

Implementing psychosocial factors in physical  
therapy treatment for patients with musculoskele-  
tal pain in primary care

In loving memory of my mother, Maria Johanna Overmeer-Oosterwijk  
To my father  
To Jennie, Amanda and Johanna  
And Maria of course





## **Abstract**

This dissertation focuses on 2 parts: 1) Whether evidence-based guidelines are recognized and integrated into clinical practice in primary care and 2) Whether a university course aimed at teaching physical therapists to identify and address evidence-based psychosocial factors in primary care might change practice behaviour and patient outcome.

To this end practising clinicians were surveyed and a course for physical therapists was developed. Concerning the first part, we showed that a relatively large proportion of clinicians in primary care were unfamiliar with the content of evidence-based guidelines and/or with the concept of “Red flags”. Yet, concerning the self-reported practice behaviour, the majority indicated they followed the key points in the guidelines. To enhance the impact of guidelines, interventions or tactics for teaching and implementing guidelines should include interactive education, discussion, feedback, and reminders which in research have shown to enhance knowledge, skills and change behaviour. Furthermore, the clinical applicability of the guidelines needs to be further developed. We could also show that psychosocial factors were integrated up to a certain point and that physical therapists in primary care were well aware of the importance of psychosocial risk factors, but it seemed physical therapists lack specificity about which factors are important. Physical therapists may have heard about risk factors but probably did not have a clear model or structure about how these factors work.

Concerning the second part, the results showed that we, by means of a university course, managed to change attitudes and beliefs, increase knowledge, skills and competencies towards a more biopsychosocial standpoint. But despite these changes, the results did not show a behavioural change on behalf of the physical therapists or a better outcome for patients at risk of long-term pain and disability. Several possible explanations for this are discussed. First, the content of the course should be changed so it focuses more on behavioural change on behalf of the physical therapists. This would facilitate implementation of new behaviour in clinical practice and increase the likelihood that the new behaviour is maintained and thereby the possibility of improved patient outcome. Second, treating patients at risk for long-term pain and disability may also be too difficult for a single physical therapist in a clinical setting. This would imply large changes in the way patients are directed through the health care system compared to now. The main tasks of the physical therapists in primary care would then be to select patients at risk for long-term pain and disability. They would then treat the patients not at risk and refer the patients at risk for long-term pain and disability to more suitable treatment, for example CBT treatment delivered by a psychologist or multimodal treatment delivered by a team of experts. Since risk patients experience most suffering and are the most costly for the health care system, it is important they get the appropriate treatment at the earliest possible opportunity.

In summary, this dissertation shows that integrating psychosocial factors in physical therapy is not an easy task.

*Keywords:* Physical therapy, musculoskeletal pain, psychosocial factors, dissemination, evidence based, education, primary health care



## **Publications**

This thesis is based on the following papers, which are referred to in the text by the corresponding Roman numerals:

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- II. Overmeer T, Linton SJ, Holmquist L, Eriksson M, Engfeldt P.  
Do evidence-based guidelines have an impact in primary care? A cross-sectional study of Swedish physicians and physiotherapists.  
Spine. 2005;30(1):146-151.
- III. Overmeer, T., Boersma, K., Main, CJ. and Linton, SJ.  
Do physical therapists change their beliefs, attitudes, knowledge, skills and behaviour after a biopsychosocially orientated university course?  
Journal of Evaluation in Clinical Practice. 2009;15:724-732.
- IV. Overmeer T, Boersma K, Denison E, Linton SJ.  
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## **Abbreviations**

LBP	Low back pain
HCP	Health care provider
EBP	Evidence-based practice



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# 1 Introduction

## 1.1 Background

Although implementing the latest knowledge about psychological factors into practice might resolve at least part of the enormous problem of neck and back pain, this has yet to happen. Improving the process of translating research findings into clinical practice is not an easy task. It seems that health care decision makers and clinicians up have till now adopted a too simplistic attitude but the evidence on implementation of research findings and clinical guidelines does not support such an optimistic approach<sup>33, 36 24, 34, 64</sup>.

In the mean time, neck and back pain continue to be extremely common, with a high prevalence and wide socio-economic consequences all over the industrialized world<sup>72</sup>. Many international surveys of low back pain report a lifetime prevalence of about 60% to 70%<sup>72</sup>. This leads to considerable suffering, disability, health care use and costs.

The Swedish Council on Technology Assessment in Health Care<sup>73</sup> calculated that the total cost for back pain in Sweden was almost 30 billion Swedish crowns. Of this sum, direct medical costs accounted for 2,4 billion crowns whereas compensation accounted for 27 billion crowns. In the United Kingdom, direct medical costs for back pain in 1998 were estimated to £1632 million and indirect cost to a total of £10668 million<sup>65</sup>. Even though less than 10% of those with back problems develop chronic pain, they represent the majority of the costs<sup>63, 72</sup>.

Traditionally the medical model of disease has dominated the view on neck and back pain. Yet the pure biomedical or biomechanical approach to the assessment and treatment of patients has not solved the problem satisfactory<sup>72, 100</sup>. Pathological changes can exist without symptoms and symptoms can exist without pathology<sup>8, 37</sup>. Large investments and improvements in advanced technology have not led to desirable results<sup>37, 97</sup>. All this led to a new clinical model for the treatment of back pain; the biopsychosocial model of illness<sup>97, 100</sup>. In this model, pain is viewed as a complex interaction of biological, psychological and social variables<sup>97</sup>.

Research has shown this model to be relative successful in the treatment of musculoskeletal pain<sup>41, 50</sup> and evidence-based guidelines recommend treatment according to the biopsychosocial model<sup>52</sup>. Yet there is reason to believe that practitioners might not have up-to-date knowledge about these evidence-based guidelines let alone the biopsychosocial model<sup>21, 31, 104</sup>. Moreover, physical therapists still have substantial biomedical orientated pain beliefs influencing their clinical reasoning including the explanation given to the patients<sup>6, 17, 89</sup> and in their treatment they still commonly use non-evidence based passive treatment modalities<sup>22, 80, 81</sup>.

This dissertation will therefore focus on 2 parts: First, how well evidence-based guidelines are recognized and integrated into practitioner's clinical practice, as well as how well evidence-based information about psychosocial factors is recognized and incorporated into physical therapy in primary care. Second, it will focus on the results of a university course aimed at teaching clinicians (physical therapists) how to identify and address evidence-based psychosocial prognostic factors within physical therapy treatment in primary care in Sweden.

After introducing the biopsychosocial model, psychosocial risk factors and their clinical application in physical therapy will be discussed. Thereafter, the development of evidence-based physical therapy and the implementation and dissemination of evidence-based guidelines in physical therapy will be reviewed. The main focus will be on health care provider's and particularly physical therapist's attitudes and beliefs toward the biopsychosocial model, treatment orientation and on the previous attempts that have been made to change physical therapist's attitudes, beliefs and behaviour and what lessons can be learned from that. In the discussion possible explanations for the results will be discussed and the clinical implications will be highlighted.

## 1.2 The biopsychosocial model

Through the years a growing interest has risen for other factors than the pure biomedical or biomechanical. The first major change occurred with the gate control theory of pain<sup>69</sup>. This theory postulates that pain no longer can be regarded as merely a physical sensation of noxious stimulus and disease but a conscious experience of pain may be modulated by mental, emotional and sensory mechanisms and includes both sensory and emotional components.

The major conceptual contribution of the gate control theory is that it replaces the Cartesian mind-body dichotomy and allows for the complexity of observed pain phenomena. It explains how psychological and social influences may indeed modulate individual perception of and response to disease<sup>100</sup>.

Another major change in the view of pain came with Fordyce<sup>20</sup>, he views pain from a behavioural perspective, postulating that pain behaviour is something that is learned through experience and therefore via parents or significant others.

All this led to a new clinical model for the treatment of back pain; the biopsychosocial model of illness<sup>97, 100</sup>. In this model, the distinction between “disease” and “illness” is crucial to understanding pain<sup>97</sup>. Disease is generally defined as an “objective biological event” that involves disruption of specific body structures or organ symptoms caused by pathological, anatomical or physiological changes. In contrast to this customary view of physical disease, illness is defined as a “subjective experience of self-attribution” that a disease is present; it yields physical discomfort, emotional distress, behavioural limitations and psychosocial disruption<sup>97</sup>. In other words, illness refers to how the sick person and members of his or her family and wider social network perceive, live with, and respond to symptoms and disability.

The distinction between disease and illness is analogous to the distinction between “nociception” and “pain”. Nociception entails stimulation of nerves that convey information about tissue damage to the brain. Pain is a subjective perception that results from the transmission and modulation of sensory input filtered through a person’s genetic composition and prior learning history and modulated further by the person’s current physiological status, idiosyncratic appraisals, expectations, current mood state and sociocultural environment. This is why we cannot remove the person who is being exposed to the nociception from the pain.

In contrast to the biomedical model’s emphasis on disease, the biopsychosocial model focuses on both disease and illness, a complex interaction of biological, psychological and social variables<sup>97</sup>. From this perspective, diversity in illness expression (which includes its severity, duration and consequences for the individual) is accountable for by the inter-relationship among biological changes, psychological status and the

social and cultural contexts. All these variables shape the person's perception and response to the illness.

Treatment based on the biopsychosocial model should not only address the biological basis of symptoms, but should also incorporate the full range of social and psychological factors that have been shown to affect pain, distress and disability<sup>97</sup>. Indeed psychosocial factors have in recent years been acknowledged as very important in patients with musculoskeletal complaints<sup>56</sup>. There is today strong evidence indicating that psychosocial factors have a greater impact on disability than biomechanical or biomedical factors<sup>11, 57, 96</sup>. There is also strong evidence that psychosocial factors are strongly linked to the transition from acute to chronic pain<sup>57</sup>.

### **1.3 Patients at risk for long-term pain and disability**

It is important to identify patients early on who are at risk for long-term pain and disability because it seems like there is no unlimited time frame to reduce pain and disability after onset. Vingård et al.<sup>105</sup> showed in her study of an area with a population of 17.000 inhabitants that pain and disability reduced in the first 3 months after seeking care. After 3 months there was no additional reduction in pain and disability on a group level despite continuation of treatment for those who had not recovered. A systematic review on the prognosis of low back pain<sup>79</sup> showed similar results, no additional reduction of pain and disability after 3 months. A recent article on rehabilitation in Sweden<sup>48</sup> showed that participants who have more than 60 sick days before rehabilitation had a statistically significant increased risk of disability pension. This highlights the importance of early identification of patients at risk for long-term pain and disability so adequate treatment can start in time in order to prevent persistent pain and disability.

One way of identifying patients at risk for long term pain and disability is by assessing psychosocial risk factors. Kendall et al.<sup>51</sup> introduced the term "Yellow flags" referring to these risk factors. Risk factors such as catastrophizing, distress, perceived disability and depressed mood have been shown to be important in the development of prolonged pain and disability<sup>101</sup> and in recent years there has been a growing recognition of psychosocial risk factors as predictors of long-term disability<sup>60, 74, 94</sup>. Psychosocial risk factors or Yellow flags refer to psychological and social /environmental factors present in patients with recent onset of musculoskeletal pain. The presence of these risk factors increases the risk of non-recovery and long-term disability and work loss. There is even evidence that early treatment changes in risk factors like catastrophizing and fear of movement/injury are predictive of treatment outcome<sup>92</sup>. Secondary prevention would be aimed at the social and psychological risk factors that have been shown to affect pain, distress and disability.

To ensure an efficient secondary prevention, identification of patients at risk of developing long-term problems is needed. Without screening procedures, any early intervention program might be overwhelmed with a very large number of patients because of the high incidence rate of back pain<sup>58</sup>. Conversely, screening to identify patients at risk of developing a chronic problem would allow allocation of resources to those most in need and most likely to benefit from an intervention. In this concept, acute back pain patients are screened to determine the presence and extent of psychosocial risk factors<sup>15, 57, 87</sup>.

Although the concept of screening for psychosocial risk factors was developed several years ago and has shown to be effective in detecting nearly 80% of the patients at risk of long-term sick leave<sup>55</sup>, there appears to be considerable uncertainty about its clinical application. Koes et al.<sup>52</sup> made a comparison between different national evidence based guidelines on low back pain. Although all national guidelines acknowledged psychosocial factors as evidence-based risk factors for developing chronic pain, no clear advice was given in any of the guidelines about which factors to take into consideration, when to assess them or how to screen for them.

Moreover it seems that health care providers (HCPs) may not have adequate knowledge on evidence based psychosocial factors in the context of back pain. When asked to name psychosocial factors, the respondents in a recent study indicated a wide range of psychosocial factors whereof only 16% was evidence based<sup>78</sup>. Most of the listed factors mirror various life difficulties that people present within a clinical context, such as familial issues or lack of social support. These factors are broad, general and non-modifiable for clinicians within the scope of their treatment possibilities. It seems that HCPs have different conceptions of the relationships between psychosocial factors and back pain disability than those currently proposed in the literature and appear to lack knowledge on specific, modifiable and evidence based factors.

Yet, research shows that screening for psychosocial risk factors and subsequently targeting interventions on specific factors may improve patient outcome<sup>29, 30, 61, 93</sup>. George et al.<sup>30</sup> showed a significant reduction in fear-avoidance and disability in acute low back pain patients when risk factors were addressed. Sullivan et al.<sup>93</sup> showed that an intervention, delivered by physical therapists and occupational therapists, targeting risk factors resulted in a considerable higher return to work rate. Linton et al.<sup>61</sup> studied a cognitive behavioural treatment targeting risk factors in comparison to an information and self-care group. The intervention group receiving cognitive behavioural treatment targeting risk factors had significantly less pain, was more active, enjoyed better quality of life, and had better general health relative to the information comparison group still at five years follow-up. There was no difference on health care use. The risk of long-term sick leave was 3 times higher in the information comparison group. The cognitive be-

havioural group had significantly less lost productivity costs. Gatchel et al.<sup>29</sup> studied the clinical effectiveness of employing an early intervention program with these high-risk patients in order to prevent the development of chronic disability at a 1-year follow-up. He found that the high-risk subjects who received early intervention displayed statistically significant fewer incidences of chronic pain disability on a wide range of work, healthcare utilization, medication use, and self-report pain variables, relative to the high-risk subjects who do not receive such early intervention. So there is accumulating evidence that potentially modifiable Yellow flags can be identified and targeted by interventions with better patient outcome as a result.

Unfortunately there are also indications in the literature that physical therapists don't succeed very well with patients at risk for long-term pain and disability. A pragmatic, multi-centre, randomised controlled trial in Britain<sup>26</sup> showed that patients with low back pain of more than six weeks' duration did not benefit more at 12 month follow up from routine physical therapy compared to one session of assessment and advice from a physiotherapist. Sandborgh et al.<sup>86</sup> found that patients at risk of long-term disability had increased disability, decreased work capacity and daily function at 8 months follow-up despite treatment by physical therapists.

In summary, although the concept of psychosocial risk factors still is relatively new, there seems to be an international consensus about the importance of psychosocial risk factors for the prevention of the development of chronic pain but there appears to be considerable uncertainty about the clinical application. Yet, there is accumulating evidence that potentially modifiable Yellow flags can be identified and targeted by interventions with better patient outcome as a result. But routine physical therapy does not seem to be a very successful treatment for patients at risk for long-term pain and disability.

#### **1.4 Evidence based physical therapy**

The demand for and interest in applying evidence to physical therapist practice has grown in the past decade. Sackett et al.<sup>85</sup> defined *evidence-based medicine* as "the use of current best evidence in making decisions about the care of individual patients." They noted that both clinician expertise and clinically relevant research were important components of evidence-based practice (EBP). The concept of evidence-based medicine, or, more broadly, EBP, marks a shift among health care professionals from a traditional emphasis on actions based on the opinions of authorities to guide clinical practice to an emphasis on data-based, clinically relevant studies and research.

An important issue is whether physical therapists' attitudes and beliefs reflect the best available evidence base. Unfortunately there are signs in the literature pointing towards barriers to implementation of the evidence base influencing clinical practice. A



study of physical therapists in Great Britain and Australia showed that physical therapists ranked research results last in importance as a basis for treatment choice<sup>98</sup>. Treatment techniques they were taught during their initial training, the experience of treatment effect on prior patients and information gained in practice-related courses were primary reasons for treatment choice. Metcalfe et al.<sup>70</sup> showed that although 97% of the physical therapists agreed that research findings were important, the majority felt that both the evidence base and their own ability to access and understand it were inadequate. Stevenson<sup>90</sup> found in her study that physical therapists were in favour of the idea of EBP but remained reluctant to change their practice. Turner<sup>99</sup> showed in another study that there is limited access to scientific literature at physical therapy departments.

Some recent studies suggest that changes are taking place. Jette et al.<sup>49</sup> studied American physical therapists and found that 90% agreed or strongly agreed that EBP is necessary. She also found an association with age showing therapists who were younger or had been licensed for fewer years tended to express more positive attitudes and state they had greater skills and confidence related to accessing and critically appraising information. Eighty-four percent of the respondents indicated that they agreed or strongly agreed that they needed to increase the use of evidence in their daily practice. Eighty-five percent of the respondents indicated that they agreed or strongly agreed that they were interested in learning or improving the skills necessary to implement EBP. Sixty-five percent of the respondents agreed or strongly agreed that they were confident they had search skills, and 70% of the respondents agreed or strongly agreed that they had knowledge about using databases such as MEDLINE and CINAHL. Training, familiarity with and confidence in search strategies, use of databases, and critical appraisal tended to be associated with younger age and fewer years since licensure. That both age and education level were related to knowledge, suggests that within recent years all professional education programs, regardless of the degree offered, have increased emphasis on the skills needed to implement EBP. Only 67% of the respondents stated they agreed or strongly agreed that their facility supports the use of evidence in practice. Forty-six percent of the respondents indicated that insufficient time was the most important barrier to the use of evidence in practice. Iles et al.<sup>45</sup> performed a similar survey in Australia with basically similar results.

Bridges et al.<sup>10</sup> showed in a recent article that incorporating EBP will depend on whether or not the individual physical therapist providing direct patient care has the propensity to integrate the best current research evidence available with patient values and clinical experience and then apply the research evidence to the prevention, assessment and intervention of physical therapy problems across the continuum of care. The study demonstrated that multiple factors influence physical therapists' propensity to adopt EBP. Personal characteristics contributed significantly to the variance in the pro-

propensity to adopt EBP. Three predictors, desire for learning, highest degree held, and practicality accounted for a moderate proportion of the variance of the propensity to adopt EBP. Age and years licensed as a physical therapist were again negatively correlated with the propensity to adopt EBP.

These more recent studies were all surveys with self-reported data and some caution is called for with these kinds of studies because practitioners tend to overestimate their ability, knowledge and skills when asked to rate themselves compared to objective measures of adherence<sup>1, 45, 67</sup>.

In summary, the demand for and interest in applying evidence to physical therapist practice has grown in the past decade. Physical therapists seem to have a more positive attitude to EBP and especially the younger and newly licensed physical therapists are confident in their ability to adopt EBP. Clear barriers that can be identified are insufficient time and that the working facility does not fully support the use of evidence in practice.

### **1.5 Implementation and dissemination of evidence based guidelines**

Each year clinical research produces new findings that may contribute to effective and efficient care for back pain patients. To date, the traditional model of disseminating research findings has involved publication in peer-reviewed journals. This model assumes that health care providers have the time, energy and skills to appraise research and the ability to introduce new practices into their clinical practice. However, professionals have limited time to read the ever-growing mountain of research and there is today an increasing recognition of the failure to translate these research findings into practice<sup>34, 35, 104</sup>.

Evidence based guidelines compile the scientific evidence and should steer clinical practice, but practitioners may not read, let alone heed them. Guidelines, based on empirical evidence, are meant to ensure that patients get the most effective treatment. Yet, although general practitioners and physiotherapists are aware that clinical guidelines exist, many have not actually read them<sup>21, 31</sup>. In Canada<sup>53</sup> only 46% of Ontario's physical therapists agreed that the Canadian guidelines for treatment of back pain were useful. A recent systematic meta-review studied which factors affect the implementation of guidelines<sup>24</sup>. The meta-review found that a substantial proportion (although not all) of the reviews indicated that effective strategies for implementing guidelines often have multiple components and that the use of one single strategy, such as reminders only or an educational intervention, was less effective. Characteristics of the guidelines themselves also affected actual use. For instance, guidelines that were easy to understand, could easily be tried out, and did not require specific resources, had a greater chance of

implementation. In addition, characteristics of professionals – e.g., awareness of the existence of the guideline and familiarity with its content – likewise affected implementation. Furthermore, patient characteristics appeared to exert influence: for instance, comorbidity reduces the chance that guidelines were followed. Finally, environmental characteristics may influence guideline implementation. For example, a lack of support from peers or superiors, as well as insufficient staff and time, appear to be the main impediments.

As the barriers largely differ within guidelines, tailored and barrier-driven implementation strategies focusing on key recommendations are needed to improve adherence in practice. In addition, guidelines should be more transparent concerning the underlying evidence and applicability<sup>64</sup>. A recent study evaluated the quality of low back pain guidelines<sup>9</sup>. Compared to a similar quality assessment in 2004, the authors conclude that the average quality has improved since 2004 but especially the applicability of the guidelines needs to be further developed. This shows that the process of EBP and guidelines is developing more but there is still room for improvement.

Improving the process of translating research findings into clinical practice is not an easy task<sup>82</sup>. To successfully incorporate psychosocial factors in clinical practice requires favourable attitudes, up-to-date knowledge and skills on behalf of the physical therapists to ensure a behavioural change<sup>12</sup>. A general framework for changing practice based on theoretical perspectives and research evidence has been suggested<sup>35</sup>. The key points of this program on implementing evidence-based guidelines in primary care are:

- 1) Development of a concrete proposal for change,
- 2) Analysis of the target setting and group to identify obstacles to change,
- 3) Linking interventions to needs, facilitators, and obstacles to change,
- 4) Development of an implementation plan,
- 5) Monitoring progress with implementation.

It is then of the utmost importance to choose interventions that have been proven to be effective. Interventions or tactics for teaching and implementing guidelines including interactive education and discussion, feedback, and reminders have been shown to enhance knowledge, skills and change behaviour<sup>5, 16, 32, 34</sup>.

Bekkering<sup>3</sup> studied the effect of such an active strategy for the implementation of the clinical guidelines on physical therapy for patients with low back pain. The strategy consisted of 2 training sessions, each lasting 2.5 hours with groups of 8 to 12 physical therapists. The authors found no additional benefit to applying an active strategy to implement the physical therapy guidelines for patients with low back pain and concluded that active implementation strategies are not recommended if patient outcomes are to be improved. However, in an additional article on the same trial significant changes in practice behaviour were shown for those in the intervention group compared to the con-

trol group <sup>4</sup>. The physical therapists in the intervention group more often correctly limited the number of treatment sessions for patients with a normal course of back pain, more often set functional treatment goals, more often used mainly active interventions and more often gave adequate patient education. But these changes in physical therapist behaviour did not result in better outcome for their patients and the active implementation strategy was not cost effective compared to standard dissemination strategies <sup>40</sup>. This shows again that improving the process of translating research findings into clinical practice is not an easy task even though evidence based methods were used.

Yet, adherence to the evidence-based recommendation for active physical therapy care has been shown to give better clinical outcome for patients. A recent study from Australia studied the effect of the implementation of evidence-based medicine in clinical practice. This study demonstrated that evidence-based treatment of musculoskeletal complaints accomplished better results than traditional treatment <sup>68</sup>. Evidence-based treatment achieved significantly greater pain reductions, at a lower cost, more patients were fully recovered after one year than a treatment-as-usual control group. A significantly greater proportion of patients estimated the evidence-based treatment as extremely helpful. Fritz et al. <sup>25</sup> undertook a retrospective review where adherence to the recommendation for active care was determined from billing records. The results showed that patients receiving adherent care had fewer physical therapy visits with lower charges, greater improvement in pain and disability. During the year after discharge, receiving adherent care was associated with a lower likelihood of receiving prescription medication, magnetic resonance imaging (MRI), or epidural injections. Feuerstein et al. <sup>19</sup> studied provider adherence with clinical practice guidelines for acute low back pain and its impact on clinical outcomes and cost. He also studied the patient journals retrospectively and found that adherence was related to better functional outcomes and lower healthcare costs. Patients receiving more adherent care also reported higher levels of patient satisfaction and general health. Higher levels of adherent care that included efforts to address both ergonomic and psychosocial factors in the course of acute back pain were related to better clinical outcomes and lower costs.

In summary, each year clinical research produces new findings that may contribute to effective and efficient care for back pain patients. However, professionals have limited time to read the ever-growing mountain of research and there is today an increasing recognition of the failure to translate these research findings into practice. Multiple components can affect implementation, and factors like the characteristics of the guidelines themselves, characteristics of professionals, patient characteristics and environmental characteristics may influence guideline implementation. Yet despite using evidence based methods for implementation success is not guaranteed. Studies comparing adherent care with less adherent care to guidelines show that more adherent care

results in better patient outcome. It can be concluded that improving the process of translating research findings into clinical practice is not an easy task and more research is needed to understand how the process transfer can be improved.

### **1.6 Health care providers attitudes and beliefs**

While seeking treatment for their back pain, patients come into contact with several health care providers (e.g. general practitioners, medical specialists, physical therapists, and psychologists). The communication between health care providers (HCP) and patient, influences compliance and thereby treatment outcome. Compliance is considered to be essential to patient well-being.

A model that predicts compliance was developed by Ogden<sup>75</sup>. This model predicts compliance by a combination of patient satisfaction with the process of the consultation, understanding of the information given and recall of this information.

In terms, the first part of this model, i.e. patient satisfaction, research has shown that patient satisfaction increases if physicians frequently ask questions concerning the patients' psychosocial factors<sup>77</sup>. Concerning the second part of the model, the information, have doctors traditionally been regarded as having an objective knowledge set that comes from their extensive medical education. If this were the case, then it could be predicted that physicians with similar level of knowledge and training would behave in similar ways. In addition, if doctors' behaviour were objective then their behaviour would be consistent.

Nevertheless, there is reason to believe that physician's beliefs about pain and treatment orientation can influence their behaviour towards patients in a crucial way, thereby influencing treatment outcome. Haldorson<sup>38</sup> found in her study that general practitioners showed a random level of decision-making concerning sickness certification regarding patients with musculoskeletal pain. This suggests that medical providers did not have firm criteria or systems for determining disability and struggled with their role as disability advisors.

In a national survey, Cherkin<sup>13</sup> observed a lack of consensus among physicians in their beliefs about the effectiveness of many commonly used treatments for low back pain. Recently a survey of orthopaedic spine surgeons and family physicians showed a large variety of recommendations for activity and work to back patients<sup>84</sup>. The physicians were presented with patient vignettes and asked to recommend treatment. Their recommendations were influenced by their pain attitudes and beliefs, as did their perception of the severity of the patient's clinical symptoms. This might indicate that HCP's beliefs and attitudes not only influence their behaviour (the information they provide), but also the medical information they view as being important. Fullen et al.<sup>27</sup> found in his review of doctors' attitudes and beliefs regarding acute low back pain man-

agement a lack of consensus regarding the natural history of LBP, around treatment options, and issues regarding work. In a recent review by the same authors<sup>28</sup> it was concluded that there was consistent evidence that doctors did not adhere to clinical guidelines when performing a spinal assessment and there was inconsistent evidence that education increased adherence with acute LBP guideline recommendations.

Even physicians treatment “style” is related to outcome for low back patients<sup>106</sup>. Physicians with a low frequency of prescribing pain medication and bed rest resulted in patients with significantly lower pain-related activity limitations and disability at follow-up than physicians with a high frequency of prescribing pain medication and bed rest.

In an extension of the model of compliance, clinical decision making can be conceptualised as a form of problem solving<sup>75</sup>. Variability in the behaviour of HCPs can therefore be understood in terms of the processes involved in clinical decisions. The HCPs’ own beliefs about the nature of the clinical problem influences the hypothesis about the patients complaints<sup>75</sup>. Subsequently, more biomedical-orientated physicians will develop a hypothesis that reflects their perspective and HCPs who views health and illness as relating to psychosocial factors may develop hypotheses reflecting their perspective. This may result in different information to patients with similar complaints thereby influencing treatment outcome. In other words, HCPs’ attitudes and beliefs influences the information given to patients resulting in different patient outcome depending on the HCPs’ attitudes and beliefs.

Thus, physicians seem to lack consensus about how to treat back patients. HCPs’ attitudes and beliefs appear to influence the information they provide to patients, thereby influencing the communication between HCP and patients. This may subsequently result in different patient outcome depending on the HCPs’ attitudes and beliefs.

### **1.7 Physical therapists attitudes and beliefs**

In the treatment of back pain, physical therapists are frequently consulted, and often already at an early stage of the complaints. Furthermore, physical therapists spend considerable time with their patients, so there is ample opportunity for interaction. As Rainville<sup>83</sup> pointed out, it is likely that, the attitudes of health care providers could be an important source of attitude information for patients’ attitudes. Therefore, it could be assumed that physical therapists’ attitudes influence the beliefs and attitudes of their patients.

Two different attitudes or treatment orientations can be extracted from the literature regarding non-specific back pain, one with attitudes based on the biomechanical model of disease and another with attitudes based on the biopsychosocial model<sup>76</sup>.

The first treatment orientation is physical therapists' beliefs orientated from the biomechanical model of disease. As mentioned before, this model is based upon the notion that pain and disability are a consequence of physical pathology. Diagnoses provide the basis for physical treatment of the illness. Since pain is a signal of pathology or tissue damage, a physical therapist with a predominantly biomechanical treatment orientation towards chronic low back pain will very likely adapt his or her treatment to the pain level of the patient (i.e. use a pain-contingent treatment approach). Furthermore, treatment will primarily be aimed at finding the physical impairment that is the cause of the pain and consequently treating the impairment <sup>43</sup>.

The second source of physical therapists' treatment orientation or attitudes derives from the biopsychosocial model of chronic back pain. This model emphasises the role of psychological and social factors in the development and maintenance of complaints. Therefore, pain does not have to be a sign of pathology or tissue damage, but is also influenced by social and psychological factors. Because of these factors, disability due to pain can be maintained long after the initial pathology has healed. According to this model, it is not necessarily beneficial to adapt the treatment to the pain level of the patient. Treatment should rather focus on an increase in activity according to a previous defined timeframe <sup>62</sup>. Physical therapists with a predominantly biopsychosocial treatment orientation generally hold a time-contingent treatment approach <sup>43, 54</sup>.

The Pain Attitudes and Beliefs Scale for physical therapists (PABS-PT) was developed to distinguish between physical therapists with the two different treatment orientations mentioned above <sup>76</sup>. The scores on the PABS-PT showed to be related to physical therapists' judgements of the harmfulness of physical activity for their patients and to physical therapists' recommendations for return to normal activity <sup>43</sup>. More biomechanical orientated physical therapists perceived greater harmfulness in physical activity for their patients and subsequently more restrictive in their recommendations for return to normal activity.

It is suggested that treatment orientation or attitudes of physical therapists can be reflected on patients, and therefore have an effect on patients' beliefs and attitudes <sup>42</sup>. Another study by Houben et al. <sup>43</sup> showed that the only therapist characteristics associated with work and activity recommendations were again physical therapists' attitudes and beliefs toward the relationship between pain and impairment. Moreover, in a recent study physical therapists were able to recognize patients at high risk of developing chronicity, yet their recommendations to patients to limit their activity level and to not work were not consistent with the biopsychosocial model, suggesting persistence of the biomedical model of back pain <sup>6</sup>.

In summary, physical therapists attitudes and beliefs are relatively unexplored but seem to have an effect on patients' attitudes and beliefs, which can affect patient outcome in terms of sick leave, health care use and function.

### **1.8 How can health care providers attitudes, beliefs and practice be altered?**

Because there is today a growing understanding that the biomedical approach is inadequate<sup>23</sup> it is important that physical therapists treat patients according to evidence-based guidelines and, in accordance with guidelines, incorporate the biopsychosocial model in their clinical practice. Yet, physical therapists still often have substantial biomedical orientated pain beliefs influencing their clinical reasoning including the explanation given to the patients<sup>6, 17, 89</sup>. Moreover, in their treatment they still commonly use non-evidence based passive treatment modalities<sup>2, 22, 80, 81</sup>. Thus, there seems to be a mismatch between what physical therapists are supposed to do according to evidence based guidelines and what they actually do. Two questions arise: (1) Can this mismatch be addressed by an evidence-based education and skills development using a biopsychosocial framework? And (2) Will such training lead to a change in clinical practice and patient outcome?

The results of such educational approaches to date have been disappointing<sup>3, 18, 39, 46, 91</sup>. Engers et al.<sup>18</sup> studied the results of a 2-hour educational and clinical practice workshop for general practitioners. They compared this to a control group receiving no intervention. The results showed no significant differences between the patients in both groups at follow-up. Jellema et al.<sup>46</sup> provided general practitioners with an intervention of two training sessions of 2.5 hours each. The training consisted of theory, role-playing, and feedback on the practised skills. The results again showed no significant differences between the groups on any outcome measure during 12 months of follow-up in the whole group or in relevant subgroups (patients with high scores on psychosocial measures at baseline). Hay et al. gave physical therapists a two-day training course to deliver a pain management programme for sub-acute low back pain patients in primary care<sup>39</sup>. They compared outcome to patients receiving manual therapy. The clinical outcome showed no differences between the interventions. Stevenson et al. trained 30 musculoskeletal physical therapists for 5 hours in evidence based education package in psychosocial factors<sup>91</sup>. After the course there was little change in the physical therapists' actual clinical practice. The question is why did these studies fail to show a change in behaviour and patient outcome?

In order to achieve a change, a number of stages appear to be necessary<sup>12</sup>. First, clinicians need to understand and accept the need for a biopsychosocial approach to therapy. They need to shift from a more narrow biomedical perspective to a broader



biopsychosocial standpoint. Although the mechanisms through which clinicians attitudes and beliefs influence practice behaviour, and subsequently the outcomes for patients, are not yet fully understood <sup>7, 102</sup>, it seems unlikely that without a positive “re-orientation” they will be reluctant to change their behaviour. Secondly, enthusiasm is not sufficient. Although research shows that improved knowledge by it self did not improve clinical decisions-making skills <sup>7, 95</sup> or clinical behaviour <sup>66, 88</sup>, clinicians will still need up-to-date knowledge about which specific psychosocial factors are important and how to address these. Thirdly clinicians need to enhance their current level of skill to be able to elicit and modify these factors. In summary, it seems reasonable to suggest that favourable attitudes, up-to-date knowledge and new skills are all pre-requisites for behavioural change towards a biopsychosocial intervention. In other words, our hypothesis is that with the goal to improve patient outcome in terms of disability and pain, we first need to change physical therapists attitudes and beliefs toward a biopsychosocial standpoint, increase their knowledge on psychosocial risk factors, teach them new clinical skills and competencies so they can change their behaviour. This behavioural change can influence patients to change their behaviour that can lead to an improved patient outcome. Each step would be a pre-requisite for the next step. Figure 1 shows our model of how to achieve improved patient outcome.

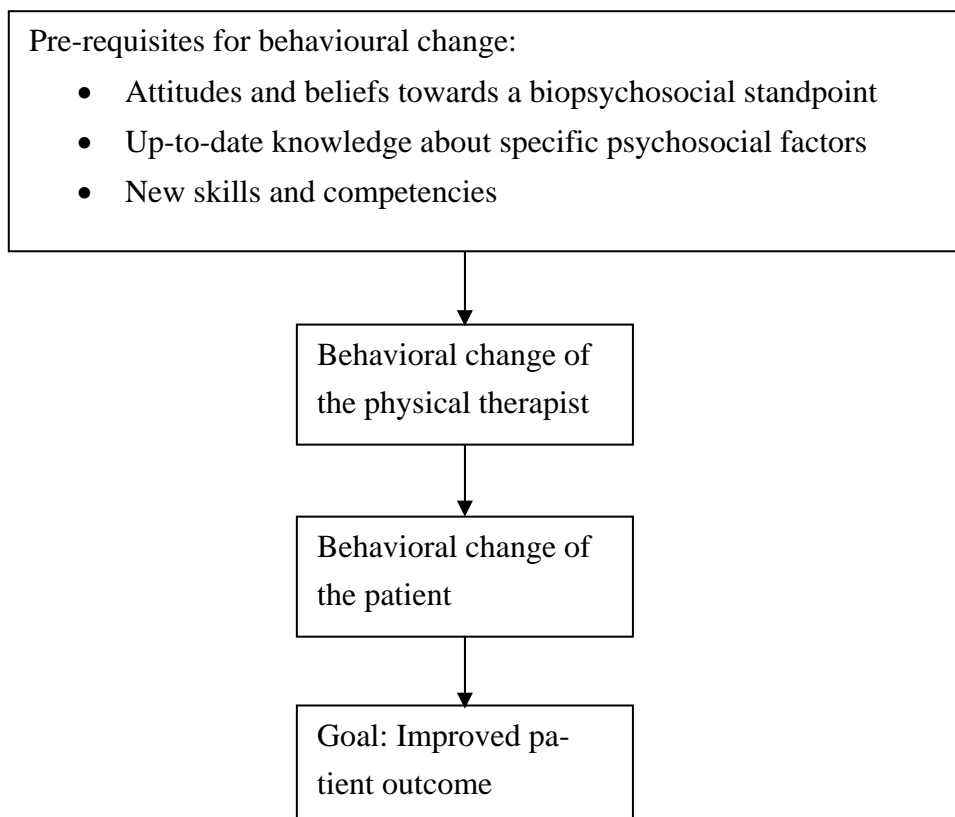


Figure 1. Our model on how to achieve improved patient outcome

Did these previous attempts succeed in changing all these vital process variables in clinicians? As mentioned before clinician's attitudes and beliefs can be divided into more biomedical or more biopsychosocial orientated attitudes <sup>76</sup>. Jellema et al. <sup>47</sup> showed indeed a change in attitudes in a follow-up article where she analysed the reasons why the intervention was not effective. GPs in the intervention-group did adopt a less biomedical-orientated attitude than the control-group, thus showing a change towards a more biopsychosocial orientation.

Concerning the next process variable, knowledge, previous studies did not evaluate specifically whether knowledge increased as a result of the intervention. Recent research has suggested however, that practitioners may lack up-to-date knowledge on evidence based psychosocial factors in the context of back pain. When asked to name psychosocial factors the respondents in a recent study indicated a wide range of psychosocial factors whereof only 16% were evidence based <sup>78</sup>. The vast majority of the listed factors mirrored various life difficulties that people present with in a clinical context, such as familial issues or lack of social support. These factors were not clinically modifiable psychosocial risk factors but were broad and general and non-modifiable for clinicians within the scope of their treatment possibilities.

In order to be able to change their behaviour, clinicians also need to acquire new skills, both in the identification and treatment of psychosocial factors. For example a physical therapist would have to both learn to elicit patient's models of his/her back problem and address, modify as well as correct maladaptive cognitions and attitudes on behalf of the patient. Jellema et al. <sup>47</sup> showed in her follow-up article that the physicians in the intervention group only were moderately successful in identification of psychosocial factors. A study analyzing adherence to protocol in the Hay et al. study <sup>71</sup> showed about 1 of 3 patients did not receive appropriate treatment as specified per protocol. Furthermore, most of the time spent on treatment comprised assessment and non-specific methods, particularly spinal mobilisation exercises. This indicates a lack of newly acquired skills and raises the question if the clinicians delivering the intervention had acquired sufficient competency.

In a recent article describing the lessons that could be learned from these trials several reasons were entertained for the disappointing results <sup>103</sup>. A first reason may be that professionals failed to acquire the specific competencies or skills taught in the training. These specific competencies or skills are essential to be able to successfully deliver an intervention with a cognitive behavioural approach aimed at psychosocial risk factors. A second reason may be that the training provided for health care professionals was very limited. These short educational interventions may change clinician's attitudes towards a biopsychosocial orientation but are probably not sufficient to increase their

knowledge and skills. A third reason may be that the interventions were not fully delivered in the manner they were intended. There were for example clear signs of protocol violations and not all patients received appropriate treatment as specified per protocol

39.

In summary, it becomes apparent that previous attempts have succeeded in changing attitudes but may have failed to increase knowledge and probably failed in teaching new skills. These short educational interventions which only target change in clinician's attitudes (towards a biopsychosocial orientation) although probably necessary, need to be supplemented by addressing knowledge and skills in assessment and management if change in clinical practice as a precursor to improved patient outcome is to be achieved.

### **1.9 Summary**

Neck and back pain continue to be extremely common, with a high prevalence and wide socio-economic consequences all over the industrialized world. Traditionally the medical model of disease has dominated the view on neck and back pain. Yet the pure biomedical or biomechanical approach of assessment and treatment patients has not solved the problem satisfactory. This has led to a new clinical model for the treatment of back pain; the biopsychosocial model of illness. Treatment based on the biopsychosocial model not only must address the biological basis of symptoms, but also must incorporate the full range of social and psychological factors that have been shown to affect pain, distress and disability. Indeed psychosocial factors have in recent years been acknowledged as very important in patients with musculoskeletal complaints. There is today strong evidence indicating that psychosocial factors have a greater impact on disability than biomechanical or biomedical factors. There is also strong evidence that psychosocial factors are strongly linked to the transition from acute to chronic pain.

Because psychosocial factors are so important in the development of musculoskeletal pain and because of the enormous costs for back pain, the need for an early intervention as means of secondary prevention has been pointed out. Secondary prevention would be aimed at the social and psychological risk factors that have been shown to affect pain, distress and disability. Although the concept of psychosocial risk factors still is relatively new, there seems to be an international consensus about the importance of psychosocial risk factors for the prevention of the development of chronic pain but there appears to be considerable uncertainty about the clinical application. Moreover, routine physical therapy does not seem to be a very successful treatment for patients at risk for long-term pain and disability.

The demand for and interest in applying evidence to physical therapist practice has grown in the past decade. Physical therapists seem to have a positive attitude to EBP

and especially the younger and newly licensed physical therapists are confident in their ability to adopt EBP. Clear barriers that can be identified are insufficient time and that the working facility does not fully support the use of evidence in practice.

Each year clinical research produces new findings that may contribute to effective and efficient care for back pain patients. However, professionals have limited time to read the ever-growing mountain of research and there is today an increasing recognition of the failure to translate these research findings into practice. Multiple components can affect implementation, and factors like the characteristics of the guidelines themselves, characteristics of professionals, patient characteristics and environmental characteristics may influence guideline implementation. Yet despite using evidence based methods for implementation success is not guaranteed. Retrospective studies comparing adherent care with less adherent care to guidelines show that more adherent care results in better patient outcome. This has yet to be shown prospectively. It can be concluded that improving the process of translating research findings into clinical practice is not an easy task.

HCPs seem to lack consensus about how to treat back patients. HCPs' attitudes and beliefs appear to influence the information they provide to patients. Thereby influencing the communication between HCP and patients. This may subsequently result in different patient outcome depending on the HCPs' attitudes and beliefs.

Physical therapists attitudes and beliefs are relatively unexplored but seem to have an effect on patients' attitudes and beliefs, which can affect patient outcome in terms of sick leave, health care use and function.

Research shows that previous attempts with educational approaches have succeeded in changing HCP's attitudes but may have failed to increase knowledge and probably failed in teaching new skills. These short educational interventions which only target change in clinician's attitudes (towards a biopsychosocial orientation) although probably necessary, need to be supplemented by addressing knowledge and skills in assessment and management if change in clinical practice as a precursor to improved patient outcome is to be achieved.

Two questions arise: (1) Can a more extensive evidence-based and skills development education using a biopsychosocial framework address these shortcomings? And (2) Will such training lead to a change in clinical practice and patient outcome?

## **2 Aim of the dissertation**

The goal of this dissertation is to acquire more in-depth knowledge on how well evidence-based information about psychosocial factors is incorporated in physical therapy, the impact of evidence-based guidelines in primary care and the effects of a university course for physical therapists aimed at teaching to identify and address evidence-based psychosocial prognostic factors within physical therapy treatment in primary care on physical therapist's knowledge, skills, clinical practice and thereby on patient outcome in terms of pain, function, depression and catastrophizing.

### **2.1 Aims of the studies**

#### **2.1.1 Study I**

Study I is a cross sectional study where the purpose was to assess how well evidence-based information about psychosocial factors was incorporated into physical therapy in primary care in Örebro County, Sweden, as well as how well physical therapists self-reported practice behaviour coincided with the most recent evidence-based review in Sweden.

#### **2.1.2 Study II**

Study II is also a cross sectional study where the purpose was to determine the impact of current evidence-based guidelines for back pain management on general practitioners' and physiotherapists' behaviour in primary health care in Örebro County, Sweden.

#### **2.1.3 Study III**

Because study III evaluates the effects of the university course both on the therapists, but also on how patients react, we have combined a randomized controlled trial on the patient level with a pre-post design on the therapist level. The aim of this study was to examine the effects of an eight day university-based training course (7.5 credits over 1 semester), aimed at identifying and addressing psychosocial prognostic factors during physiotherapy treatment, in shifting therapists towards a more biopsychosocial orientation as measured by changes in beliefs/ attitudes, knowledge, skills and behaviour.

#### **2.1.4 Study IV**

The study is a randomised controlled trial with the aim to examine the effects of a course on psychosocial factors for providers on patient outcome for patients at risk of long-term disability. The first question is whether patients of physical therapists who have participated in a course on psychosocial factors have better outcome (pain, disability) compared to patients of physical therapists who have not participated in such a

course. The second question is whether the effect of a course on psychosocial factors in terms of outcome for patients on pain and disability is dependent on the presence of psychosocial risk factors (catastrophizing, depression) within patients.

### **3 Short description of the studies**

#### **3.1 Study I**

Do physical therapists recognise established risk factors?

Swedish physical therapists' evaluation in comparison to guidelines.

#### **Background**

The Swedish Council on Technology Assessment in Health Care has widely distributed the most recent Swedish evidence-based review on neck and back pain. In this review psychosocial factors were acknowledged as important risk factors for developing chronic pain. We surveyed physical therapists' evaluation of risk factors for the development of chronic pain. The results were compared to the review of the Swedish Council on Technology Assessment in Health Care.

#### **Aim**

The purpose of this study was to assess how well evidence-based information about psychosocial factors was incorporated into physical therapy in primary care in Örebro County, Sweden, as well as how well physical therapists self-reported practice behaviour coincided with the most recent evidence-based review in Sweden.

#### **Overview of the design**

Physical, social and psychological risk factors are described in the most recent evidence-based review in Sweden. By means of a questionnaire, we surveyed both physical therapists' evaluation of the importance of these risk factors and their self-reported practice behaviour concerning sick leave and instructions regarding activities and pain relief. The answers were then compared to the evidence-based review.

#### **Participants**

The survey was administered to all the 117 physical therapists working in primary care in Örebro County. We chose this group of physical therapists because their main area of work is musculoskeletal pain and they primarily come in contact with patients with acute back pain. Because public funding pays for all physical therapy in Sweden, a list, obtained from the County Council, enabled us to reach all primary care physical thera-

pists, both employed by the County and private practitioners. We chose physical therapists in primary care because they were one of the primary targets for the information campaign for the evidence-based information. Accordingly, we surveyed physical therapists' evaluation of risk factors for the development of chronic pain. Furthermore, we assessed the key guideline self-reported practice behaviour concerning sick leave and activities as well as pain relief and finally, we compared this with the most recent evidence-based review in Sweden.

## Results

One hundred and two (87%) physical therapists responded to the survey. Over 50% of the physical therapists indicated more than twice as many risk factors as important as there is support for in the evidence-based review. Figure 2 shows the distribution of the number of risk factors indicated by the physical therapists. More than 50 % of the physical therapists pointed out all eight evidence-based factors described in the evidence-based review but they also indicated a median of 10 additional factors with little or no support in the literature. More than 80% of the physical therapists responded according to the recommendations of the evidence-based review concerning sick leave and instructions to patients regarding activities and pain relief. Forty-four physical therapists (43%) indicated they could predict which patients would develop chronic pain in the future.

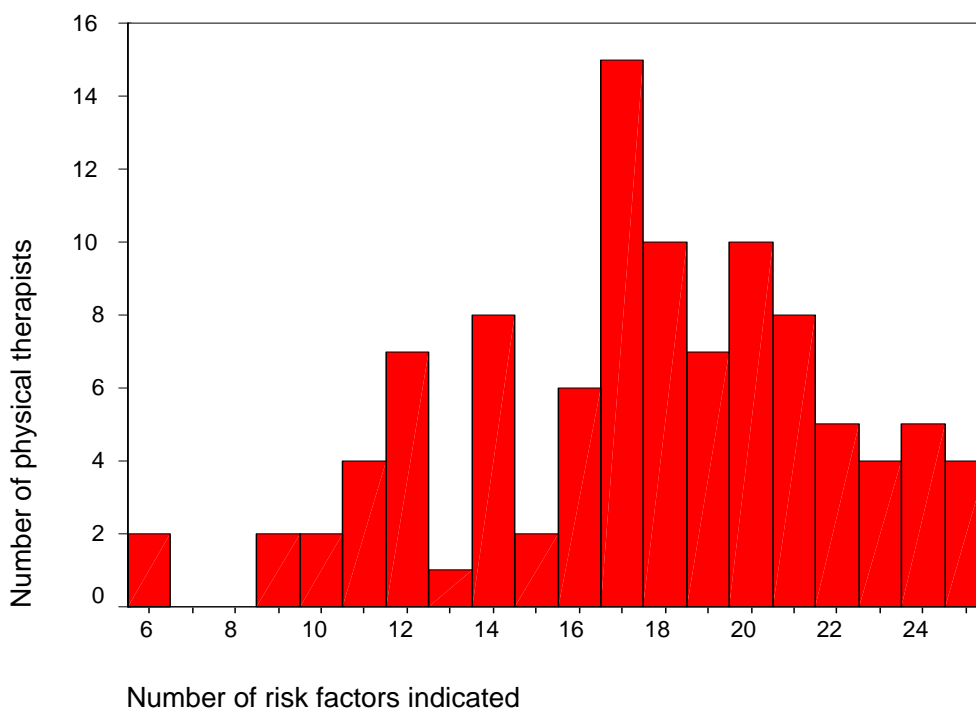


Figure 2. Frequency of the number of risk factors indicated by the physical therapists. (N=102)

## **Conclusions**

Physical therapists represented by this sample were well aware of the importance of psychosocial risk factors, but because of the large number of additional factors indicated it seems physical therapists lack specificity about which factors are important. But we still don't know if clinicians actually follow evidence-based guidelines.

## **3.2 Study II**

Do evidence-based guidelines have an impact in primary care?

A cross-sectional study of Swedish physicians and physiotherapists.

## **Background**

Guidelines, based on empirical evidence, are meant to ensure that patients get the most effective treatment. These evidence-based guidelines should steer clinical praxis, but clinicians may not read, let alone heed, them.

## **Aim**

The purpose of this study was to determine the impact of current evidence-based guidelines for back pain management on general practitioners' and physiotherapists' behaviour in primary health care in Örebro County, Sweden. In addition we asked clinicians if they felt a need for continuing education concerning key points of the guidelines.

## **Overview of the design**

A questionnaire was used to survey all physicians and physiotherapists (N=235) working in primary health care in Örebro County, Sweden and employed by the Örebro County Council. Because public funding pays for all health care in Sweden, a list, obtained from the County Council, enabled us to mail all primary health care physicians and physiotherapists employed by the County. This group of clinicians was chosen because one of their main areas of work is musculoskeletal pain and they primarily come in contact with patients with acute back pain.

## **Participants**

Because public funding pays for all health care in Sweden, a list, obtained from the County Council, enabled us to mail all primary health care physicians and physiotherapists employed by the County. At the time of the survey, the County employed 153 physicians and 82 physiotherapists. This group of clinicians was chosen because one of their main areas of work is musculoskeletal pain and they primarily come in contact with patients with acute back pain.



## Results

Forty two percent of the physicians and 37% of the physiotherapists were unfamiliar with the content of the guidelines and 40% of the physicians and 25% of the physiotherapists were unfamiliar with the concept of “Red flags”. Less than half of the clinicians, 47%, were familiar both with the content of the guidelines and the concept of “Red flags”. Their opinion about the guidelines showed that 54% of the physicians and 56% of the physiotherapists agreed that the guidelines were useful in clinical praxis. Concerning the self-reported practice behaviour, the majority indicated they followed the key points in the guidelines. Figure 3 shows the physicians and physical therapist’s attitude towards evidence-based guidelines.

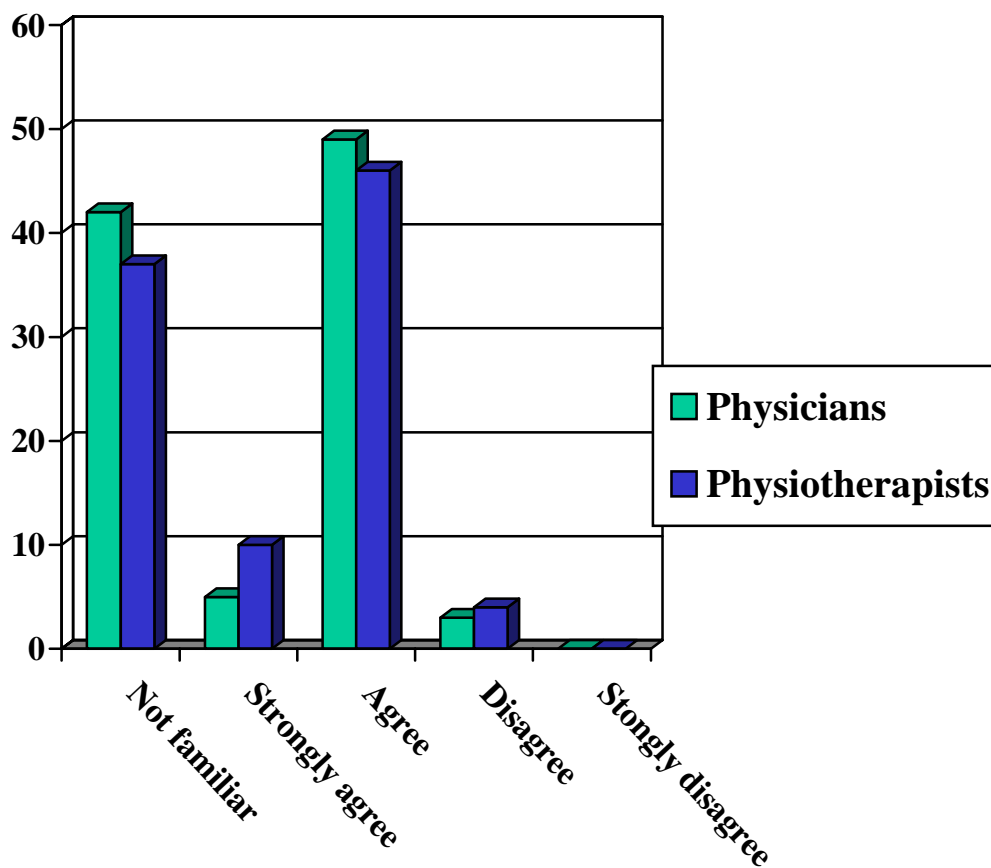


Figure 3. The physicians and physical therapist’s attitude towards evidence-based guidelines. The item was; “I consider the guidelines for the management of neck and back patients to be useful in clinical practice”. “Not familiar” was measured with the alternative: “Not familiar enough with the content of the guidelines to answer the question”.

## **Conclusions**

This study shows that a relatively large proportion of clinicians were unfamiliar with the content of evidence-based guidelines and/or with the concept of “Red flags”. The process of implementing research into clinical practice is in need of an overhaul and the impact of guidelines on clinical practice may be questioned. There seems to be a need to improve the transfer of evidence-based knowledge into clinical practice. An interactive goal-orientated course in combination with other interventions addressing obstacles to implementation may enhance compliance to evidence based health care and guidelines.

### **3.3 Study III**

Do physical therapists change their beliefs, attitudes, knowledge, skills and behaviour after a biopsychosocially orientated university course?

## **Background**

In the treatment of back pain, physical therapists are frequently consulted, and often already at an early stage of the complaints. Moreover, physical therapists spend considerable time with their patients, so there is ample opportunity for interaction. Because there is today a growing understanding that the biomedical approach is inadequate it is important physical therapists treat patients according to evidence-based guidelines and, in accordance with guidelines, incorporate the biopsychosocial model in their clinical practice. Yet, physical therapists still have substantial biomedical orientated pain beliefs influencing their clinical reasoning including the explanation given to the patients. Moreover, in their treatment they still commonly use non-evidence based passive treatment modalities. Thus, there seems to be a mismatch between what physical therapists are supposed to do according to evidence based guidelines and what they actually do. Two questions arise: (1) Can this mismatch be addressed by an evidence-based education and skills development using a biopsychosocial framework? And (2) Will such training lead to a change in clinical practice?

## **Aim**

The aim of this study was to examine the effects of an eight day university-based training course, aimed at identifying and addressing psychosocial prognostic factors during physiotherapy treatment, in shifting therapists towards a more biopsychosocial orientation as measured by changes in beliefs/ attitudes, knowledge, skills and behaviour.

## **Overall design**

Because study III evaluates the effects of the university course both on the therapists, but also on how patients react, we have combined a randomized controlled trial on the patient level with a pre-post design on the therapist level. Forty-two physiotherapists were randomized before receiving an educational training program designed to enhance knowledge, skills and practice behaviour concerning integrating psychosocial factors in their clinical practice.

## **Procedure**

The physical therapists participating in the course were randomised to either Course 1 or Course 2. The courses were identical and consisted of 8 full training days over an eight-week period. We used a before/after design to evaluate the effects of the education on the physical therapists attitudes, knowledge, and skills. The course participants recruited consecutive musculoskeletal pain patients in their clinical practice to the study both before and after the course. Course 2 was given at a later time and had 2 periods of collection of patients prior to the course thus serving as a waiting list control. The course participants were tested before and after the course with questionnaires regarding their attitudes and beliefs toward psychosocial factors, knowledge tests, judgement of patient vignettes and their judgement of a video of an imaginary patient. The patients that the course participants recruited in their daily practice were asked to fill out a questionnaire at treatment start and a follow up with the same questionnaire 6 month later. They also received a questionnaire about the physical therapist's behaviour and patient satisfaction 6 weeks after treatment start. The procedure is depicted in the flow chart in Figure 4.

## **Process variables**

The evaluation of the university course focused on the following process variables; attitudes and beliefs, knowledge, skills and perceived behaviour addressing psychosocial factors in clinical practice.

## **Results**

The results show that physical therapists' attitudes and beliefs became more biopsychosocially and less biomedically orientated, they were less convinced that pain justifies disability and limitation of activities, and their knowledge and skills on psycho-

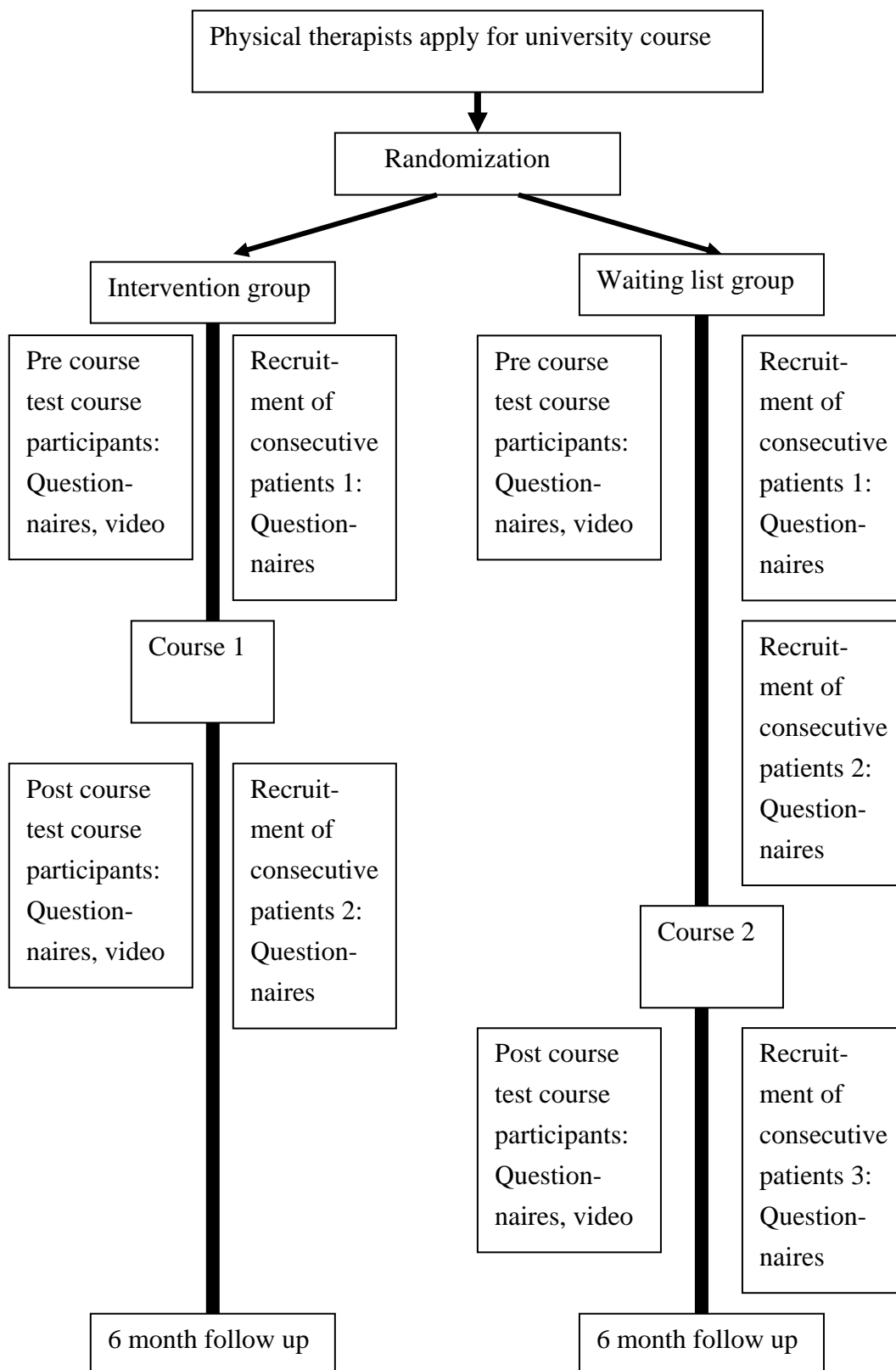


Figure 4. Flow chart of the procedure

social risk factors increased after a university accredited training course. Yet despite these changes their patients perceived their practice behaviour before and after the course as similar and were equally satisfied with their treatment and treatment result.

## **Conclusions**

A course, which enhanced biopsychosocial attitudes and beliefs, as well as increased such knowledge and skills did not change the way patients perceived their physical therapists. A future question is whether it improves patient outcome.

### **3.4 Study IV**

Does teaching physical therapists to deliver a biopsychosocial treatment program result in better patient outcome?

## **Background**

In recent years there has been a growing recognition of psychosocial risk factors as predictors of long-term disability. Risk factors such as catastrophizing, distress, perceived disability and depressed mood have been shown to be important in the development of prolonged pain and disability. Theoretically, addressing these modifiable risk factors by providing early psychosocial interventions in primary care may, at least for a part of the patients at risk of developing long-term disability, prevent chronicity. In order to address and modify these risk factors health care providers need to adopt and incorporate the biopsychosocial model in their clinical practice. There have been several attempts to train health care professionals to provide psychosocial interventions aimed at addressing risk factors. The results of such educational approaches to date have been disappointing, showing no improved results on patient outcome. We have designed an intervention differing in two important ways from previous studies. First, in attempting to improve patient outcomes, we have targeted specifically vital process variables such as clinicians' attitudes, knowledge, skills and behaviour so that clinicians can successfully address important risk factors such as patient's pain, distress, and disability. Secondly, in offering a more extended training program, we have attempted to offer physical therapists ample opportunity to acquire new knowledge and practice newly acquired skills in their clinical situation.

## **Aim**

The aim of the study was therefore to examine the effects of a course on psychosocial factors for providers on patient outcome for patients at risk of long-term disability. The first question is whether patients of physical therapists who have participated in a course

on psychosocial factors have better outcome (pain, disability) compared to patients of physical therapists who have not participated in such a course. The second question is whether the effect of a course on psychosocial factors in terms of outcome for patients on pain and disability is dependent on the presence of psychosocial risk factors (catastrophizing, depression) within patients.

### **Overall design**

We conducted a randomised controlled trial with the aim to evaluate the result of an eight day university training course designed to integrating psychosocial factors in clinical practice on a patient level. The study had the same sample of physical therapists and patients as well as same basic design as study III. Forty-two physiotherapists applied for the course. The course consisted of 8 whole days spread over 8 weeks, one course day each week. The practitioners were randomised to either a waiting list control group or an intervention group. Twenty-two physical therapists participated in the intervention group and twenty in the waiting list control group. The physiotherapists recruited consecutive acute and sub-acute patients with musculoskeletal pain to the study both before and after the course. The waiting list control group attended the course at a later time and had 2 periods of collection of patients prior to the course thus serving as a waiting list control. Data of a total of 266 patients were collected. Patients were followed up 6 months after completion of the initial questionnaire.

### **Risk patients**

Higher levels of catastrophizing and/or depression are generally considered a risk factor for long-term disability. For the second question of this study, we therefore divided patients into risk vs. non-risk group on the basis of a median split of the Pain Catastrophizing Scale and of the Hospital Anxiety and Depression Scale.

### **Results**

There were no significant differences in outcome for pain or disability at 6-month follow-up for the patients of physical therapists who had participated in a course on psychosocial factors compared to patients of physical therapists who had not participated in such a course. Concerning the effect of a course on psychosocial factors in terms of outcome for patients on pain and disability is dependent on the presence of psychosocial risk factors (catastrophizing, depression) within patients the results showed that this was not the case. Course participants' patients with higher levels of catastrophizing or depression did not improve significantly more than non-course participants' patients with higher levels of catastrophizing or depression at 6-month follow up.

## **Conclusions**

An eight-day university course for physiotherapists aimed at identifying and treating psychosocial risk factors did not improve patient outcome for either the group of patients as a whole or for patients determined to be at higher risk of developing long-term disability.





## **4 General discussion**

This dissertation focused on 2 parts: First, how well evidence-based guidelines are recognized and integrated in practitioner's clinical practice, as well as how well evidence-based information about psychosocial factors is recognized and incorporated into physical therapy in primary care. Study I showed that physical therapists in primary care were well aware of the importance of psychosocial risk factors, but because of the large number of additional non-evidence based factors indicated, it seems physical therapists lack specificity about which factors are important. Study II showed that a relatively large proportion of clinicians were unfamiliar with the content of evidence-based guidelines and/or with the concept of "Red flags". Yet, concerning the self-reported practice behaviour, the majority indicated they followed the key points in the guidelines.

The second part of the dissertation focused on the results of a university course aimed at teaching to identify and address evidence-based psychosocial prognostic factors within physical therapy treatment in primary care in Sweden. The results from study III showed that a course, which enhanced biopsychosocial attitudes and beliefs, as well as increased such knowledge and skills, nevertheless did not change the way patients perceived their physical therapists' behaviour. Moreover, study IV showed that the eight-day university course for physical therapists did not improve patient outcome at 6-month follow-up, either for the group of patients as a whole or for patients determined to be at higher risk of developing long-term disability.

### **4.1 How do the results relate to the aim of the dissertation**

The first aim of the dissertation was to acquire more in-depth knowledge on how well evidence-based information about psychosocial factors is incorporated in physical therapy. Study I showed that physical therapists in primary care were well aware of the importance of psychosocial risk factors, but because of the large number of additional non-evidence based factors indicated, it seems physical therapists lack specificity about which factors are important. The survey showed that over half of the physical therapists indicated 17 or more risk factors as important for the development of chronic pain in patients with acute back pain. This is more than twice as many as stated in the most recent evidence-based review. The message of the evidence-based review that psychosocial factors are important was well known by the physical therapists. But physical therapists had difficulties knowing which factors are important. The study showed that the factors with support in the literature are present among the answers of more than 50% of the respondents.

The second aim was to study the impact of evidence-based guidelines in primary care. Study II showed that despite great efforts to distribute the guidelines a relatively large proportion of clinicians were unfamiliar with the content of evidence-based guidelines and with the key concept of “Red flags”. The fact that 42% of physicians and 37% of physiotherapist were unfamiliar with the content of the guidelines and that 40 percent of physicians and 25 percent of physiotherapists were unfamiliar with the concept of “Red flags” highlights the problem of disseminating and implementing evidence based research findings in primary health care. Yet, in contrast, the self-reported practice behaviour of a majority of the clinicians was in accordance with the key points of the guidelines. Here we have to keep in mind that surveys with self-reported data may not always reflect actual behaviour because practitioners tend to overestimate their ability, knowledge and skills when asked to rate these them selves compared to objective measures of adherence <sup>1, 45, 67</sup>. No significant differences in practice behaviour were found between those familiar with the guidelines and those unfamiliar. Only when the difference between those unfamiliar with both the content of the guidelines and ”Red flags” and those familiar with both was calculated was a difference found.

The third aim of the dissertation was to study the effects of a university course for physical therapists aimed at teaching to identify and address evidence-based psychosocial prognostic factors within physical therapy treatment in primary care on physical therapist’s knowledge, skills, clinical practice and thereby on patient outcome in terms of pain, function, depression and catastrophizing. Study III showed physical therapists changed significantly on important process variables like attitudes, beliefs, knowledge, and skills after a university course. Their attitudes and beliefs became more biopsychosocially and less biomedically orientated, they were less convinced that pain justifies disability and limitation of activities, and their knowledge and skills on psychosocial risk factors increased. Yet, despite these changes, their patients perceived their therapists’ behaviour before and after the course as similar and were equally satisfied with their treatment and treatment result. The results of this study are in line with previous studies <sup>3, 18, 39, 46, 91</sup>. Earlier research was not able to show a change on a patient level. However, they did not evaluate all the process variables and were therefore unable to demonstrate why no results were achieved on a patient level. We evaluated all process variables and could demonstrate that a change in attitudes and beliefs, increased knowledge and skills did not lead to a behavioural change as perceived on a patient level.

The results of study IV are again in line with previous studies <sup>3, 18, 39, 46, 91</sup>. Despite our attempts to improve on the shortcomings in earlier studies we were not able to show a change on patient outcome either. Our hypothesis was that a change in attitudes and beliefs, an increase of the physical therapist’s knowledge, skills and competencies would create the necessary requirements for behavioural change on behalf of the thera-

pists. We evaluated all process variables and could indeed demonstrate that we significantly changed attitudes and beliefs, increased knowledge and skills but this did not lead to a behavioural change as perceived on a patient level and did not improve outcome for the therapists' patients.

#### **4.2 Possible explanations**

There might be several possible explanations for these results. The results of study I can be explained in light of an article <sup>52</sup>, published just before the survey. In the article a comparison was made between different national evidence-based guidelines on low back pain. Although all national guidelines acknowledged psychosocial factors as risk factors for developing chronic pain, no clear advice was given in the guidelines about which factors to take into consideration, when to assess them or how to screen for them. Clinicians may fall back on their clinical experience rather than unclear evidence-based reports. Experiences from previous patients that were difficult to treat are surely present here. Physical therapists probably lack a clear theoretical model and structure in their view of risk factors. Physical therapists may have heard about risk factors but may not have a clear model or structure about how these factors work. Since these risk factors are mostly psychological and social factors, and since this is not physical therapists main area of knowledge, it is understandable that physical therapists are not familiar with theory and probably lack a clear structure.

Study II showed that despite great efforts to distribute the guidelines a relatively large proportion of clinicians were unfamiliar with the content of evidence-based guidelines and with the key concept of "Red flags". Twenty percent of the respondents felt both unfamiliar with the concept of "Red flags" and unfamiliar with the content of the guidelines. This might indicate a subgroup of clinicians not familiar at all with research findings. This was reflected in their self-reported practice behaviour. This group, in contrast to the key points of the guidelines, indicated they significantly more often provided pain relief and recommended rest, less often assured the patient that the complaints are not a sign of a serious disease and less often advised the patient to be active despite pain if compared to the group familiar with both the content of the guidelines and "Red flags".

In Sweden, the guidelines at the time of the study consisted of 2 books, the first of 417 pages and the second of 389 pages. Moreover, the way the content of the guidelines were distributed was mainly by means of passive oral presentations. Research shows that these kinds of strategies are ineffective <sup>24, 34</sup>. In light of this one can argue that it is nearly remarkable that proximally 60% of the respondents felt they were familiar with the content of the guidelines.

Study III showed physical therapists changed significantly on important process variables like attitudes, beliefs, knowledge, and skills after a university course. Yet, despite these changes, their patients perceived their therapists' behaviour before and after the course as similar and were equally satisfied with their treatment and treatment result. There may be several possible explanations for this. First, the physical therapists attending the course applied voluntarily. The results showed they were already interested in, had knowledge about, and had to a certain extent already adopted the biopsychosocial model before the course. This may have resulted in a ceiling effect. This hypothesis is supported when comparing the clinician's mean scores of their attitudes and beliefs on the PABS-PT and HC-Pairs with other studies using the same questionnaires. It showed that the physical therapists in our study already scored higher on the biopsychosocial factor, lower on the biomedical factor and lower on the HC-Pairs before the course than other comparable primary care physical therapists and physicians<sup>6, 44, 47, 76, 83, 84</sup>. Moreover when we compared the results of the open question with a recent study<sup>78</sup> using the same question we found that before the course 38.4% of the factors the physical therapists in the present study wrote down were evidence based. In the other study, only 16% of the factors the clinicians wrote down were evidence based.

Even in satisfaction with the treatment encounter we probably reached a ceiling effect. Already before the course the patients were highly satisfied with the encounter and rated a mean of 8.8 on a 0-10 scale. As a result of all this there might have been little room for improvement of their behaviour. Had we started from an other base-rate, the change could have been more likely to be detected.

A second explanation is that the questions we used to evaluate the behavioural change of the participants might have been too broad to accurately capture practice behaviour and were not sensitive enough to measure change. The difference in our study may constitute of the specific aspects rather than the more general labels. We asked for example "Did your physical therapist give you a clear explanation of what causes your complaint?" The physical therapists may in fact have given an explanation more in accordance with the biopsychosocial model after the course than before, but with our question the patients could only indicate if they thought the explanation was clear, unfortunately not if it was in alignment with a biopsychosocial approach.

A third explanation may be that the patients in the group after the course were not the same group of patients as before the course. In order to measure the change after the course it was inevitable to use a different patient group. The fact that two different groups of patients answered the questionnaire about the behaviour of the same therapists might explain why there was no difference in contrast to if the same patients had filled in the questionnaire before and after the course.

There are several possible explanations for the results of study IV. The first explanation concerns the content of the course. It might well be so that it is necessary to change attitudes and beliefs, increase knowledge, skills and competencies but that these increases are probably insufficient by themselves to change previous clinical behaviour. In other words, we probably managed to obtain the prerequisites in the first step of our model but may have failed to reach the next step; behavioural change of the physical therapists. A recent randomized clinical trial by Cleland et al <sup>14</sup> showed that a Continuing Education course for physical therapists without ongoing education and an educational outreach session after the course did not improve the overall outcome for patients. Yet, the group of therapists in the same study receiving ongoing education and an educational outreach session after the course achieved a significantly greater reduction in disability for their patients. Educational outreach visits in the therapist's clinical environment with an actual patient may provide the direct clinical feedback needed to change actual behaviour and thereby create the possibility to improve patient outcome. Although our course had both extensive role play and one course day each week which gave participants the possibility to practice newly acquired skills by themselves as homework assignments in their own clinical practice and get feedback on the practiced skills the next week we did not include an educational outreach visit in our education. We could therefore not provide our participants with direct clinical feedback.

It is possible that this is the missing part in our model. Behavioural change does not occur without the prerequisites in the first step of the model but direct clinical feedback might be a prerequisite to elicit a behavioural change on behalf of the physical therapists.

A second explanation also concerns the content of the course. Our initial idea was to give the participants a broader overview of which evidence-based psychosocial risk factors to assess and how to deal with these factors as well as more detailed knowledge on these factors and how they could maintain the pain problem leading to chronicity. We thought this would give the participants flexibility in dealing with a diversity of patient groups typically encountered in primary care. In hindsight we might have been too broad and general without providing enough detail about how to specifically deal with these factors. In other words, we may have underestimated what was needed to change the practitioners' behaviour. First, no manuals were provided to the participants and few specific treatment techniques were taught. A recent study by Sullivan et al. <sup>93</sup> showed positive results in patient outcome after a training course for physical therapists. In their course Sullivan and colleagues used a strict manual, regulating in detail how to deal with specific risk factors. We provided no such manual. Second, our focus in the course may have been too much on assessment and too little on specific treatment. This led to the physical therapists improving on assessment skills, as shown in study III, but

the therapists may not have enquired enough specific treatment skills to change outcome for patients at risk for long-term disability.

A third explanation concerns the course participants. It may be that we might have encountered a ceiling effect. The physical therapists attending the university course applied voluntarily. The results from our previous study showed they were already interested in, had knowledge about, and had to a certain extent already adopted the biopsychosocial model before the course as shown in study III. In other words, the physical therapists may already before the course have had a competency exceeding typical “average” physical therapists. This may have resulted in a ceiling effect leaving limited room for improvement of the therapist’s behaviour. We can find an other indication for this when we compare the results of a recent study<sup>86</sup> of physical therapists in Sweden with the present study. The Sandborgh et al. study was conducted in a similar setting with similar patients as our study; primary care in Sweden. It showed similar patients at risk of long-term disability had *increased* disability, *decreased* work capacity and daily function at follow up despite treatment by physical therapists. When we look at the outcome for the patients in the present study we can see that the patients at risk of long-term disability treated by the participants before the course at least had not become worse at follow up. One possible explanation is that the therapists in the present study already had adopted the biopsychosocial model to a certain extend and therefore were more competent to deal with the psychosocial risk factors for long-term disability at hand.

The fourth reason for the results concerns the patients. Patients at risk of long-term disability and with relatively high levels of catastrophizing are among the most difficult patients to treat. Even studies with experienced CBT providers show moderate to low outcome results for this patient group<sup>59</sup>. Maybe it is too much to ask of a single physical therapist in a primary care setting to change outcome for a group of patients that professionals with extensive training and competencies only have moderate success with. In view of this the results of this study may not be so disappointing but a much better result may not be feasible for a single clinical physical therapist. A course directed at direct behavioural change on behalf of the physical therapists may improve outcome more than we were able to do but there is probably a limit in how much improvement clinically experienced physical therapists can achieve with this challenging patient category.

The perfect study probably still has to be published. If we consider the possible explanations of the studies in this dissertation it is likely that a combination of explanations is the main reason for the results rather than one explanation by it self. Unfortunately the data at hand is too incomplete to give us a certain answer. This combination would probably consist of a ceiling effect because the participants of the course were

already biopsychosocially orientated, we underestimated what it would take to achieve a behavioural change and the difficulty to accomplish a better outcome for this difficult patient category.

### **4.3 Clinical implications**

There are several clinical implications of the results of this dissertation. The first study pointed out the need for an educational intervention in psychosocial risk factors for physical therapists. Physical therapists may have heard about risk factors but probably did not have a clear model or structure about how these factors work. We tried to accommodate to this by providing an evidence-based education aimed at changing attitudes and beliefs as well as increasing knowledge, skills and competencies. We succeeded in this but were unable to change patient outcome.

Implications for the implementation of evidence-based guidelines in primary care are two fold. First, the way the content of the evidence-based guidelines were implemented and disseminated in Sweden is, according to research, ineffective<sup>24</sup>. Multiple components can affect implementation and dissemination, and factors like the characteristics of the guidelines themselves, characteristics of professionals, patient characteristics and environmental characteristics may influence guideline implementation. It is then of the utmost importance to choose interventions that have been proven to be effective. Interventions or tactics for teaching and implementing guidelines should include interactive education and discussion, feedback, and reminders which have been shown to enhance knowledge, skills and change behaviour<sup>5, 16, 32, 34</sup>. Furthermore, the applicability of the guidelines needs to be further developed<sup>9</sup>. Second, we found a subgroup of twenty percent of the respondents that felt both unfamiliar with the concept of “Red flags” and unfamiliar with the content of the guidelines. This indicates, as mentioned above, a subgroup of clinicians not familiar at all with research findings, which was reflected in their self-reported practice behaviour. Implementation efforts should pay extra attention to this group in trying to identify these clinicians and use evidence-based interventions to change their attitudes and beliefs, increase their knowledge, skills and competencies.

The clinical implementation of the results of the course we provided is of course dependent on which of the possible explanations mentioned before are considered most plausible. If we consider the fact that we encountered a ceiling effect as the most plausible explanation we need to change to way we recruit participants to the course and different physical therapists need to be educated. The physical therapists in these studies, attending the course, applied voluntarily and the results showed they were already interested in, had knowledge about, and had to a certain extent already adopted the biopsychosocial model before the course. Educating these physical therapists did not improve

patient outcome. A logical conclusion would be that courses should then be aimed at physical therapists with more biomedical attitudes and beliefs. This would increase the likelihood of a better result.

If we consider the shortcomings in the content of the course as the most plausible explanation we need to focus more on actual behavioural change of the physical therapists. We managed to change attitudes and beliefs, increase knowledge, skills and competencies but behavioural change turned out to be more difficult to achieve than we anticipated. We probably managed to obtain the prerequisites in the first step of our model but may have failed to reach the next step; behavioural change of the physical therapists. So we need to change the content of the course in two ways. First, we need to use a strict manual, regulating in detail how to deal with specific risk factors. This way, physical therapists would know exactly what to do and say when encountering a specific patient. This would probably facilitate implementing new behaviour in clinical practice and increase the likelihood that the new behaviour is maintained. Second, we need to, in accordance with Cleland<sup>14</sup>, include educational outreach visits in the education so we can provide the participants with direct clinical feedback when treating their patients. By these changes the content would focus more on behavioural change and this would facilitate implementation of new behaviour in clinical practice and increase the likelihood that the new behaviour is maintained and thereby the possibility of improved patient outcome.

An-other plausible explanation would be that treating patients at risk for long-term pain and disability is too difficult for a single physical therapist in a clinical setting. This would imply large changes in the way patients are directed through the health care system compared to now. At present time most patients with musculoskeletal pain see a physical therapist often at the early stages of the complaints. The physical therapist assesses the patient and treats him/her according to the findings in the assessment. As mentioned before, there does not seem to be an unlimited time frame to reduce pain and disability after onset. The results of our studies and other studies<sup>26, 86</sup> show that most patients at risk of long-term pain and disability do not recover from the treatment delivered by the physical therapists. If treatment does not result in a successful outcome valuable time is lost and the patient is closer to long-term pain and disability. Yet, our studies show that the physical therapists improve their assessment skills. A logical conclusion would be that physical therapists would screen and assess the patients. One of the main tasks of the physical therapists in primary care would then be to select patients at risk for long-term pain and disability. What the exact cut-of scores need to be can of course be debated. They would then treat the patients not at risk and refer the patients at risk for long-term pain and disability to more suitable treatment, for example CBT treatment delivered by a psychologist or multimodal treatment delivered by a team of



experts. There is moderate evidence of positive effectiveness of multidisciplinary rehabilitation for subacute low back pain<sup>50</sup>. Since risk patients experience most suffering and are the most costly for the health care system<sup>72</sup>, it is important they get the appropriate treatment at the earliest possible opportunity.

#### **4.4 Methodological considerations**

The studies in this dissertation have both some general and some more specific methodological disadvantages and strengths that must be kept in mind when interpreting the results as well as when considering future research. The first and foremost general shortcoming of all studies in this dissertation is that we have no insight in to the physical therapists' actual practice behaviour. First, in study I, half of the physical therapists indicate 17 or more risk factors and in clinical practice it is very difficult to assess and acknowledge so many risk factors at the same time. Secondly, we don't know how or if physical therapists take risk factors into account when they make their treatment choice. Moreover, we do not know which treatment they chose and last but not least we do not know if this results in less patients with persistent pain and disability. In study II we do not know if self-reported practice behaviour reflects actual practice behaviour. Unfortunately we were dependent on self-report instead of being able to study clinicians practice behaviour in their clinical setting. We have to keep in mind that in surveys with self-reported data some caution is called for because practitioners often overestimate their ability, knowledge and skills when asked to rate these them selves compared to objective measures of adherence<sup>1, 45, 67</sup>. One can even assume a bias towards socially acceptable answers leading to an overrating of clinicians' reported awareness of the guidelines' content. Yet, if there were a social bias, this would imply even fewer clinicians aware of the content of the guidelines or their clinical usefulness. Not being familiar with the concept "Red flags" does not mean the clinicians do not exclude these "Red flags" in their clinical practice. They may well exclude serious conditions without knowing this is called "Red flags" in more recent literature. Their actual practice behaviour may be in accordance with the recommendations of the guidelines without even being familiar with the word "Red flags".

Even in studies III and IV we have no measure of the physical therapists actual practice behaviour so we don't know if the therapist's behaviour was according to evidence-based guidelines and how it was taught during the course. We only have an indirect measure of how the patients perceived the physical therapists' behaviour.

Another weakness in study III and IV is the lack of an evaluation of treatment skills. The video we used to evaluate skills shows improved skills in assessment. The physical therapists became more competent in detecting yellow flags or psychosocial risk factors when assessing a patient. However, we have no measure of their actual

treatment skills. So we don't know whether non-biopsychosocial orientated treatment delivered by physical therapists is equally effective as biopsychosocial treatment as we don't know which treatment was delivered to the patients. Because we don't know how the therapists treated their patients we can only draw the conclusion that this extensive training of physical therapists did not result in an improved treatment outcome for their patients.

One of the strengths in these studies is the high rate of response from the physical therapists and the patients. Because of the high response rate (87%) in study I we can assume that the results reflect the view of the physical therapists in the county on risk factors. Still, we do not know how well these findings generalize to other physical therapists in other settings. The relatively low response rate of the physicians (58%) in study II is comparable with response rates by physicians in other studies<sup>84</sup> and implies that we have to be somewhat cautious with the results of this group. Unfortunately, we have no data on the non-responders. We asked a sample of 10 non-responders for their main reason not to respond. They unanimously answered lack of time to be their main reason. We therefore had no obvious reason to believe non-responders differed in any way from responders. Because of the high response rate of the physiotherapists (87%) in study II it can be assumed that the results reflected the opinion about the guidelines' clinical usefulness and the self-reported practice behaviour of the physiotherapists in the county. Still, we do not know how well these findings generalize to other therapists in other settings. Concerning the response rate of the patients, in both study III and IV was the response rate over 80%.

Another strength of study III is that we evaluated all process variables enabling us to see where the changes occurred and where not. Moreover, the large number of patients makes the results robust.

#### **4.5 Directions for future research**

The studies in this dissertation raise a number of questions for future research. First, very little research has been conducted on physical therapists' actual practice behaviour and the process of what happens in the interaction between physical therapist and patient during treatment is still somewhat of a back box. Future research should investigate what the actual content of the communication is, how physical therapists react on distressed patients and what messages are given by the physical therapist. This way we could better understand if the communication is biomedical or more biopsychosocial orientated. It would also enable us to understand if the physical therapists change their communication dependent on the patients' way of expressing concerns or distress. We would also know if the messages are clear and consistent and in accordance with the aims of the treatment.

Second, we showed that the physical therapists attending the course applied voluntarily and the results showed they were already interested in, had knowledge about, and had to a certain extent already adopted the biopsychosocial model before the course. This may have left little room for improvement. It would therefore be worthwhile to replicate the course with physical therapists with more biomedical attitudes and beliefs. This course should have its major focus on behavioural change on behalf of the physical therapists according to the lessons that can be learned from our course. This might lead to a significant improvement in patient outcome compared to the group of physical therapists who attended our course. This would also answer the question whether the results of our studies depended on our selection of physical therapists, on the content of the course or on the degree of difficulty in treating patients at risk for long-term pain and disability.

Still, at present we do not know which treatment given by who would result in the most improved treatment outcome for patients at risk for long-term pain and disability. Therefore, the course mentioned above should be held. It should also include participants not very well acquainted with the biopsychosocial model. Then, a randomised controlled trial can be conducted where patients at risk for long-term pain and disability were randomised to either treatment by a physical therapist who attended the course or CBT treatment delivered by a psychologist or multimodal treatment delivered by a team of experts. The results of such a trial would give us the best indication of what would be the most successful treatment strategy for this challenging patient group.

#### **4.6 Summary and concluding remarks**

In summary, this dissertation shows that integrating psychosocial factors in physical therapy is not an easy task. We showed that a relatively large proportion of clinicians in primary care were unfamiliar with the content of evidence-based guidelines and/or with the concept of “Red flags”. Yet, concerning the self-reported practice behaviour, the majority indicated they followed the key points in the guidelines. To improve the implementation interventions or tactics for teaching and implementing guidelines should include interactive education and discussion, feedback, and reminders, which have been shown to enhance knowledge, skills and change behaviour. Furthermore, the applicability of the guidelines needs to be further developed.

We were also able to show that psychosocial factors were integrated up to a certain point and that physical therapists in primary care were well aware of the importance of psychosocial risk factors, but it seemed physical therapists lack specificity about which factors are important. Physical therapists may have heard about risk factors but probably did not have a clear model or structure about how these factors work. We tried to accommodate to this by providing an evidence-based education aimed at changing

attitudes and beliefs as well as increasing knowledge, skills and competencies. We succeeded in this but were unable to change patient outcome. The question is whether the results of our studies depended on our selection of physical therapists, on the content of the course or on the degree of difficulty in treating patients at risk for long-term pain and disability.

If the most plausible explanation of the result is our selection of physical therapists the course needs to be replicated with physical therapists with more biomedical attitudes and beliefs. This might lead to a significant improvement in patient outcome compared to the group of patients of the physical therapists who attended the course.

Our results show we managed to change attitudes and beliefs, increase knowledge, skills and competencies but behavioural change turned out to be more difficult to achieve than we anticipated. We probably managed to obtain the prerequisites in the first step of our model but may have failed to reach the next step; behavioural change of the physical therapists. So, if we assume the content of the course was the main reason why we did not improve patient outcome we need to change the content of the course in two ways. First, we need to use a strict manual, regulating in detail how to deal with specific risk factors. This way, physical therapists would know exactly what to do and say when encountering a specific patient. This would probably facilitate implementing new behaviour in clinical practice and increase the likelihood that the new behaviour is maintained. Second, we need to include educational outreach visits in the education so we can provide the participants with direct clinical feedback when treating their patients. By these changes the content would focus more on behavioural change and this would facilitate implementation of new behaviour in clinical practice and increase the likelihood that the new behaviour is maintained and thereby the possibility of improved patient outcome.

The third explanation would be that treating patients at risk for long-term pain and disability is too difficult for a single physical therapist in a clinical setting. This would imply large changes in the way patients are directed through the health care system compared to now. The results of our studies and other studies show that most patients at risk of long-term pain and disability do not recover from the treatment delivered by the physical therapists. If treatment does not result in a successful outcome valuable time is lost and the patient is closer to long-term pain and disability. Figure 5 shows the current way patients are directed through the health care system.

Yet, our studies show that the physical therapists improve their assessment skills. A logical conclusion would be that physical therapist would screen and assess the patients. One of the main tasks of the physical therapists in primary care would then be to

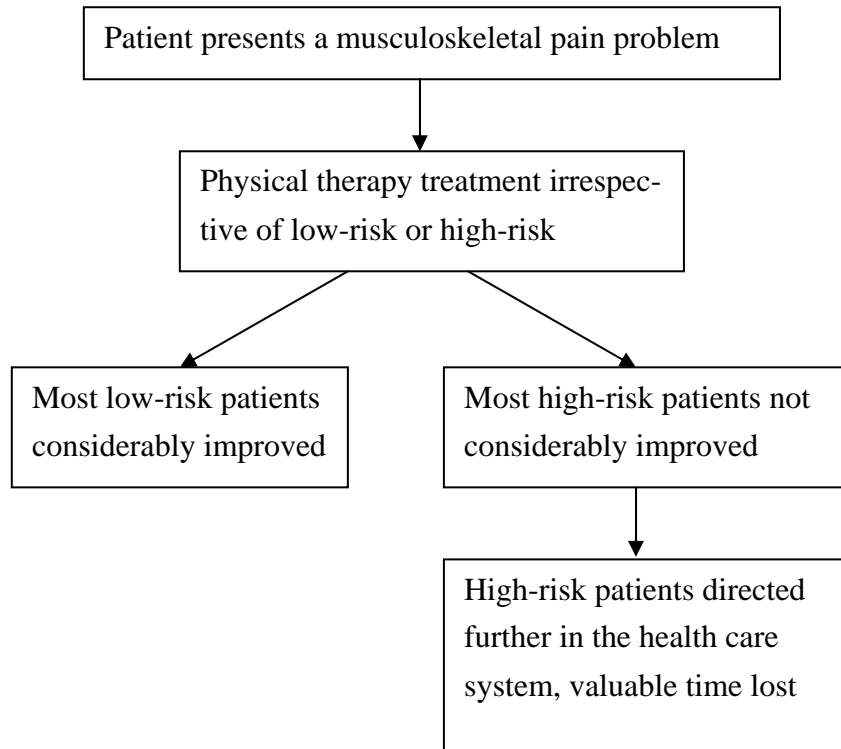


Figure 5. The current way patients with acute/sub acute musculoskeletal pain are directed through the health care system

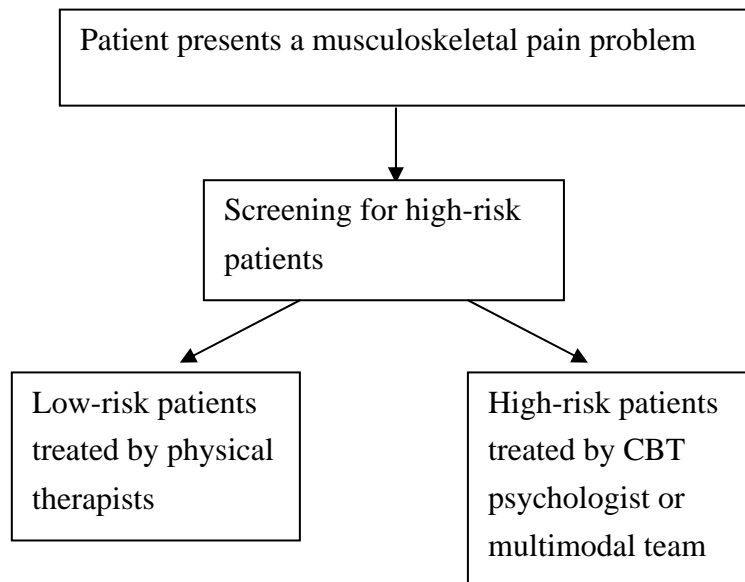


Figure 6. A more evidence-based way to direct patients with acute/sub acute musculoskeletal pain through the health care system.

select patients at risk for long-term pain and disability. What the exact cut-of scores need to be can of course be debated. They would then treat the patients not at risk and refer the patients at risk for long-term pain and disability to more suitable treatment, for example CBT treatment delivered by a psychologist or multimodal treatment delivered by a team of experts. Figure 6 shows the more evidence-based way to direct patients with acute/sub acute musculoskeletal pain through the health care system. Since risk patients experience most suffering and are the most costly for the health care system, it is important they get the appropriate treatment at the earliest possible opportunity.

## 5 Conclusions

- Physical therapists were well aware of the importance of psychosocial risk factors, but it seems physical therapists lack specificity about which factors are important.
- A relatively large proportion of clinicians were unfamiliar with the content of evidence-based guidelines and/or with the concept of “Red flags”. The process of implementing research into clinical practice is in need of an overhaul and the impact of guidelines on clinical practice may be questioned.
- A course, which enhanced physical therapists’ biopsychosocial attitudes and beliefs, as well as increased such knowledge and skills did not change the way patients perceived their physical therapists.
- An eight-day university course for physical therapists aimed at identifying and treating psychosocial risk factors did not improved patient outcome for either the group of patients as a whole or for patients determined to be at higher risk of developing long-term disability.
- Physical therapists in primary care should screen for and select patients at risk for long-term pain and disability. They should then treat the patients not at risk and refer the patients at risk for long-term pain and disability to more suitable treatment, for example CBT treatment delivered by a psychologist or multimodal treatment delivered by a team of experts.





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