea Medicală și psiho-socială a performanței și stării de sănătate*, Pitești, pag 7,8
- [2]. Predescu, Teodora., Ștefan, Cătălin, (1994) *Pregătirea Stadială în Baschet*, ED., Semne, 147-159
- [3] Kontonopoulou I., Xidea-Kkemeni A. (2004). *Musculoskeletal Injuries and the Parameters that Contribute to their Appearance in Professional Athletes or in Athletes of High Level*, the 13 th Balkan Sports Medecine Congress, Drama.
- [4]. Papadopoulou, S.D., Gallos, G.K., Paraskevas, G., Tsapakidou, A., Fachantidou, A. (2002) The somatotype of Greek female volleyball athletes. 22-25, *International-journal-of-volleyball-research*-(Colorado-Springs,-Colo.), 5(1), 22-25.
- [5] Gagea, A. (1999) *Metodologia cercetării științifice în educație fizică și sport*. Ed. Fundației "România de Mâine". București, 105-115; 139-143; 156-163.
- [6] Mihalaș G I, Lungeanu D (1998) *Curs de Informatică Medicală*. Timișoara: Ed. Eurobit,
- [7]. Mircioagă Elena Doina (2009) Prevention of Musculo-Skeletal Traumas in Competitive Sportsmen (Aspects regarding trauma incidence in volleyball and basketball teams), *Analele Universitatii "Ovidius" "Seria Educatie Fizica si Sport / Vol IX , Issue 2 –supliment , septembrie,*
- [8]. Mircioagă Elena-Doina, Alexandra Mircioagă (2010) A study on musculoskeletal traumas incidence in competitive sportmen, – *Revista de Medicină Sportivă, Romanian Sport Medicine Society, Vol VI, Nr.4 (24)*

THE INFLUENCE OF AQUATIC GYMNASTICS PROGRAMS ON CHILDREN WITH DISABILITIES

INFLUENȚA PROGRAMELOR DE GIMNASTICĂ DESFĂȘURATE ÎN MEDIUL HIDRIC ASUPRA COPIILOR CU DIZABILITĂȚI

Chera Ferario Bianca¹¹, Plăstoi Camelia²

Key words: motor skills, aquatic gymnastic, children with disabilities.

Cuvinte cheie: capacitate motrică, gimnastica în apă, copii cu dizabilități.

Abstract

Introduction. Climate and social changings are too fast and too aggressive for quieter evolution of man needs. Therefore with the rapid evolution of society has emerged a growing number of children with physical and intellectual deficiencies, who require constant help and support.

Aim. The purpose of this paper is the observation of the influence the use of gymnastic exercises conducted in the aquatic environment has on children with various physical and mental disabilities.

Hypothesis. Participation of children with physical and mental disabilities at a water gymnastics program, will enhance the level of development of motor skills of each individual.

Material and methods. The activity had been conducted with a group of five children, a girl and four boys with different disabilities, which had been performed once a week, during six months in 2015.

The structure of the lesson lasted 60-80 minutes including a standard structure in three parts.

It organized a group of children with physical disabilities that took up a water gymnastics exercises program. Four tests were applied to people with reduced capacity of motion: A. Flamingo test - to assess the balance; B. Flexibility legs and trunk; C. Coxo-femoral flexibility; D. Arm curl.

Results. We achieved an improvement of motor skills evaluated and observed by us and a breakthrough psycho-motor for each child.

Conclusions. Gymnastics programs conducted in the aquatic environment allowed the children to perform exercises more easily with little or no help, the most important aspect being their overall condition manifested by joy. A beneficial impact was found in the social sphere, children becoming more communicative and more confident. An improved social behavior of children at school and during other extracurricular activities was observed.

Rezumat

Introducere. Schimbările climatice și sociale din care facem parte sunt mult prea rapide și prea agresive pentru evoluția mai liniștită de care are nevoie omul. De aceea odată cu evoluția rapidă a societății a apărut și un număr tot mai mare de copii cu deficiențe fizice și intelectuale, care necesită ajutor și asistență permanentă.

Scop. Scopul lucrării este observarea influenței utilizării exercițiilor de gimnastică desfășurate în mediul acvatic la copiii cu dizabilități fizice și intelectuale diferite.

Ipoteză. Participarea la un program de gimnastică în mediul hidric personalizat a copiilor cu dizabilități fizice și intelectuale, va permite îmbunătățirea nivelului de dezvoltare a calităților motrice proprii fiecărui individ.

Material și metode. Activitatea a fost realizată cu un grup de cinci copii, o fată și patru băieți cu diferite dizabilități, care au participat la un program o dată pe săptămână, timp de șase luni, în 2015. Structura lecției a durat 60-80 minute, inclusiv o structură standard în trei părți. Ea a fost organizată cu un grup de copii cu dizabilități fizice care au parcurs un program de exerciții de gimnastică în apă. S-au aplicat patru probe de evaluare pentru persoanele cu capacitate redusă de mișcare: A. Proba Flamingo; B. Flexibilitate trunchi și membre inferioare; C. Flexibilitate coxo-femurală; D. Flexii ale brațelor.

Rezultate. Am obținut o îmbunătățire a calităților motrice evaluate și observate de noi și un progres psihomotric pentru fiecare copil în parte.

Concluzii. Programele de gimnastică realizate în mediul hidric au permis copiilor să execute cu mai multă ușurință exercițiile, cu asistență redusă sau chiar fără asistență, cel mai important aspect fiind starea lor generală manifestată prin bucurie. Un impact benefic s-a constatat și în sfera socializării, copii fiind mai comunicativi, mai veseli și mai încrezători. Acest aspect a produs modificări, în bine, și asupra comportamentului social al copiilor pe parcursul activităților școlare și extrașcolare.

¹¹ Assoc. Prof. PhD., „Valahia” University of Târgoviște, Faculty of Human Science, Physical Education and Sport Department, corresponding author. Str. Lt. Stancu Ion, 32-35, Târgoviște, Dâmbovița, ferrariobianca@yahoo.com

² Assoc. Prof. PhD., „Constantin Brâncuși” University of Târgu-Jiu, Faculty of Medical and Behavioural Sciences, corresponding author. Str. Tineretului, nr.4, Targu Jiu, Gorj,

Corresponding author: cam_i_plastoi@yahoo.com

Introduction

Climate and social changings are too fast and too aggressive for quieter evolution of man needs. Therefore with the rapid evolution of society has emerged a growing number of children with physical and intellectual deficiencies, who require constant help and support.

Thus, gymnastics programs are developed and will compensate and correct the deficiencies, improving the quality of life.

One of the most common techniques of education, reeducation and rehabilitation for children, is gymnastics. The efficiency of these techniques is given by the early and accurate assessment of the child in its application in a process of correction, improvement or acquisition, which requires continuity. [1]

The most common disorders are torticollis, clubfoot congenital myopathy, trisomy 21, the delay in the development of the neuro-motor system, urinary or faecal incontinence, hip dysplasia and deviation of the spine, which by means of meetings of pediatric kinesiology would result in normalization of tone muscles, improving joint mobility, static and dynamic balance, harmonious physical development, coordination development, respiratory rehabilitation. [2]

For children with disabilities, one of the main institutions dealing with their lifestyle is Special Olympics. The basic institution is permanently centered on sports activities for children with various disabilities and their development towards an independent life. [3]

Water, is ideal for making physical exercises. This produces a state of weightlessness and so any person, regardless of age, weight, sports experience and skills, can carry out these exercises. [4]

Aquatic therapy movement is part of a holistic therapeutic complex along with other therapeutic means. The basic element in the recovery of motor or mental disorders is the gymnastics exercises conducted in water. [5]

Children with disabilities may have physical, mental or intellectual disabilities: autism, down syndrome, reduced IQ, associated disabilities. This may be due to genetic errors, problems during pregnancy, problems at birth or health problems due to social conditions of living. [6]

Nowadays we witness increasingly rapid ineffective changes of the environment to which we belong, modern and industrial activities being more and more aggressive and alert.

Climate and social changes are becoming more aggressive with a long-term negative impact on the development and evolution of the human body. It is understood that the individual, as a social being, is trying to adapt as quickly as possible to the demands of society, and especially as effectively, but not always with positive results.

Excess pollution, increasingly processed food and its production in industrial quantities generate major changes in the sphere of human genetics, which can be seen at future generations.

Because of these aspects mentioned above, in today's society appear a growing number of children with physical and mental disabilities, who require constant help and support. Thus some gymnastics programs can be developed in order to correct, to compensate and to improve the quality of a life with disabilities. Using interdisciplinary programs with specific elements of gymnastics and swimming is not a novelty, but a permanent way to improve the motion of children with disabilities.

Aim

The purpose of this paper is the observation of the influence the use of gymnastic exercises conducted in the aquatic environment has on children with various physical and mental disabilities.

Hypothesis

Participation of children with physical and mental disabilities at a water gymnastics program, will enhance the level of development of motor skills of each individual.

Material and methods

The activity had been conducted with a group of five children, a girl and four boys with different disabilities, which had been performed once a week, during six months in 2015.

The structure of the lesson lasted 60-80 minutes including a standard structure in three parts.

It organized a group of children with physical disabilities that took up a water gymnastics exercises program.

The group under investigation:

Investigated group of subjects: 5 children, one girl and four boys.

Table no.1 - Groups of subjects

| No. crt. | Girls | No.crt. | Boys |
|----------|-------|---------|------|
| 1 | B.S. | 1 | S.L. |
| | | 2 | P.S. |
| | | 3 | S.D. |
| | | 4 | U.A. |

| No | Name/Surname | Year of birth | Diagnosis |
|----|--------------|---------------|------------------------------|
| 1 | S.L. | 2008 | Muscular Dystrophy |
| 2 | P.S. | 2007 | Dislocation of the right hip |
| 3 | B.S. | 2006 | Cerebral palsy |
| 4 | S.D. | 1997 | Cerebral palsy |
| 4 | U.A. | 1994 | Hemiparesis |

Research methods used

Evaluation samples were extracted from Eurofit test, and intended to assess the motion skills necessary for daily activities. Also evaluation samples are basic exercises in the development of the neuromotor handicaps. [7]

Four tests were applied to people with reduced capacity of motion.

- A. Flamingo test - to assess the balance;
- B. Flexibility legs and trunk;
- C. Coxo-femoral flexibility;
- D. Arm curl.

Exercise program used

Exercise program conducted took into account the lesson plans on structures for gymnastic exercises performed in water.

Objectives: general muscle relaxation, walking practice by education, development the mobility of the hip, mental relaxation.

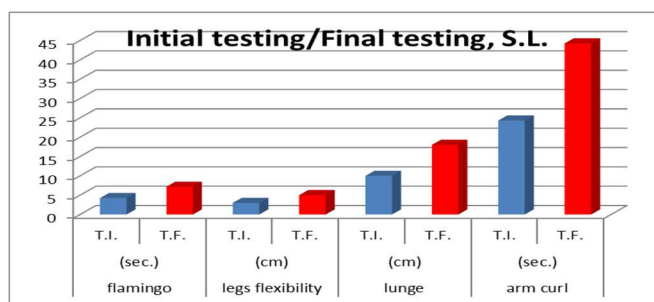
- Raising the arms from the shoulders – above;
- Arms forward into water;

- Spinning fists over each other;
- Wall pushups;
- Twisting the torso after a floating object;
- Lift the knee to the chest for 3-5 seconds;
- Lean against the wall, raising knees to chest;
- Continue with raising knees to chest 5m;
- Lateral movement 5 m;
- Throwing balls in a basket;
- Catching of ducklings.

Results

Table no. 3 Initial/Final assessment

| name/ surname | flamingo (sec.) | | legs and trunk flexibility (cm) | | lunge (cm) | | arm curl (sec.) | |
|------------------|--------------------|------|------------------------------------|-------|---------------|------|--------------------|-------|
| | T.I. | T.F. | T.I. | T.F. | T.I. | T.F. | T.I. | T.F. |
| S.L. | 4, 25 | 7,18 | 3 | 14,31 | 10 | 18 | 24,31 | 34,25 |



Graphic no.1 – Initial / Final testing. S.L.

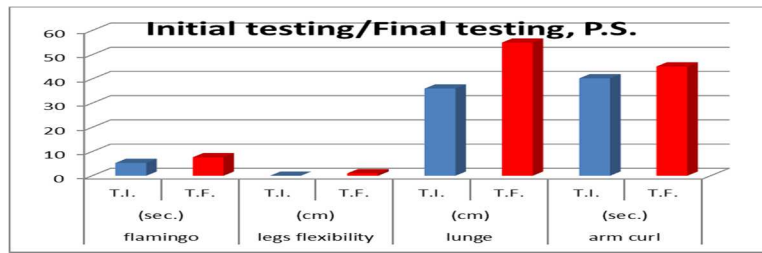
Following work carried S.L. the following results for initial testing and final testing. The case of S.L. has a muscular dystrophy situation, which implies poor muscle tonicity throughout the body and travelling with an attendant is mandatory.

S.L. with muscular dystrophy generally has performed well the assessment tests.

He has improved his balance, but guided with help, has also improved the flexibility of his legs; he has developed hip-femoral flexibility. By exercises conducted in water with assistance and help was developed muscle tone resulting in an improvement at the evaluation in time of force in both arms and legs.

Table no.4, Initial/Final assessment

| name/ surname | Flamingo (sec.) | | trunk and legs flexibility (cm) | | lunge (cm) | | arm curl (sec.) | |
|------------------|--------------------|---------------|---------------------------------------|---------------|-----------------|---------------|--------------------|---------------|
| | Initial testing | Final testing | Initial testing | Final testing | Initial testing | Final testing | Initial testing | Final testing |
| P.S. | 5,28 | 7,62 | 0 | 1 | 36 | 45 | 40,22 | 45,15 |



Graphic no.2 - Initial / Final testing, P.S.

Subject P.S. has an evolving medium-good torso and legs movement. Thus, the progress is very small, the dorsal mobility being of 1 cm and determined by the stiffness of the trunk and lower limbs. If the hip-femoral joint is observed it can cope better about 9 cm.

Subject P.S. could perform water exercises independently, with large amplitude, leading to greater flexibility on land. It is noticed that the results are quite high especially in the initial testing which determined small progress in the final testing. The exercises for the muscles of the arms carried in water have been achieved without the permanent supervision.

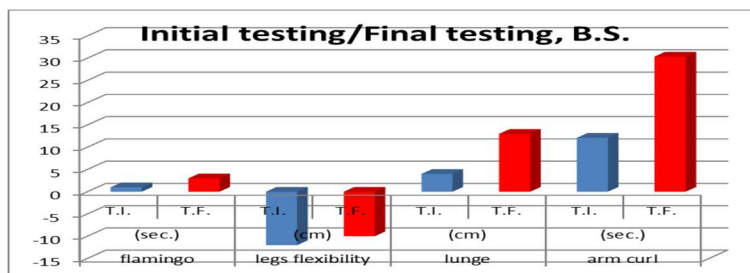
This subject has improved balance, flexibility of his legs being less developed due to one of the legs that is more rigid.

The flexibility of the hip-femoral joint has developed very well.

Exercises in water were performed in this case for increasing muscle assessment tests requested by us, seeing a positive result in all subjects.

Table no. 5, Initial/Final assessment

| name/ surname | flamingo (sec.) | | legs flexibility (cm) | | lunge (cm) | | arm curl (sec.) | |
|------------------|--------------------|---------------|--------------------------|---------------|-----------------|---------------|--------------------|---------------|
| | Initial testing | Final testing | Initial testing | Final testing | Initial testing | Final testing | Initial testing | Final testing |
| B.S. | 1 | 3 | -12 | -10 | 4 | 13 | 12,11 | 30,36 |



Graphic nr.3 - Initial / Final testing, B.S.

Undergoing gymnastics programs conducted in water B.S. has the following results from initial testing and final testing.

B.S. presents cerebral palsy.

Despite the difficulty of movement this little girl came from a permanent water training program and has had good results.

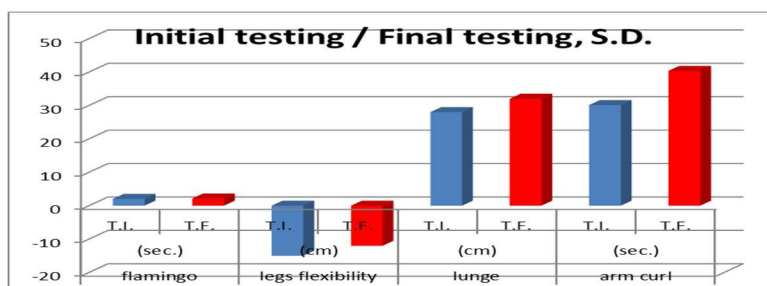
It has improved balance, and flexibility as well as the dorsal part of the legs and of the hip-femoral joint.

Recording the results we can assume that it has achieved a breakthrough at this level. We must point out that in this case too toned muscles and limbs are permanently rigid, which is an advantage for this subject.

The most important thing is to develop flexibility and to reduce joint pain, which in our case was carried out in a lesser extent.

Table no. 6, Initial/Final assessment

| nume/ prenume | flamingo (sec.) | | legs flexibility (cm) | | lunge (cm) | | arm curl (sec.) | |
|------------------|--------------------|------|--------------------------|------|---------------|------|--------------------|-------|
| | T.I. | T.F. | T.I. | T.F. | T.I. | T.F. | T.I. | T.F. |
| S.D. | 2.03 | 2.15 | -15 | -12 | 28 | 32 | 30.12 | 40.35 |



Graphic nr.4 – Initial/Final Testing, S.D.

Performing sports, S.D. obtained the following results for the initial testing and final testing.

This subject has presented extreme rigidity of limbs which makes moving hard to achieve. It has made a little progress in the balance area because it has no stability in his limbs.

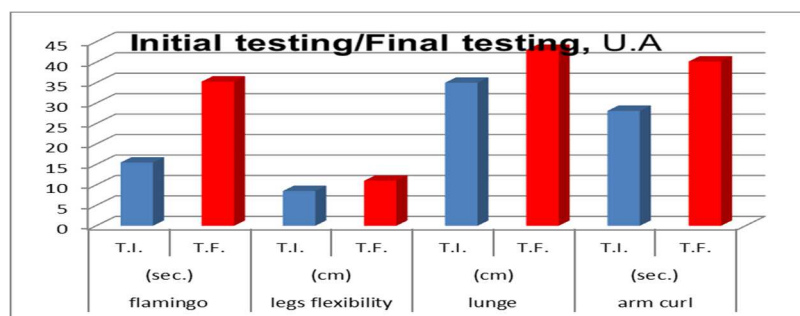
He has improved the flexibility of the dorsal part of the legs, and has also developed better flexibility of the hip-femoral joint, making it difficult to position segments.

Observed progress and evidence of static force, all registering higher values from baseline to the end.

The development of muscle and joint flexibility must be pursued, because it is a rather slow process.

Table no. 7, Initial/Final assessment

| nume/ prenume | flamingo (sec.) | | legs flexibility (cm) | | lunge (cm) | | arm curl (sec.) | |
|------------------|--------------------|-------|--------------------------|------|---------------|------|--------------------|-------|
| | T.I. | T.F. | T.I. | T.F. | T.I. | T.F. | T.I. | T.F. |
| U.A. | 15.48 | 35.27 | 8.5 | 11 | 35 | 43 | 28.11 | 40.17 |



Graphic nr.5 – Initial/Final testing

After performing physical exercises U.A. has the following results from initial testing and final testing.

U.A. has presented a psycho-motor deficiency disorder of static and active movements. With this subject we achieved positive values in all control tests; deficiency is an easy one, and for which final results have improved. Each of the subjects shows a trend improved from baseline, water exercises being a determining factor and positive effect on their organism.

Subjects worked to carry out exercises in water within their own limits, some needed help, others practiced alone, but each child has shown perseverance and enthusiasm.

Meetings had a playful side, the children were able to play with different objects, with water toys, which delighted them so much. Also, the perseverance of parents is very important, keeping these children motivated to go through all the training; it is pleasing to improve motion and the motor skills of children, who can enjoy moving easily in water and who can also relax at the swimming pool.

Conclusions

- Gymnastics programs conducted in the aquatic environment allowed the children to perform exercises more easily with little or no help, the most important aspect being their overall condition manifested by joy.
- The evolution obtained from subjects undergoing the study demonstrates the beneficial influence of gymnastics exercises conducted in water and performed by children with disabilities. In the course of ongoing programs, children were able to experience improved measured motor skills, and overall better physical condition.
- A beneficial impact was found in the social sphere, children becoming more communicative and more confident. An improved social behavior of children at school and during other extracurricular activities was observed.
- The children were excited and happy to have performed gymnastics exercises, especially those carried out in water, where it was easier to achieve movement. Parents were also satisfied and pleased with the program, bringing constantly their children to the courses.
- Being in water children were able to execute exercises more easily with little or no help from the supervisors, the most important aspect being the thrill of the children playing together.
- In the course of the ongoing programs in aquatic gymnastics, children were able to improve motor skills and a new and better physical condition, as reflected in swimming journeys undertaken.

References

- [1] Chera, Bianca, Finichiu, Mariana, Vintilescu, Mihaela, Plăstoi, Camelia (2011), *Gymnastics, a vital element in the lives of children with disabilities*, Analele Universitatii Valahia, Targoviste
- [2] *** (2016) *Importanta gimnasticii mediale in procesul de crestere si dezvoltare al copilului*, <http://consultadoctorul.ro/articole-medicale/importanta-gimnasticii-mediale-procesul-de-crestere-si-dezvoltare-al-copilului/26.05.2016>, 8.37
- [3] *** (2016) www.specialolympics.ro, 26.05.2016
- [4] <http://inot-sport.ro/recuperare-fizica/notiuni-generale-inot.html>, 26.03.2016, 10.30
- [5] Georgiana Ozana Tache (2012) *Recuperarea-medicala-in-mediul-acvatic*, <http://www.saptamanamedicala.ro/articole/25.03.2016/1.45>
- [6] Neagoe, Maria (2003), *Disability and health, Models of disability*, SemnE Publishing House, Bucarest;
- [7] Moțet, D. (2001), *Psychopedagogy handicaps neuromotor recovery*, Fundația Humanitas Publishing House, Bucarest;

INTEGRAREA PERSOANELOR CU DIZABILITATI PRIN ACTIVITĂȚILE EDUCAȚIEI NON-FORMALE - CERCETAȘIA

INTEGRATION OF DISABLE PEOPLE THROUGH NON-FORMAL EDUCATION ACTIVITIES - SCOUT

Dana Ioana Cristea¹²

Key words: disable people, integration, non-formal education, scout

Cuvinte cheie: persoane cu dizabilități, integrare, educația non-formală , cercetășie

Abstract

The number of disabled persons continues to increase in tandem with growth of the world population .Therefore certain measures are imposed witch came to help the disabled persons to facilitate their integration. Discussion of inclusive practices in school and work life is an ever current issue. Non-formal education along with the formal and informal provides a complete and balanced preparedness of child for adult life. This movement promotes an educational model through active methods based on pedagogical fundamentals adapted ages between 7 and 18 years old. Experience has shown that a Scout with a disability can have a positive impact on a Scout troop, and the Scouts take great pride in his accomplishments, which shows it was integrated very well in group.

Rezumat

Numărul persoanelor cu dizabilități este în continuă creștere în tandem cu creșterea populație globului. De aceea se impun anumite măsuri care să vină în ajutorul persoanelor cu dizabilități pentru a le facilita integrarea.

Discuțiile despre modalitățile de integrare în școală și muncă vor fi mereu de actualitate. Educația non-formală alături de cea formală și informală, asigură o pregătire totală, echilibrată a copilului pentru viața adultă. Această mișcare promovează un model educativ prin metode active bazate pe fundamente pedagogice adaptate vârstelor cuprinse între 7 și 18 ani. Experiența a arătat că un scoutist cu un handicap poate avea un impact pozitiv asupra trupei sale de cercetași, iar aceștia se mândresc cu realizările lui, fapt care demonstrează acesta s-a integrat foarte bine în grup.

Introduction

The complexity of human life in society today and the challenges of the contemporary world have resulted in a rethinking of the role and place of factors that contribute to lifelong learning. Both formal and non-formal must have as a basic acquisition by students of knowledge and skills that enable them to continue lifelong learning. Non-formal education along with the formal and informal training provides a complete, balanced child for adult life.[1]

Non-formal education is framed as a flexible and creative achievement of learning, through which the subject has greater discretion over the scope of action and strategies work better by answering such personal interests and generating intrinsic motivation. [1]

According to the authors, there are four options methodology for carrying out non-formal education: [2]

- Centered content (health, training in different areas);
- Centered on the problems of daily life;
- Centered awareness to knowledge and respect for fundamental human rights;
- Centered humanistic education issues-getting a proper self-esteem, confidence in their own abilities, integration and decision.

¹² University of Oradea, Geography, Tourism and Sport Faculty
Corresponding author: email danacristea07@yahoo.com

Scope

There are over 500 million persons with disabilities., 10% of the global population. The number of disabled persons continues to increase in tandem with growth of the world population.[3] Therefore imposed measures to help the disabled persons to facilitate their integration. Discussion of inclusive practices in school and work life is an ever current issue. However, inclusion does not stop there, and for persons with disabilities to be able to actively participate in every aspect of society, organizations like the scouts must also do their part.[4]

What is scouting?

Scouting was established in 1907 as an open and inclusive organisation with the current Equal Opportunities Policy put in place in 1996. This policy supports the principle that no member should be discriminated against on the basis of their class, gender, ethnic background, nationality, sexuality, mental or physical ability and political or religious belief.[5] We can see from this interpretation that Scouting is an open door to all persons without restrictions.

Scouting is an organized movement led by young people with experience in this field, with its own regulation, which often took being near churches, being promoted by missionary priests, pursuing the development of children, young people from point of view physically, mentally and morally-volitional. Scouting is based on an education program based on the game, the outdoor life, the communion friendly. This movement promotes an educational model based on active methods adapted ages between 7 and 18 years old.

Scouting mission in the Romanian society is to help educate young people through a value system based on a promise and law to help build a better world where people are fulfilled as individuals and play a constructive role in society. This is achieved by involving young people in an educational process non - formal throughout the years in which are formed as individuals, using a specific method that makes each child primary agents of their own development as a person motivated, responsible and open, to help young people establishing a system of values based on spiritual principles, social and individual as they are expressed through a mission and regulations. [6]

Scouting is a program based on life in nature, the hike sites (hiking) and fields (tented camps).

Wild, exotic, distant places have always attracted people. Experience the magic of sleeping outdoors in a tent, sunrise over the mountain and water, the feeling of greatness that you include on a mountaintop, the feeling of mystery when you enter a cave, remain in my heart and memories for life.[7]

Scouts have the opportunity to enjoy all this. And if for an "elf" (scout from 7 to 11 years) adventure can mean lighting a fire without a match with a magnifying glass, a patrol of "bold" (12-15 years) may consist in making an adventure rafts wood and string, then driving a distance on the water with it. For "explorers" (16-18) mountain expedition in a difficult area offers the same satisfaction. [8]

Scouting purpose

The purpose of Scouting is to contribute to the development of youth, in order fulfillment to their physical, intellectual, social, spiritual, to become responsible citizens of local, national and international communities.

Method Scout is a system of progressive self-education based on: [6]

1. A Promise and Law;
2. Learning by doing;
3. Life in small groups, following the progressive discovery and acceptance of responsibilities, training the spirit of self-determination in character development, acquisition of knowledge and skills, gain self-confidence, adaptability and ability to cooperate and lead;

4. progressive and stimulating programs of activities based on the interests of participants, including games, useful practical knowledge and community service, taken in general, within the framework of nature, closely related to it;

Active method proposed is achieved through concrete activities children are encouraged to learn from the success and mistakes of their own. Scouting proposed action learning activities, thus giving precedence action. Activities are carried out with simplicity and relies on poor means to foster the participation of everyone, regardless of economic conditions. In this regard, Baden Powell says "Education Scout attract children of all classes, high and low, rich and poor, extends even to those who have a physical disability, deaf, dumb, blind, inspire in everyone the desire to learn". [9]

Educational content of the proposal

Baden Powell founded the Scouting proposal on four points: [10]

- Character building;
- Physical health;
- Ability manual;
- Serving neighbor.

Scout and disability, brief history

Integration of children with disabilities in Scouting is really old, which corresponds more or less with the integration of people with special educational needs in mainstream schools, around 1970 Baden Powel was convinced from the start of the importance of involving in this movement and those who experienced a disability, is considered quite advanced thinking for that time in 1919, resumed in 1940 the idea preface Scout for youth. [9]

At first it was used the term "extension scouting" for groups of scouts with disabilities, functioning within the hospitals or rehabilitation centers. After the meeting of the World Scout Conference in 1968, it was decided to integrate people with special needs in regular scout groups to facilitate their integration into society through active participation. More in support of this idea and to help them scout group leaders in their educational action, appeared in "We can" publication (We can) in 1989 and other newsletters, such as "Consciousness".[9]

Switzerland first scout association that addresses the issue of persons with special needs arise in 1924 but only in 1945 was officially opened section for Scouts with disabilities. After 1974, in Italy, it was decided to integrate children with disabilities into regular units. [9]



Fig 2. Children with special needs doing home chores
source: <https://www.google.ro/scout+disability+awareness>

Can we speak about adapted Scout?

The basic premise of Scouting for youth with disabilities and special needs is that they want most to participate like other youth - and Scouting gives them that opportunity. Thus, much of the program for Scouts with disabilities and special needs is directed at helping unit leaders develop an awareness of disabled people among youth without disabilities and encouraging the inclusion of Scouts with disabilities and special needs. Many special Scouting units are located in special schools or centers that make the Scouting program part of their curriculum. [11]

Most Scout camps and public campgrounds have accessible camp-sites to accommodate individuals with disabilities. Most camp operations work with the troop leadership to design a program for Scouts with disabilities if given adequate advance notice. Many Scouts with disabilities can accomplish the basic skills of Scouting but may require extra time to learn them. Working with these youth will require patience and understanding on the part of troop leaders and other Scouts. [11]

Troop leaders should know the limitations and strengths of the Scout and, in some cases, may need to discuss the extent of physical activity with the health-care provider, in addition to the parents or guardians. Permission of the parent is required to contact the health-care provider. Before a Scout with a disability joins a troop, the Scoutmaster (with parental permission) should explain to the members of the troop what they should expect. Experience has shown that a Scout with a disability can have a positive impact on a Scout troop, and the Scouts take great pride in his accomplishments.

Since the 1970s, mainstreaming or integrating individuals different from the majority population has been an important approach in special education schools and organizations.

In Scouting, mainstreaming has driven much of the programs of emphasis, i.e., Scouting for the Handicapped, Scoutreach, Soccer and Scouting, and so forth. The idea behind mainstreaming is in the use of extra adaptations/accommodations or services to help youth fit in. Today's preferred approach is inclusion, which focuses on building positive relationships with everyone.

Inclusion in Scouting supports the idea that all Scouting youth are unique individuals with unique abilities, all capable of advancing and having gratifying outdoor experiences. In general, this educational presentation's main thrust is to show how inclusion benefits all youth and adults, and explain the process in an easy-to-understand approach. Let's begin by sharing inclusion's important place in Scouting.

Inclusion is a process that requires a conscious personal decision to treat everyone with dignity and respect. These values are important in creating and sustaining an environment in which everyone feels included, valued, and appreciated. Sometimes it's the small things, like a warm smile, that has the biggest impact on a Scout who has a disability.

For the most part, individuals with disabilities learn good social and life skills when they're able to bond with peers their age. Their friends become role models of good behaviors.

Their self-esteem and confidence begins to build when they feel a sense of belonging.

Tasks they once felt were difficult or impossible become manageable.

In Scouting, positive results can be seen as a youth with a disability starts to advance in rank and take on leadership positions. Genuine praise given to a Scout who has a disability can be very powerful.

In an inclusive Scouting unit, all Scouts stand to benefit from interacting with fellow Scouts with special needs. Strong friendships develop when a spirit of empathy abides. Scouts gain a deeper understanding and acceptance for people different from themselves.[12]

Reach out to all Scouts to be sure they are part of the group.[13]

- **R** – RESPECT
- **E** – ENCOURAGE
- **A** – ACCEPT
- **C** – CARE
- **H** – HONOR



Conclusions

- The integration of disabled children into groups of scouts is achieved easily, as education Scout is to help their neighbor.
- For groups of scouts there are children with disabilities can say that both actors could be considered winners: on the one hand scouts learn to accept and work with people with disabilities and on the other hand they will gain confidence and their they will discover new abilities through Scouting activities.
- By the way work is done in small group smooth transition from family group represented by the person with special needs is usual group of scouts, thus developing self-confidence and sense of belonging to the group.
- It is proved that teamwork can lead to group cohesion because each member is motivated to bring his team in a favorable position.
- Conduct activities both outdoors and indoors with people with disabilities, requires additional training, thorough, even specialized, group coordinators.
- Conduct activities in the form of competition, increase self-confidence, team spirit in helping the conviction that every act for the good of the team, according to the principle "I will do everything as best I can."
- Scouting essentially fosters teamwork, without putting emphasis on individual success, and this supports people with disabilities who bring their own contribution as far as possible.

References

- [1] Blândul V., coordonator (2008) Educația non-formală, de la teorie la practică, Editura Universității din Oradea
- [2] Marcu V., Orțan F., Deac A., (2003) Managementul activităților extracurriculare, Editura Universității din Oradea
- [3] Goyal, O. P. (2004). Understanding and scouting with physically handicapped. Gyan Publishing House
- [4] Wethal, E. B. (2014). Inclusion of children and youth with disabilities in scouting - A quantitative investigation of inclusive practices in Norges KFUK-KFUM-speidere
- [5] <http://www.scouting.org/filestore/pdf/510-071.pdf>. Guide to working with Scout with special needs and disabilities
- [6] www.catholica.ro/
- [7] www.federatia-filatelica.ro/
- [8] www.greek-catholic.ro
- [9] https://it.wikipedia.org/wiki/Scoutismo_d'estensione
- [10] Baden-Powell, R.,(1997). Scoutismo per Ragazzi, Editura Nuova Fiordaliso, Roma
- [11] <http://www.scouting.org/filestore/pdf/SpecialNeedsInformationSheet.pdf>
- [12] www.scouting.org/disabilitiesawareness.aspx Inclusion – The Key to Disabilities
- [13] (http://www.scouting.org/filestore/boyscouts/pdf/2015_Inclusion_Presenters_Notes.pdf)

THE EFFECT OF A PHYSICAL ACTIVITY PROGRAM ON THE HEALTH RELATED FITNESS AND QUALITY OF LIFE ON A FEMALE STUDENT GROUP FROM ORADEA

EFFECTUL UNUI PROGRAM DE ACTIVITATE FIZICĂ ASUPRA CONDIȚIEI FIZICE RAPORTATE LA SĂNĂTATE ȘI A CALITĂȚII VIETII LA UN GRUP DE STUDENTE DIN ORADEA

Klara Nagy¹³, Carmen Șerbescu¹⁴, Doriana Ciobanu¹⁵

Key words: health-related quality of life, female students, physical activity program/intervention, health-related fitness

Abstract

Background: There is a huge transversal database showing that health related quality of life (HRQOL) seems to decrease with the increase of body weight. With the increasing environmental challenges in relation with healthy lifestyle behaviors, especially between the ages of 18-24 there is a continuous search for effective obesity-prevention and promotion of regular PA programs. Therefore, the aim of our study was to assess the effectiveness of a prophylactic exercise program on HRQOL and others parameters measuring health-related fitness (HRF) in young female university students.

Methods: 20 female students (23.1±1.68y, BMI 21.9±2.1kg/m²) from Oradea participated in this study. HRQOL was assessed using (FS-36) questionnaire. Young female underwent a somatoscopic exam and the following components of the HRF were assessed: *Body composition* and the optimum body mass (estimated based on the five skinfolds measures); *circumferences*, *BMI*, muscular strength and endurance, flexibility, VO_{2max}. Subjects participated in an 18 weeks training program (60min, 3/weeks) aiming to enhance the HRQOL by ameliorating the cardio-respiratory condition and body composition.

Results: All the parameters improved at follow-up for all the subjects, but only maximum oxygen uptake, arm and core muscles strength, and Self reported scores of HRQOL improved significantly (p<0.05).

Conclusions: The preventive PA program on female students for a period of four month showed significant improvements on cardio-respiratory fitness, muscular strength and the perception about own vitality and physical and mental health. The results gives us the right to ascertain that our PA program ameliorated the HRQOL.

Cuvinte cheie: calitatea vieții, studente, program de activitate fizică, condiția fizică raportată la sănătate

Rezumat

Introducere: Există o mare bază de date transversale care arată descreșterea calității vieții raportată la sănătate (CVRS) odată cu creșterea masei corporale. Datorită provocărilor din ce în ce mai crescute ale mediului înconjurător legate de comportamentele unui stil de viață sănătos, în special între 18-23 de ani, există o continua căutare a celor mai eficiente programe de prevenire a obezității și de promovare a activității fizice regulate. De aceea, scopul studiului nostru este de a evalua eficiența unui program de exerciții fizice profilactice asupra CVRS și a altor parametrii care măsoară condiția fizică raportată la sănătate (CFRS).

Metode: 20 de studente (23.1±1.68ani, IMC 21.9±2.1kg/m²) din Oradea au făcut parte din acest studiu. Au fost evaluate: CVRS folosind chestionarul (FS-36), postura corporală (somatoscopia), și componente ale condiției fizice raportată la sănătate (*compoziția corporală și masa corporală optimă* - estimate pe baza a cinci pliuri cutanate; *circumferințe*, *IMC*, *forța și rezistența musculară*, flexibilitatea, VO_{2max}). Subiecții au participat la un program de antrenament de 18 săptămâni (60min, 3/săptămână) care are ca scop creșterea CVRS prin ameliorarea condiției cardio-respiratorii și a compoziției corporale.

Rezultate: Toți parametrii s-au îmbunătățit la final pentru toți participanții, dar numai consumul maxim de oxigen și forța mușchilor nucleului abdomino-lombopelvic, precum și scorurile raportate ale CVRS au crescut semnificativ (p<0.05).

Concluzii: Aplicarea programului profilactic de activitate fizică asupra tinerelor studente timp de 4 luni a demonstrat creșteri semnificative ale condiției cardio-respiratorii, a forței musculare și a percepției asupra propriei vitalități și sănătății fizice și mentale. Rezultatele ne dau posibilitatea să afirmăm că programul nostru a ameliorat CVRS.

¹³ University assistant, University of Oradea, Faculty of Geography, Tourism and Sports, Department of Physical Education, Sports and Physical Therapy

¹⁴ senior lecturer, University of Oradea, Faculty of Geography, Tourism and Sports, Department of Physical Education, Sports and Physical Therapy

Corresponding author: tel. 0727872472, email: Carmen_serbescu@yahoo.com

¹⁵ senior lecturer, University of Oradea, Faculty of Geography, Tourism and Sports, Department of Physical Education, Sports and Physical Therapy

Background

The health-related quality of life (HRQOL) is given by a general status of satisfaction and happiness, including psychological, emotional, functional and spiritual aspects of the well-being. The level of regular physical activity (PA) have benefit in reducing chronic diseases in the adults. The prevalence of achieving physical activity recommendations declines rapidly between the ages of 18 and 24 when many young people are undertaking university education [1,2].

The results of the studies underscore the importance of health programs to promote regular PA with a focus on young adults, a group known to be affected from environmentally associated decline of physical activity, and to promote the continuation of physical exercise from early adulthood into later life in general [3], but little is known on the association between HRQOL and PA levels among young population. Massida et. al found that high level of regular PA are associated with more favorable scores in HRQOL in young Italian men [4]. HRQOL is a particularly important issue among women, as women consistently report worse health than men (71% vs 61%) [5]. Nevertheless, female students are highly preoccupied with their body weight and overweight and obesity are problems in university communities, and they are associated with many health-related lifestyle behaviors [6].

There is a huge transversal database showing a strong relationship between obesity and quality of life, where HRQOL seems to decrease with the increase of body weight [7]. With the increasing environmental challenges in relation with healthy lifestyle behaviors, there is a continuous search for effective obesity-prevention and promotion of regular PA programs. These interventions should be based on factors that have the potential to influence body weight, body composition, physical fitness and HRQOL. Therefore, the aim of our study was to assess the effectiveness of a prophylactic exercise program on HRQOL and others parameters measuring health-related fitness (muscular strength and endurance, VO_{2max} , body composition, BMI) in young female university students.

Methods

A. Participants

In this study participated 20 female students (23.1 ± 1.68 years, 61 ± 8.4 kg, 166.5 ± 5.36 cm, $IMC 21.93 \pm 2.14$ kg/m²) from the Partium Christian University of Oradea, between 10 February – 10 June 2013. Subjects were included based on their option to participate in a prophylactic PA program, aimed to ameliorate their health-related fitness and to prevent weight gain or to lose weight. Other selection criteria were that the subjects were healthy, aged 18–30 y (young adult) and active during Physical Education (PE) lessons. In particular healthy was defined as having no history of any illness considered likely to affect PA.

Prior to the commencement of the experiment, the young women gave a signed consent. 20 from 34 students were included in PA program and underwent the baseline and final testing (participation rate was established at 80-100%).

B. Assessment of health-related fitness

A. Somatoscopic exam was done upon the international standards.

B. Anthropometry and Body Composition/Antropofiziometrical measurements were measured according to the standard procedures described by the International Society for the Advancement of Kinanthropometry: ISAK [8].

Height was measured in duplicate using a wall-mounted stadiometer at baseline to the nearest 0.1 cm. *Weight*, to the nearest 0.1 kg, was measured using a calibrated floor scale at baseline and at the end. All of the data were collected by the program provider (physiotherapist and PE teacher).

Skinfold thickness (0.1 mm) were assessed with a caliper, only on the right side of the body, 3 times on each site, and using the mean value at five sites: Triceps, bicepsului brahial (arm hanging by the side, parallel to the long axis of the arm at midpoint), subscapular (relaxed shoulders, the line of the skinfold is determined by the natural fold lines of the skin), abdominal (at 5 cm lateral by the umbilicus, in the longitudinal axis), supraspinale (2-4 cm above the ASIS on the lateral side of the trunk, the fold is oriented anteriorly and inferiorly), thigh (at the

midpoint of the anterior face in the longitudinal axis), medial calf (foot is placed on a box with the calf relaxed, on the most voluminous region).

Circumferences were measured with the subjects in a standing position with a non-elastic measuring tape in following regions: neck (at the midpoint between chin and clavícula); breast (under mamelo, on the bra line); arm (at the most voluminous part); waist circumference was measured at the midpoint between highest point of the iliac crest and lowest part of the costal margin in the mid-axillary line with a non-distensible tape measure); hip circumference was measured at the widest part of the hip region, on the pubic symphysis.

Body mass index (BMI) was calculated as weight (kg)/height (m²). It was used to classify the young university students into categories of Underweight (BMI < 18.5 kg/m²: ≤ 16.00 Moderate thinness < 16.99; 17.00 ≤ Mild thinness < 18.49), Normal (18.5 kg/m² ≤ BMI < 25 kg/m²), Overweight (25 kg/m² ≤ BMI < 30 kg/m²; 25.00 ≤ Pre-obese < 27.49), and Obese (BMI ≥ 30 kg/m²) [9].

Body composition and the optimum body mass were estimated using the formulas of National Centre of Sport Medicine from Romania [10], based on the five mentioned skinfolds measures. Then, based on body fat (%BF), actual body mass (BM)kg, actual fat-free mass (FFM)kg, optimum body mass(kg), optimal active mass(kg) and optimal body mass were calculated: %BF = (5 skinfolds sum(mm) x 0.15) + 5.8 + Body Surface Area (BSA)m² was estimated using Du Bois formula [11]; Actual BF (kg) = Actual body mass(kg) x %BF; Actual FFM (kg)=Actual BM (kg)-BF(kg); Optimum FFM (kg)=Actual BM(kg)x75%; FM(kg)=Optimum FFM (kg) + Optimum BF

C. Muscular strength and endurance, flexibility

a. *Abdominal muscles*: supine position on the mat, knees bent at an angle of approximately 140°, feet flat on the floor, legs slightly apart, arms straight and parallel to the trunk: flexion of the cervico-toracal spine, slow curling of the upper back until the scapulae are not in contact with the mat, the arm crossed on the chest. Number of correct repetition in 60 sec are counted.

b. *Upper arm and shoulder girdle strength and endurance* : push-up. prone position on the mat with hands placed under or slightly wider than the shoulders, fingers stretched out, legs straight and slightly apart, and toes tucked under. The student pushes up off the mat with the arms until arms are straight, keeping the legs and back straight. The back should be kept in a straight line from head to toes throughout the test. For those who were unable to perform with straight legs, the position on the knee was permitted. Number of correct repetition in 20 sec were counted.

c. Sit and Reach test measures the *flexibility* of the lower back and hamstring muscles. The level of the feet was recorded zero, so that any measure that does not reach the toes was negative and any reach past the toes was positive.

D. Cardiovascular Fitness Assessment. Cardiovascular fitness VO_{2max} (mlO₂/kg/min) was predicted from the Astrand-Ryhming nomogram, using the cycle ergometer and following the recommended submaximal test protocol [12]. The intensity for untrained women was set between 100-150WATS, depending on the anamnesis data. The normative data were used from the Cooper Institute for Aerobics Research are ranked from very poor to superior [13,14].

D. To assess the HRQOL, students were asked to complete self-administered questionnaires, including (FS-36) [15] short form consisting of 36 items, of the functional health status, a summary of the basic values of physical and mental health, and an index of health.

Training Program

Subjects were enrolled in an 18 weeks training program consisting of 60 min sessions 3 x weeks.

The program was aimed to enhance the HRQL through the major objectives of mentaining/ ameliorate the health-related fitness components: cardio-respiratory condition and body composition. The following primary objectives were settled:

1. Postural correction by correcting the muscular imbalance. Hence, exercises to activate/strengthen weak muscles (major pectoralis, biceps and triceps brachii, sholders muscles, spinal extensors, core muscles, lower limbs muscles) and release/stretch the tight muscles were done to better enable muscle balance.
2. Increase the cardio-respiratory capacity (VO_{2max})

Methods, means and techniques used: dynamic, repetitive exercises, with large muscles groups; hard resistive exercises (fig 1) și balance exercise (Pilates) (fig2), stretching exercises. The intensity of the exercise was moderate to vigorous; it was calculated to be 55% from VO_{2max} in the weeks 1-4 and after one month was 70-85% VO_{2max} .



Figure 1 a – Strenthening of scapulae adductors, external arm rotators, dorsal with abdominal-cocontraction in order to avoid hyperlordosis. **b** Pilates like strengthening of the back muscles, biceps, triple extension chain of the inferior limbs; **c** – exercises to correct the cypholordotic/asymetrical posture, strengthening of the erector spinae and shoulders by statical contraction of trapezius, latissimus dorsi, rhomboid major, levator scapulae, serratus posterior, iliocostalis lumborum, longissimus thoracis, spinalis thoracis) and shouldres, maintaining position 2 x 30-45sec.

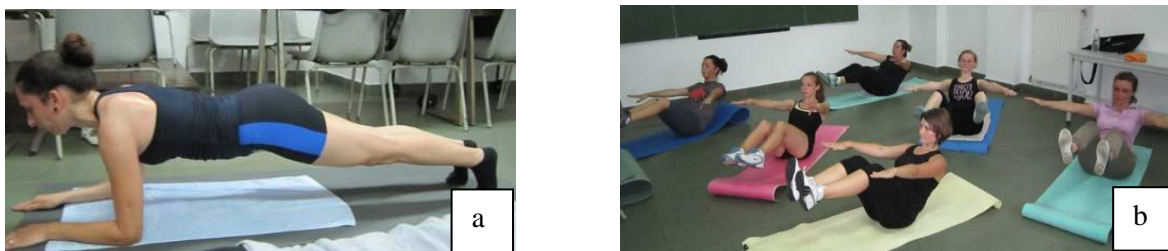


Figure 2 a – Ventral Planking – core muscles strength;

b – abdominal and core muscles reinforcement – sitting in balance

Statistical analysis

Mean and standard deviation (SD) are given as descriptive statistics for all parameters: anthropometrical, physiometrical, metrical and psychological. Data were grouped upon the evaluation moment in baseline and follow-up. The net differences were calculated by subtracting the changes from baseline to follow-up. Descriptive data at baseline was analyzed using paired t-tests. Statistical analysis for changes in anthropometrical, physical performances, maximum oxygen uptake and components of HRQOL was done using ANOVA with repeated measures (baseline, after 18 weeks). Statistical significance was set at $p < 0.05$. For all statistical analyses we used SPSS version 10.1

Results a. Somatoscopic evaluation

The most frequent faulty postures of the young women participating in our study were: kyphotic-lordotic posture (8 subjects), functional slight lateral thoraco-lumbar 'C' curve (2), sway-back posture (2), head and neck cap forward (9), faulty pelvis posture (ante/ retroversion / translated / inclined (17), thoracic flat back (1).

b. Functional variables Mean values of evaluated parameters for the entire group, at baseline and follow-up after 18 weeks are presented in table 1. All the parameters improved at follow-up for all the subjects, but only maximum oxygen uptake, arm and core muscles strength, and Self reported scores of HRQOL improved significantly ($p < 0.05$).

Table 1 Changes in anthropometric and functional variables from baseline to final assessment (18 weeks) (n=20)

| Characteristics of the subjects (n=20) | Baseline Mean±SD* | | | Follow-up Mean±SD | | | Mean difference | P-Value |
|--|-------------------|--------|-------------|-------------------|--------|-------------|-----------------|---------|
| Age (years) | 23.1±1.68 | | | - | | | - | - |
| Weight and BMI | | | | | | | | |
| Weight (kg) | 60.85±8.12 | | | 59.88±8.09 | | | - 0.98 | ns |
| BMI for age(kg/m ²) | 21.88±2.06 | | | 21.53±2.08 | | | - 0,35 | ns |
| Prevalence of BMI (BMI categories) (n) | Under weight | Normal | Over weight | Under weight | Normal | Over weight | - | - |
| | 1 | 18 | 1 | 1 | 19 | - | | |
| Body composition | | | | | | | | |
| Skinfold sum (mm) | 112.3±39.98 | | | 103±36.63 | | | - 9,3 | Ns |
| Body Fat (kg) | 15.38±6.14 | | | 13.99±5.30 | | | - 1,39 | Ns |
| Fat Free mass (kg) | 45.92±4.04 | | | 45.4±3.66 | | | - 0,52 | Ns |
| Circumferences (cm) | | | | | | | | |
| Neck | 32.25±2.14 | | | 32±2.05 | | | - 0,25 | ns |
| Chest | 79.55±8.3 | | | 78±7.52 | | | - 1,55 | ns |
| Arm | 26.5±2.38 | | | 26.45±2.08 | | | - 0,05 | ns |
| Waist | 73.6±6.63 | | | 72.25±6.63 | | | - 1,35 | ns |
| Pelvis | 100.4±12.35 | | | 99.05±11.85 | | | - 1,35 | ns |
| Tight | 50.05±5.2 | | | 49.55±5.27 | | | - 0,5 | ns |
| Calf | 34.9±2.98 | | | 34.79±4.7 | | | - 0,1 | ns |
| Cardiovascular fitness | | | | | | | | |
| VO ₂ max (mlO ₂ /kg/min) | 31.68±5.17 | | | 34.79±4.7 | | | +3,11 | <0.05 |
| Motric parameters | | | | | | | | |
| Strenght-endurance abdomen (n) | 34.8±7.19 | | | 37.5±6.78 | | | +2.7 | ns |
| Arm strength & core muscles (n) | 5.9±2.4 | | | 8.5±1.24 | | | +2.6 | <0.0001 |
| Sit and reach - flexibility test (cm) | 9.9±11.57 | | | 14.9±11.38 | | | +5 | ns |
| Self-report of HRQOL scores (SF 36) | | | | | | | | |
| Physical functioning | 77.60±14.68 | | | 88.37±8.66 | | | +10,77 | <0.005 |
| Mental Health functioning | 69.03±13.64 | | | 85.76±7.16 | | | +16,73 | <.0001 |

*SD Standard deviation, BMI Body mass index,

BMI mean value was into the normal range, the light decreasing at follow up was not significant (table 1).

The baseline and follow up actual values of body weight, as well the skinfolds based estimated optimum weight, body fat and fat free mass values are shown in table 2.

Table 2 Mean values of body weight, fat mass and fat free mass at baseline and followup and the difference between the two moments, and the optimum estimated values.

| Parameter | Actual | | | Optimum (O) | Diff B-O |
|--------------------|--------------|--------------|----------|-------------|----------|
| | Baseline (B) | Followup (F) | Diff B-F | | |
| Weight (kg) | 61.3±8.12 | 59.4±8.09 | -1.9 | 57.46±8.85 | -3.84 |
| Fat mass (kg) | 15.37±6.14 | 13.99±5.30 | -1,38 | 11.48±1.77 | -3,89 |
| Fat free mass (kg) | 45.92±4.04 | 45.4±3.66 | -0,52 | 45.96±7.09 | +0,04 |

Discussion

At baseline the mean weight was 61.3 kg (table 2) and the mean optimum weight was estimated at 57.46 kg, which means a target of mean weight loss of 3.84 kg during the 18 weeks.

At follow up the entire group lost a mean of 1.9 kg.

It is well known that physical activity alone has a limited capacity of weight loss; training programs are reported to loss a mean of 70-90 gr/week, and for women even less or at all. The result of a program aimed to reduce the fat mass based only on physical activity, like our study, is a slight increase in muscular mass, obtaining a slender silhouette with an increased muscular tone, and all these without a substantial loss in kilogram number [16]. Our subjects achieved after 18 weeks to lose a mean of 105.5 gr/week.

There are numerous studies indicating the same tendencies in the evolution of the studied parameters like in our study after similar PA training program. Hereby, after a 3 month PA program (endurance and/or strengthening) (60 min, de 3x/week), 44 women with abdominal fat decreased significantly body mass, BMI, total fat mass, waist and thigh and VO_{2max} . A marked increase in the total fat free mass had the group who underwent endurance and strength muscular training [17].

In our study at baseline mean fat free mass of the group had optimum values. Young participants have not increased fat free mass, on the contrary, they had a decrease of 0.52 kg.

This could be explained by a low level of the work load. Thus, from 1.9 kg of lost body mass, only 1.38 kg were lost from fat mass, the rest (0.52kg) being lost from the fat free mass. Probably cardiovascular training was in optimum dose, as the VO_{2max} values increased significantly.

Optimum mean fat mass indicate that a decrease of 3.9 kg for the whole group is recommendable (table 2). But in our study, after 18 weeks, fat mass decreased with a mean value of only 1.38 kg. However, fat mass and body mass decrease had the same tendencies with the skinfolds and circumferences, which decreased as well.

Thus, could be noticed that circumferences mean values at neck, chest, waist, pelvis (table 1) had a decreasing tendencies, the same with the skinfolds measured in the same areas (subscapular, abdominal, supraspinale), whilst the strength values in the same areas augmented as well. We could say that fat mass in the central region decreased, but without an increase in the fat free mass. Previous studies conducted in well-controlled exercise testing laboratories have demonstrated significant reductions in central obesity (waist circumference) following resistance training in individuals with or not at risk of type 2 diabetes[18,19,20].

Another study done on healthy women but older than in our group (39-64years) shows an increase of the muscular strength and in fat free mass but a decrease in fat mass after a 21 weeks endurance and strength training program[21]. But, it is necessary to precise that these studies used dual-energy X-Ray absorptiometry to evaluate the body-composition.

18 students in our study had BMI in the normal category; one female was underweight/mild thinness and one overweight/preobese. After WHO (2009) the percentage of women having a normal BMI (18,5-24,99) in our country was 57,2% [22].

We should discuss the evolution of the extremes, minimal and maximal value.

One participant had at baseline a BMI in the pre-obese category, who lost 6 kg of her body mass from which 4.55 kg was fat mass. At followup BMI was in normal category, skinfolds sum decreased with 22 mm, circumferences of chest with 6 cm, waist (5 cm) and pelvis (3 cm). The subject enhanced her motor performances (strength and endurance, flexibility), cardiovascular fitness and HRQOL scores.

On the opposite position is the young woman who was in the underweight/mild thinness BMI category (18.49 kg/m²) at baseline and at followup went even lower, at the underweight/moderate thinness category (18.11kg/m²). Taking into account the HRQOL results shows a decrease of the physical health score, we assume that an inappropriate stress management could create such a result.

At the HRQOL questionnaire mean values show a significant increase (table 1) at both components, physical and mental health (fig1).

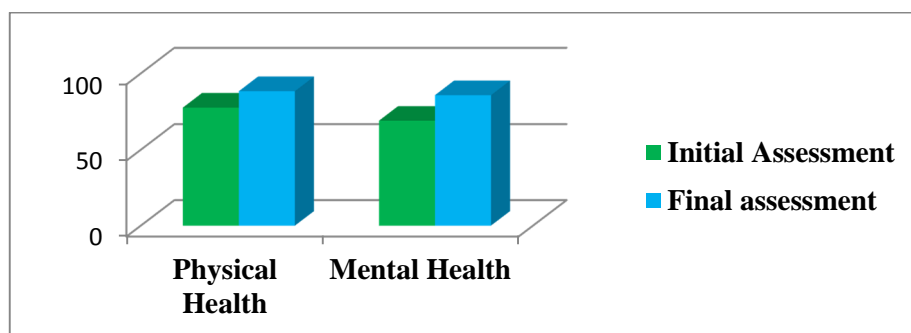


Figure1 Mean values of the two components of the HRQOL at baseline and followup

Our results sustain what was previously found: even small reduction in weight could conduct many times in significant increase of the HRQOL [23].

Moreover, Bajer et al shows that the reduction of intraabdominal fat and an increase of cardiorespiratory capacity, by improved quality of nutrition, sedentary reduction and an enhanced active participation to physical activity/exercises could be associated with clinical benefits, sometimes, even without weight reduction [24].

Conclusions

Our study demonstrates the importance of the preventive physical activity programs aimed to enhance the HRQOL. The four month PA program ameliorated all physical, motor, functional psychical parameters of all 20 participants.

The preventive physiotherapy PA program for female students for a period of four month realised a decrease in many of the health-related fitness: weight, body composition, muscular strength and endurance, flexibility. Significant improvement showed cardio-repirator fitness, muscular strength evaluated by push-ups, and the perception about own vitality, physical and mental health, HRQOL.

Maybe a longer period of time of the PA program would have allowed to increase even more all the parameters, and also to attain the target values (optimum body mass and fat mass).

Even though, the results gives us the right to ascertain that our PA program ameliorate the HRQOL.

References

- [1] Haase A, Steptoe A, Sallis JF, Wardle J. (2004) Leisure-time physical activity in university students from 23 countries: associations with health beliefs, risk awareness, and national economic development. *Prev Med.*;39:182–90.
- [2] Irwin JD. (2004) Prevalence of university students' sufficient physical activity:a systematic review. *Percept Mot Skills.*;98:927–43.
- [3] Eibich P, Buchmann N, Kroh M, Wagner GG, Steinhagen-Thiessen E, Demuth I, Norman K (2016) Exercise at Different Ages and Appendicular Lean Mass and Strength in Later Life: Results From the Berlin Aging Study II, *J Gerontol A Biol Sci Med Sci.*Apr;71(4):515-20. doi: 10.1093/gerona/glv171. Epub 2015 Oct 5.
- [4] Massidda, M., Cugusi, L, Mathieu A. (2015) Physical activity levels and health-related quality of life in young Italian population. *J Sports Med Phys Fitness.* May;55(5):506-12. Epub 2014 Oct 30.
- [5] <http://www.cdc.gov/hrqol/pdfs/cdnrwinter03.pdf> Data: 10.06.2013
- [6] Pérusse-Lachance E, Tremblay A, Drapeau V. (2010) Lifestyle factors and other health measures in a Canadian university community. *Appl Physiol Nutr Metab.* 2010 Aug;35(4):498-506. doi: 10.1139/H10-035.
- [7] Fontaine KR, Bartlett SJ. (2003) Health-related quality of life in obese individuals. In: Anderson RE, editor. Obesity: Etiology Assessment, Treatment, and Prevention. Champaign, IL: *Human Kinetics*; pp. 59–71.
- [8] Marfell-Jones M, Olds T, Stewart A, Carter L (2006) International Standards for Anthropometric assessment. *International Society for the Advancement of Kinanthropometry (ISAK)*. South Africa: Potchefstroom
- [9] ***WHO http://apps.who.int/bmi/index.jsp?introPage=intro_3.html, 14.05.2016, 19:07
- [10] Drăgan, I. (2002) *Medicina sportivă*. Ed. Medicală, București
- [11] Du Bois D, Du Bois EF (1916). "A formula to estimate the approximate surface area if height and weight be known". *Archives of Internal Medicine* 17 (6): 863-71. PMID 2520314. Retrieved 2012-09-09.
- [12] Astrand PO, Ryhming I. (1954) A nomogram for calculation of aerobic capacity (physical fitness) from pulse rate during sub-maximal work. *J Appl Physiol.* Sep;7(2):218–221.
- [13] Vivian H. Heyward (1998) *Advance Fitness Assessment & Exercise Prescription*, 3rd Edition, The Cooper Institute for Aerobics Research, Dallas TX, pg 48
- [14] http://sportsmedicine.about.com/od/fitnessevalandassessment/a/VO2_Norms.htm Data: 09.01.2013
- [15] <http://ahsri.uow.edu.au/content/groups/public/@web/@chsd/documents/doc/uow132411.pdf> Data: 05.02.2013
- [16] *** (1987) Fitness and Amateur Sport: Canadian Standardized Test of Fitness, *I.a.C. Manual*. 1987
- [17] Skrypnik D, Bogdański P, Mądry E, Karolkiewicz J, Ratajczak M, Kryściak J, Pupek-Musialik D, Walkowiak J. (2015) Effects of Endurance and Endurance Strength Training on Body Composition and Physical Capacity in Women with Abdominal Obesity, *Obes Facts*;8(3):175-87. doi: 10.1159/000431002. Epub 2015 May 8.
- [18] Banz WJ, Maher MA, Thompson WG, Bassett DR, Moore W, Ashraf M, Keefer DJ, Zemel MB (2003) Effects of resistance versus aerobic training on coronary artery disease risk factors. *Exp Biol Med* 2003, 228:434-440.
- [19] Boule NG, Haddad E, Kenny GP, Wells GA, Sigal RJ (2001) Effects of exercise on glycemic control and body mass in type 2 diabetes mellitus: A metaanalysis of controlled clinical trials. *JAMA*, 286:1218-1227.
- [20] Minges et al. (2011) Evaluation of a resistance training program for adults with or at risk of developing diabetes: an effectiveness study in a community setting. *International Journal of Behavioral Nutrition and Physical Activity*, 8:50.
- [21] Sillanpää E, Laaksonen DE, Häkkinen A, Karavirta L, Jensen B, Kraemer WJ, Nyman K, Häkkinen K. (2009) Body composition, fitness, and metabolic health during strength and endurance training and their combination in middle-aged and older women. *Eur J Appl Physiol.* May;106 (2):285-96. doi: 10.1007/s00421-009-1013-x. Epub 2009 Mar
- [22] http://apps.who.int/bmi/index.jsp?introPage=intro_3.html, 14.05.2016, 19:07
- [23] Fontaine KR, Barofsky I. (2001) Obesity and health-related quality of life. *Obes Rev.*;2:173–182. doi: 10.1046/j.1467-789x.2001.00032.x.
- [24] Bajer B, Vlcek M, Galusova A, Imrich R, Penesova (2015) A Exercise associated hormonal signals as powerful determinants of an effective fat mass loss. *Endocr Regul.* Jul;49(3):151-63.

- [25] Guyatt GH, Feeny DH, Patrick DL. (1993) Measuring health-related quality of life. *Ann Intern Med.*;118:622–629
- [26] Hassan MK, Joshi AV, Madhavan SS, Amonkar MM. (2003) Obesity and health-related quality of life: A cross-sectional analysis of the US population. *Int J Obes.* 2003; 27:1227–1232. doi: 10.1038/sj.ijo.0802396.
- [27] Kolotkin RL, Meter K, Williams GR. (2001) Quality of life and obesity. *Obes Rev.*;2:219–229. doi: 10.1046/j.1467-789X.2001.00040.x.
- [28] Sbenghe, T. (2002) *Kinesiologie – Știința mișcării*, Editura Medicală, București;
- [29] Șerbescu, Carmen (2007) *Kinetoprofilaxie primară; Biologia condiției fizice*, Editura Universității din Oradea, p. 29, 91, 119, 126, 128, 150, 151
- [30] Tudor, Maria (2012) – *Managementul programelor de gimnastică aerobică de întreținere și Pilates dedicate adulților*. Teză de doctorat nepublicată. Universitatea națională de educație fizică și sport, București;
- [31] http://www.dspbior.ro/?page_id=91 Data: 02.06.2013
- [32] <http://ro.wikipedia.org/wiki/S%C4%83n%C4%83tate> Data: 4.06.2013
- [33] <http://www.sergiubaltatescu.info/cursuri/cursuri-de-licenta/calitatea-vietii> Data:04.06.2013
- [34] WHO: *Preamble to the Constitution of the World Health Organization*. Geneva. 1948.
- [35] <http://ro.wikipedia.org/wiki/S%C4%83n%C4%83tate> Data: 04.06.2013
- [36] <http://www.cdc.gov/hrqol/pdfs/cdnrwinter03.pdf> Data: 10.06.2013
- [37] http://www.csupomona.edu/~pvetter/ape/MSI_Scoresheet.pdf - Motor Development Clinic Cal Poly University, Pomona – Motor Skills Inventory Data: 05.02.2013
- [38] <http://ahsri.uow.edu.au/content/groups/public/@web/@chsd/documents/doc/uow132411.pdf> Data: 05.02.2013
- [39] http://sportsmedicine.about.com/od/fitnessevalandassessment/a/VO2_Norms.htm Data: 09.01.2013

RECOMANDĂRI PENTRU AUTORI

La baza redactării lucrării stau principii deontologice, reguli, norme și uzanțe etice și estetice. Pentru realizarea aspectului uniform al revistei și pentru asigurarea ținutei științifice a articolelor, colectivul de redacție recomandă colaboratorilor revistei să ia în considerare aspectele ce se vor prezenta.

Redactarea articolelor se conformează în general recomandărilor stabilite de Comitetul Internațional al Editorilor de Reviste Medicale (www.icmje.org).

Lucrarea în extenso se va redacta în limbile română, engleză sau franceză și va fi precedată de un rezumat în limba în care este redactat articolul, precum și de un rezumat în limba română. Pentru autorii străini, lucrarea în extenso și rezumatul se vor trimite într-o limbă de circulație internațională (engleză sau franceză).

Lucrarea va avea **8-10 pagini**, inclusiv ilustrații, tabele, grafice. Se va procesa spațiat la un rând, justifiat, redactat în Office Word, Time New Roman, font 12, diacritice, format A4, cu margini: top 2 cm, bottom 2 cm, left/inside 2,5cm, right/outside 2cm.

PREGĂTIREA ARTICOLULUI

Titlul lucrării (în limbile română și engleză sau franceză): Din punct de vedere formal acesta trebuie să fie scurt și concis, fără paranteze, abrevieri, să nu fie explicat printr-un subtitlu, să anunțe conținutul și caracteristicile dominante ale articolului.

Titlul se scrie cu majuscule, bold, centrat, font 14.

Rezumatul lucrării (în limbile engleză sau franceză, precum și în limba română)

Acesta trebuie să informeze cititorul asupra esenței conținutului și asupra contribuției autorului; trebuie să fie fidel textului, să nu depășească 15-20 de rânduri sau 250 de cuvinte scrise cu font 11. El trebuie să fie cât mai informativ. Rezumatul va cuprinde obiectivele lucrării, metodele noi utilizate, una sau mai multe concluzii edificatoare.

Cuvinte-cheie (în limbile română și engleză sau franceză) : - Vor fi precizate 3-5 cuvinte cheie, italic, aliniate stânga, cu font 11. Ele trebuie să fie semnificative, să exprime esența demersului epistemic și a conținutului articolului și să difere pe cât posibil de cuvintele din titlu.

Textul lucrării. Textul trebuie să fie echilibrat ca volum al părților componente, să aibă o exprimare clară și elevată, frazele să fie scurte, evitându-se propozițiile negative, exagerările lingvistice.

Când tema studiată necesită o clarificare teoretică sau o discuție teoretică pentru justificarea formulării ipotezei, în planul lucrării se poate afecta un capitol destinat discuțiilor datelor din literatură, încadrarea temei cercetate în contextul domeniului, aportul cercetării la clarificarea, precizarea unor aspecte, etc. Prima parte a textului cuprinde noțiuni care evidențiază importanța teoretică și practică a temei, reflectarea acesteia în literatura de specialitate, scopul lucrării, obiectivele și sarcinile acesteia, pe scurt. Dacă este necesară amintirea datelor anatomo-fizio-patologice acestea trebuie să fie scurte și noi, prin conținut și prezentare.

Se recomandă pentru studii structurarea în următoarele secțiuni:

- **Introducere** – se arată pe scurt scopul și rațiunea studiului. Se prezintă numai fundalul, cu un număr limitat de referințe necesare cititorului să înțeleagă de ce a fost condus studiul.
- **Material și metodă** – se prezintă ipoteza sau ipotezele alternative, se descriu pe scurt, planul și organizarea cercetării, pacienții, materialele, metodele, criteriile de includere-excludere, explorările, procedura precum și metoda statistică folosită.

Experimentele umane și non-umane: Când sunt raportate experimente umane autorii trebuie să precizeze dacă au fost respectate standardele etice pentru experimentele umane după cum este specificat în declarația de la Helsinki, revizuită în 2000 (*World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects*. JAMA. 2000 Dec 20; 284(23):3043-5)

• **Ilustrațiile și tabelele** vor fi inserate în text la locul potrivit, numerotate cu cifre arabe (Tabel 1,2 etc., scris deasupra tabelului sau Fig.1,2.etc. scris dedesubtul figurii, caractere de 11, bold), cu un titlu și legendă însoțite de precizarea sursei exacte a citării (titlul lucrării/articolului și primul autor). Imaginile, tabelele și figurile trebuie să fie în format jpeg, de minimum 300 dpi. Figurile (desene, scheme) vor fi reprezentate grafic profesional. Fiecare fotografie va avea menționat în subsol numărul, iar partea superioară a figurii - indicată cu o săgeată (dacă nu se poate deduce care este aceasta).

• **Legendele ilustrațiilor** - se recomandă exprimarea rezultatelor în unități de măsură internaționale și în SI. Vor fi utilizate abrevierile acceptate internațional. Se vor scrie cu caractere Times New Roman

RECOMANDĂRI PENTRU AUTORI

• **Rezultate** – trebuie expuse rezultatele detaliate și trebuie citate toate tabelele și figurile în ordinea logică și care trebuie să suplimenteze textul, nu să îl dubleze. Se subliniază numai cele mai importante observații și nu comparativ cu rezultatele altora. Aceste comparații se fac la secțiunea discuții.

• **Discuții, concluzii** – a nu se repeta datele prezentate la rezultate și nici nu trebuie prezentate date noi aici. Prezentarea concluziilor cercetării va fi realizat sintetic și sistematic, autorul putând diviza acest capitol în funcție de caracterul teoretic sau experimental al acestora. Autorul va evidenția contribuția cercetării la progresul teoriei și practicii domeniului temei investigate. Discuțiile cuprind raportarea rezultatelor personale la datele de literatură. Vor fi subliniate aspectele noi relevate de studiu și se vor discuta implicațiile acestora și limitele lucrării. Lucrarea poate să prezinte un experiment, un studiu statistic sau să descrie o metodă sau tehnică specifică.

Analiza statistică – trebuie să fie clar specificate care teste au fost folosite pentru evaluarea datelor. Când datele sunt prezentate sub forma tabelară, testul statistic trebuie să fie indicate printr-o notă de subsol pentru fiecare test în parte.

• **Mulțumiri** – numai persoanelor care au adus o contribuție semnificativă la studiu, dacă este cazul.

• **Referințe bibliografice**, obligatorii pentru orice articol, se vor scrie conform Convenției de la Vancouver.

Caracteristica ce diferențiază stilul de scriere a referințelor față de alte stiluri, este aceea că fiecare sursă citată va primi un număr de referință, în ordinea apariției în text. Pentru citarea în text ale aceleiași referințe se va folosi doar numărul respectiv. Bibliografia va fi sortată în funcție de numărul de referință (în ordinea apariției în text) și nu în ordine alfabetică. Acest lucru va oferi cititorului posibilitatea de a găsi mai repede sursa detaliată în bibliografie. Astfel, prima sursă citată va primi numărul [1], a doua sursă citată va primi numărul doi [2] ș.a.m.d., numerele fiind scrise între paranteze drepte.

Bibliografia va cuprinde în ordine: autor, an de publicare, titlu articol, editor, numele publicației, volum, număr, pagini. În cazul citatelor, acestea se trec între ghilimele și se indică numărul sursei și pagina/paginile.

Cărți: – Sbenghe, T. (2002), *Kinesiologie: Știința mișcării*. Editura Medicală, București, pp. 112,

Reviste: - Verbunt JA, Seelen HA, Vlaeyen JW, et al. (2003) Fear of injury and physical deconditioning in patients with chronic low back pain. *Arch Phys Med Rehabil*; 84:1227-32.

Reviste on-line: - Robinson D. (2006) The correlation between mutant plague virus forms and the host animal. *SA Entomologist* [Internet].; 3: 15 [cited 2007 June 10]. Available from: <http://www.saentomologist.com/175-2306/3/15>

Citări de website-uri: - The South African Wild Life Trust [Internet]. [cited 2004 April 13]. Available from: www.sawlt.org/home-za.cfm

Manuscrisul/ lucrarea în format electronic va fi trimisă la următoarea adresă:

Editor șef: CIOBANU DORIANA

Adresă de contact: doriana.ciobanu@yahoo.com

PROCESUL DE PEER-REVIEW

Manuscrisele vor fi revizuite riguros de cel puțin doi referenți competenți, astfel încât materialul să corespundă cu cerințele unei reviste internaționale. Apoi manuscrisul va fi trimis referenților revistei, luând în considerare tematica abordată. Redacția va primi observațiile referenților, aducând la cunoștința autorului modificările și corecturile nevecare, astfel încât materialul să poată fi publicat. Procesul de recenzare durează aproximativ 4 săptămâni. Autorul va fi informat dacă articolul a fost acceptat spre publicare.

CONFLICTUL DE INTERESE

Toate posibilele conflicte de interese, precum și lipsa acestora, vor fi menționate de către autori. Dacă există resurse financiare, acestea vor fi menționate în lu

RECOMANDĂRI PENTRU AUTORI

CRITERII DEONTOLOGICE

Prin apariția unei lucrări în reviste, dreptul de autor se trece asupra revistei și, ca atare, lucrarea nu mai poate fi trimisă spre publicare, integral sau parțial, unei alte reviste, decât cu acordul Comitetului de redacție. De asemenea, revista nu publică lucrări apărute în alte reviste din țară sau străinătate. Răspunderea pentru conținutul științific al materialului revine în întregime autorului/ autorilor. Colectivul de redacție asigură dreptul la replică, cu argumente științifice și metodice corespunzătoare, exprimate într-un limbaj academic civilizată. Nicio parte a lucrărilor publicate nu va putea fi folosită, vândută, copiată distribuită fără acordul prealabil, scris al autorului și numai cu respectarea Legii nr. 8/1996 privind drepturile de autor și drepturile conexe.

RECLAME

Cererile pentru spațiul de reclamă se vor adresa Colegiului Editorial al Revistei Române de Kinetoterapie.

Adresa: Str. Calea Aradului, nr 27, bl. P61, et. 5, ap.16, 410223, Oradea, Romania.
mail: doriana.ciobanu@yahoo.com

Prețul unei reclame color, format A4, pentru anul 2012 va fi: 65 EURO pentru o apariție și 100 EURO pentru două apariții. Costul publicării unui logo pe copertă va depinde de spațiul ocupat.

TAXA DE ÎNSCRIERE

Revista Română de Kinetoterapie apare de două ori pe an. Accesul la ultimul număr al revistei (in extenso) și al celor precedente este gratuit pe pagina web a revistei www.revrokineto.com. Autorii pot citi, descărca, printa lucrările revistei.

Pentru cei care doresc varianta printată, prețul abonamentului este de 45 lei/ 2 numere/ an. Expedierea este inclusă.

Pentru instituții – prețul abonamentului este 150 lei/ an (include câte 2 exemplare/ număr și expedierea inclusă în preț)

Pentru autori, taxa de publicare este:

- 65 lei pentru cadre universitare, kinetoterapeuți sau alți specialiști ai domeniului/ număr
- 30 lei pentru studenți nivel master/ număr

Prețul pentru fiecare număr anterior al Revistei Române de Kinetoterapie, anterior anului 2009 este de 10 lei/ număr.

Pentru alte informații sau pentru înscriere on-line, se poate trimite mesaj la:
doriana.ciobanu@yahoo.com

INDEXARE

Titlul revistei: **Revista Română de Kinetoterapie**

ISSN: 1224-6220

Pagina web: www.revrokineto.com

Profil: revistă de studii, cercetări, recenzii

Editură: Editura Universității de în Oradea, recunoscută CNCSIS

Indexare: Index Copernicus, Socolar, Ebsco Publishing, DOAJ, DRJI

Anul primei apariții: 1995

Periodicitate: bianual

RECOMMENDATIONS FOR THE AUTHORS

At the basis of paper editing, there are deontological principles, rules, norms and ethical and aesthetic usages. In order to achieve the uniform presentation of the journal and to ensure the scientific aspect of the papers, the Editorial staff recommends the following aspects to be taken into consideration.

The editing of manuscripts is generally made according to the recommendations established by the International Committee of Medical Journal Editors (www.icmje.org).

The full-length manuscript will be written in Romanian, English or French and it will be preceded by an abstract in the language in which the manuscript is written, as well as an abstract in the Romanian language. In the case of foreign authors, the full-length manuscript will be sent in an internationally used language (English or French).

The manuscript will have **8-10** pages, including pictures, tables and graphics. It will be written at one line, justified, edited in Word Office, Times New Roman, font 12, with diacritical signs, A4 format, with the following indents: top 2 cm, bottom 2 cm, left/inside 2.5 cm, right/outside 2 cm.

PREPARATION OF THE ARTICLE

The title of the paper (in Romanian and English or French): - From the formal point of view, it should be short and concise, without parentheses, abbreviations, it should not be explained by a subtitle, it should announce the contents and dominant characteristics of the article. The title is written in capital letters, bolded, centered, font 14.

The abstract (in English or French and in Romanian): - It should inform the reader about the essence of the contents and about the author's contribution; it has to be according to the text, it should not exceed 15-20 lines or 250 words written with font 11. It should be as informative as possible. The abstract contains the objectives of the paper, the new methods which have been used and one or more self-evident conclusions.

The keywords (in Romanian and English or French): - There will be 3-5 keywords, italic, aligned to the left, font 11. They should be significant and should express the essence of the epistemic approach and of the article contents and they should differ as much as possible from the words in the title.

The text of the paper

It should be balanced as volume of the two parts, it should have a clear and elevated language and the sentences should be short, with the avoidance of the negative sentences and linguistic exaggerations.

When the studied topic requires theoretical clarification or a theoretical discussion in order to justify the formulation of hypothesis, in the paper plan there can be a chapter for the discussions of data from literature, for the research theme to be placed in the context of the domain, the contribution of research to the clarification of certain aspects, etc. The first part of the text contains notions which emphasize the theoretical and practical importance of the theme, its reflection in the special literature, the purpose of the paper, its objectives and tasks, all on short. If it is necessary to mention anatomic-physio-pathological data, they should be short and new in content and presentation.

For studies, the following section structure is recommended:

- **Introduction** – it is shortly shown the purpose and reason of the study. It is presented only the background, with a limited number of references necessary for the reader to understand why the study has been conducted.
- **Material and method** – the hypothesis or alternative hypotheses are presented, the following are described shortly: research plan and organization, patients, materials, methods, criteria of inclusion-exclusion, explorations, used procedure as well as statistical method.

Human and non-human experiments: When human experiments are reported, the authors should state whether the ethical standards for human experiments have been respected as specified in the declaration of Helsinki, reviewed in 2000 (*World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects*. JAMA. 2000 Dec 20; 284(23):3043-5)

- **The pictures and tables** will be inserted in the text at the right place, numbered with Arabic numbers (Table 1, 2 etc, written above the table or Fig. 1,2 etc, written below the figure, 11, bold), with title and legend together with the exact source of the quotation (title of the paper/article and the first author). The pictures, tables and figures should be in jpeg format of minimum 300 dpi. The figures (pictures and schemes) must be professionally represented graphically. Each picture will be numbered below and pointed with an arrow above it (if it cannot be deduced which picture it is).
- **Picture legends** – it is recommended the expression of results in international measurement units and in SI. There will be used internationally accepted abbreviations. The writing type will be Times New Roman letters of 10.

RECOMMENDATIONS FOR THE AUTHORS

- **Results** – detailed results must be presented and all tables and figures must be quoted in their logical order, which should add something more to the text, not double it. Only the most important observations are emphasized and not by comparing them with other researchers' results. These comparisons are made in the section for discussions.
- **Discussions, conclusions** – the presented data should not be repeated at results and neither should be presented new data here. The presentation of the conclusions will be made synthetically and systematically, the author being able to divide this chapter according to the theoretical or experimental character of the conclusions. The author will emphasize the contribution of the research to the progress of theory and practice in the domain of the investigated theme. The discussions contain the reporting of personal results to data from literature. There will be emphasized the new relevant aspects of the study and their implications and the limits of the paper will be discussed.

The paper can present an experiment, a statistic study or describe a specific method or technique.

Statistic analysis – it should be specified clearly which tests have been used to evaluate data. When data are presented in the form of tables, the statistic test should be indicated in a footnote for each test.

- **Acknowledgements** – are given only to persons who have had a significant contribution to the study, if it is the case.
- **References** written according to the Convention from Vancouver. The characteristic which makes the difference between styles of writing references is that each quoted source will have a reference number in order of their appearance in the text, written between brackets.

In order to quote the same references in the text, there will be used only the respective number. Bibliographic reference will be written according to the number of reference (in order of appearance in the text) and not alphabetically. This will provide the possibility to find faster the detailed source in bibliography. Therefore, the first quoted source will be number [1], the second quoted source will be number [2] and so on, the numbers being written between straight parentheses [].

Each reference will contain: author, publishing year, title of the article, editor, name of publication, volume, number, pages. In the case of quotations, they are placed between quotes and it is indicated the number of the source and the page/pages.

Books:– Sbenghe, T. (2002), *Kinesiologie: Știința mișcării*. Editura Medicală, București, pp. 112,

Journals: Verbunt JA, Seelen HA, Vlaeyen JW, et al. (2003), Fear of injury and physical deconditioning in patients with chronic low back pain. *Arch Phys Med Rehabil*; 84:1227-32.

On-line journals:– Robinson D. (2006) The correlation between mutant plague virus forms and the host animal. *SA Entomologist* [Internet]; 3: 15 [cited 2007 June 10]. Available from: <http://www.saentomologist.com/175-2306/3/15>

Websites quotations: - The South African Wild Life Trust [Internet]. [cited 2004 April 13]. Available from: www.sawlt.org/home-za. Cfm

The manuscript/ electronic format of the paperwork will be sent to the following address:

Chief Editor: CIOBANU DORIANA

Contact address: doriana.ciobanu@yahoo.com

PEER-REVIEW

The paperworks will be closely reviewed by at least two competent referees, in order to correspond to the requirements of an international journal. After that, the manuscripts will be sent to the journal's referees, taking into account the issue of the paperworks. The editorial staff will receive the observations from the referees, and will inform the author about the changes and the corrections that has to be done, in order to publish the material reviewed. The review process should last about 4 weeks. The author will be informed if the article was accepted for publication.

CONFLICT OF INTEREST

All possible conflicts of interest will be mentioned by the authors, as well as there is no conflict of any kind. If there is financing resources, they will be mentioned in the paperwork.

RECOMMENDATIONS FOR THE AUTHORS

DEONTOLOGICAL CRITERIA

Together with the appearance of a paper in the journal, the royalties do not belong to the author anymore but to the journal, so the paper cannot be sent for publication anymore, totally or partially, to another magazine unless the Reviewing Committee agrees to it. The journal does not publish papers appeared previously in other magazines in the country or abroad. The responsibility for the scientific contents of the material belongs entirely to the author/authors. The editing staff provides the right to reply with scientific and methodic proper arguments expressed in a civilized academic language. No part of the published papers can be used, sold, copied or distributed without the author's previous written agreement and only respecting the Law n° 8/1996 regarding copyright and related rights.

ADVERTISEMENTS

Request for advertising should be addressed to the Editorial Board of the Romanian Journal of Physical Therapy

Adress: Str. Calea Aradului, nr 27, bl. P61, et. 5, ap.16, 410223, Oradea, Romania.

Mail: doriana.ciobanu@yahoo.com

The price for an advert, full color A4 for the year 2012 will be: 65 EURO for one appearance and 100 EURO for two appearances. The cost for publishing one logo on the cover depends on the occupied space.

SUBSCRIPTION COSTS

The "Romanian Journal of Physical Therapy" is printed two times a year. The journal has free of charge access, on webpage **www.revrokineto.com**. Users are free to read, download, copy, distribute, print, search, or link to the full texts of journal's articles.

Only at client request, we can provide the printed version of 2 journals/ year, for an amount of 35 lei

For the authors, the publication's fee is:

- 50EURO for teachers from academic environment, physical therapists and other health care providers/issue
- 25 EURO for master students/issue

The price for every previous issue of the Romanian Journal of Physical Therapy, before 2009, is 10 lei/ issue. Other information or for subscription, please send a message to: doriana.ciobanu@yahoo.com

INDEXING

Title of the journal: **Romanian Journal of Physical Therapy**

ISSN: 1224-6220

Web page: www.revrokineto.com

Profile: a journal of studies, research, reviews

Editor: Oradea University Printing House

BDI Indexed: Index Copernicus, Socolar, Ebsco Publishing, DOAJ, DRJI

Year of first publication: 1995

Issue: half-early

TALON DE ABONAMENT

REVISTA ROMÂNĂ DE KINETOTERAPIE

UNIVERSITATEA DIN ORADEA

Str. Universității nr.1, 410087, ORADEA

pt. Facultatea de Geografie, Turism și Sport

Departamentul de Educație Fizică, Sport și Kinetoterapie

Telefoane: 04-0259-408148; 04-0259-408164; 0722-384835

Fax: 04-0259-425921

E-mail: doriana.ciobanu@yahoo.comTALON DE ABONAMENT
REVISTA ROMÂNĂ DE KINETOTERAPIE

(2 numere/)

NUME, PRENUME:.....
 ADRESA: Str..... Nr..... Bloc..... Scara..... Etaj:..... Ap.....
 Sector:..... Localitatea:..... Județ:.....
 Cod poștal:..... Tel.fix:..... Tel.mobil:.....
 Fax:..... E-mail:.....

Plata se va face în contul Asociației Profesionale a Kinetoterapeuților din Transilvania, cu specificația „Abonament la Revista Română de Kinetoterapie pentru anul.....” sau direct la FGTS Oradea, Departamentul de Educație Fizică, Sport și Kinetoterapie.

Banca: TRANSILVANIA**Cod IBAN: RO59BTRLRONCRT0209644501****Titular cont: ASOCIAȚIA PROFESIONALĂ****A KINETOTERAPEUȚILOR DIN TRANSILVANIA****Adresa: Constantin Noica, nr.10, bl.PB8, et.1, ap.7, Oradea, Bihor, România**

Vă rugăm trimiteți prin poștă sau electronic (doriana.ciobanu@yahoo.com), xerocopia dovezii de achitare a abonamentului pentru anul respectiv, iar pentru studenți și xerocopia carnetului de student, în vederea difuzării revistelor.

REVISTA ROMÂNĂ DE KINETOTERAPIE

UNIVERSITATEA DIN ORADEA

Str. Universității nr.1, 410087, ORADEA

pt. Facultatea de Geografie, Turism și Sport

Departamentul de Educație Fizică, Sport și Kinetoterapie

Telefoane: 04-0259-408148; 04-0259-408164; 0722-384835

Fax: 04-0259-425921

E-mail: doriana.ciobanu@yahoo.comTALON DE ABONAMENT
REVISTA ROMÂNĂ DE KINETOTERAPIE

(2 numere/)

NUME, PRENUME:.....
 ADRESA: Str..... Nr..... Bloc..... Scara..... Etaj:..... Ap.....
 Sector:..... Localitatea:..... Județ:.....
 Cod poștal:..... Tel.fix:..... Tel.mobil:.....
 Fax:..... E-mail:.....

Plata se va face în contul Asociației Profesionale a Kinetoterapeuților din Transilvania, cu specificația „Abonament la Revista Română de Kinetoterapie pentru anul.....” sau direct la FGTS Oradea, Departamentul de Educație Fizică, Sport și Kinetoterapie.

Banca: TRANSILVANIA**Cod IBAN: RO59BTRLRONCRT0209644501****Titular cont: ASOCIAȚIA PROFESIONALĂ****A KINETOTERAPEUȚILOR DIN TRANSILVANIA****Adresa: Constantin Noica, nr.10, bl.PB8, et.1, ap.7, Oradea, Bihor, România**

Vă rugăm trimiteți prin poștă sau electronic (doriana.ciobanu@yahoo.com), xerocopia dovezii de achitare a abonamentului pentru anul respectiv, iar pentru studenți și xerocopia carnetului de student, în vederea difuzării revistelor.