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# The result of deep neck flexors training on disability and pain over upper back and neck muscles in patients with chronic neck pain

**Submission date**
19/11/2015

**Recruitment status**
No longer recruiting

**Registration date**
01/12/2015

**Overall study status**
Completed

**Last Edited**
07/01/2022

**Condition category**
Signs and Symptoms

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

## Plain English summary of protocol

Background and study aims
Neck pain is a common problem that has various causes; sleeping in an awkward position, using a computer for a long period, anxiety, stress and straining a muscle to name a few. It is thought that 67% of the general population will experience neck pain. More women have been reported to have the condition then men (22% compared with 16%). It can cause problems for people trying to do their usual daily activities. Neck pain contributes significantly in the suffering of individuals and it is one of the most common problems that is seen in primary health care (for example, GP surgeries). Chronic neck pain of otherwise unknown (idiopathic) cause is often due to weak deep neck flexors (longus capitis and longs colli); these are muscles on the front of the neck that allow for simple movements such as nodding and turning the head. It is known that people who report the greatest neck pain have the weakest deep neck flexors. Myofascial trigger points, or simply trigger points, have been reported in many studies and it seems that they may be responsible for neck pain. Trigger points can be described as hypersensitive points within muscles that can cause pain if irritated or stimulated in some way. It is known that the deep neck flexors training reduces neck pain and disability caused by neck pain. However, whether or not this training can affect the sensitivity of myofascial trigger points (and therefore causing extra pain) has not been thoroughly investigated. The aims of this study were to investigate the effect of neck treatments (interventions) on disability to investigate the pain pressure thresholds over myofascial trigger points around the neck and upper back region for patients with chronic neck pain after the treatment.

Who can participate?
Adults aged 18-65 suffering from neck pain for at least the last three months.

What does the study involve?
The participants are randomly assigned into one of three treatment groups. Each group of participants are given different neck treatments twice a week for seven weeks. Each participant from all groups are assessed at the beginning of the study and after the end of treatment. This

includes assessing the extent of neck disability and pain, range of movement and whether the participants are satisfied with the treatment. All participants have a clinical examination and are taken though their medical history before they start the study.

What are the possible benefits and risks of participating?
Possible benefits from participating include diagnosing the cause of the neck pain and identifying the most appropriate treatment. Any participant that felt dizzy or any discomfort during their treatment stopped the treatment referred to the researchers physician.

Where is the study run from?
Technological Educational Institute of Western Greece, Branch Aigio

When is the study starting and how long is it expected to run for?
February 2014 to March 2015

Who is funding the study?
Technological Educational Institute of Western Greece, Department of Physiotherapy

Who is the main contact?
Mr Palvos Bobos

# Contact information

### Type(s)
Public

### Contact name
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# Additional identifiers

### EudraCT/CTIS number

### IRAS number

### ClinicalTrials.gov number

### Secondary identifying numbers

14075/26-3-14

# Study information

### Scientific Title
The effect of neck muscles training on disability and pain in patients with chronic neck pain: a prospective single blind randomized controlled trial

### Study objectives
There will be a difference in pain, disability, and pain pressure thresholds over myofascial trigger points after the neck muscles training in patients with chronic neck pain.

### Ethics approval required
Old ethics approval format

### Ethics approval(s)
Technological Educational Institute of Western Greece (Aigio) committee, 26/03/2014, ref: 14075 /26-3-14

### Study design
Single-centre single-blind randomized controlled trial

### Primary study design
Interventional

### Secondary study design
Randomised controlled trial

### Study setting(s)
Other

### Study type(s)
Treatment

### Participant information sheet
Not available in web format, please use contact details to request a participant information sheet

### Health condition(s) or problem(s) studied
Chronic neck pain

### Interventions
All participants received instruction guidelines through written leaflet and digital video disk (duration 17 minutes recorded by the two physiotherapists) with ergonomic advices and exercise guidelines for neck for a fuller understanding of the execution of the therapeutic exercises. All therapeutic interventions from all groups were applied twice per week for 7 consecutive weeks with gradually increasing exercising difficulty depends on the level of each patient.
All the Individuals that met the inclusion criteria and signed the consensus form to participate in the study, they received an exercise leaflet guide (what to do at home) and a digital video disk

how to performed those exercises at home. More specifically, the leaflet instruction guide and the digital video disk had the following training program for the neck and shoulder region. The program was divided in 3 parts, the warm-up, the basic part and the ergonomic guidelines with stretching part. In the warm-up patients were instructed to do:
1. Slow rotations of the head in all directions 10 times/per rotation.
2. Movement of the shoulders and the back in all directions 10 times each movement
3. Rotation of the arms in all directions 10 times each movement Patients were instructed to breath normal during the warm-up period.

Basic Part: Patients were instructed to do:
1. Posterior movement of the neck from sitting position 10 times
2. Posterior movement of the neck with towel or elastic belt from sitting position 10 times
3. Isometric contraction of neck muscles in all directions (flex-extension, side flexion-extension, rotation left-right and forward and backward the neck) by adding resistance with their hand 10 times per movement
4. Very slow rotary motion of the head 10 times

Stretching part: The patients were instructed to do:
1. Neck extension- flexion stretching 10 sec - 15 sec maximum to avoid possible dizziness
2. Neck side flexion and rotation stretching 10 sec - 15 sec maximum to avoid possible dizziness
Ergonomic directions: Patients were repeatedly instructed how to sleep, sit on the chair during their work, driving position and walk

Group (A)-Intervention Deep neck flexors Group
Deep neck Flexors group (A): Performed the following exercises:
1. The craniocervical Flexion Test (CCFT) with air pressure biofeedback
2. Nodding from supine position
3. Nodding from pronation position
4. Nodding from Stand position close to the wall All exercises were terminated if the patient activated the superficial neck muscles

Group (B)- Intervention Superficial Neck muscles Group
Superficial Neck muscles Group (B)
1. Posterior head movement from sitting position
2. Posterior head movement from supine position
3. Movement in all directions from pronation position
4. Basic "cat exercise" from knee positioning

Group (C)- Advice Group
Advice Group (C) The advice group performed the above mentioned exercises that were described in the leaflet and the digital video disk.

In the end all the groups performed stretching exercises (the group (A) and (B) with the help of the physiotherapist) except from the group (C) that performed the stretching part with the help of the DVD and the leaflet.

All the measurements (self-reported outcomes & clinician based outcomes) were done in the start and in the end of the therapeutic training programs. Also, patients were informed not participate in other therapeutic sessions and do not receive any medication. Thus, they were informed that they can leave from the study whenever they desire.

## Intervention Type

Procedure/Surgery

### Primary outcome measure
The Neck Disability Index (NDI) which measures the disability of the neck and the score ranging from 0"no disability" to 50"severe disability"

Measured at the beginning and the end of the training programme

### Secondary outcome measures
1. The Numeric Pain Rating Scale (NPRS) an 11-pain scale which measures the pain intensity from 0"no pain" to 10"maximum pain"
2. The Short-Form 12 (SF-12) questionnaire which measures the quality of life
3. The Client Satisfaction Questionnaire-8 (CSQ-8) an 8 item questionnaire which measures the patient satisfaction ranging from 0"no satisfaction" to 32"maximum satisfaction"
4. The craniocervical flexion test (CCFT) tested with Chatanooga pressure biofeedback unit which measures the deep neck flexors muscle endurance
5. The pain pressure thresholds (PPTs) over Myofascial Trigger points of levator scapulae, upper trapezoid and splenius capitis muscles (both sides), tested with Wagner pressure pain algometer (FDK-20 model)
6. The thoracocervical angle which measures the angle from C-7-tragus-horizontal and tragus-eye-vertical for traction of the head with digital photo pictures (Nikon Coolpix p520) and analysis of angles with digital protractor

Measured at the beginning and the end of the training programme

### Overall study start date
20/02/2014

### Completion date
31/03/2015

## Eligibility

### Key inclusion criteria
1. All patients that had at least 3 months or more pain in the neck
2. Age range 18-65 years
3. Both genders

### Participant type(s)
Patient

### Age group
Adult

### Lower age limit
18 Years

### Upper age limit
65 Years

### Sex
Both

### Target number of participants
A power analysis was performed and the power sample size was calculated 59 individuals. The total recruitment was 92 individuals and 25 were excluded from the study. The trial started with 67 individuals and were randomnly assigned in each of the 3 groups. The first (A) group had 23 , The second (B) group had 22 and the third (C) had 22 patients.

### Total final enrolment
67

### Key exclusion criteria
Individuals were excluded from the study if they had:
1. Cervical radiculopathy
2. Any systemic disease (e.g diabetes)
3. Previous neck surgery
4. Pregnancy
5. Diseases of central nervous system
6. Myopathy
7. Participation in neck treatment program for the last 6 months

### Date of first enrolment
01/10/2014

### Date of final enrolment
09/01/2015

## Locations

### Countries of recruitment
Greece

### Study participating centre
**Technological Educational Institute of Western Greece, Branch Aigio**
Psaron 6, Myrtia
Aigio
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## Sponsor information

### Organisation
Technological Educational Institute of Western Greece

### Sponsor details
Psaron 6, Myrtia
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Greece
25100

### Sponsor type
University/education

### Website
http://physio.teiwest.gr/en/

### ROR
https://ror.org/01mymm084

## Funder(s)

### Funder type
University/education

### Funder Name
Technological Educational Institute of Western Greece, Department of Physiotherapy

## Results and Publications

### Publication and dissemination plan

### Intention to publish date
30/11/2015

### Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request.

### IPD sharing plan summary
Available on request

### Study outputs

| Output type | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|---|---|---|---|---|---|
| Results article | | 21/11/2016 | 07/01/2022 | Yes | No |