CHAPTER 8

General discussion
The aim of this thesis was to examine psychological mechanisms of the chronic pain experience and to evaluate the effectiveness of psychological interventions for chronic pain. We studied the role of pain-related catastrophizing, general psychological acceptance and mindfulness in chronic pain and we investigated the feasibility and effectiveness of cognitive-behavioral interventions for chronic pain in primary care, in a group format and through the internet. In this concluding chapter, the main findings of this thesis are presented and their implications are discussed. Methodological strengths and limitations are also described.

8.1 Main findings

The main findings of the studies in this thesis are presented below:

- **Chronic pain is highly prevalent in the general population.**
  We found that in a sample from the general population more than one-third of the participants experienced pain complaints at the moment of the study. The prevalence of current pain of more than six months was 23.1%.

- **Pain-related catastrophizing is present in pain patients as well as in people with pain in the general population in a dose-response pattern.**
  We found that catastrophizing is not limited to the chronic pain experience, but is also present in people with pain in the general population. However, levels of catastrophizing were significantly higher in pain patients than people with pain in the general population. We found a linear relationship between catastrophizing and pain intensity, indicating a dose-response pattern in pain-related catastrophizing. Thus, the higher the level of catastrophizing, the more pain was reported.

- **In non-clinical pain, pain-related catastrophizing is an important factor determining aspects of pain-related medical consumption.**
  We described that catastrophizing predicted specialist consultation and medication use in people with pain in the general population. Higher levels of catastrophizing were associated with increased use of medication and more specialist consultations. In pain patients, the pattern relating catastrophizing to medical consumption was less clear. These findings indicate that catastrophizing is an important factor determining pain-related medical consumption in people with pain in the general population, and thus should be targeted in the early stages of a pain problem, before pain becomes chronic and thus more complex.

- **General psychological acceptance is a strong predictor of pain-related catastrophizing.**
  We found that acceptance of psychological experiences outside of pain itself was a strong predictor of pain-related catastrophizing, independent of gender, age and pain intensity. Thus, general psychological acceptance seems to play an important role in the pain experience and should be part of the treatment of chronic pain, for example in the context of acceptance and commitment therapy. The focus of the treatment of chronic pain does not necessarily have to be on acceptance of pain per se, but may be aimed at acceptance of unwanted experiences in general.
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- **Mindfulness in the sense of “acting with awareness” is not related to pain-related catastrophizing.**

  We found that mindfulness, as measured with the Mindful Attention Awareness Scale (MAAS), did not predict levels of pain-related catastrophizing. Thus, mindfulness in the sense of “acting with awareness” was not related to catastrophizing. Based on this finding in comparison with previous research, we recommend a broader conceptualization of mindfulness and the use of a multifaceted questionnaire for mindfulness instead of the unidimensional MAAS.

- **Half of all patients use the internet for medical information and almost 40% search online for information regarding pain. Patients are reasonably certain that the information found online is accurate and reliable, while this may not always be the case.**

  We found that a large part of the patients of our Pain Center use the internet to acquire medical and pain-related information. Patients rated this information as accurate and reliable, while this may not always be the case. We suggest that physicians should routinely inquire about patients’ use of various sources of information, such as the internet, and offer to clarify any questions or concerns that arise from that use.

- **Psychological treatment of chronic pain in a primary care setting is viewed as a good treatment option by both patients and psychologists.**

  We found that psychological treatment of chronic pain in primary care is considered to be a good treatment option. Nevertheless, only a minority of chronic pain patients were referred to primary care psychologists. Treatment by the primary care psychologist enhanced the general problem-solving skills, improving patients capability to face future challenges. It appears that the focus of treatment extends beyond merely having to cope with the pain. It is interesting to note that patients are not very focused on pain reduction, which is in line with the consequence model. Nevertheless, a large proportion of patients did report experiencing less pain. We suggest that chronic pain patients should more often be advised to seek psychological treatment in primary care.

- **A cognitive-behavioral group intervention for chronic pain patients leads to positive changes in catastrophizing and locus of control.**

  We found that a structured cognitive-behavioral group intervention of short duration is a promising treatment for patients with chronic pain. The intervention resulted in significant improvements in catastrophizing and locus of control, both directly after the course and at the booster session two months later. The present results can be seen as an indication that a cognitive-behavioral group approach has potential as a useful intervention for chronic pain patients.

- **An internet-based cognitive-behavioral intervention with therapist contact by e-mail for patients with non-specific chronic pain is at least as effective as a group intervention, and on some outcome variables even more effective.**

  We found that a cognitive-behavioral internet course and a group course were both effective in improving pain-related catastrophizing, pain coping strategies, locus of control and
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various aspects of global health-related quality of life, both directly after the 7-week course and at the booster session two months later. On the outcome measures for catastrophizing, pain intensity, pain coping, and the quality of life dimensions vitality, pain and perceived health change, participants in the internet course showed significantly more improvement two months after the course than participants in the group course. Also, the internet course was cost-effective compared to the group course.

8.2 Implications of the findings

8.2.1 Mechanisms of chronic pain

The impact of chronic pain

Chronic pain is highly prevalent in the general population. In chapter 2 of this thesis, we found that in a sample from the general population more than one-third experienced pain complaints at the moment of the study. The prevalence of current pain of more than six months was 23.1%. This prevalence is in line with previous research in which an average prevalence of approximately 20% for chronic pain with a duration of more than six months is described (Breivik et al., 2006). Chronic pain is indeed a major problem for huge numbers of people.

Previous research has shown that catastrophizing is a key element in the chronic pain experience. Catastrophizing is one of the defining aspects in the fear-avoidance model (Vlaeyen & Linton, 2000). The degree by which a person experiencing pain appraises the pain as extremely threatening, determines whether a downwards spiral towards increased avoidance, disability and continuing pain is set in motion, or a path of confrontation and fast recovery is taken. One of the most consistent findings regarding catastrophizing in previous research is that it is associated with a heightened pain experience (Sullivan et al., 2001). This was confirmed in the study described in chapter 2 of this thesis. We found catastrophizing to be associated with pain intensity in a dose-response pattern in pain patients as well as in people with pain in the general population. Thus, the higher the level of catastrophizing, the more pain was reported. With regard to this finding, we suggested that catastrophizing may precede the development of chronic pain. This claim is substantiated by prospective studies in which catastrophizing was found to be causally related to pain (Burton et al., 1995; Linton et al., 2000; Severijns et al., 2005). However, intense pain may also cause catastrophic thinking (Sullivan et al., 2001). Catastrophizing may have a reactive nature, which deserves further investigation.

What is “abnormal” about the chronic pain experience?

In chapter 2, we showed that catastrophizing is not just present in patients with chronic pain complaints, but is also common in people with pain in the general population. Thus, catastrophizing is a common phenomenon in the pain experience. This suggests that catastrophizing may be a rather normal reaction to the experience of chronic pain. In a recent paper, Crombez et al. (2012) also state that in chronic pain “erroneous” beliefs are normative, rather than “irrational”. This means that pain-related catastrophizing is not necessarily grounded in psychopathology, but is a normal and culturally endorsed reaction to the pain experience.
Thus, to worry about pain is essentially a normal process. Eccleston (2011) also advocates a normal psychology of chronic pain. For most chronic pain patients, their way of reacting to the pain represents a normal reaction to an abnormal event. Thus, what is abnormal about the chronic pain experience is the chronic pain itself, and not the reaction to it.

Experiencing pain is not just unpleasant; it is a fundamentally disruptive experience. Pain functions as an alarm, indicating threat and danger to physical integrity. Thus, when in pain, we instinctively act upon that pain. These actions usually take the form of escape, pain management or seeking assistance. In cases of acute pain, these actions are adaptive and mostly effective. The pain subsides, there is no longer any treat or danger, and life subsequently returns back to normal. The chronic pain experience is however fundamentally different. In chronic pain, the warning system delivers false alarms. There is no real threat, but this threat is nevertheless felt, leading to worrying and catastrophic thinking. Humans have not evolved to be able to ignore the warning signal of pain. To do nothing when in pain, is counter-cultural as well as counter-biological (Eccleston, 2011).

**Misdirected problem solving**

In chronic pain, pain reduction often becomes a primary goal in life, setting aside previously valued life goals. Based on a metasynthesis of qualitative studies, Bunzli et al. (2013) concluded that individuals with chronic low back pain live a life “on hold”. The “pause” button has been pressed until the pain is resolved and they can return to their former, pain-free lives. However, the goal of a pain-free life is unrealistic and efforts to control pain can even become counterproductive.

Recently, Crombez et al. (2012) have attempted to recast the fear-avoidance model in a motivational perspective. In this perspective, the dysfunctional pattern seen in chronic pain patients is regarded as the result of a persistent search for pain relief; a goal that is based on the biomedical belief that pain is a sign of bodily damage. In the acute stage of pain, this type of problem solving may be adaptive. However, when pain persists and becomes chronic, such problem-solving becomes dysfunctional. Eccleston and Crombez (2007) label this pattern as “misdirected problem-solving”. When the goal of pain relief is unobtainable, catastrophizing is fueled and a “perseverance loop” is established. In this context, catastrophizing can be seen as actively and repeatedly engaging in effortful attempts to solve the wrong problem.

The results described in chapter 2 of this thesis, fit into this model of “misdirected problem-solving”. We found catastrophizing to be predictive of medical consumption in our sample of non-clinical pain. Participants with higher levels of pain-related catastrophizing reported more specialist consultations and medication use, indicating more medically oriented, “misdirected” problem-solving behavior. Our findings are consistent with those found in a study by Flink et al. (2012), who also found that catastrophizing was related to medically oriented problem-solving behavior in a sample from the general population.

**Framing of the pain problem**

The misdirected problem solving model emphasizes biomedical problem framing as a determining factor in problem solving behavior. When a chronic pain problem is interpreted biomedically, problem solving behavior will be focused on finding pain relief. Medical care
will repeatedly be sought, without the pain getting any better. In the “perseverance loop”, reframing of the problem does not readily occur. However, reframing of the pain problem is the only viable strategy to escape the perseverance loop (Eccleston & Crombez, 2007). Thus, chronic pain must no longer be framed as a biomedical problem.

The biomedical belief that pain is a sign of harm and should as such be avoided as much as possible, is still widely held among the lay and chronic pain population (Ihlebaek & Eriksen, 2003; Gross et al., 2006). Framing a chronic pain problem in biomedical terms leads to greater suffering and disability (Aldrich et al., 2000). Beside the biomedical view of pain as a sign of harm, the belief that pain must be resolved or greatly reduced in order to resume daily life is also a strongly held idea among chronic pain patients (Crombez et al., 2012). In this view, pain is seen as an obstacle in the pursuit of valued goals.

The management of chronic pain should move away from the biomedical paradigm. Patients as well as health care professionals should adopt a biopsychosocial frame of mind. In clinical practice, patients’ biomedical beliefs about chronic pain need to be challenged by health care professionals. Clinicians need to provide their patients with a biopsychosocial diagnostic explanation of their subjective experience that is acceptable to the patient. Tensions surrounding the clinical diagnosis of chronic pain can lead to the delegitimation of suffering and redefining of physical problems into psychological ones (Glenton, 2003). Seeing chronic pain as a “psychosomatic disorder” and the concept of a “pain personality” are still widely held beliefs, even among health care professionals. However, to date no evidence has been found for a “pain personality” or any stable personality traits that increase the risk of developing chronic pain (Eccleston, 2011). Crombez et al. (2009) also state that the failure or absence of a biological explanation for pain is an insufficient reason to promote a psychological cause.

**Shedding the biomedical perspective**

Biomedical-oriented pain beliefs are still very common among health care professionals themselves (Linton et al., 2002; Coudeyre et al., 2006; Bishop et al., 2008). This implies that there still is a strong need for education for health care professionals regarding the biopsychosocial model of pain. Furthermore, health care professionals need to realize how their own beliefs about chronic pain and the subtle ways they communicate these beliefs to their patients, may influence the effects of treatment. Health care providers pre-treatment expectations have been shown to significantly correlate with the effects of treatment, suggesting that health care professionals communicate their expectations to patients during treatment which may subsequently influence patients’ responses (Galer et al., 1997). Also, characteristics of health care professionals, such as their status as professionals, their therapeutic style, the words they use with patients, their beliefs about the problem and their confidence in treatment, have all been suggested to influence treatment outcome (Main et al., 2010).

Patients’ beliefs about pain may also be shaped by prevailing community views, health policy decisions regarding access to and payment of health care, legislation around sick leave and compensations, as well as the political agendas of governing powers (Main et al., 2010). Interventions targeted at the population with the aim of altering community views about chronic pain, may be effective in improving pain-related outcomes. Various mass media campaigns explaining the nature of chronic pain (from a biopsychosocial perspective) and ad-
dressing self-efficacy and promoting self-management of chronic pain have been conducted, showing promising results with respect to shifting public beliefs about pain (Waddell et al., 2007; Buchbinder et al., 2008; Gross et al., 2010).

8.2.2 Psychological interventions for chronic pain

Cognitive-behavioral treatment
Cognitive-behavioral interventions for chronic pain are widely used and there has been a lot of research into the effects of this form of treatment. The cognitive-behavioral treatment of chronic pain focuses on gaining a sense of control over the effects of pain by learning more adaptive ways of thinking, feeling and behaving (Turk, 2003). Cognitive-behavioral treatment can be provided to patients at various stages in the pain experience, in various settings and in various forms.

In this thesis, we undertook to study the effects of cognitive-behavioral interventions for chronic pain in primary care, in a group format and through the internet. The overall conclusion of this part of the thesis is that a cognitive-behavioral intervention can help patients deal with the chronic pain problem. Chronic pain patients can indeed learn “to live with the pain”.

In chapter 5 of this thesis, we conclude that cognitive-behavioral treatment may very well be applied in primary care. Despite the preliminary nature of our results, this study suggests that primary care psychologists are well able to treat patients with chronic pain and that treatment in the setting of primary care is seen as a good treatment option by chronic pain patients. In chapter 6 of this thesis, we describe that cognitive-behavioral treatment for chronic pain can very well be provided in the form of a group format. In this chapter, we found that a structured cognitive-behavioral group intervention resulted in significant improvements in catastrophizing and locus of control. Chapter 7 of this thesis showed that the internet can also be used in providing cognitive-behavioral treatment to chronic pain patients. Based on our study, we conclude that an internet-based cognitive-behavioral intervention with therapist contact by e-mail is at least as effective, and on some outcome measures even more effective, than a face-to-face group intervention.

Psychological interventions: when, where and how?
In chapter 5 of this thesis, we describe that primary care is a suitable setting for the psychological treatment of chronic pain. One particular advantage of treating chronic pain patients in primary care is moving out of the biomedical setting, which might make it easier to abandon the biomedical framing of the pain problem. According to Samwel et al. (2002), chronic patients should only be treated outside of primary care when complex or combined treatment is indicated. Furthermore, primary care is an ideal setting for the early intervention of chronic pain. As we mention in chapter 2, pain should ideally be treated in an early stage, before the problem becomes chronic and more complex. Previous studies have demonstrated that early cognitive-behavioral interventions for persistent pain complaints are effective in improving pain-related outcomes (Linton & Ryberg, 2001; Gatchel et al., 2006; Menzel & Robinson, 2006). Cognitive-behavioral intervention in the early stages of the pain problem can also have a preventive effect. Targeting pain-related catastrophizing, pain-related fear,
avoidance and hypervigilance early on, can prevent pain from becoming chronic and can help patients cope with future pain episodes.

However, in chapter 5 of this thesis we found that despite it being viewed as a good treatment option, only a minority of chronic pain patients are referred to a primary care psychologist for psychological treatment. This could be due to insufficient knowledge about the capabilities and working methods of primary care psychologists. Also, health care professionals might not know suitable primary care psychologists in the area where the patient lives. Thus, there is a need for better contact and communication between pain specialists in secondary and tertiary care and psychologists with an interest in and knowledge of the treatment of chronic pain.

A cognitive-behavioral group format is also well suited to be applied in primary care or as part of an early intervention. Treating chronic pain patients in a group format has various advantages with regard to cost and time effectiveness for the psychologist and the opportunity to share experiences with others for the patients (Newton-John & Geddes, 2008). However, a group format also includes the risk of participants amplifying each other’s dysfunctional pain cognitions or biomedical problem framing. Psychologists need to be well aware that the cognitive-behavioral content of the treatment should prevail over the supportive function of the group. Thus, a cognitive-behavioral group intervention for chronic pain is much more than a chronic pain support group.

An internet-based intervention also takes patients out of the medical setting, which may help stimulate a biopsychosocial framing of the pain problem. Internet-based treatment is also well suited to be applied as an early intervention (Del Pozo-Cruz et al., 2012). In chapter 7, we discuss that the format of an internet-based intervention has an inherent focus on self-management. Due to its form, participants in an internet-based intervention may be more intensely stimulated to adopt a self-management approach. In this way, the format of the course implicitly contributes to the aim of increased self-efficacy and self-management skills. Our results with regard to internet-based treatment open up the possibility of wide implementation of cognitive-behavioral treatment for large groups of people with chronic pain complaints. This is further supported by our findings in chapter 4, in which we found that for a large percentage of patients the internet is an important source of medical information.

It needs to be stressed that between 2006, the year we conducted this study into patients’ use of the internet for pain-related medical information, and 2012, the percentage of households with access to the internet in the Netherlands has risen from 80% to 94% (Statistics Netherlands, 2013). Nowadays, almost everyone in the Netherlands has access to the internet, paving the way for the wide implementation of internet-based treatment.

**What works for whom?**

We need to be aware that not all forms of treatment may be suitable for all pain patients. An internet-based treatment program may work very well for patients with a busy schedule who appreciate a self-management approach, are motivated and disciplined and able to use written communication, but not for others. Participants who experience a need for contact with fellow patients and thrive in a social context, may be the ones benefitting the most from a group approach. Some patients may benefit significantly from treatment of relatively short
duration in primary care, while patients with more persistent complaints or comorbid psychiatric problems may need treatment that is more intensive or specialized.

Thus, in clinical practice there is a need for adequate diagnostic screening in an early stage of the pain problem in order to provide patients with the most suitable treatment option. The state of research into cognitive-behavioral treatment for chronic pain is at the point where we need to focus on the question “what works for whom” (Eccleston et al., 2009). We need to know which components of treatment work for which patients. The same applies to the format. Further study is needed to investigate which patients fare best with internet, individual or group treatment in either a primary or secondary care setting.

**The referral of patients for psychological treatment**

In the studies into the effect of psychological interventions for chronic pain we conducted in this thesis, we noted a slow inclusion of participants. While living with a disabling chronic pain complaint poses a huge challenge for the affected patients, physicians still seem not easily inclined to refer a patient for psychological treatment. It appears that the biomedical view on chronic pain still has an influence on the treatment advice physicians give to their patients. Patients are referred to psychologist when there are indications of psychopathology, but patients without overt psychological complaints are not often offered a psychological intervention. However, from the viewpoint of a normal psychology of chronic pain (Eccleston, 2011), psychologists can also have a role in helping patients with a normal reaction to the abnormal situation of having to deal with chronic pain. Experiencing worry about their pain, feeling anxious or depressed, being hypervigilant and avoiding certain situations are no exceptional reactions to being confronted with a chronic pain complaint. These reactions are not necessarily signs of psychopathology, but do lead to suffering and disability. These patients can be helped in dealing with their pain by a cognitive-behavioral treatment approach of short duration. Thus, physicians also need to offer this treatment option to their “normal” patients, and not exclusively reserve referrals to psychologists for patients with psychopathological problems.

**New forms of treatment**

Currently, there is a large evidence base for cognitive-behavioral treatment of chronic pain (Eccleston et al., 2009). Our results in chapter 5, 6 and 7 of this thesis further confirm this. In recent years, new forms of cognitive-behavioral treatments have emerged. These new interventions have a focus on acceptance and mindfulness and are increasingly used for chronic pain. As mentioned earlier in this chapter, disengagement from the pursuit of the unachievable goal of pain relief should be an important focus of treatment. Giving up the goal of pain relief requires a certain amount of acceptance.

In chapter 3 of this thesis we found that acceptance of psychological experiences was a strong predictor of pain-related catastrophizing. Thus, an accepting stance in life can have a positive influence of catastrophizing, and may subsequently influence the chronic pain experience, reducing misdirected problem solving behaviors and diminishing avoidance and experienced disability. A study by McCracken and Eccleston (2005) also suggests that the willingness to experience pain and to engage in activities regardless of pain, can lead to healthy
functioning for patients with chronic pain.

In a meta-analysis, Veehof et al. (2011) conclude that acceptance-based interventions are not superior to cognitive-behavioral treatment, but may be a good alternative. Given our finding that acceptance seems to play a role in the chronic pain experience, acceptance should be targeted in the treatment of chronic pain. Aspects of acceptance should be incorporated into cognitive-behavioral treatment instead of setting aside cognitive-behavioral treatment for acceptance-based treatment altogether. Although there is a large evidence base for cognitive-behavioral interventions, studies into the effects of acceptance-based interventions are still an emerging field. The added value of acceptance-based intervention deserves further investigation.

Recent years have seen a great increase in mindfulness interventions. Mindfulness seems to be everywhere nowadays. Mindfulness courses are offered in treatment settings, but also in commercial centers with a focus on wellness or personal growth. This development comes with certain risks. What is the quality of the courses offered and how to choose from such a wide range of courses and programs? It is safe to say that mindfulness has become a hype. Mindfulness treatment may be helpful for certain chronic pain patients. However, a sole focus on mindfulness in the sense of “acting with awareness” appears to be an incomplete treatment approach for most chronic pain patients. In chapter 3 of this thesis, we found the “actaware” facet of mindfulness not to be related to pain-related catastrophizing. Thus, merely learning patients to be aware of and focus on the present moment might be insufficient to positively influence the chronic pain experience. Mindfulness may be a useful addition to the treatment of chronic pain, but can best be used in combination with other components of cognitive-behavioral treatment.

8.3 Strengths and limitations of the studies

The studies described in this thesis have various strengths as well as limitations. In the studies in chapters 2 and 3, the question of causality poses an issue. We used a cross-sectional method, based on which no inferences can be made with regard to the direction of the associations. For example, in chapter 2 we cannot tell whether catastrophizing is a precursor or a consequence of pain-related outcomes. The same applies to chapter 3. We found a strong association between acceptance and catastrophizing, but we cannot say with certainty if low levels of acceptance precede catastrophizing, or that catastrophizing leads to lower levels of acceptance. The question of causality is a recognized issue in bidirectional models. Experimental studies that manipulate these concepts or longitudinal studies are needed to clarify the causal relationships.

The limited sample size in some of the studies in this thesis, poses another limitation. This especially holds for chapters 5 and 6. In chapter 5, in which we investigated the treatment of chronic pain by the primary care psychologist, the inclusion of participants was very limited. In itself, this was an interesting finding. This limited inclusion is highly distinctive for the current referral process to the primary care psychologist. In chapter 6, in which we studied the effects of a cognitive-behavioral group intervention for chronic pain patients, we did not use a comparison group. We cannot say with certainty that the improvements we found were
caused by the intervention. Spontaneous recovery cannot be ruled out, although that is unlikely in a sample of patients with such longstanding pain complaints. Due to these limitations, the results of chapters 5 and 6 are preliminary. However, the aim of these two studies was indeed exploratory in nature. The use of only self-report measures is another limitation in the studies in this thesis. The use of self-report measures may be subject to several kinds of bias with regard to for example response styles, the fixed response format and psychometric properties of the measures. Future studies should include a broader range of validated measuring methods.

A strong feature of the studies in this thesis is the type of participants. Most participants in the reported studies were patients from a university pain clinic. While these participants may not be considered to be representative of all persons experiencing chronic pain complaints, they do represent those pain patients who are severely limited by their pain complaints. Also, these patients are the ones receiving disability benefits, who are on sick leave from work or are large consumers of medical care. The findings from chapters 5, 6, and 7, indicating that cognitive-behavioral interventions of relatively short duration can have a profound positive effect on how pain influences the daily lives of these patients, represent a hopeful message. This thesis confirms that even in patients with longstanding disabling pain complaints, cognitive-behavioral intervention can be highly effective. This may imply that gains could also be achieved in patients with less longstanding pain complaints.

In the study described in chapter 2, we studied the nature of pain-related catastrophizing in a patient sample as well as in a sample from the general population. Few studies have investigated the nature of pain-related catastrophizing in people with pain who are not (yet) pain patients. The use of both a patient sample and a community sample is a strong feature of this study. Our study adds new insights into the occurrence of catastrophizing in the general population and its relation to experienced pain intensity and pain-related medical consumption. Furthermore, our findings may have implications for early intervention and prevention programs.

Chapter 3 deals with a topical subject. Currently, there is a large interest in metacognitive concepts from the “third generation cognitive behavioral approach”. We investigated the role of acceptance and mindfulness in the pain experience, and more specifically its relation to pain-related catastrophizing. This is one of the first contributions to this specific subject. Our findings have added to the understanding of the role of these “new” concepts in chronic pain.

Chapter 7 of this thesis also deals with a current topic. We investigated the effects of an internet-based cognitive behavioral intervention for non-specific chronic pain. A particular strength of this study is the comparison of an internet-based intervention to a face-to-face group intervention. To our knowledge, this is the first randomized controlled study comparing an internet-based cognitive-behavioral intervention to face-to-face treatment in the area of chronic pain.
8.4 Conclusion

This thesis provided new insights into psychological mechanisms of chronic pain and psychological interventions for chronic pain.

Chronic pain is highly prevalent and poses a major problem for many people. In this thesis, we found pain-related catastrophizing and general psychological acceptance to be important aspects of the pain experience. These reactions to chronic pain are not abnormal in itself, but can become very burdensome, especially in patients with a fixed biomedical perspective on the pain problem. In this thesis, the importance of moving away from the biomedical paradigm in the management of chronic pain is highlighted. Health care providers should propagate a biopsychosocial view on chronic pain complaints. Mass media interventions targeted at the general population may also be useful in altering biomedical public beliefs regarding pain.

In clinical practice, patients should learn to view their pain from a biopsychosocial perspective. They need to accept the nature of chronic pain and to focus on those aspects of the pain experience that they can influence, instead of the often unrealistic goal of pain relief. This thesis shows that cognitive-behavioral treatment can help patients deal with the chronic pain experience. We conclude that cognitive-behavioral treatment is an effective treatment option for chronic pain patients, even those who are severely limited by longstanding pain complaints. It can be applied in primary care, in a group format and in the form of an internet-based intervention.

In this thesis, it is suggested that psychological treatment should be used more often in the treatment of chronic pain, preferably outside of the hospital setting and in an early stage of the pain problem. The psychologist is not just there for psychologically disturbed patients, but can also help “normal” patients who are thrown off balance by chronic pain complaints. New forms of treatment, such as acceptance-based approached, may pose useful additions to established cognitive-behavioral interventions, but should not replace cognitive-behavioral treatment altogether. Cognitive-behavioral treatment is “here to stay”, and the internet provides opportunities for a wide implementation of cognitive-behavioral interventions for chronic pain.
References


