Locomotor System Complaints Related to Stress

Physiotherapeutic interventions for chronic non-specific low back pain taking psychological stress into consideration

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Foreword

The subject we chose to write about in our research, locomotor system complaints related to stress, is one we are genuinely interested in. It is a problem that we have encountered in many different situations during our clinical affiliations and we find it is exiting to present a topic, which will be of great use in the future physiotherapy practice. During our work on this research we have gained a lot of knowledge regarding interventions for chronic low back pain. We have also had the possibility to gain insight into the psychological aspects of our profession.

To illustrate our theme we chose the picture “Violon d’Ingres” by Man Ray from 1924. The surrealist’s motive of a seated nude woman with the f-holes symbols of the violin on her back. It represents our bodies being our instrument. There are however many factors that influence the way we play our instrument.

Finally we would like to thank some of the people that have helped us through this research. As we have been given a lot of help from our general supervisor, Eveline Wouters, both day and night-time, it is important to thank her for all her time and advice. We would like to thank our methodological supervisor, Marijke Moonen, for her time, support and feedback throughout the process. In addition, Annelies Simons deserves a thank you for helping us with specific research questions. Furthermore we would like to thank Peter van Burken and Herman Nederlof for their time and interest regarding this research. At last we would like to thank Hr. Egny, a librarian in Aachen.

Eindhoven, 27.05.2003

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Summary

Design
Literature research.

Objective
To find out whether there is a difference in physiotherapeutic interventions related to chronic non-specific low back pain if psychological stress is given consideration and if it is not.

Summary of background data
Chronic non-specific low back pain is a disorder of unknown cause that has been present longer than 3 months. It can be maintained by a combination of physical, mental and social factors, which are all of equal importance to the total functional capacity. The physiotherapy approach is not uniform and many different interventions, i.e. exercise therapy and back schools, exist to this problem.

Method
An Internet search was performed in English, German, Dutch, and Norwegian. 160 abstract found in Medline, PubMed, Cinahl, Cochrane Library and PsychLit were looked through and a total of 7 articles were included in this study. 5 articles considered the psychological factors (stress group) and 3 articles did not (no stress group). 1 article was counted twice. The data extraction was related to the 1) Physiotherapeutic (co-) interventions, 2) Frequency of treatments per week, 3) Time of total treatment, and 4) Duration of each treatment session. The statements/conclusions concerning the interventions were extracted from the two guidelines; Philadelphia Guidelines and KNGF-richtlijn Lage-rugpijn.

Results
Different forms of active exercise therapy were used in all researches included. A back school program was present 3 times in the stress group and not once in the no stress group. The total treatment time in the no stress group was 12 weeks in 75% of the cases and in app. 43% of the cases in the stress group. The mean frequency was 2.9 in the no stress group and 1.9 in the stress group. In the no stress group the treatment sessions lasted 60 minutes in 75% of the cases and in the stress group app. 43%. There were 2 co-interventions present in the stress group, one directed at the psychological variables and the other to the physical variables.

Conclusion
There is a small difference in the choice of physiotherapeutic interventions related to chronic non-specific low back pain if psychological stress is given consideration and if it is not. Different forms of exercise therapy are used for these patients. If psychological stress is given consideration emphasis is also placed on advice and education. No significant difference exists between both groups concerning the total length of the treatment time and 12 weeks are most often used. There is a clear tendency to a lower frequency of treatments per week if stress is given consideration. The duration of each treatment session is most often 60 minutes in both groups. Co-interventions, like motivation sessions and fitness programs, are only present in the stress group.
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Introduction

This report is written in the framework of the “Graduation project” at Fontys University of Professional Education, Eindhoven, for the Department of Physiotherapy. Two teachers at this university made the project proposal for this project. They both have a degree in psychology and one of them is also a physiotherapist. They were originally interested in seeing which interventions exist in stress related motion problems and a survey was suggested. The aim was to divide interventions into strictly physiotherapeutic interventions, non-physiotherapeutic interventions and others. Due to the extensiveness of this proposal it was narrowed down to physiotherapeutic interventions for chronic non-specific low back pain.

Low back pain (LBP) is a condition often seen in physiotherapy practice. The prognosis of recovery is usually good, but in some cases it persists to become chronic (>12 weeks) (1). In this transition from acute to chronic and in chronic LBP psychological factors are supposed to become more important (1). Therefore it is crucial that physiotherapists take these factors into consideration when treating patients with this problem.

Several treatment possibilities exist to the problems of chronic non-specific LBP, but it is not clear if there is a difference in the physiotherapeutic interventions used if stress is given consideration and if it is not. In the current study the main question that had to be answered was: Is there a difference in physiotherapeutic interventions related to chronic non-specific low back pain if psychological stress is given consideration and if it is not?

In order to make this question clear some definitions were made.

Chronic: Referring to a health related state lasting for a long time. The US National Centre for Health Statistics defines a chronic condition as one of 3 months/12 weeks duration or longer (26).

Non-specific low back pain: Low back pain not attributed to a recognisable pathology (such as infection, tumour, osteoporosis, rheumatoid arthritis, fractures, or inflammation) (30).

Stress: In psychology and biology, any strain or interference that disturbs the functioning of an organism. The human being responds to physical or psychological stress with a combination of psychic and psychological defences. If the stress is too powerful, or the defences inadequate a psychosomatic or other mental disorder may be the result (4).

Psychological stress: Psychological stimuli of some kind exceeding the limits of strain, triggering a stress reaction, may in time lead to somatic manifestations.

Intervention: An action or ministration that produces an effect that is intended to alter the course of a pathologic process [L inter ventio, coming between] (26).

Time: The total length of a treatment period.

Frequency: The amount of treatments per week.

Duration: The length of each treatment session.

Other definitions can be found in appendix II.

A literature search was performed on the Internet and two key figures and one other source were contacted. The first key figure Peter van Burken is both a physiotherapist and a psychologist. He works at Fontys University of Professional Education in Eindhoven as a psychologist with experiences in physiotherapy and in a private practice as a physiotherapist with experience in psychology. The second key figure Herman Nederlof is a physiotherapist with additional education in psychosomatic disorders. He works as a physiotherapist in a private practice and treats a lot of patients with stress related disorders. Stichting Flow is a professional organisation in psychosomatic disorders. They concentrate on stress related complaints and initiates scientific research in the field of psychosomatic physiotherapy, including interventions.

The interventions presented in the selected articles were divided into two groups, one giving the psychological factors consideration (stress group) and the other one not (no stress group). With this division it was possible to compare the total treatment time used, the frequency of the treatment, the duration of each treatment session and possible co-interventions. If only a small amount of articles was
found, an alternative solution to this project was made. It consisted of making a structured interview in which the researchers should find out if physiotherapists in the daily practice recognise psychological stress when treating patients with chronic LBP.

Information concerning chronic non-specific LBP, influencing factors, therapy strategies and the related main question is present in chapter one. The theory behind the method and the method used are accounted for in chapter two. The kind of research chosen is explained and thoroughly gone through step by step along with the procedure of data collection, data analysis synthesis. The findings and results are then visualised in tables and figures. In chapter four, which entails a discussion regarding the method and the results, links to literature and recommendations can be found. At the end the conclusion can be found. A reference list and appendices are also included.
1. **Approach to Chronic Non-Specific Low Back Pain**

Chronic non-specific low back pain (LBP) is one of the main problems within locomotor system complaints related to stress (3). Psychological stress is often recognised as an influencing factor and there are many physiotherapy interventions for this complaint. This chapter will first underline the relevance and prevalence of chronic non-specific LBP in the society. Its psychological influencing factors are given attention before different therapy strategies are described. At the end the whole chapter will be zoomed in to the main question.

1.1. Chronic non-specific low back pain

In healthy persons a balance exists between the functional load required for work and for activities of daily living (ADL) and a person’s functional capacity. Functional capacity is seen as the performance potential for ADL and work. An imbalance between these two elements can be caused by an overload or by decreased capacity and can lead to chronic non-specific LBP (11).

Chronic non-specific LBP is a very common problem in the society today. The prevalence of this complaint present incredibly high numbers. 60% to 90% of the population suffer from LBP at least once in their life (1,11,23) and 30 % of these patients will develop chronic LBP (23). The costs related to this complaint have exploded during the past 10 to 15 year (27). In the Netherlands 1.5% of the Gross National Product goes to LBP and as much as 97% of these costs results from long-term sick leave, reemployment, and early retirement (27). This is not only a problem here in Europe. In the United States back pain is reported as the second leading cause of work absenteeism. This results in more lost productivity than any other medical condition (25).

1.2. Influencing factors

Chronic non-specific LBP can be maintained by a combination of physical, mental, and social factors. These three factors have an equal importance in the total functional capacity (11). Evidence now supports that psychosocial elements play an essential role in production and maintenance of LBP disability (1,12). Wadell (1984) (33) considered psychological distress (read stress) to be the most important psychological factor. Additionally it has been suggested that fear of pain and its subsequent avoidance may also be of essence in the aetiology of musculoskeletal disorders (29).

The patients handling of his/her situation is quite crucial to the outcome of the treatment (6) and can be described in coping strategies. Coping strategies are associated with pain beliefs, locus of control and self-concept. Patients who believe in their ability to control pain, to avoid catastrophing, to separate themselves from the pain and disability, and perceive themselves as individuals first and as patients second are better prepared to cope with their pain and return to normal lifestyle. Active and passive coping strategies relate to whether the patient copes with the complaint adequately or not. Active coping means that the patients try to get in control of the situation and disorder themselves. They manage to adjust their level of activity to actively deal with their situation. The passive coping strategy involves an attitude where the patients adopt to the situation by for example resting or using medication. They do not put an active effort into adequately improving from the current state (1).

The feeling of control over own health and disability is crucial to patients. This control is known as locus of control and can be either internal or external. The internal locus of control is seen in patients who want and try to take control over their own situation. They consider their health to be mainly self-controlled. On the other side are the patients with external locus of control. They leave the responsibility for their own health up to others; i.e. the surroundings or the physiotherapist, without making any effort to take any control themselves (1). Persons with a higher internal locus of control tend to perceive less pain, have less psychological distress, and potentially less disability (8).
1.3. Therapy strategies

There are many physiotherapeutic interventions for chronic non-specific LBP. *Back schools* entail most often interventions that are variants of the Swedish back school from the eighties. The Swedish back school gives information on back anatomy, biomechanics, optimal posture, and includes exercises presented in a 4-8 hour course (32). The psychological aspects of the complaint are often addressed (7,11).

*Medical exercise therapy (MET)* is a progressively graded exercise system developed by the Norwegian physiotherapist Oddvar Holten during the early 1960s. The aim of the exercises is to normalise function by using specific exercises for mobilising hypomobile areas of the spine and by designing stabilising exercises for other parts. Under continuous supervision by the physiotherapist, MET is given for 1 hour in a group with maximum 5 patients. Each patient has an individual designed exercise program related to symptoms, clinical diagnosis, needs, and expectations. To obtain information regarding these aspects, the initial assessment includes history taking and a clinical examination, which is the basis for choosing the appropriate exercises and their grading (27).

*(Conventional) physiotherapy* is described as a combination of methods such as heat or cold, massage, stretching, different forms of electrotherapy, traction and exercises (27). Focus is applied on improving the functional capacity of the patient and instructions are given on ergonomic principles (16).

*Exercise programs* use exercises to improve spinal mobility, trunk and lower limb muscle length, force, endurance and co-ordination in order to restore normal function. In addition home exercises are often given to encourage the patients to be physically active and to continue exercise at home. These exercises are seen as an aid to overcome the fears of anticipated or actual pain as this can lead to avoidance of physical activity. The patients do also often receive postural correction and advice regarding both personal and professional activities (6).

Even though the physiotherapist realises that there are stress factors involved in the patients’ complaint, he may choose different interventions than those directly linked to psychology. The physiotherapist’s main contribution in the treatment of patients with LBP is coaching. The objective is to enable them to regain control with respect to function and activities. Coaching may include (re)activation, reassurance and motivation of patients, determination of progress, and rewarding by giving positive feedback (1).

To increase the patients’ self-management it may be necessary to influence the coping, cognition and fear (1). In the therapy the emphasis is put on challenge rather than anxiety, and precipitated fear towards any harmful situations (9).

For the physical therapy to be successful the therapist should be able to motivate and the patient should be open to the motivational efforts of the therapist. Consequently compliance is more likely to appear when the therapist gives clear instructions and the patient understands the rationale and benefits of the prescribed regimen (6).

1.4. The main question

Chronic non-specific LBP is with its high prevalence becoming a folk disease. The load it places on the society is just increasing (27). Long term sick leave, reemployment, and early retirement results in high costs (27). The complaint is not one-sided but is maintained by a combination of physical, mental, and social factors (11). Psychological stress is considered to be the most important psychological factor (35). The physiotherapeutic treatment of chronic non-specific LBP patients has a lot of options concerning the interventions. Due to the many aspects of this complaint and all the possible linked interventions the main question of this research arose:

**Is there a difference in physiotherapeutic interventions related to chronic non-specific low back pain if psychological stress is given consideration and if it is not?**

For the related sub-questions see the project plan in appendix I.
A literature research was performed to answer the main- and sub-questions. After locating and selecting the articles the methodological quality was evaluated. This chapter is divided into two parts. The first part concerns the theory behind the method and is included due to some important issues that need to be discussed. The second part contains the specific method of this research.

2. Method

2.1. Theory behind the method

2.1.1. The P.I.C.O. Model

Clinically relevant evidence evolves from defining research questions in terms of a very specific problem. To help formulate patient centred questions the PICO model was made (38). The P in PICO represents the patient or population of the targeted subject while the I serves as the Intervention. The C corresponds to the Comparison of interventions and the O expresses the Outcome of the current study.

The PICO-model was used as a help to define the main question:
- **Patients**: Chronic non-specific LBP patients
- **Intervention**: All interventions performed by a physiotherapist treating chronic non-specific LBP
- **Comparison**: Of interventions when stress is recognised and when not
- **Outcome**: Consider the (co-)interventions, the time, the frequency and the duration of the treatment

2.1.2. Databases

The databases used in the current study are health related and contain articles concerning LBP, psychological stress, and physiotherapeutic interventions. The databases and their characteristics are presented below.

*Medline*
Medline provides authoritative medical information on medicine, nursing, dentistry, veterinary medicine, the health care system, pre-clinical sciences, and much more (40).

*PubMed*
PubMed is the Internet version of the database Medline. PubMed provides authoritative medical information on medicine, nursing, dentistry, veterinary medicine, the health care system, pre-clinical sciences, and much more (40).

*Cinahl*
Cinahl is the Cumulative Index to Nursing & Allied Health Literature and contains references to articles from 1200 + English language paramedic- and nursing journals. There is also a lot of information within the professions of physiotherapy and podotherapy (40).

*Cochrane Library*
Cochrane Library is a source of reliable and up-to-date information on the effects of interventions in health care. It is designed to provide information and evidence to support decisions taken in health care and to inform those receiving care (40).
PsycARTICLES™ is a database of full-text articles from journals published by the American Psychological Association (APA), the APA Educational Publishing Foundation, the Canadian Psychological Association, and Hogrefe & Huber. The database includes all material from printed journals with the exception of ads and editorial board lists (39).

PsycINFO is an abstract (not full-text) database of psychological literature from the 1800s–present. It is also published by the American Psychological Association, the APA Educational Publishing Foundation, the Canadian Psychological Association, and Hogrefe & Huber.

2.1.3. Search strategy

A pre-search was performed to plan and formulate the search strategy. Different searching aids were taken into use, which have explained in more details.

Boolean operators

The Boolean operators are AND, OR, and NOT. These were used to expand and narrow the search. OR is an expander. This means that one or the other term has to be included in the search. An example is “physiotherapy OR physical therapy”. AND is narrowing the search. This operator includes two terms in the search. An example is “physiotherapy AND low back pain”. NOT is narrowing the search. This means that one word is included while the other is excluded from the search. An example is “stress NOT fracture”.

Medical Subject Headings (MeSH)

A specific terminology that is available in some databases is the so-called MeSH. It is used to make certain words more uniform and was taken into use in this research in Medline, PubMed, Cinahl, and Cochrane Library. An example of a MeSH term for physiotherapy is “Physical Therapy Techniques”[MeSH].

Parentheses and Quotation marks

Parentheses were used to connect groups of words that were in fact the same search term. An example is (intervention OR treatment OR therapy). Quotation marks connect words and make them one term. An example is “low back pain”.

Advanced search

Two different search methods, a basic search and an advanced search, were available in the databases. In this research advanced search was chosen which resulted in extra possibilities. Three of them, human, language, and expander were used. Human was used to be sure that all the researches to be found were dealing with human subjects. The language was pre-selected, in the case of German, Norwegian and Dutch, and the expander was used to broaden the search. The two possibilities for expanding were:
- Also search within the full text articles.
- Also search for related words.

Clinical Queries

Clinical queries using Research Methodology Filters (34). This specialised search is intended for clinicians and has built-in search filters based largely on Haynes RB et al. (35). Four study categories (therapy, diagnosis, aetiology, prognosis) are provided, and the emphasis can lie on sensitivity (i.e. most relevant articles but probably some less relevant ones) or specificity (i.e. mostly relevant articles but probably omitting a few). This research used the category “therapy” and emphasised sensitivity and specificity. “Physiotherapy” and “low back pain” were used as search terms. See table 2.1 for further information.
Table 2.1: The Clinical Queries within “therapy” with emphasis on sensitivity and specificity. The search words used were physiotherapy and low back pain.

<table>
<thead>
<tr>
<th>Category</th>
<th>Optimised for</th>
<th>Sensitivity/ Specificity¹</th>
<th>PubMed equivalent²</th>
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<tbody>
<tr>
<td>Therapy</td>
<td>Sensitivity</td>
<td>99%/74%</td>
<td>&quot;randomized controlled trial&quot; [PTYP] OR &quot;drug therapy&quot; [SH] OR &quot;therapeutic use&quot; [SH:NOEXP] OR &quot;random*&quot; [WORD]</td>
</tr>
<tr>
<td></td>
<td>Specificity</td>
<td>57%/97%</td>
<td>(double [WORD] AND blind* [WORD]) OR placebo [WORD]</td>
</tr>
<tr>
<td></td>
<td>Specificity</td>
<td>55%/98%</td>
<td>&quot;sensitivity and specificity&quot; [MESH] OR (&quot;predictive&quot; [WORD] AND &quot;value*&quot; [WORD])</td>
</tr>
<tr>
<td>Aetiology</td>
<td>Sensitivity</td>
<td>82%/70%</td>
<td>&quot;cohort studies&quot; [MESH] OR &quot;risk&quot; [MESH] OR (&quot;odds&quot; [WORD] AND &quot;ratio*&quot; [WORD]) OR (&quot;relative&quot; [WORD] AND &quot;risk&quot; [WORD]) OR &quot;case&quot; control* [WORD] OR case-control studies [MESH]</td>
</tr>
<tr>
<td></td>
<td>Specificity</td>
<td>40%/98%</td>
<td>&quot;case-control studies&quot; [MH:NOEXP] OR &quot;cohort studies&quot; [MH:NOEXP]</td>
</tr>
<tr>
<td></td>
<td>Specificity</td>
<td>49%/97%</td>
<td>prognosis [MH:NOEXP] OR &quot;survival analysis&quot; [MH:NOEXP]</td>
</tr>
</tbody>
</table>

1. Sensitivity and specificity as reported in Haynes RB et al.
2. Approximate equivalent in the PubMed query language as recommended in Haynes RB et al. for searches from 1991 to the present. The PubMed “Clinical Queries Using Research Methodology Filters” page used these parameters for all the searches, regardless of time period, in the interest of simplicity.

History
The history is the memory the databases keep of the searches performed. Each search is recalled in a list that the user can take into use whenever it is necessary. If the first search term was “low back pain” (#1) and the second term “Physiotherapy” (#2), the user can combine these, #1 AND #2, and a new outcome will result.

2.1.4. The PEDro scale

The PEDro scale (37) is a tool to evaluate the methodological quality of articles specifically dealing with interventions. The scale is based on the Delphi list developed by Verhagen and colleagues at the Department of Epidemiology, University of Maastricht and is a criterion list for quality assessment of randomised controlled trials (RCT’s) (41). Two additional items not present in the Delphi list (PEDro scale items 8 and 10) have been included in the PEDro scale.

The PEDro scale contains 11 criteria/items. Criterion 1 is related to the external validity and is not counted when calculating the PEDro score. Criteria 2- 9 concern internal validity and criteria 10 and 11 concern the sufficiency of statistical information. See appendix IV for further information.

An article considering the reliability of the PEDro scale states that the evaluation performed using the PEDro scale is more reliable when it is based upon consensus of a panel of evaluators rather than an individual’s judgement (36). With the exception of one article, this research used a panel of evaluators.
2.2. The method used

2.2.1. Locating and selecting the articles

**Keywords**
Specific keywords were used to find relevant articles. They were formulated in Norwegian, Dutch, English, and German and contained the words: chronic, non-specific, low back pain, physiotherapy, intervention, and psychological stress and thesaurus for these words. Table 2.2 presents the keywords taken into use in the current study.

<table>
<thead>
<tr>
<th>Table 2.2: Keywords from the current study. Norwegian, Dutch, English and German terms were taken into use.</th>
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</table>

**Criteria**
To select relevant articles for this research both inclusion- and exclusion criteria were formulated. These criteria concerned the year of publication, the type of participants and interventions, and the language used in the articles. The articles had to be from year 1995 or newer, the participants had chronic (≥12 weeks) non-specific LBP, a physiotherapist performed the interventions, and the language of the articles were Norwegian, Dutch, English, or German. Even if all the inclusion criteria were fulfilled, an article was excluded if one of the exclusion criteria were present. The exclusion criteria were case studies, specific LBP, acute or sub-acute (< 12 weeks) LBP, interventions not performed by a physiotherapist, and articles written in other languages than Norwegian, Dutch, English, and German.

**Key figures and other sources**
Two key figures and one other source were contacted in order to find out whether they were aware of any literature concerning physiotherapeutic (co-) interventions used in relation to chronic non-specific LBP if psychological stress was given consideration. The contacts used were:
- Peter van Burken
- Herman Nederlof
- Stichting Flow

**The search strategies**
The databases to be searched included Medline, PubMed, Cinahl, Cochrane Library, and PsychLit. When searching with Dutch, Norwegian, and German keywords the databases were searched according to the spoken language of the authors. The first one who finished proceeded with the English search. Clinical queries in the therapy-category emphasised both sensitivity and specificity and were used in PubMed. Boolean, parentheses, quotation marks, and MeSH were taken into use. Advanced search was always performed together with the history. Each search was printed or saved.
The searches were performed in the beginning of April 2003. See appendix III for a more specific search plan.

First phase (Selection of the relevant articles)
The Dutch, Norwegian, German, and English searches were performed in the same way. At the beginning all keywords were used together. That was then changed and one word was used at the time. These one-word searches were later combined. The words concerning psychological stress were included as the last ones. In PsychLit and Cochrane Library only English keywords were used. Titles and abstracts of interest were pre-selected from the search and were in- or excluded based on the criteria made. If no answer was found to one or two criteria, the articles were given the benefit of the doubt. When a title or an abstract contained one of the exclusion criteria it was excluded.

A selection concerning the relevance of the articles took place when the full-text articles were collected. At this stage one member read the German articles, one member read the Dutch articles and the English articles were divided equally within the group. When the articles had been read, a discussion regarding the unsure criteria followed and consensus had to be reached whether to in- or exclude the articles.

For the methodological quality evaluation the articles were once again divided within the group. Two persons evaluated the articles. If consensus was not reached, a third assessor evaluated the same article. One assessor evaluated one article alone. After the evaluation a second selection of articles took place.

The articles were included if:
- ≥5 points on the PEDro scale were obtained.
- It was possible to organise the information into one of the two groups:
  1. Psychological stress was given consideration (stress group)
  2. Psychological stress was not given consideration (no stress group)
- The article considered subject variables in the outcome(s) i.e. pain, disability.

Two members performed the organisation of the articles into the stress and no stress group. When they did not agree or considered the article to be in a grey-zone, a new evaluation was performed by the third assessor. The division of the articles was the only criterion given consideration when dealing with the selected guidelines.

Second phase (Collection of full-text articles)
The PiCarta database and the OPAC der Zeitschriftenbank (ZDB) were used to locate the full-text articles. One full-text article was found in PsychLit and two were found on the Internet, www.bmj.com. The other articles were found in the libraries mentioned below.

The Netherlands:
- Fontys’ library, Eindhoven
- Technische Universiteit, Eindhoven (TU/e)
- Witte Dame, Eindhoven (public library)
- Nederlands Instituut voor Wetenschappelijke Informatiediensten (NIWI), Amsterdam
- Hogeschool Amsterdam
- Vrije Universiteit, Amsterdam
- Amsterdam Medische Centrum (AMC)

Germany:
- Deutsche Zentralbibliothek für Medizin, Köln

Third phase (References)
The relevance of each reference from the selected articles was checked. An article was preliminary included if it contained at least one of the inclusion criteria. These criteria were LBP, intervention(s) and physiotherapy. If an article contained one of the exclusion criteria it was excluded at once.

For collection of the full-text articles see 2.2.1, Second phase (collection of the full-text articles).
2.2.2. Decision moment concerning structured interview

After the three phases a decision was made to in- or exclude the structured interview from this research.

2.2.3. Methodological quality of the articles

The methodological quality of the RCT’s and quasi-experimental studies was evaluated using the PEDro scale.

2.2.4. Data extraction

To answer the research question data was extracted from the selected articles. The data extraction form concerned:
- The design of the researches performed
- The number of subjects in the research performed
- The age of these subjects
- Pain duration of the chronic non-specific LBP
- The physiotherapeutic (co-) interventions used for treating chronic non-specific LBP
- Frequency of the treatment per week
- Time of the total treatment period
- Duration of each treatment session
- Outcome/authors conclusion of the researches performed in the selected articles

The statements/conclusions concerning the (co-) interventions were extracted from the guidelines.

2.2.5. Data-analysis and data-synthesis

The results were presented in tables and graphic illustrations. The mean, mode, and median, as well as the variance, regarding the time, frequency and duration, were calculated for both groups. The range was documented, with the exception of frequency. The guidelines’ statements or conclusions concerning the (co-) interventions were compared.
3. Results

After the appropriate studies for this research were found and data-extraction performed, a comparison of the collected data started. In order to answer the main questions, several sub-questions had to be answered first.

The information that had to be compared between the two groups was:

1. The main interventions chosen
2. The total time of the treatment period
3. The frequency of the treatment
4. The duration of each treatment session
5. Co-interventions if present

This chapter includes three main parts. The first part deals with the studies included. The second part explains the methodological quality of the studies evaluated. In the third part the results from this research will be presented. To visualise these results tables and figures were used.

3.1. Studies

Key figures and other sources
Peter van Burken was contacted per E-mail. He did not know of any information that could have a value to the current research. See appendix V for more information.
In March 2003 Herman Nederlof was contacted personally by one of the group members. He did not have or know of any additional information that could be of interest to this project.
Stichting Flow was contacted per E-mail. They said that their Internet site included many links to articles that could be of interest. This Internet site was looked through without any result. See appendix VI for further information.

First phase (Selection of the relevant articles)
In the beginning of April selection of relevant articles after the in- and exclusion criteria took place. 160 abstracts/titles were looked through. Two abstracts fulfilled all the inclusion criteria and 65 abstracts/titles were preliminary included with maximum two unsure criteria. 93 were excluded.

Second phase (Collection of full-text articles)
From the included 67 abstracts/titles, with and without unsure criteria, 10 articles were obtained at Fontys Hogeschool, 36 at NIWI, 4 at AMC, 1 at Hogeschool Amsterdam and 2 at Vrije Universiteit Amsterdam. 10 articles were found at the Deutsche Zentralbibliothek für Medizin in Köln and 3 were obtained at TU/e. 1 article was excluded because it could only be found in the USA.
Having read through the full-text articles and checked the unsure criteria, 14 of the 160 abstracts were included and 146 excluded.

Third phase (References)
29 references from the selected articles were preliminary included after checking their relevance to the current study.

7 articles were excluded before the full-text articles were collected. 1 article was not to be found in the Netherlands or Germany or as abstract on Medline, Cinahl or Cochrane Library and was excluded due to non-availability. 1 article was from a conference and therefore excluded. 1 article was excluded because it was not published. Another article was from a forum and therefore excluded. 2 were excluded when checking PiCarta because they were from one book and were overviews and not researches. 1 was excluded because it was not possible to find. It was a supplement to a journal
(Spine) and the volume and year did not fit. After checking all the supplements given out by the journal Spine the article was still not to be found.

Of the 22 remaining references 2 articles were found at Fontys Hogeschool and 8 at TU/e. 1 was found at Witte Dame and 2 were found on the Internet: www.bmj.com. 9 articles were found in Köln. An in- and exclusion criteria meeting for these references resulted in 5 included references.

Exclusion of full-text articles
There were some articles that did not satisfy the inclusion criteria or contained one or more of the exclusion criteria that were made. Criteria for exclusion were acute LBP: Non-specific was not mentioned; Chronic was defined as <12 weeks/3 months; Treatment was not performed by a physiotherapist; Conditions other than LBP; Older than 1995; Other languages than Norwegian, English, Dutch, or German; Case study; Chronic was not mentioned; Did not consider intervention(s).

Status after the three phases
From the search of 160 articles 14 were included and 146 excluded. Of the 29 references 5 were included and 24 excluded. This meant that a total of 19 articles were included at this point.

Final exclusion of studies:
1 descriptive research (5) was thoroughly read through before the evaluation could take place because a special evaluation form had to be made. The article was excluded before the evaluation because it was not possible to organise it into the stress or the no stress group. This division was not possible in one other article either (15).
1 article that considered a very typical physiotherapeutic intervention was excluded during the evaluation because the treatment was performed by a physiatrist (13).
2 guidelines collected considered the same study and 1 of them were excluded (31).
When not enough relevant information could be sought for the data-extraction the article would be excluded. This happened to 1 article (28).
3 articles scored 3 points on the PEDro scale and where therefore excluded (10,14,24).
4 articles based on the same research. These articles had different titles, were published in different years and journals, were present in more languages, and emphasised different topics concerning the outcome. 2 of these were excluded (20,21) and 2 (*16,*17, *18, *19) were considered as one. Information was used from both.
1 article defined chronic as being present for >2 months. This article was included at first because it was thought to have important information regarding physiotherapeutic interventions for chronic non-specific LBP. At a later stage, when the whole article was read, this assumption turned out to be wrong and it was therefore excluded (22).
One article was re-included after counting the points from the PEDro scale for the second time. The official PEDro score do not calculate criterion number one and because this was not acknowledged at first, one article ended up with 5 points when this was considered (11).
The article by Torstensen (1998) was not excluded even though it contained a section about costs because the efficiency section in the outcome considered subject variables.

Final study sample:
This research dealt with a total of seven research articles concerning chronic non-specific LBP and physiotherapeutic interventions. Five articles were taking the psychological factors into consideration and three articles did not. One of the articles was counted twice. Table 3.1 describes the different qualities of the articles that were included in this research. Information is given to the study, the design, participants, (co-) interventions and the authors’ conclusion.

*17, *18, *19 were three different parts of one article and were considered as one in the current research.
<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants</th>
<th>Intervention</th>
<th>Co-intervention</th>
<th>Authors conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friedrich (1998)</td>
<td>Double-blind prospective randomised controlled trial</td>
<td>N = 93, Age: 44.12 yrs., Pain duration: ≥4 months or 3 episodes of pain last 6 months with current episode lasting 2 months</td>
<td>1. Standard exercise program, 2. Standard exercise program</td>
<td>1. motivation program</td>
<td>Program combining conventional exercise therapy with a motivation-enhancing intervention strategy significantly reduced the level of disability and pain in low back pain patients. However, this treatment did not ameliorate self-reported compliance as measured by the level of adherence with long-term exercise after treatment termination.</td>
</tr>
<tr>
<td>Frost (1998)</td>
<td>Single blind randomised controlled trial with follow up</td>
<td>N = 81, Age: between 18-55 yrs., Pain duration: &gt; 6 months</td>
<td>1. Back school and advice, 2. Back school and advice</td>
<td>1. Fitness program</td>
<td>It is likely that the specific exercises themselves are not as important as the general philosophy of encouraging normal movement with an aim to increase general fitness without unduly stressing the spine. Some evidence for clinical effectiveness in the long-term but a full cost effectiveness analysis is necessary to confirm the benefits of this treatment approach.</td>
</tr>
<tr>
<td>Hodselmans (2001)</td>
<td>Quasi-experimental cohort study with a waiting list control group</td>
<td>N = 24, Pain duration: &gt; 3 months, Age: 38 ± 7.7/ 8.1 yrs.</td>
<td>1. Back school, 2. Waiting list</td>
<td>None reported</td>
<td>This back school program significantly improved participants’ functional capacity and functional health status. Patients obtained better balance between functional load and functional capacity.</td>
</tr>
<tr>
<td>Mannion (1999)</td>
<td>Randomised controlled trial</td>
<td>N = 148, Pain duration: &gt;3 months, Age: &lt; 65 yrs.</td>
<td>1. Physiotherapy, 2. Muscle reconditioning using training devices, 3. Aerobics/stretching classes</td>
<td>A list of co-interventions were made including: acupuncture, pain medication, injection, traction, manipulation, chiropractic therapy, massage, corset, strength training, or other</td>
<td>The different treatments were equally efficacious in their ability to effect significant reductions in pain intensity, pain frequency, and disability in tasks of ADL immediately after therapy. These treatments also effected a change in fear-avoidance beliefs about physical activity. Moreover, the effects observed after treatment were well maintained, and sometimes even improved, over the following 6 months, with the exception of disability in the physiotherapy group.</td>
</tr>
<tr>
<td>Torstensen (1998)</td>
<td>A multicentre, randomised single-blinded controlled trial with 1-year follow-up</td>
<td>N = 208, Age: between 20-65 yrs., Pain duration: &gt;12 weeks</td>
<td>1. Medical exercise therapy (MET), 2. Conventional physiotherapy (CP), 3. Self-exercise by walking</td>
<td>None reported</td>
<td>Both MET and CP are equally effective and are superior to leaving patients on their own to maintain a normal activity level including walking. A pragmatic approach combining different modalities in relation to the needs of the patient is an effective way to manage chronic low back pain.</td>
</tr>
</tbody>
</table>
### Table 3.1: Characteristics of included studies, in alphabetical order (continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants</th>
<th>Intervention</th>
<th>Co-intervention</th>
<th>Authors conclusion</th>
</tr>
</thead>
</table>
| Bekkering (2001)       | Guidelines-systematic reviews or meta-analysis were included           | Pain duration: acute <6 wks, sub-acute 7-12 wks, chronic >12 weeks             | 1. Biofeedback and traction  
2. Massage  
3. Electrotherapy (incl. TENS)  
4. ultrasound or laser  
5. Exercise therapy  
6. Behavioural therapy  
7. Patient education | None reported               | There is strong evidence of the effectiveness of exercise therapy in the treatment of patients with chronic LBP. It is not clear which exercises are best. There is limited/moderate evidence of effectiveness of behavioural therapy (operant approach by physiotherapists). The effectiveness of ultrasound, electrotherapy, laser, TENS, and massage is unclear. There is moderate evidence of ineffectiveness of biofeedback. There is strong evidence of ineffectiveness of traction. |
2. Thermal therapy (hot - & cold packs  
3. Electrical stimulation  
4. EMG biofeedback  
5. TENS  
6. therapeutic ultrasound  
7. therapeutic exercise  
8. combinations of these | None reported               | There is evidence to support and recommend the use of therapeutic exercise for chronic LBP. There is a lack of evidence at present regarding whether to include or exclude the use of thermotherapy, therapeutic massage, EMG biofeedback, mechanical traction, therapeutic ultrasound, TENS, electrical stimulation and combined rehabilitation interventions in the daily practice of physical rehabilitation. |

**Abbreviations:**
CP = Conventional physiotherapy; Gr = Group; MET = Medical exercise therapy; N = Number of patients; wks = weeks; yrs = years
3.2. Methodological quality of the articles

Included studies
The articles included had to score more than 5 points on the PEDro scale. Of the RCT’s one scored 5 points, two scored 7 points and one scored 8 points. The quasi-experimental research scored 5 points. Table 3.2 demonstrates the results from the different RCT studies and table 3.3 shows the results of the quasi-experiment.

Table 3.2: Included randomised controlled trials, ordered after the points scored on the PEDro scale. The numbers 1-11 refers to the criteria of the PEDro scale, and the numbers 1 and 0 - corresponding to each study- refers to the points accredited. Y= Yes and indicates that this criterion was satisfied.

<table>
<thead>
<tr>
<th>Study</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mannion (1999)</td>
<td>Y</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5/10</td>
</tr>
<tr>
<td>Friedrich (1998)</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>7/10</td>
</tr>
<tr>
<td>Torstensen (1998)</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7/10</td>
</tr>
<tr>
<td>Frost (1998)</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8/10</td>
</tr>
</tbody>
</table>

Table 3.3: Included quasi-experimental study. The numbers 1-11 refers to the criteria of the PEDro scale, and the numbers 1 and 0 - corresponding to the study- refers to the points accredited. N= No and indicates that this criterion was not satisfied.

<table>
<thead>
<tr>
<th>Study</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hodselsmans (2001)</td>
<td>N</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5/10</td>
</tr>
</tbody>
</table>

Excluded studies
Table 3.4 and 3.5 indicate the scores on the PEDro scale for the excluded RCT’s and the quasi-experiment. Of the RCT’s three articles scored 3 points, one article scored 5 points, two articles scored 6 points and one article scored 7 points. The quasi-experimental study scored 6 points. The five articles that scored more than 5 points were excluded for other reasons.

Table 3.4: Excluded experimental studies, ordered after the points scored on the PEDro scale. The numbers 1-11 refers to the criteria of the PEDro scale, and the numbers 1 and 0 - corresponding to each study- refers to the points accredited. Y= Yes and indicates that this criterion was satisfied.

<table>
<thead>
<tr>
<th>Study</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hernandez-Reif (2001)</td>
<td>Y</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3/10</td>
</tr>
<tr>
<td>Rissanen (1995)</td>
<td>Y</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3/10</td>
</tr>
<tr>
<td>Johannsen (1995)</td>
<td>Y</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3/10</td>
</tr>
<tr>
<td>Mannion (2001)</td>
<td>Y</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5/10</td>
</tr>
<tr>
<td>Kankaapää (1999)</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6/10</td>
</tr>
<tr>
<td>Mannion (2001)</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6/10</td>
</tr>
<tr>
<td>Moseley (2002)</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>7/10</td>
</tr>
</tbody>
</table>

Table 3.5: Excluded quasi-experimental studies. The numbers 1-11 refers to the criteria of the PEDro scale, and the numbers 1 and 0 - corresponding to the study- refers to the points accredited. Y= Yes and indicates that this criterion was satisfied.

<table>
<thead>
<tr>
<th>Study</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>SUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tritilanunt 2001</td>
<td>Y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6/10</td>
</tr>
</tbody>
</table>

The reasons for excluding the articles were:
Hernandez-Reif (2001) (10) : Scored only 3 points on the PEDro scale
Rissanen (1995) (24) : Scored only 3 points on the PEDro scale
Johannsen (1995) (14) : Scored only 3 points on the PEDro scale
Kankaapää (1999) (15) : Did not clearly go into one group or the other
Mannion (2001) (20) : Same as another included study
Mannion (2001) (21) : Same as another included study (German language)
Moseley (2002) (22) : Due to the definition of chronic >2 months
Tritilanunt (2001) (28) : Not enough information could be sought in the data-extraction
3.3. Differences between physiotherapeutic interventions if psychological stress is given consideration and if it is not

The division of the stress and no stress groups and the interventions in the RCT’s and the quasi-experiment are shown in table 3.6. A total of 5 articles were used in this research. One article was counted twice leaving 2 articles in the No stress group and 4 in the Stress group. A total of 5 articles were used in this research. One article was counted twice leaving 2 articles in the No stress group and 4 in the Stress group.

No stress
The interventions were all used once: medical exercise therapy, conventional physiotherapy, self-exercise by walking, and standard exercise program.

In the medical exercise therapy (MET) all the patients received an individually designed exercise program and aimed to normalise function by specific exercises for mobilising hypomobile areas of the spine and making stabilising exercises for the other parts (27).

Conventional physiotherapy was described as a combination of methods such as heat or cold, massage, stretching, different forms of electrotherapy, traction, and a few exercises on the treatment table.

In the self-exercise by walking program the patients were given information on the importance of self-exercise and activity of the back. The patients were instructed to walk for an hour three times a week with one day rest in-between.

In the standard exercise program an individual sub-maximal, gradually increased exercise program was used. The exercises given were aimed at improving spinal mobility, trunk and lower limb muscle length, force, endurance and co-ordination in order to restore normal function. In addition home exercises were given.

Stress
Back school was used 3 times, one time with additional advice and fitness, one time with additional advice. Standard exercise program with motivation program was used once just like physiotherapy, muscle reconditioning using training devices and aerobics and stretching classes.

The aim of the back school program by Hodselmann (2001) was to achieve optimal functional capacity and optimal functional health status. Teaching the patient to react adequately to signals of overload and to be aware of the balance between functional load and functional capacity was of importance. The back school consisted of a three part divided intervention set. The first intervention was presented according to the principles of McKenzie. Secondly the treatment of energetic capacity, local endurance and general endurance consisted of individual circuit training and, if necessary aqua jogging and playing sports in groups. Third the treatment of self-efficacy by explaining the functional overload mechanism and the influence of mental and social factors on the functional health status.

The back school as described by Frost (1998) involved 2 sessions of 90 minutes. These 2 sessions included discussion of the patient’s main problem, functional anatomy, simple applied body mechanics, advice regarding functional activities and exercise, relaxation techniques, ergonomic advice, a video entitled backfire and practical workshops. The aim was to encourage a positive attitude and a positive return to activities. The additional fitness program is described in 3.4.5, Co-interventions. Additional advice was given to the patients to perform 4 individual exercises and to remain active and continue with the exercises twice daily until their follow-up appointment 6 weeks later.

The standard exercise program was the same in both groups. See “No stress” for the description of the program. A description of the motivation program is to be found in 3.4.5, Co-interventions.

Mannion (1999) applied three different types of interventions. The physiotherapy applied focused on improving the functional capacity of the patient and giving instruction on ergonomic principles. Isometric exercises, exercises with Therabands and general strength-training devices were applied. For the muscle reconditioning using training devices, the David Back clinic program was chosen. The program consisted of iso-inertial loading to the lumbar spine in the sagital, frontal and horizontal planes. Relative progression of the loading was applied throughout the whole period. The sessions also consisted of warm up (cycling, stepping). Before and after the exercise on each of the devices relaxation and stretching were carried out.
The third treatment group was *aerobics and stretching classes*. These classes contained a warm up, including whole body static stretching and low impact aerobic exercises, specific exercises directed predominantly at the trunk and leg muscles, and a cool down and relaxation exercises.

### Table 3.6: Division of the interventions from the Randomised controlled trials and quasi-experimental study into the stress and the no stress group

<table>
<thead>
<tr>
<th>Stress</th>
<th>No Stress</th>
</tr>
</thead>
</table>
| **Mannion (1999)** | - Physiotherapy  
- Muscle reconditioning using training devices  
- Aerobics and stretching classes  
Torstensen (1998) | - Medical exercise therapy  
- Conventional physiotherapy  
- Self-exercise by walking |
| **Friedrich (1998)** | - Standard exercise and motivation program  
Friedrich (1998) | - Standard exercise program |
| **Frost (1998)** | - Back school, advice and fitness program  
- Back school and advice  
Hodselmans (2001) | - Back school |

### 3.4. Differences between the treatment process if psychological stress is given consideration and if it is not

#### 3.4.1. Description of outcome measures

The outcomes measures of interest were the interventions used, the total time used per treatment period, the frequency of the treatment per week, the duration of each treatment session and the co-interventions used if present. Table 3.7 describes the data extracted concerning time, frequency, duration, co-interventions.

### Table 3.7: Outcome measures of the total time used per treatment period, the frequency of the treatment, the duration of each treatment session and co-interventions.

<table>
<thead>
<tr>
<th>Study</th>
<th>Time</th>
<th>Frequency</th>
<th>Duration</th>
<th>Co-intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friedrich (1998)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ex-group: Standard exercise- and motivation program</td>
<td>no direct info</td>
<td>2,5</td>
<td>25</td>
<td>motivation sessions</td>
</tr>
<tr>
<td>Control group: Standard exercise program</td>
<td>4</td>
<td>2,5</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Torstensen (1998)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical exercise therapy</td>
<td>12</td>
<td>3</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Conventional physiotherapy</td>
<td>12</td>
<td>3</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Self-exercise by walking</td>
<td>12</td>
<td>3</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Mannion (1999)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>12</td>
<td>2</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Muscle reconditioning using training devices</td>
<td>12</td>
<td>2</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Aerobics/Stretching classes</td>
<td>12</td>
<td>2</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Frost (1998)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ex-group: Back school, advice and fitness program</td>
<td>4</td>
<td>2,5</td>
<td>66</td>
<td>fitness program</td>
</tr>
<tr>
<td>Control group: Back school and advice</td>
<td>no info</td>
<td>2</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Hodselmans (2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ex-group: Back school</td>
<td>15</td>
<td>0,8</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation:  
Ex-group: Experimental group; min= minutes; ttm= treatment
3.4.2. Time

The time was measured in weeks and considered to be the amount of time needed to complete the treatment. The results from both the no stress and the stress group can be seen in figure 3.1. In the articles used, the time varied from 4 to 15 weeks leaving the range to be 11.

**No stress**

The treatment time within this group differed from 4 to 12 weeks, leaving the range to be 8. Two options were present for this group: 4 or 12 weeks. 4 weeks equalled a variance of 9 and 12 weeks equalled a variance of 1.

Three out of four treatments were completed in 12 weeks, which corresponded to 75% of the results. One treatment lasted only 4 weeks, which corresponded to 25% of the results.

The mean treatment time was calculated to be 10. The median and the mode were 12.

**Stress**

The treatment time differed from 4 to 15 weeks leaving a range of 11. Four different options were included in this group: no information, 4 weeks, 12 weeks and 15 weeks.

No information equalled a variance of 121. 4 weeks equalled a variance of 49. 12 weeks equalled a variance of 1. And 15 weeks equalled a variance of 16.

One treatment lasted 15 weeks, which corresponded to 14.29% of the results. Three treatments lasted 12 weeks, which corresponded to 42.86% of the results. One treatment lasted 4 weeks, which corresponded to 14.29% of the results. There were two cases in which information could not be obtained, which corresponded to 28.57% of the results.

The mean treatment time for this group was 11. The median and the mode were 12.

---

**Figure 3.1:** Treatment time, in weeks, of total treatment period. Number 1 on the Y-axis represent the no stress group and number 2 represents the stress group.
3.4.3. Frequency

The frequency was the amount of treatments the subjects received per week. The results can be seen in figure 3.2.

No stress
There were two different options for the frequency within this group: 2.5 or 3 times per week. 2.5 times per week equalled a variance of 0.04 and 3 times per week equalled a variance of 0.0025.

One article stated that the interventions were given 3 times per week, which corresponded to 75% of the results. The other article reported that the mean treatment frequency was 2.5, which corresponded to 25% of the results.

Stress
There were three options concerning the frequency within this group: 0.8, 2 or 2.5 times per week. 0.8 equalled a variance of 0.17, 2.5 equalled a variance of 0.05, and 2 equalled a variance of 0.0014. Four out of seven treatments given to this group were performed 2 times per week, which corresponded to 57.86% of the results. One article stated that the treatments were given either 2 or 3 times per week, leaving the average to be 2.5. One other treatment had a frequency of 2.5 as well. This corresponded to 28.57% of the results. The last data from this group had to be calculated by the authors of this research themselves because it was only given as a mean and standard deviation in the article used. The frequency was calculated to be 0.8 times per week, which corresponded to 14.29% of the results.

Looking at the frequency as a whole, the mean frequency for the No stress group was 2.9 and for the Stress group 2. The median and mode were 3 for the No stress groups and 2 for the Stress group.

Figure 3.2: Frequency, in treatments per week. Number 1 on the Y-axis represent the no stress group and number 2 represents the stress group.
3.4.4. Duration

The duration of each treatment session was calculated in minutes. The results can be seen in figure 3.3. It differed from 25 to 90 minutes leaving the range to be 65.

No stress

The treatment duration within the group differed from 25 to 60 minutes, leaving the range to be 35. There were two treatment options for this group: 25 or 60 minutes. 25 minutes equalled a variance of 172.92 and 60 minutes equalled a variance of 18.92. Three treatments given lasted 60 minutes and corresponded to 75% of the results. One treatment lasted 25 minutes and corresponded to 25% of the results.

The mean was 51.3, and the median and mode was 60.

Stress

In this group the duration differed from 25 to 90 minutes between the studies, leaving the range to be 65. There were five different treatment options within this group: 25, 30, 60, 66 and 90 minutes. 25 minutes equalled a variance of 136.05, 30 minutes equalled a variance of 95.53, 60 minutes equalled a variance of 2.45, 66 minutes equalled a variance of 14.69 and 90 minutes equalled a variance of 166.51. Three treatments lasted 60 minutes, which corresponded to 42.86% of the results. The other treatments lasting 25, 30, 66 and 90 minutes were all present one time and each corresponded to 14.29% of the results.

The mean duration of each treatment was 55.86 minutes, and the median and the mode was 60.

![Duration of each treatment session](image)

Figure 3.3: Duration of the treatment sessions in minutes. Number 1 on the Y-axis represents the no stress and number 2 represents the stress group.

3.4.5. Co-interventions

Co-interventions were used in two studies included in this research. Both of these co-interventions, a motivation program and a fitness program, were included in the stress division.

The motivation program was implemented in addition to standard exercise program. The motivation program consisted of several interventions. One intervention included extensive counselling and information strategies to make sure the patient received clear instructions. Reinforcement techniques were used with the therapist giving positive feedback and commenting patients for their efforts. In co-operation with the patient, reward and punishment strategies were made to better reinforce the beneficial behaviour. The patient was also asked to make an exercise dairy, reporting all the exercise they had done (6).
And additional fitness program consisted of 8 sessions with duration of 60 minutes extending over 4 weeks. It was based on a normal model rather than the disease model. The participants were advised to see themselves as sportsmen who had been laid of their training for a longer period and needed to get back to their previous activities. They received maximal encouragement and positive reinforcement where appropriate and pain behaviour was not rewarded with any attention. They were told that the exercises were progressive and that they had to start slowly and gently in order to avoid over-activity. Each patient also received an exercise sheet to record the number of repetitions achieved in each session. The patients were also instructed on the difference between hurt and harm. They were informed that the new activity would lead to muscle ache, which was perfectly normal. They were also encouraged to incorporate exercise into their daily routines and increase their regular levels of activity from the beginning. Each session included a warm up and general stretching exercises. After this a circuit of 15 progressive exercises on the large muscle groups followed. The class finished with low impact aerobic exercise and further stretching and relaxation exercises. Throughout the program the physiotherapists used cognitive behavioural principles (7).

Mannion (1999) stated that a questionnaire was used in order to find out whether the participants had received other treatment for their LBP during the course of the treatment administered for the study. It was reported that 61% of the subjects did not receive any other treatment for their LBP. If subjects received co-interventions, a list was made. This list included: Acupuncture; Pain medication; Injection; Traction; Manipulation; Chiropractic therapy; Massage; Corset; Strength training; Other.

3.5. Difference between the interventions discussed in the guidelines if psychological stress is given consideration and if it is not

The guidelines included could not be looked at in the same way as the RCT’s and quasi-experiment. From these articles the statements and advice given were extracted. The division of the interventions from the guidelines is presented in table 3.8.

### Table 3.8: Division of the interventions from the guidelines into the stress and the no stress group

<table>
<thead>
<tr>
<th>Stress</th>
<th>No stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient education</td>
<td>Massage</td>
</tr>
<tr>
<td>Behaviour therapy</td>
<td>Thermal therapy (hot- &amp; cold packs)</td>
</tr>
<tr>
<td>Electrotherapy, including TENS</td>
<td>Electrical stimulation</td>
</tr>
<tr>
<td>Biofeedback and traction</td>
<td>EMG biofeedback</td>
</tr>
<tr>
<td>Massage</td>
<td>TENS</td>
</tr>
<tr>
<td>Ultrasound or laser</td>
<td>Therapeutic ultrasound</td>
</tr>
<tr>
<td>Exercise therapy</td>
<td>Therapeutic exercise</td>
</tr>
<tr>
<td></td>
<td>Combinations of these</td>
</tr>
</tbody>
</table>

3.5.1. Philadelphia Panel (2001) (23)

This article belonged to the No stress group. The studies that were included in this article were all randomised clinical trials. There was no information to be found concerning the time, duration, frequency and co-intervention.

**Therapeutic exercise**

There was good scientific evidence of clinically important benefit of therapeutic exercise on pain and function with stretching or strengthening exercises. There was no difference in range of motion (ROM), strength, or return to work.
Mechanical traction
Good evidence of no important benefit on pain, function, or patient-rated improvement of mechanical traction was demonstrated. There was no difference in pain, function or patient global assessment. Work absence was shorter in the traction group after 6 months (35 days with traction verses of 45 without). The Panel recommends that there is poor evidence to include or exclude mechanical traction alone as an intervention for chronic LBP.

Therapeutic ultrasound
The Panel recommends that there is poor evidence to include or exclude therapeutic ultrasound alone as an intervention for chronic LBP. This was due to fair scientific evidence of no clinically important benefit on pain. There was no difference in pain improvement between continuous therapeutic ultrasound and sham therapeutic ultrasound after 1 month of therapy. No data was reported for functional status, ROM, strength, quality of life or return to work.

TENS
Due to good evidence of no clinically important benefit on pain, the Panel recommends that there is poor evidence to include or exclude TENS alone as an intervention of chronic LBP.

EMG biofeedback
The Philadelphia Panel recommends that there is poor evidence to include or exclude EMG biofeedback alone as intervention for chronic LBP. There was no shown effect on pain relief, functional status, or ROM after 1 month of therapy.

3.5.2. Bekkering (2001): KNGF-richtlijn Lage-rugpijn (2)
This article belonged to the Stress group and stated that the most important interventions in the treatment of patients with LBP with an abnormal course are patient education and exercise. Information or advice concerning frequency, duration and co-intervention could not be found.

Treatment time
This article describes a difference between a normal course and an abnormal course of the complaints. For patients with an abnormal course (including patients with chronic LBP) it is advised to make clear appointments concerning starting- and ending the treatment. This is going to help the patient to keep control of his functioning.

Exercise therapy
There is strong evidence of the effectiveness in the treatment of patients with chronic low back pain. It is not clear which exercises are best.

Behaviour therapy and exercise in water
There is limited/moderate evidence of effectiveness of behavioural therapy (operant approach by physiotherapists) and exercise in water.

Ultrasound, electrotherapy, laser, TENS, and massage
The effectiveness of ultrasound, electrotherapy, laser, TENS, and massage is unclear.

Biofeedback
There is moderate evidence of ineffectiveness of biofeedback.

Traction
There is strong evidence of ineffectiveness of traction.
**Patient education**

Patient education is considered to be the most important intervention next to therapeutic exercise in the treatment of chronic LBP. An education model by Verhulst and Van der Burgt (1996) hypothesised that the readiness to change behaviour is determined by an interplay between attitude, social influence and self efficacy. The model consists of six steps ‘being open’, ‘understanding’, ‘wanting’, ‘doing’, ‘being able’, and ‘keep on doing’. These steps are seen in table 3.9.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1: Being open</td>
<td>The physiotherapist will try to meet the experiences, expectation, questions and worries of the patient.</td>
</tr>
<tr>
<td>Step 2: Understanding</td>
<td>The information must be offered in such a way that the patient is able to understand and remember the information.</td>
</tr>
<tr>
<td>Step 3: Wanting</td>
<td>The physiotherapist evaluated what drives (does not drive) the patient to show certain behaviour. The physiotherapist offers support and provides information about possibilities and alternatives. Agreements should be feasible.</td>
</tr>
<tr>
<td>Step 4: Being able</td>
<td>The patient must be able to perform the desired behaviour. Functional activities need to be practised.</td>
</tr>
<tr>
<td>Step 5: Doing</td>
<td>The physiotherapist makes clear, concrete and feasible agreements with the patient and sets concrete targets.</td>
</tr>
<tr>
<td>Step 6: Keep doing</td>
<td>During the treatment episode there must be communication about whether or not the patient thinks that he will be able to show and maintain the new behaviour. If there are problems, solutions must be sought.</td>
</tr>
</tbody>
</table>
4. Discussion

This research is based upon 4 RCT’s, 1 quasi-experimental study, and 2 guidelines. The guidelines are not studies performed with an experimental- and a control group, but have been written based on a literature search that have been made. They were included because they contain evidence-based information and because the conclusions were highly relevant to the current study.
In this chapter a discussion of the limitations, changes, and decision moments of the method will take place. An interpretation of the results from this study and recommendations for further research will then proceed.

4.1. Limitations, changes, and decision moments

4.1.1. The P.I.C.O. Model

In the starting phase of the current study, one problem occurred when making the research question. It was difficult to make it specific enough, and the PICO-model was therefore taken into use. This model was of great help for the formulation and creation of the question.

4.1.2. Locating and selecting the articles

A pre-search was performed to plan and formulate the search strategy and hereunder also the keywords. During the pre-search many hits on the word “stress” resulted, but very few dealt with psychological stress. These hits concerned among other stress fracture, stress incontinence, and stress on a certain structure and were not relevant for this research. Many words for psychological stress were used in combination with LBP with little results. To include all the articles concerning psychological stress and LBP, a decision was made to use as many thesauruses as possible for psychological stress.

Two key figures and one other source were contacted. They did unfortunately not bring extra literature or articles into the research.

To find relevant articles, the first search contained all the keywords. This gave no results. A decision was then made to search with one word at the time and then to combine these one-word searches. This was a more effective method for this project. The words for psychological stress limited the search too much and did not give all the relevant articles needed. A decision was therefore made to include these words at the end if it was necessary.

In this research British English was the written language. In Medline American English was used, which was recognised when using MeSH terms. This had consequences for one English keyword “behaviour”. In American English this word is spelled “behavior”. This difference was noticed during the search and it was decided to include both words in the keywords.

During the literature search it was noticed that the keywords in German and Dutch did not include all the relevant words. These languages were third languages for the authors. Two extra keywords were included in the German search, namely “Rückenschmerzen” and “Schmerzen”. The Dutch word “rugpijn” was recognised as missed but not included in the keywords.
The authors do not think they overlooked relevant articles from the Internet search because of absent keywords. Nearly all the abstracts on the Internet were in English and these keywords can therefore be seen as the most important ones. The English keywords were used as an addition in the German, Dutch and Norwegian search.
The literature searches were performed in the beginning of April 2003. Before the search started, decisions regarding the specific search strategy took place. A decision was made to start in Medline and proceed to
PubMed. Thereafter Cinahl and Cochrane Library were searched. The last database to be searched was PsychLit. A refreshment was held in the use of Boolean, quotation marks, and parentheses.

**PsychLit**

The first search in PsychLit was performed in PsycINFO Field Search (abstracts) “New Fielded Search”. This database could only process a maximum of three keywords at the time, which meant that a limited amount of keywords could be combined. Looking at the limited number of articles concerning physiotherapy (328 hits) combined with low back pain (3 hits) this was not a limitation for this research. The PsycINFO Quick Search (abstracts) “New Quick Search” did not register the parentheses or the quotation marks. That had a consequence for the word “physical therapy”. The word was read as “physical AND therapy” and gave irrelevant articles. Use was made of physiotherapy, which gave the same number of hits as in PsycINFO.

More selection meetings concerning the in- and exclusion criteria were held than first planned. This was due to lack of information. Not all the criteria were mentioned in the 160 abstracts/titles that were looked through, which became clearer throughout the selection phase. When the first selection was finished, it was discussed and the members agreed that inconsistent methods had been used to solve this problem. A decision was made to do it all over again the next day. All the abstract/titles were looked through again and were preliminary included if they had two or less unsure criteria. There was a new in-/exclusion meeting when the full-text articles had been found. When the original articles did not say anything about the unsure criteria they were excluded.

A meeting with one of the project’s supervisor resulted in a decision to include an article when the role of the physiotherapist was unsure as long as the intervention was a typical physiotherapeutic intervention.

In the beginning 1 article that did fulfil the criterion concerning “chronic” was included. This article was included at first because it was thought to have important information regarding physiotherapeutic interventions for chronic LBP when psychological stress is given consideration. When the whole article was read at a later stage, the article was excluded because it did not consider stress in the intervention.

One article was excluded because the intervention was performed by a physiatrist. The members of this research did not know the word physiatrist and as the dictionaries used did not give an answer this article had to be excluded. It was later found to be an American word for a physiotherapist.

A lot of researches concerning chronic LBP were found and many of these included a multidisciplinary team approach. Such an approach included professionals like psychologists, physiotherapists, dieticians, occupational therapist, doctors and nurses. When reading these articles it became clear that the role and influence of the physiotherapists alone was not possible to recognise. Furthermore there was no information about the physiotherapy intervention, treatment time, frequency or duration in these articles, and they were therefore excluded from this study.

The German library Deutsche Zentralbibliothek für Medizin in Köln was used but not mentioned in the project plan. This library was found through the Medizinische Bibliothek, Universitätsklinikum Aachen in Germany and was of great help to find the full-text articles.

### 4.1.3. Decision moment concerning structured interview

The structured interview was not included in this research because more than 5 articles were found and included in the current study.
4.1.4. Methodological quality of the articles

Before the methodological quality of the articles was evaluated, 3 new criteria were made. As it was stated in the project plan that the articles should be of high international quality, a decision was made to include articles that received more than 5 points on the PEDro scale. In order to have two groups for a comparison of the outcomes, the articles had to be divided into the stress group or the no stress group. When a study did not clearly belong to either one of them, it had to be excluded. Due to the fact that the articles had to have some similarities, the outcomes of the original studies had to consider patient variables in the outcome.

Even though the PEDro scale is recommended for RCT’s a choice was made to use it for the quasi-experiments as well. The only difference between these two research designs is that either a comparison group is missing or that the groups were not randomised in the quasi-experiment. A decision was made to use the PEDro scale for this research type as well because they considered interventions in the current study.

Either two or three assessors evaluated all articles, with the exception of one. When the assessors did not agree or reach consensus, a third assessor evaluated the articles. The discussions that resulted from this meeting can be seen in appendix VII. The one article that was evaluated by one person only was written in German, which is only spoken and written by one of the authors.

4.1.5. Data extraction

The number and age of the subjects, and pain duration were added to the original data extraction form because they were seen as a help to judge the studies performed. Without this information important factors concerning the relevance and the comparability of the studies would have been overlooked. The design of the studies was also extracted due to the methodological quality evaluation that took place later during the current study. The outcome was added to the original data extraction form because it was necessary as additional information. This information was of value when comparing it to the results of this research.

The guidelines needed a different data extraction. These articles did not consider a specific intervention or the process performed, but concerned evidence based interventions alone. A decision was made to extract their statements/conclusions concerning (co-) interventions. The data extracted could not be directly compared to the other articles due to the available information and the different forms of study that had been done.
4.2. Interpretations of the results

The data-extraction and data-analysis and data synthesis belonging to the results will be addressed first. Thereafter a discussion concerning the interventions used, the total treatment time, the frequency, the duration of each treatment session and the co-interventions will be presented. The guidelines will be discussed as an own part thereafter. At the end therapy strategies in the articles considering stress will be given attention.

4.2.1. Data extraction

It was difficult to extract the co-interventions from the selected articles. There had been no definition concerning this term at a pervious moment of the research and it was not always clear if an intervention was a co-intervention or not.

Extraction of the outcomes of the articles was also difficult. There was a lot of information and different variables that were measured. Extracting only the main outcome and the authors’ conclusion solved this problem.

In the filled in data extraction form it was not possible to see whether the articles had included the component of stress and given this consideration in the approach. A decision was made to include an article in the group giving psychological stress consideration if:
- The article had a questionnaire at the beginning and at the end of the research, in which the psychological aspect was taken into consideration.
- The article stated that the physiotherapist used cognitive behavioural principles.

When an article compared several interventions in its study, all the interventions were used in this research. That means that even though only a limited amount of articles were included, the data extraction contained more than one intervention per article. The consequence was that the results were not equally based upon the seven articles.

4.2.2. Data-analysis and data-synthesis

The decision to include articles in this research was not dependent on the purpose or the outcome of the studies, nor the intervention chosen. The interest was appointed to the process of the approach. Due to differences in the purpose, outcome and interventions the baseline variables were not the same and it was not possible to make statistical comparisons.

It was difficult to compare the results from this research, whether it was concerning time, frequency, duration or co-intervention, because the articles included did not entail the same interventions. It was also difficult due to the fact that they focused on the outcome and not the process.

The co-interventions as presented by Mannion (1999) were not discussed as a part of the result because they were only reported in 39% of the subjects and looked upon as bias in the research.

There was a limited amount of articles used in this research. The stress group was based on 7 interventions presented in 4 articles and the no stress group was based on 4 interventions presented in 2 articles. 1 guideline was included in the stress group and 1 guideline was included in the no stress group. The relatively low number of interventions and articles may influence the credibility of the results and may not present the overall picture.
4.3.3. Discussion of Interventions

All the interventions had included one or more forms of active therapies. Conventional physiotherapy (27) from the no stress group focused less on the active exercises and gave only a few exercises on the treatment table. In the stress group, Frost (1998) included a discussion of relevant topics in the back school while the advice intervention included 4 exercises and encouragement to perform these regularly. All the other 3 interventions in the no stress group and the other 6 interventions stress group had their main focus on some form of exercise therapy.

In the stress group some interventions were especially directed to the stress component. The back school by Hodselmann (2001) included an explanation of the functional overload mechanism and the influence of mental and social factors on the functional health status. The back school of Frost (1998) aimed to encourage a positive attitude and a positive return to activities. In the standard exercise program by Friedrich (1998) a motivation program considered stress. See 4.2.7. Discussions of co-interventions for further discussion.

Interesting to notice was that the interventions in the stress group described by Mannion (1999) did not include any interventions especially directed towards the stress component. For Mannion’s own comment about this see 4.2.9. Therapy strategies in the articles given consideration to stress.

In the no stress group information was included in one of the interventions. The self-exercising by walking of Torstensen (1998) gave patient information on the importance of self-exercising and activity of the back.

Back school was the intervention most often performed and was included 3 times in the stress group and not at all in the no stress group. A standard exercise program was performed in both the stress and no stress group but had an addition of a motivation program in the stress group. Conventional physiotherapy/physiotherapy was also performed in both groups.

To summaries one may say that exercise therapy is the main intervention for chronic non-specific LBP whether psychological factors have been given consideration or not. When giving considering to stress advice and education are often included.

4.2.4. Discussion of Time

Hodselmans (2001) gave all the results from his research in means and standard deviation. In order to use this information in the present study, the authors re-calculated the time themselves. The mean time was given in months to be 3.7±2.1. The calculation was performed from the number 3.7 months and suggested that one month was 30 days: 3 months (12 weeks) +10/30*7. This resulted in 12 weeks + 21 days (3 weeks) as became 15 weeks.

There was a big variation in range within both groups (stress versus no stress). Yet the stress group had a bigger variety (11 compared to 8). The stress group also had the longest lasting time of 15 weeks. This appeared in one occasion and was 14.29% of the result.

The variances in the stress group were from the smallest to the greatest 1, 16, 49, or 121 and in the no stress group 1 or 9. The high number of 121 in the stress group was due to two missing data. The variance of 1 represents 12 weeks in both groups.

Both the stress- and the no stress group had three treatments that lasted 12 weeks and one that lasted 4 weeks. One may therefore say that there was a tendency toward performing the treatment over a 12-week period (75% in no stress- and 42.86% in stress group). Although a time of 12 weeks appeared in less than 50% of the results in the stress group the mean -11- was very close to 12. The no stress group had higher percent (75%) of times of 12 weeks but here the mean was slightly lower -10- than the stress group.

The median and mode were 12 in both groups. It can be summarised that there was no significant difference in the time used between the two groups and that 12 weeks was the most common.
4.2.5. Discussion of Frequency

The highest frequency in the stress group was 2.5 and this appeared in 28.57% of the occasions. The highest frequency in the no stress group was 3 and this appeared in 75% of the occasions. Interesting was that the stress group had the lowest frequency of 0.8 and the no stress group the highest frequency of 3. The lowest frequency in the no stress group was 2.5.

There were small variances in the frequency used. 0.8 had the greatest variance with 0.17.

The most striking results were the mean of 2.9 in the no stress group and 2.0 in the stress group and the mode and median which were 3 in the no stress group and 2 in the stress group. This showed a tendency to a lower frequency if stress is given consideration compared to if this was not the case.

4.2.6. Discussion of Duration

The stress group had almost the double range compare to the no stress group (65 versus 35 minutes). When looking at the duration the stress group had the longest session of 90 minutes while the longest duration within the no stress group was 60 minutes. Both groups had one treatment lasting 25 min.

This all suggests great differences between the two groups, yet the mean, mode and median were quite similar. The mode and median were the same within both groups -60- and the mean was 55.86 in the stress group and 51.30 in the no stress group.

The reason for these first widely spread results, yet very similar mean, mode, and median was clearer when looking at the percent and variance. In the stress group 60 minutes equalled a percent of 42.86 compared to 75% in the no stress group. The stress group had four other results were two were below 60 minutes of duration and two were above. The no stress group had only one session below 60 minutes. In the no stress group the shortest duration was 25 minutes and equalled a variance of 172.92. In the stress group the longest and shortest session had a variance of respectively 166.51 and 136.05.

The duration of 25 minutes in the no stress group lowers the mean, but in the stress group the great variance of short and long duration equals one another out to some extent. That explains why there were great differences in the duration between the groups, yet keeping the means as good as equal.

It can be summarised that there was a tendency to treat for 60 minutes in both groups, although the stress group showed a wider range of differences.

4.2.7. Discussion of Co-interventions

Two approaches included co-intervention and they both belonged to the stress group. One co-intervention concerned motivation sessions and was strongly focused on the patients’ psychological aspects. This co-intervention was performed together with a standard exercise program. It included counselling and information strategies, reinforcement techniques and the patient was asked to make an exercise diary, reporting all the exercises they had done. The article stated that the combined exercise and motivation program was demonstrated to be significantly more effective than the standard exercise program alone, as measured by the decrease in the degrees of disability and pain (6).

The other co-intervention was a fitness program. This co-intervention was performed together with a back school and advice and did also focus on the patients’ psychological aspects. The patients got the advice to imagine themselves as sportsmen that needed to get back to their previous level, they got maximal encouragement and positive reinforcement, pain behaviour was not rewarded, and a lot of information was given. The patients should also record the number of repetitions achieved in each training session. From this information it can be said that co-interventions gave the accent to psychological aspects of the patients and were more common when psychological stress was taken into consideration.
4.2.8. Discussion of the Guidelines

One guideline belonged to the No stress group (23), the other one to the Stress group (2). The interventions being accounted for in the guidelines were quite similar. Both articles considered massage, electrotherapy (including TENS), biofeedback, traction, exercise therapy and ultrasound. Interesting was that patient education was only included in the KNGF-richtlijn (2) and considered to be of major importance for patients with chronic LBP. Behaviour therapy was also only included in the KNGF-richtlijn. The Philadelphia Panel (23) consider thermal therapy in addition to the above mentioned interventions.

Both guidelines stated that it was good/strong evidence of clinical important benefit of therapeutic exercise for patients with chronic non-specific LBP. The KNGF-richtlijn also stated that it was not clear which exercises are best.

4.3.8. Therapy strategies in the articles giving consideration to stress

The articles used in the present study recognised and considered stress in five out of seven cases. Coping strategies, different approaches and a model, the role of the physiotherapist, and specific information emphasised in the five articles will be given attention.

The patients active- or passive coping strategies and locus of control are considered to be of importance when dealing with chronic non-specific low back pain. It was interesting to see that three articles considered the coping strategies (2,6,16) and that three articles (2,6,11) considered the locus of control of the subjects involved.

There were used different approaches to the subjects in the researches performed. Cognitive behaviour principles were applied in one article (7). Another article focused on functional capacity and functional health status (11). Self-efficacy beliefs were taken into consideration in Mannion (1999). Bekkering (2001) reported mention the cognitive approach but reported that the operant approach was best suited for the physiotherapist's professional domain.

The model taken into use was only specified in Bekkering (2001). They emphasised the biopsychosocial model.

The physiotherapist was given a coaching (2), advising (2,7,16), and educating role (2,6,11,16) in the five articles considering psychological stress. Reinforcement techniques were used in one article (6,7).

Friedrich (1998) reported important findings concerning the therapists’ perceptions of own teaching:

“The therapist certainly play a crucial role in implementing the motivation program described in our study. However, it has been showed the therapists’ teaching behaviours rarely correspond to their perceptions of their own teaching. Therefore, health care providers must be taught to manage adherence successfully and to enhance patients motivation.”

Bekkering (2001) emphasised the patient education model (Van der Burgt & Verhulst 1996). Interesting was that Friedrich (1998) wrote indirectly about the same model:

“The therapist-patient relationship influences the patient motivation on several levels, including the psychological one. For physical therapy to be successful the therapist must be able to motivate and the patient must be open to the motivational efforts of the therapist. Consequently, compliance is more likely when the therapist gives clear instructions and when the patient understands the rational and benefits of the prescribed regime. In contrast, non-compliance often arises from misunderstanding or forgetting the instructions given by the therapist.”
Frost (1998) emphasised the psychological involvement:
“Gentle exercises may encourage the individual to be cautious or think of themselves as disables and do not encourage patients to be more generally active. Often psychological processes are overlooked when treating low back pain although they are known to play a major role in the patients’ recovery. In contrast, the fitness program described enables participants to rediscover normal movement and aims at improving the individual’s confidence in their spine. It utilises cognitive behavioural principles and encouraged patients to improve their general fitness in order to return to their normal activities.”

Hodselmans (2001) placed chronic LBP and the improvement found in their research in psychological perspectives:
“Chronic low back pain is maintained by the interaction of physical, mental, and social factors. These factors are of equal importance in restoring balance. If physical, mental, and social factors are equally important treating patients with chronic non-specific LBP requires a multidimensional approach. The improvement (in the outcome) was not primarily attributable to physical training principles; rather, it was attributable more to improved reactions to signals of overload and to better insight into the balance between functional load and functional capacity.”

Friedrich (1998) compared a standard exercise program with a standard exercise- and motivation program and stated:
“It appears that the patients in the motivation group were more willing to adapt to the behaviour and lifestyle changes required by the treatment.”

Mannion (1999) believed to have found a structure reflecting the different psychological dimensions relevant to chronic LBP patients:
“Summarising the theoretical considerations and empirical findings, the four-factor structure- which distinguished between use of coping strategies, self-efficacy beliefs, fear-avoidance (appraisals), and psychological distress- seemed to accurately reflect the different psychological dimensions relevant to chronic LBP patients.”

Mannion (1999) also reported an interesting view concerning physiotherapeutic interventions and its influence on psychological variables:
“Interestingly, in the present study, non of the three therapies involved any psychological or cognitive behavioural interventions, yet various psychological variables (e.g., catastrophizing, fear-avoidance-beliefs, self-efficacy in controlling pain) showed positive changes. Perhaps these attributes are addressed inadvertently by active therapy programs, insofar as patients experience something quite different from their expectations (i.e., their being able to complete the prescribed exercises without harm) and thereby correct their irrational cognition and appraisals. It is also possible that patients readjust psychologically whenever pain is reduced - for any reason and regardless of the intervention method. Thus, active therapy programs appear to incorporate many of the positive benefits of cognitive-behavioural therapy, with additional advantage of serving to improve the general physical condition of the patient. Whether changes in the psychological profile and clinical status of the patient are more effectively reduced by purely psychological interventions than by active therapies is not known; to date -1997, no high quality RCT’s have been carried out to address this issue.”
4.3. Recommendations

Further research is necessary concerning the process and interventions used for chronic non-specific LBP patients if psychological stress is given consideration. Three aspects would be of great interest:

- What would the process and intervention(s) be in the daily practise for patients with chronic non-specific LBP if psychological stress is taken into consideration and if this is not the case?

- It would be of interest to perform two RCT’s concerning exercise therapy and chronic non-specific low back pain. One is giving consideration to stress and the another not. The aim of these researches should be to find out which process is the most effective for each of these groups. Comparing the results of these researches will reveal important information for the domain of physiotherapy.

- Also interesting would be to find out to which extent psychological stress in chronic non-specific LBP need to be addressed to have most effect. Is a standard exercise program enough, or should there be an extra education session added, or would multidisciplinary interventions be better, or would a purely psychological intervention be more effective?

A new graduation proposal was made and can be found in appendix VIII.
5. Conclusion

There is a small difference in choice of physiotherapeutic interventions related to chronic non-specific LBP if psychological stress is given consideration and if it is not. Different forms of exercise therapy are often used for patients with this complaint. If psychological stress is given consideration emphasis is also placed on advice and education. No significant difference exists between both groups regarding the total length of the treatment time and 12 weeks are most often used for both. There is a clear tendency to a lower frequency of treatment per week if stress is given consideration. The duration of each treatment session is most often 60 minutes in both groups. Co-interventions like motivation sessions and fitness programs are only present in the group giving consideration to stress.
Reference List

According to ICMJE; international Committee of Medical Journal Edition.


10. Hernandez-Reif M, Field T, Krashnegor, Theakson H. Lower Back Pain is reduced and Range Of Motion increased after massage therapy. Intern J. Neuroscience 2001;106;131-145


SOURCES FROM INTERNET


37. PEDro scale. Available at URL: www.cchs.usyd.edu.au/pedro/PEDro%20scale.doc

38. PICO model for Clinical Questions. Available at: URL: www.uic.edu/depts/lib/lhsp/resources/pico.shtml


40. The mediatheek at the library at the Fontys University of Higher Professional Education, Department of Physiotherapy. Available at URL: www.fontys.nl/mediatheek/bronnenbank/links.asp?catid=7&cattitle=Gezondheidszorg


*The three parts of the Mannion study (17,18,19) are put in chronological order due to its belonging together.

The Appendices contains 2 additional references.


#2 Roberts, P. Theoretical Models of Physiotherapy. Physiotherapy 1994 Jun;80(6); p.6-11
## Appendices

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Appendix I

0. PROJECT: LOCOMOTOR SYSTEM COMPLAINTS RELATED TO STRESS

0.1. Name of project:

Physiotherapeutic interventions for chronic non-specific low back pain taking psychological stress into consideration.

0.2. Participating students:

Grete T. Baarsen,
Cesilie Høstmælingen,
Ranveig Heier

Group E-mail: graduation-stress@gmx.net

0.3. Date and version number:

01.04.03

1. PROJECT LEADER/COMMISSIONER

1.1. Responsible Commissioner:

Marijke Moonen,
Peter van Burken

1.2. Supervisory teachers:

General Supervisor:
Eveline Wouters

Methodological Supervisor:
Marijke Moonen

2. DEFINITION OF THE PROBLEM

2.1. Background

Low back pain is a major health problem among populations in the western industrialised countries, and a major cause of medical expenses, absenteeism and disablement (1). Due to this fact there have been many researches to identify the cause of this problem (2). Some predictors have been recognised stepwise to be: pain, psychological distress, fear avoidance beliefs, muscle activation levels, lumbar range of motion and gender (3).

Stress is one of the natural responses of the human being and can be positive and beneficial or negative and detrimental. Yet there are individual differences to how this stress is dealt with. As a result some individuals will experience negative stress while others will remain unaffected in similar situations. Stress being present for a long period of time may lead to a vicious circle in the body. It can cause negative emotional responses that influence the body in such a way that biological or behavioural changes appear and these changes may in turn affect the emotional response (2).

There is increasing evidence of the role of psychological factors in the treatment of chronic back pain (4). Therefore it is crucial that physiotherapists take these factors into consideration when dealing with these patients. Several different treatment possibilities exist to the problem of chronic non-specific
low back pain, but it not clear if there is a difference in the physiotherapeutic interventions used if stress is given consideration and if not.

2.2 Problem definition

There exists an uncertainty concerning the difference in physiotherapy treatment of chronic non-specific low back pain if psychological stress is given consideration and if it is not.

2.3 Main question

Is there a difference in physiotherapeutic interventions related to chronic non-specific low back pain if psychological stress is given consideration and if it is not?

Sub-questions:

1. Is there a difference and what is this difference in time used for treating chronic non-specific low back pain if psychological stress is given consideration and if it is not?
2. Is there a difference and what is this difference in frequency used for treating chronic non-specific low back pain if psychological stress is given consideration and if it is not?
3. Is there a difference and what is this difference in duration used for treating chronic non-specific low back pain if psychological stress is given consideration and if it is not?
4. Is there a difference and what is this difference in co-interventions used for treating chronic non-specific low back pain if psychological stress is given consideration and if it is not?

2.4. Working definitions:

Chronic: Referring to a health related state lasting for a long time. The US National Centre for Health Statistics defines a chronic condition as one of three months duration or longer (5).

Non-specific low back pain: Low back pain not attributed to a recognisable pathology (such as infection, tumour, osteoporosis, rheumatoid arthritis, fractures, or inflammation) (6).

Stress: In psychology and biology, any strain or interference that disturbs the functioning of an organism. The human being responds to physical or psychological stress with a combination of psychic and psychological defences. If the stress is too powerful, or the defences inadequate a psychosomatic or other mental disorder may be the result (7).

Psychological stress: Psychological stimuli of some kind exceeding the limits of strain, triggering a stress reaction, may in time lead to somatic manifestations.

Intervention: An action or ministration that produces an effect that is intended to alter the course of a pathologic process [L inter ventio, coming between] (5).

Time: The total length of a treatment period.

Frequency: The amount of treatments per week.

Duration: The total length of one treatment.

3. OBJECTIVES

A report dealing with the physiotherapeutic interventions related to chronic non-specific low back pain taking the psychological stress into consideration.

1. A comparison of the physiotherapeutic (co-) interventions used in relation to chronic non-specific low back pain if psychological stress is given consideration and if it is not.
2. Alternative: A structured interview will be made and tested if less than five articles are included in the literature research (after the three phases).
4. PROJECT PRODUCTS

1. A research report.
3. Title of the project and a short summary of the content of the project.
4. Oral presentation.

5. METHOD

Literature research:

Databases:
Psychlitt – Peter van Burken will be contacted. May also enter this database from the university of Maastricht.

Libraries:
Norway
Library at Høyskolen i Trondheim.

Holland
Fontys’ library, Eindhoven.
Library of the free university of Amsterdam/Den Haag (NIWI).
Library of Utrecht.

Germany
Medizinische Bibliotek, Universitätsklinikum Aachen.

Key figures:
Peter van Burken, physiotherapist and psychologist
Herman Nederhof, physiotherapist with basis in psychosomatics

Other sources:
Stichting Flow: www.stichting-flow.nl and secretariaat@stichting-flow.nl

Search strategies:
Keywords and Mesh Headings will be used in a free combination within one language from the list under. Clinical queries within therapy, both sensitivity and specificity will be used. Boolean (AND, OR, NOT) and parentheses will also be taken into use to choose which words that should be processed first and to make two or more words a term.

Keywords:
Norwegian key words:

Dutch key words:
English key words:

German keywords:

Inclusion criteria:

Information:
- From the 1995 and newer

Types of participants:
- With non-specific low back pain for more than 12 weeks (chronic)

Types of interventions:
- Physiotherapeutic intervention
- Treating chronic non-specific low back pain

Language:
- Norwegian, Dutch, German, and English

Exclusion criteria:

Types of information:
- Case studies

Types of participants:
- Specific low back pain
- Acute non-specific low back pain (less than 12 weeks)

Types of interventions:
- Not used by a physiotherapist

Language:
- Other languages than Norwegian, Dutch, German, and English

Selection of relevant literature:

First phase:
Each group member is searching for interventions used by physiotherapists for chronic non-specific low back pain when psychological stress is recognised. Other articles concerning physiotherapeutic interventions for chronic non-specific low back pain which do not recognise the psychological stress will be searched for and used for comparison.
From the abstract and /or titles, using the in- and exclusion criteria mentioned above, the information concerning interventions is selected to be useful or not in this study. All the pre-selected titles and abstracts will be compared.
If more information is found about the same intervention these will be compared and the information likely to be most evidence-based will be selected. Disagreement regarding the information selected will be solved by consensus. If consensus is not reached, the majority decides which information to include.
Second phase:
The full text of information will be sought after at their location in libraries listed above.

Third phase:
The references will be checked to find any overlooked information. New information found in this phase must go through first- and second phase to be included.

Assessment of found literature:
The PEDro (methodological validity assessment) Scale will be used.

Data extraction:
These are the data’s to be extracted.
- Physiotherapeutic (co-) intervention(s)
- Frequency of treatments per week
- Time of total treatment
- Duration of each treatment

Data-analysis and data-synthesis:
The data from the comparison will be visualised in tables/diagrams.

Alternative:
A structured interview will be made and tested if less than five articles are included in the literature research (after the three phases).

Method:
One group member attends the course concerning structured interview at Fontys 27.02 2003. After the third phase is finished the articles will be counted and a decision will be made whether to include the structured interview or not. If a structured interview is included in this project, it will be based on information from the course and two research articles found on the Internet. Structured interviews must have been used in the researches from the Internet research articles. The newly built structured interview is tested on five physiotherapists. The outcomes will be organised and compared with the results from the literature research.

6. MANAGEMENTS ASPECTS

6.1. Quality requirements

6.1.1. Boundary conditions
1. The product and the report mirror the fact that each student has worked about 550 hours on the project.
2. The product should always be accomplished by “research”:
   a) A literature research. This ought to be guided for the development of the product and must be demonstrated in the report.
   b) Used literature is relevant and of recent (not older than the 1990) and high (international) quality when found, and should, as much as possible, be evidence based.
3. The product should always be accomplished via “pre-testing” of concepts:
   a) In the case of a research project, the developed research instruments (questionnaire, interview and so on) are tested first as a concept before using them in the definitive data collection.
   b) In the case of a developmental project, the product is ‘pre-tested’ before the product is finished
in it’s definite version (as far as possible and wished be the commissioner).

4. The product has an innovative character and has a physiotherapeutic surplus value.

5. The report should meet the following demands:
   a) Form: lay-out: A4-format (use Word 97); use font Times New Roman; Character size in text: 11; character size in tables and figures etc.: 8-10.
   b) Volume of report = about 40-60 pages, excluding appendices
   c) Volume of report with separate product = about 25-30 pages, excluding appendices
   d) Make sure you correct typing errors and number the pages. It is up to you if you want to print one-sided or double-sided.

6.1.2. Design Limitations
The articles concerning physiotherapeutic (co-) intervention may not draw a clear line or contain no shift between the cases where psychological stress is given consideration and when not. Therefore it may be difficult to compare and draw conclusions concerning this project’s main question.

6.1.3. Functional Demands
The research will be written in a way that later graduates can use the evidence found to build a new project. A proposal will be made at the end of this project.

6.1.4. Operational Demands
1. The result of the project will be:
   A comparison of stress- and non-stress related physiotherapeutic interventions

2. British English will be used in the report. High school level with citations and professional terms left as they are.

6.2. Timetable

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<td>Week 2</td>
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<td>Week 3</td>
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<td>Week 5</td>
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<td>Week 6</td>
<td>28.04.03 to 02.05.03</td>
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<td>Week 10</td>
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<td>Week 11</td>
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<td>Week 12</td>
<td>09.06.03 to 13.06.03</td>
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<th>Activity:</th>
<th>Name:</th>
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<tbody>
<tr>
<td>DESIGN PHASE</td>
<td>Pre-search</td>
<td>Ramanan, Senthir, Grete, Cesilie, Ranveig</td>
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<tr>
<td>23.12.02-05.01.03</td>
<td>Christmas holiday</td>
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<tr>
<td>16.01.03</td>
<td>Finish of Initiation/Definition Phase. Hand in the first draft of our project plan</td>
<td>Ramanan, Senthir, Grete, Cesilie, Ranveig</td>
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<tr>
<td>Date/Week:</td>
<td>Activity:</td>
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<tr>
<td>23.01.03</td>
<td>Meeting with general supervisor (Eveline) to discuss the first draft of our project plan</td>
<td>Grete, Ramanan, Senthir</td>
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<tr>
<td>27.01.03</td>
<td>Hand in second draft of project plan</td>
<td>Ramanan, Senthir, Grete, Ranveig</td>
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<tr>
<td>30.01.03</td>
<td>Hand in the 3rd version of the project plan</td>
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<tr>
<td>30.01.03</td>
<td>Course concerning different types of research</td>
<td>Grete</td>
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<tr>
<td>13.02.03</td>
<td>Meeting with Eveline to discuss the development of the project</td>
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</tr>
<tr>
<td>13.02.03</td>
<td>Computer course in data-base searching</td>
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<tr>
<td>27.02.03</td>
<td>Course concerning structured interviews</td>
<td>Grete</td>
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<tr>
<td>13.03.03</td>
<td>Meeting with Eveline to discuss the development of our project</td>
<td>Grete</td>
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<td>31.01.03-01.04.03</td>
<td>Revisions of the project plan and the formal approval to continue</td>
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**REALISATION PHASE**

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<td>24.03.03</td>
<td>Revise the project plan. Deliver version 4</td>
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<td>25.03.03</td>
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<td>26.03.03</td>
<td>Revise project plan version 4</td>
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<tr>
<td>27.03.03</td>
<td>Meeting with Eveline</td>
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<td>27.03.03</td>
<td>Revise version 5</td>
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<td>31.03.03</td>
<td>Revise version 6</td>
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<tr>
<td>01.04.03</td>
<td>Meeting with Eveline and Marijke</td>
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<tr>
<td>01.04.03</td>
<td>Revise version 7</td>
</tr>
<tr>
<td>01.04.03</td>
<td><strong>Deadline:</strong> Deliver the final project plan to general- and methodological supervisor and graduation project coordinator</td>
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<td></td>
<td>Internet research Norwegian sites</td>
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<td>Internet research Dutch sites</td>
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<td>Internet research German sites</td>
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<td>Internet research English sites</td>
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<td>Research books and magazines in the study-landscape for interventions for chronic non-specific low back pain</td>
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<tr>
<td></td>
<td>Data collection: Phase 1 and selection of studies being suitable for phase 2 using the in- and exclusion criteria</td>
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<td>Part of Phase 1: Contact key figures and other sources</td>
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<td>Meeting with Eveline</td>
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<td>Checking the availability of the selected studies in the different libraries that we have selected</td>
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<tr>
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<td>Visit to library(s) to find the full text articles that have been</td>
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<tr>
<td><strong>Date/Week:</strong></td>
<td><strong>Activity:</strong></td>
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<tr>
<td>---------------</td>
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</tr>
<tr>
<td></td>
<td>selected for our study</td>
</tr>
<tr>
<td></td>
<td>Assessment of found literature: Check references for overlooked information in earlier search phases and evaluate them</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
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<tr>
<td></td>
<td>Visit to library(s) to find the full text articles found from the references</td>
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<tr>
<td></td>
<td>Assessment of found literature: Evaluation of methodological quality of collected full text studies, using the PEDRO scale</td>
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<tr>
<td></td>
<td>Data-extraction</td>
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<tr>
<td>17.04.03</td>
<td>Meeting with Marijke</td>
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<td>Decision moment: to include interview?</td>
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<td>18.04.03</td>
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<td>Data-analysis: comparison of physiotherapeutic (co-)interventions for chronic non-specific low back pain</td>
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<td></td>
<td>Updating and writing of reference list</td>
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<td><strong>Week 6</strong></td>
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<td>28.04.03-11.05.03</td>
<td>May holiday</td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td></td>
</tr>
<tr>
<td>08.05.03</td>
<td>Meeting with Eveline</td>
</tr>
<tr>
<td></td>
<td>Data-analysis continue</td>
</tr>
<tr>
<td><strong>Week 8</strong></td>
<td></td>
</tr>
<tr>
<td>13.05.03 and 15.05.03</td>
<td>Meeting with Eveline and Marijke</td>
</tr>
<tr>
<td></td>
<td>Continuation completion end product</td>
</tr>
<tr>
<td></td>
<td>Continuation writing the individual reports</td>
</tr>
<tr>
<td></td>
<td>Write the title and a short description of our project on a floppy disc</td>
</tr>
<tr>
<td><strong>Week 9</strong></td>
<td><strong>Deadline:</strong> Deliver title and short description on floppy disc</td>
</tr>
<tr>
<td>22.05.03, before 12 a.m.</td>
<td>Meeting with Eveline and Marijke</td>
</tr>
<tr>
<td></td>
<td>Correction of the written report after feedback</td>
</tr>
<tr>
<td><strong>Week 10</strong></td>
<td></td>
</tr>
<tr>
<td>27.05.03, before 12 a.m.</td>
<td><strong>Deadline:</strong> Deliver end product reports to graduation project coordinator</td>
</tr>
<tr>
<td>Date/Week:</td>
<td>Activity:</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>Work on the individual reports</td>
</tr>
<tr>
<td>29.05.03</td>
<td>Day off school</td>
</tr>
<tr>
<td><strong>Week 11</strong></td>
<td>Finish the individual reports</td>
</tr>
<tr>
<td><strong>05.06.03, before 12 p.m.</strong></td>
<td><strong>Deadline:</strong> Deliver individual report to general supervisor and project coordinator</td>
</tr>
<tr>
<td></td>
<td>Rehearsal to the oral presentation</td>
</tr>
<tr>
<td>02.06.03-10.06.03</td>
<td>Make an appointment for a presentation-rehearsal with the general supervisor</td>
</tr>
<tr>
<td>05.06.03-10.06.03</td>
<td>Make individual appointments for discussions with our general supervisor</td>
</tr>
<tr>
<td><strong>Week 12</strong></td>
<td></td>
</tr>
<tr>
<td>09.06.03</td>
<td>Day off school</td>
</tr>
<tr>
<td>10.06.03</td>
<td>Rehearsal to the oral presentation with a Dutch group</td>
</tr>
<tr>
<td>10.06.03</td>
<td>Consultation between general and methodological supervisor and the graduation coordinator</td>
</tr>
<tr>
<td><strong>10.06.03, before 5.00 p.m.</strong></td>
<td>Supervisors deliver grades of the end products to the graduation project coordinator</td>
</tr>
<tr>
<td></td>
<td>General supervisor will announce participation in the presentations or not</td>
</tr>
<tr>
<td>11.06.03</td>
<td>Individual appointments with General Supervisor</td>
</tr>
<tr>
<td>12.06.03</td>
<td>Presentations of the graduation projects</td>
</tr>
</tbody>
</table>

### 6.3 Supervision

There have been made no agreements with the responsible commissioners Marijke Moonen and Peter van Burken concerning supervision, tasks, invested powers and/or other matters.

### 6.4 Estimated Costs:

Including:
- Copying
- Original articles
- Printing
- Travelling costs
- Phone calls
- “Thank you” presents

= Expected costs approximately 400, - Euro.
7. PROVISIONAL LITERATURE

7. CD ROM Britannica 2002
Appendix II

Normal versus abnormal course:
A long episode of LBP does not necessarily imply that an unfavourable prognosis. But when an episode of LBP is associated with long lasting disabilities and participation prognosis is poor. Because of a favourable natural history 80% to 90% of the patients will recover and be back to work within 6 to 8 weeks (27). In a normal course activities and participation gradually increase over time, towards the level prior to the LBP episode, and the symptoms decrease. By this it is meant that the LBP is not gone but is no longer restricting normal activities and participation. When the activity and participation problems are not decreasing with time and persists on the same level or increase it is considered to be an abnormal course. According to the Dutch Physiotherapy Guidelines for Low Back Pain, an abnormal course is defined as when activities and participation have not increased within three weeks (1).

Impairment, disability, handicap:
Impairment is manifestations of a disorder referring to a body structure or physiological function. This can be decreased muscle strength, pain or fear of movement. Disabilities refers to problems with performance of activities, like bending or walking. Participation problems refer to problems the individual may have in its social life. (The participational problems were earlier refered to as handicap). This type of problems are work, family and hobbies (1).

Self-efficacy:
According to Bandura, learned expectations about the probability of success in given situations; a persons expectations of success in a given situation may be enough to create that success and even to blunt the impact of minor failures (1). 

Reinforcement techniques:
A stimulus event that increases the probability that the response that immediately preceded it will occure again. Negative reinforcer an unpleasant stimulus, such as pain. The removal of a negative reinforcer following some response is likely to strengthen the probability of that response recurring. The process of strengthening behaviour by following it with the removal of a negative reinforcer is called the negative reinforcer. A positive reinforcer on the other hand is a stimulus that strengthens a response if it follows the response. It can be compared to a reward. To present this positive reinforcement after a response is called positive reinforcement (2).

Cognitive therapy approach:
Cognitive therapy approach to therapy tries to change some of the patient’s habitual ways of thinking. It is related to the behaviour therapy because it regards thought patterns as a form of behaviour (4).

Operant (approach) conditioning:
Operant conditioning is a psychologic approach. The aim of the approach is to change the patient’s behaviour by reinforcing a wanted behaviour. By this it is meant that a reinforcement, presumably a positive one, is given when the patient are behaving in the wished manner. This can be if the patient is not displaying any pain behaviour, he will be rewarded by the physiotherapist for trying to do a specific exercise. What has to be learned is the relationship between the response and the reinforce (classical conditioning). What has to be learned here by the individual is that the reinforcement or specific response is the result of the specific action performed (4).

The biopsychosocial model:
The holistic model is based upon the philosophy that underneath all fragmented parts lies a whole being greater than all the separate parts. This implies the whole person, including the mental and social aspects, not solely the disease. The bio-psychosocial model has recognised this and separates the human into three different parts: a biologic being, a psychological being and a social being. All these inter-relate to form a whole human (#2pennie roberts). Biopsychosocial factors in particular are supposed to become more important in the transition from acute to chronic and in chronic low back pain (1). In the bio-psychosocial perspective LBP is the result of the interaction between biological, psychological and social factors (1).
Appendix III

The Dutch, Norwegian, German, and English search were performed in the same way. The Dutch and English search are written down as examples:

Medline April 2003
The first search included all the search words and use was made of advanced search with a cross on “human” and on “Dutch”:
(behandeling OR therapie OR oefentherapie OR techniek) AND fysiotherapie AND (“lage rugklachten” OR lumbago) AND aspecifiek AND chronisch AND (stress OR psychosomatisch OR psychosociaal)
This gave 0 hits.

The search was expanded with putting a cross on “Also search within the full text of the articles” and “Also search for related words”. This gave 0 hits.

Then all the words concerning stress were excluded still no results. Deleting the words for chronic and non-specific also gave 0 hits. The search started from the other end:
Crosses were put on “human”, “Dutch”, and on “expander”. This gave 131583 hits.

(Dutch OR Holland OR Nederland OR Nederlands OR Netherlands)
This gave 7015 hits.

The next search:
(Dutch OR Holland OR Nederland OR Nederlands OR Netherlands) AND (“physical therapy” OR physiotherapy OR fysiotherapie) AND (“lage rugklachten OR lumbago OR “low back pain”)
This gave 35 hits. 4 abstracts of interest were selected.
Different MeSH were used without giving other abstracts than the ones already found.

Pubmed April 2003
The same strategy was used. All the words for Dutch gave 6932 hits. Adding the words concerning physiotherapy gave 112 hits. Combined with the words for low back pain gave six hits. Three abstracts of interest were selected but one was already selected from Medline. To be sure that no abstracts of interest were missed the 112 hits were also looked through with no more selections. Different MeSH were used without giving other abstracts than the ones already found.

Cinahl April 2003
(Dutch OR Holland OR Nederland OR Nederlands OR Netherlands) AND (“physical therapy” OR physiotherapy OR fysiotherapie) AND (“lage rugklachten OR lumbago OR “low back pain”)
This gave 49 hits. 12 abstracts of interest were selected. Different Mesh were used without giving other abstracts than the ones already found.

Cochrane Library April 2003
fysiotherapie
This gave 37 hits. 0 of interest.

Mesh used in all the searches

The English search was performed with the same search strategy as the Dutch, Norwegian, and German search but without language limits:

Medline April 2003
(physiotherapy OR physical therapy) AND “chronic low back pain”
This gave 116 hits.

(physiotherapy OR physical therapy) AND “chronic low back pain” AND (treatment OR therapy OR intervention)
This gave 79 hits. 8 abstracts of interest where selected.

(behaviour OR stress OR psychology) were added and this gave 4 hits. 2 abstracts of interest were selected.

(physiotherapy OR "physical therapy") AND ("chronic low back pain") AND (treatment OR therapy OR intervention) AND (behavior OR stress OR psychology)
This gave 18 hits. 2 abstracts of interest were selected.

This gave 60 hits. 18 abstracts of interest were selected.

(Pubmed April 2003)
Words for physiotherapy gave 2776 hits. Chronic low back pain and lumbago gave 5784 hits. Combining these two gave 66 hits. From this four articles of interest were selected.
(stress OR psychosocial OR psychosomatic OR biopsychosocial OR psychology OR behaviour OR behavior OR patient information) were added and this gave 19 hits. No abstracts were selected.

This gave 80 hits. 1 abstract of interest was selected.

Clinical Queries were used in the category therapy with the search words: “chronic low back pain” AND (physiotherapy OR “physical therapy”):
- Sensitivity: 58 hits and 1 abstract of interest selected.
- Specificity: 8 hits and 0 abstract selected.

(Cinahl April 2003)
The Cinahl search in English was performed in the same way as the English search in Medline.

(Cochrane Library April 2003)
physiotherapy
This gave 1514 hits.

“physical therapy”
This gave 2262 hits.

“chronic low back pain”
This gave 310 hits.

(physiotherapy OR “physical therapy”) AND “chronic low back pain”
This gave 79 hits. 5 abstracts/articles of interest were selected.

(Physical therapy (speciality) single term (MeSH))
This gave 10 hits. 0 of interest.

(PsychLit April 2003)
The first search was *in PsychINFO Field Search (abstracts) “New Fielded Search”*. Physiotherapy This gave 328 hits. 0 selected.

Physiotherapy AND low back pain
This gave 3 hits. 0 selected.

Physiotherapy OR Physical therapy AND low back pain
This gave 24 hits. 2 abstracts of interest were selected.

Physiotherapy OR Physical therapy AND lumbago
This gave 1 hit. 0 selected.

Physiotherapy OR Physical therapy AND backache
This gave 1 hit. 0 selected.

*PsycINFO Quick Search (abstracts) “New Quick Search”*
Physiotherapy This gave 328 hits.

Physiotherapy AND low back pain
This gave 13 hits. 1 abstract of interest was selected.

Physiotherapy AND lumbago
This gave 0 hits.

Physiotherapy AND backpain
This gave 17 hits. 0 selected.

*PsycARTICLES Search (full-text articles) “PsycArticles Search”*
Physiotherapy
This gave 0 hits!

Low back pain
This gave 18 hits. 1 article of interest was selected.

Lumbago
This gave 0 hits.

Backache
This gave 1 hit. 0 selected.
Appendix IV

PEDro Scale

1. eligibility criteria were specified no □ yes □ where:

2. subjects were randomly allocated to groups (in a crossover study, subjects were randomly allocated an order in which treatments were received) no □ yes □ where:

3. allocation was concealed no □ yes □ where:

4. the groups were similar at baseline regarding the most important prognostic indicators no □ yes □ where:

5. there was blinding of all subjects no □ yes □ where:

6. there was blinding of all therapists who administered the therapy no □ yes □ where:

7. there was blinding of all assessors who measured at least one key outcome no □ yes □ where:

8. measures of at least one key outcome were obtained from more than 85% of the subjects initially allocated to groups no □ yes □ where:

9. all subjects for whom outcome measures were available received the treatment or control condition as allocated or, where this was not the case, data for at least one key outcome was analysed by “intention to treat” no □ yes □ where:

10. the results of between-group statistical comparisons are reported for at least one key outcome no □ yes □ where:

11. the study provides both point measures and measures of variability for at least one key outcome no □ yes □ where:

The PEDro scale is based on the Delphi list developed by Verhagen and colleagues at the Department of Epidemiology, University of Maastricht (Verhagen AP et al (1998). The Delphi list: a criteria list for quality assessment of randomised clinical trials for conducting systematic reviews developed by Delphi consensus. Journal of Clinical Epidemiology, 51(12):1235-41). The list is based on "expert consensus" not, for the most part, on empirical data. Two additional items not on the Delphi list (PEDro scale items 8 and 10) have been included in the PEDro scale. As more empirical data comes to hand it may become possible to "weight" scale items so that the PEDro score reflects the importance of individual scale items.

The purpose of the PEDro scale is to help the users of the PEDro database rapidly identify which of the known or suspected randomised clinical trials (ie RCTs or CCTs) archived on the PEDro database are likely to be internally valid (criteria 2-9), and could have sufficient statistical information to make their results interpretable (criteria 10-11). An additional criterion (criterion 1) that relates to the external validity (or “generalisability” or “applicability” of the trial) has been retained so that the Delphi list is complete, but this criterion will not be used to calculate the PEDro score reported on the PEDro web site.

The PEDro scale should not be used as a measure of the “validity” of a study’s conclusions. In particular, we caution users of the PEDro scale that studies which show significant treatment effects and which score highly on the PEDro scale do not necessarily provide evidence that the treatment is clinically useful. Additional considerations include whether the treatment effect was big enough to be clinically worthwhile, whether the positive effects of the treatment outweigh its negative effects, and the cost-effectiveness of the treatment. The scale should not be used to compare the "quality" of trials performed in different areas of therapy, primarily because it is not possible to satisfy all scale items in some areas of physiotherapy practice.
Notes on administration of the PEDro scale:

All criteria  **Points are only awarded when a criterion is clearly satisfied.** If on a literal reading of the trial report it is possible that a criterion was not satisfied, a point should not be awarded for that criterion.

Criterion 1  This criterion is satisfied if the report describes the source of subjects and a list of criteria used to determine who was eligible to participate in the study.

Criterion 2  A study is considered to have used random allocation if the report states that allocation was random. The precise method of randomisation need not be specified. Procedures such as coin-tossing and dice-rolling should be considered random. Quasi-randomisation allocation procedures such as allocation by hospital record number or birth date, or alternation, do not satisfy this criterion.

Criterion 3  **Concealed allocation** means that the person who determined if a subject was eligible for inclusion in the trial was unaware, when this decision was made, of which group the subject would be allocated to. A point is awarded for this criteria, even if it is not stated that allocation was concealed, when the report states that allocation was by sealed opaque envelopes or that allocation involved contacting the holder of the allocation schedule who was “off-site”.

Criterion 4  At a minimum, in studies of therapeutic interventions, the report must describe at least one measure of the severity of the condition being treated and at least one (different) key outcome measure at baseline. The rater must be satisfied that the groups’ outcomes would not be expected to differ, on the basis of baseline differences in prognostic variables alone, by a clinically significant amount. This criterion is satisfied even if only baseline data of study completers are presented.

Criteria 4, 7-11  **Key outcomes** are those outcomes which provide the primary measure of the effectiveness (or lack of effectiveness) of the therapy. In most studies, more than one variable is used as an outcome measure.

Criterion 5-7  **Blinding** means the person in question (subject, therapist or assessor) did not know which group the subject had been allocated to. In addition, subjects and therapists are only considered to be “blind” if it could be expected that they would have been unable to distinguish between the treatments applied to different groups. In trials in which key outcomes are self-reported (eg, visual analogue scale, pain diary), the assessor is considered to be blind if the subject was blind.

Criterion 8  This criterion is only satisfied if the report explicitly states both the number of subjects initially allocated to groups and the number of subjects from whom key outcome measures were obtained. In trials in which outcomes are measured at several points in time, a key outcome must have been measured in more than 85% of subjects at one of those points in time.

Criterion 9  **An intention to treat** analysis means that, where subjects did not receive treatment (or the control condition) as allocated, and where measures of outcomes were available, the analysis was performed as if subjects received the treatment (or control condition) they were allocated to. This criterion is satisfied, even if there is no mention of analysis by intention to treat, if the report explicitly states that all subjects received treatment or control conditions as allocated.

Criterion 10  A **between-group** statistical comparison involves statistical comparison of one group with another. Depending on the design of the study, this may involve comparison of two or more treatments, or comparison of treatment with a control condition. The analysis may be a simple comparison of outcomes measured after the treatment was administered, or a comparison of the change in one group with the change in another (when a factorial analysis of variance has been used to analyse the data, the latter is often reported as a group × time interaction). The comparison may be in the form hypothesis testing (which provides a “p” value, describing the probability that the groups differed only by chance) or in the form of an estimate (for example, the mean or median difference, or a difference in proportions, or number needed to treat, or a relative risk or hazard ratio) and its confidence interval.
Criterion 11  A point measure is a measure of the size of the treatment effect. The treatment effect may be described as a difference in group outcomes, or as the outcome in (each of) all groups. Measures of variability include standard deviations, standard errors, confidence intervals, interquartile ranges (or other quantile ranges), and ranges. Point measures and/or measures of variability may be provided graphically (for example, SDs may be given as error bars in a Figure) as long as it is clear what is being graphed (for example, as long as it is clear whether error bars represent SDs or SEs). Where outcomes are categorical, this criterion is considered to have been met if the number of subjects in each category is given for each group.
Appendix V

23-4-03

Dear students,

I am working in the field of psychosomatic physical therapy. I have the impression that there is not much literature about that is specific about the relation PT and treatment of stress related disorders. This is an impression, not based on an extensive review of literature but based on relative random readings and talks with fellow professionals. The state at this moment, in my opinion, is that the development of psychosomatic PT is done by a few enthusiastic PT’s who most of the time integrate knowledge out of the field of psychology into the field of PT or psychosomatic PT. But…, in developing this field its important to connect to mainstream ideas about PT and stress related disorders. That why the question is so important.

So, I am knowledgably about psychology, about PT, and in combining those two in my own why. But I don’t have a knowledge base about research specially done within the context of PT. I was hoping you would find some important material, because that can be used to give de psychosomatic-PT in Holland a more solid base.

To answer you question. No, I don’t have an article here about chronic low back pain, PT and stress, and (!) I don’t have the time to search for it at this moment. I’ am sorry.

….The multidiciplinary research can be interesting! Maybe within that context that the PT must do de relaxation exercises.

Greetings

Peter van Burken
Appendix VI

Dear Ranveig, Cesilie and Grete,

I would suggest that you visit our website www.stichting-flow.nl. There is a lot of literature on it. Some in english some in dutch. Good luck with?!

Kind regards,

Stichting Flow

Sjanet Wagemanns
Appendix VII

The PEDro scale was used to evaluate the methodological quality of the articles. The discussion moments that arose due to different answers are given below.

Mannion (2001) (8)
PEDro criterion number:
3: yes (one no, yes because randomisation was performed after the medical examination)
4: no (one no, no because the variables talked about in the results were not the baseline variables and table 1. did not say something about baseline variables)
9: yes (one had overlooked information)

Friedrich (1998) (2)
PEDro criterion number:
5: no (one had misinterpreted text)
6: no (one had misinterpreted text)
8: yes (two had no, yes because in table 3 it stated that at four months the results of 90% of the subjects were reported)
9: no (one yes, misinterpreted text)

Tritilanunt (2001) (17)
PEDro criterion number:
1: yes (one no, misinterpreted text)
3: yes (two overlooked information)
4: yes (one overlooked information)

Torstensen (1998) (16)
PEDro criterion number:
3: yes (two no, yes because only one nurse had the info. Long discussion about this score because of unclear text)

Moseley (2002) (13)
PEDro criterion number:
5: no (one yes, but no after long discussion because of this sentence: “… allocation was concealed from the subjects until after the initial assessment…” p. 298)
8: yes (two no, but yes because after a calculation performed by the members, 85.9% of the subjects were reported in one of the outcomes)
9: no (two yes, no because of misunderstanding around a text about withdrawals of subjects)
10: yes (one no because of overlooked information)
11: yes (one no because of overlooked information)

Hodselmans (2001) (5)
PEDro criterion number:
1: no (two yes, but no because no source was described for the subjects)
2: yes (one no, but yes because they did the randomisation. In the discussion they told that the randomisation was insufficient. The PEDro said that all criteria had to be satisfied to get a point. Two persons meant that insufficient did not mean that it was not satisfied. There was a long discussion about this and the third person gave in for the majority)
3: no (one yes, misunderstood information)
4: no (one yes, discussion found place. First two persons agreed to say yes but then all agreed upon a no. This was because most of the baseline characteristics resembled but not all.)
8: yes (one no, but it was calculated and 85.7% of the subjects outcome were given in a table)
1. **TITLE:**
Chronic non-specific low back pain in the daily practise.

2. **RESPONSIBILITY FOR PROPOSAL:**
Organisation: Fontys University of Higher Professional Education, Department of Physiotherapy
Address: Postbus 347, 5600 AH Eindhoven
E-mail: graduationphysio@fontys.nl

Commissioners to get in contact with:
Cesilie Hostmelingen: cesiliehostmelingen@yahoo.no
Ranveig Heier: rheier@online.no
Grete Turid Baarsen: gfjaerbu@hotmail.com

3. **PROBLEM DESCRIPTION:**
Due to the actuality (see graduation project: Locomotor system complaints related to stress) a literature research was performed on the topic physiotherapeutic interventions for chronic non-specific low back pain if psychological stress is given consideration and if it is not. Both the interventions used and the process followed were taken into account. The results showed a small difference in physiotherapeutic interventions related to chronic non-specific low back pain if psychological stress was given consideration and if it was not. Exercise therapy was the intervention used for this group of patients. If psychological stress was given consideration emphasised was also placed on advice and patient education. No significant difference existed between the groups concerning the time and 12 weeks were most often used. There was a clear tendency to a lower frequency if stress was given consideration. The duration was most often of 60 minutes in both groups but the stress group showed more differences. Co-interventions were only present in the stress group.

It is not clear if this picture would mirror that of the daily physiotherapeutic practise treating patients with chronic non-specific low back pain giving psychological stress consideration or not.

4. **OBJECTIVES:**
1. A structured interview made and taken into use to find out what the daily physiotherapeutic practise is when treating patients with chronic non-specific low back pain if psychological stress is given consideration and if it is not.
2. A comparison of the findings with the conclusion from the graduation project: Locomotor system complaints related to stress.

5. **PROPOSED ACTIVITIES:**
1. To develop a structured interview directed to physiotherapists in the daily practise treating chronic non-specific low back pain patients if psychological stress is given consideration and if it is not.
2. To make use of the developed structured interview.
3. To compare the findings with the conclusion from the above mentioned graduation project.

6. **PRODUCT:**
A structured interview and a report.

7. **GLOBALLY ESTIMATED COSTS:**
The costs are estimated to app. 300 €.

8. **NUMBER OF PARTICIPATING STUDENTS:**
3 or 4 students