Does tailoring really make a difference? : the development and evaluation of tailored interventions aimed at benzodiazepine cessation

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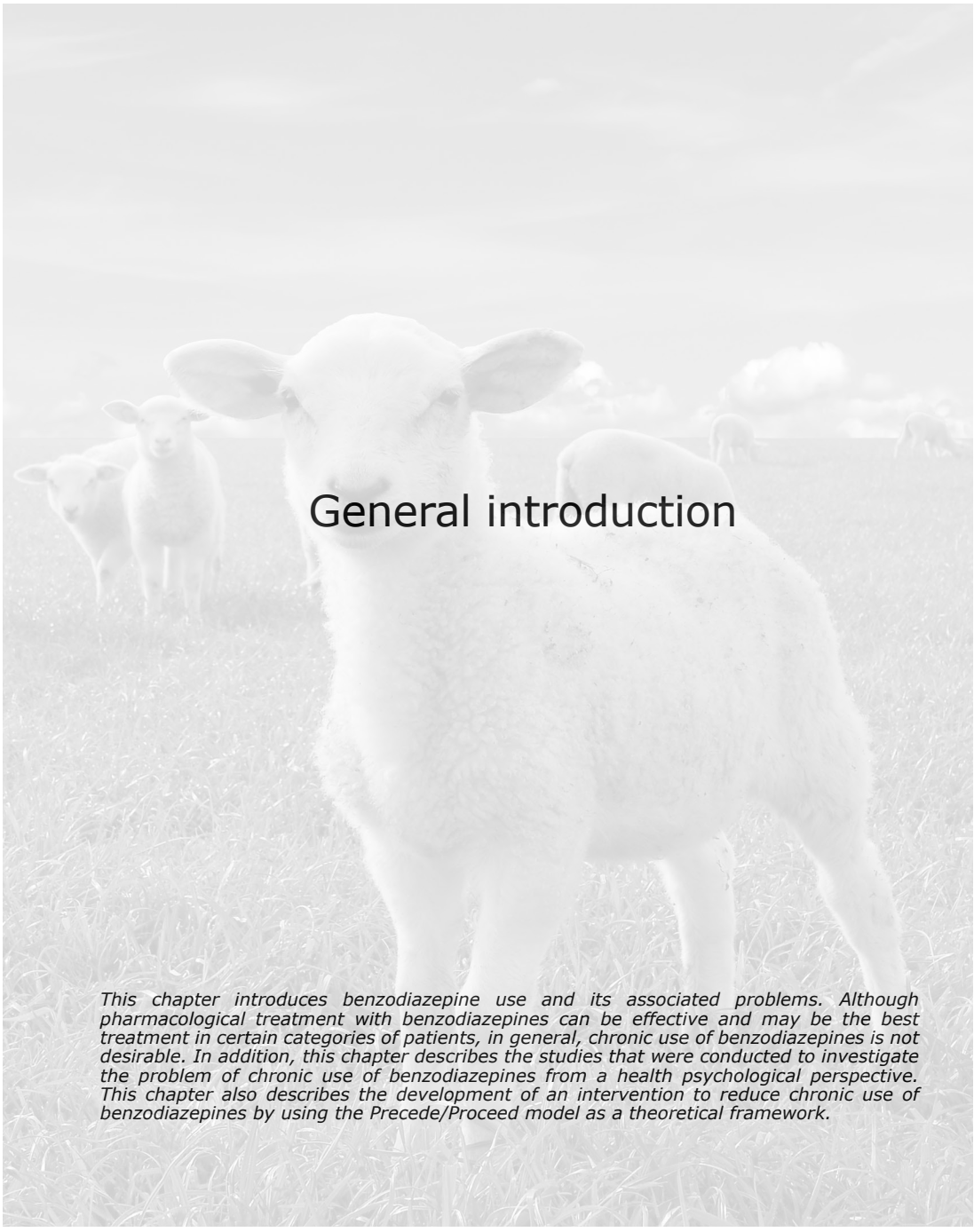
Slapen is geen geringe kunst: je moet er de hele dag voor wakker blijven
Friedrich Nietzsche

Sleeping is no mean art: for its sake one must stay awake all day

Contents

CHAPTER 1



General introduction

This chapter introduces benzodiazepine use and its associated problems. Although pharmacological treatment with benzodiazepines can be effective and may be the best treatment in certain categories of patients, in general, chronic use of benzodiazepines is not desirable. In addition, this chapter describes the studies that were conducted to investigate the problem of chronic use of benzodiazepines from a health psychological perspective. This chapter also describes the development of an intervention to reduce chronic use of benzodiazepines by using the Precede/Proceed model as a theoretical framework.

Benzodiazepine use and its associated problems

Benzodiazepines

Benzodiazepines are drugs with sedative, hypnotic, anxiolytic, anticonvulsant, amnestic and muscle relaxant properties (1). Benzodiazepines are often prescribed for short-term relief of severe, disabling anxiety or insomnia. All benzodiazepines have the same effect in the body and can therefore be used as a hypnotic (benzodiazepine used to treat insomnia) or anxiolytic (benzodiazepine used to treat anxiety). They are believed to act on the GABA receptor, the activation of which dampens higher neuronal activity. A large variety of benzodiazepines are available and they differ in the speed at which they are metabolized (in the liver) and eliminated from the body (in the urine). The speed of elimination is important in determining the duration of its effects. With most benzodiazepines, noticeable effects usually wear off within a few hours. Nevertheless, the active substances, as long as they are present, continue to exert subtle effects within the body. Thus, there are a large number of benzodiazepines, but every benzodiazepine can be used for the relief of anxiety as well as insomnia (2). However, in practice it turns out that Diazepam is mainly used to relieve anxiety, nervousness and tension, while Nitrazepam is mainly used to treat insomnia. These two types are the most commonly used benzodiazepines (3).

Prevalence

The use of benzodiazepines increases with age: half of the users are younger than age 65, twenty-five percent are between 65 and 75, and twenty-five percent are older than age 75. The prevalence of use among women is twice as high as the prevalence of use among men. Eighty per cent of benzodiazepines are prescribed by general practitioners and of these benzodiazepine prescriptions, more than eighty per cent are refills (4). Refills are repeat-requests handled by the medical staff of the general practitioner without consulting the general practitioner or medical specialist.

Benzodiazepines are one of the most prescribed classes of drugs in Western countries. The total number of benzodiazepine users in 1998 in the Netherlands was estimated at almost 1.9 million. This corresponds with an annual prevalence of 12.2% (5). Of these users, more than a third use benzodiazepines on a chronic basis. In other words, 3 to 4 per cent of the population uses benzodiazepines chronically (5). The definition of chronic use is not univocal (6). According to the guidelines for general practitioners (7), chronic use is defined as daily use of benzodiazepines for more than three months. Other countries also have to contend with widespread and long-term use: 500,000 to 1 million in the UK, 4 million in the US and several million worldwide (8). The latest report (9) is that the number of benzodiazepine prescriptions has increased by two per cent in the 2001–2006 period. There is a common understanding that the extent of chronic benzodiazepine use needs to be reduced (9). This thesis will therefore focus on chronic benzodiazepine use, with chronic use defined as daily use for more than 3 months.

Characteristics of a benzodiazepine chronic user

Most patients who take benzodiazepines on a chronic basis are elderly females. Most of them are taking benzodiazepines as hypnotics. Chronic users are mainly patients having physical problems, patients having a mental illness or patients abusing other substances (10;11). Kan et al. (12) identified risk factors for becoming a chronic user and found that patients with a higher initial benzodiazepine dose, and a longer duration of benzodiazepine use, and younger patients were more likely to become chronic users. The substance dependence criteria for benzodiazepine dependence of the DSM-III-R and ICD-10 classifications were used. Also patients of non-native cultural origin or having a lower level of education were more likely to become chronic users of benzodiazepines. Personality characteristics such as fearfulness, passivity and dependency are also associated with chronic use of benzodiazepines (13).

Problems associated with chronic benzodiazepine use

Only short-term treatment with benzodiazepines appears to be effective in the treatment of sleeplessness and anxiety. Chronic use of benzodiazepines is not only ineffective; it is even associated with several negative health consequences, such as dependence, cognitive impairment, falls and accidents, and high expense. These adverse effects will be described in that order.

Dependence

First of all, patients can become dependent. There is however little consensus about the definition of dependence. Kan et al. (14) has looked at the DSM-III-R substance abuse criteria, and the indications are that 40% of outpatient benzodiazepine users are dependent (14). The criteria for substance dependence include tolerance, escalation of dosage and withdrawal symptoms in the case of stopping. Tolerance to benzodiazepines develops at different rates in varying degrees for various actions. Tolerance to hypnotics, for example, develops rapidly, within a few days or weeks in cases of regular use (15). Although some studies cast doubt on this (16), tolerance to anxiolytics has also been reported, but this develops less rapidly (17).

Escalation of dosage also occurs. Clinical studies show that a considerable proportion of patients using hypnotics and anxiolytics gradually increase their dosage on their own, sometimes exceeding the safe levels (18;19). Benzodiazepine withdrawal symptoms have also been demonstrated. The following withdrawal symptoms can occur: rebound anxiety, rebound insomnia, depression, dizziness, tremor, muscle pain, sweating, blurred or double vision or in extreme cases seizures (20;21). Besides physical dependence, psychological dependence is likely to occur from chronic use of benzodiazepines. A study among long-term hypnotic users showed that benzodiazepine users indicated that the sleep medication greatly improved their quality of sleep. The objective results, however, did not support this. There were no significant differences between untreated sleep complainers and treated sleep complainers regarding sleep duration and sleep latency (22). Other psychological aspects of dependence have also been reported

such as drug-seeking behaviour and continued use despite the adverse effects (20;23).

Cognitive impairment

Secondly, long-term use has been associated with cognitive impairment. A meta-analysis of thirteen studies which compared long-term benzodiazepine users with controls revealed that moderate to large deficits in different cognitive domains occur (24). For example, Westra and colleagues (25) investigated the influence of benzodiazepines on memory performance. They compared sixteen daily users of benzodiazepines diagnosed with a panic disorder to sixteen age- and education-matched, non-medicated panic disorder patients. Both groups were assessed on the basis of a memory task. The results indicated that benzodiazepine users showed significantly poorer memory performance than did controls. In another study (26), chronic use of benzodiazepines caused anterograde amnesia. Anterograde amnesia is a form of memory loss in which new events are not transferred from short-term memory to long-term memory. These patients could not remember what had happened or what was learned. After withdrawal from chronic use of benzodiazepines, patients were still cognitively impaired when compared with control groups. Other studies have shown that patients do not return to levels of functioning that matched benzodiazepine-free controls (27;28). The cognitive effects might improve in the long run, since the studies did not include long follow-ups.

Falls and accidents

Although there is a study which does not find an association between the use of benzodiazepines and accidents (Leveille et al (29) found no evidence of a dose-related effect with benzodiazepines: use of benzodiazepines had little association with increased risk for injurious collisions), most studies do. It is known that chronic use of benzodiazepines leads to sedation and has a relaxant effect on muscles, and this can lead to falls, fractures and road traffic and other accidents (30-32). The elderly are most vulnerable to these effects, especially if taking multiple medications (33). Benzodiazepines are on the whole safe drugs, even if taken in an overdose (34). Nevertheless, some studies have reported that benzodiazepines can be lethal in overdose (35;36) .

High expense

Benzodiazepines are low-priced drugs: the medication price for one tablet of Nitrazepam of 5 milligrams, for example, is €1.08. Due to the high prevalence rate, however, the costs in 1998 were estimated at 145 to 172 million Euros (37). When looking at the period 1993–98, there was a mean annual increase of 2.1% which resulted in the seventh highest annual increase in drug costs in the Netherlands (5). Looking at the most recent figures, the prescriptions for Oxazepam (2.919.000) in 2006 compared to 2005 have also increased by 2.1 % (38).

As mentioned above, chronic use of benzodiazepines can cause dependency, cognitive impairment, falls and accidents, which results in high costs for the health care system. Because of these problems associated with chronic use of benzodiazepines and because long-term use results in lack of efficacy due to tolerance, there is an urge to reduce the chronic use of benzodiazepines. Which treatment methods are used in the Netherlands in order to reduce the amount of benzodiazepines prescribed?

Cessation of benzodiazepine use – treatment methods

Different treatment strategies are known in order to decrease the amount of chronic use of benzodiazepines. In a meta-analysis, Oude Voshaar et al. (39) divided the available interventions into two different strategies: minimal interventions and systematic discontinuation programs. Minimal interventions, on the one hand, invite patients to quit their long-term benzodiazepine use on their own by making them aware of the negative consequences. Systematic discontinuation programs, on the other hand, are more intensive interventions in which patients gradually discontinue their doses under the guidance of a general practitioner or pharmacist. The main finding of the meta-analysis of Oude Voshaar (40) was that minimal interventions are effective strategies for reducing benzodiazepine consumption. Three minimal interventions were investigated having a pooled odds ratio of 2.8 relative to patients receiving usual care. Only one systematic discontinuation program was evaluated. This study (41) examined the effectiveness of a dose-reduction program in a randomized controlled trial. Three arms were compared: a dose reduction program, a dose reduction program combined with cognitive therapy and a control group receiving regular care from the general practitioner. It turned out that the two experimental groups showed greater reduction than the control group (respectively 62% and 58 % versus 21 % of the control group), with the finding of an odds ratio of 6.1 There were no significant differences between the two experimental groups. A problem of this extended discontinuation program was that the participation rate was low. Only 46 % completed the program.

Although these strategies have been shown to be effective (39;42), they are often not offered to patients (43;44). It appears that general practitioners or pharmacists do not discourage their patients from chronically using benzodiazepines by educating them about the disadvantages of chronic use of benzodiazepines, since 80% of prescription refills are handed out by the assistant instead of by the general practitioners or pharmacists seeing the patient themselves (4). In other words, chronic benzodiazepine users are not stimulated to reduce or quit their benzodiazepine intake with the help of the general practitioner or pharmacist. One reason which has been frequently reported is that general practitioners and pharmacists simply lack the time (45). A study in Denmark recently showed (46) that the reorganization of prescription patterns proved to be significantly easier than practitioners had expected. The intervention consisted of helping the general practitioner follow the protocol regarding the prescriptions of benzodiazepines (i.e. prescription only for 1 month and only following consultation (telephone consultations

were eliminated). After this intervention, use of benzodiazepine hypnotics was reduced by 46.5 %, and use of anxiolytics was reduced by 41.7 %.

Education is also important because it will result in more satisfied patients, patients will have a better understanding of the pros and cons of medication, and it will result in more compliance to treatment (47). It is also known that when general practitioners or pharmacists do educate, they can play a vital role in changing patients' attitudes towards medicine use. For instance, it has been shown that pharmacists can play an important role in changing drug attitudes of depressive patients (48). Thus, we can conclude that educating the benzodiazepine user can have positive results in terms of the aim of reducing the amount of benzodiazepines.

The above shows the following two important notions. Namely, first of all, it appears that patients can be better educated in order to help them reduce chronic use of benzodiazepines. Secondly, general practitioners and pharmacists can educate their patients more often, since we know that 80 % of the prescriptions for benzodiazepines are refills. Thus, these patients are not seen by their general practitioners. Because of this, and because of the adverse effects and the lack of efficacy of benzodiazepines and the high costs of continued benzodiazepine use, there is a need to develop a tool that lightens the workload of these health practitioners, while at the same time educating patients about the disadvantages of benzodiazepine use. This tool might well be a computerized patient education program: a computer program that automatically produces educational letters. Among other health behaviours, computerized tailored information has been shown to lead to more behavioural changes as compared to no information and to similar but non-tailored interventions (49-52). Computer tailoring is aimed at a specific person, based on determinants of behavioural change, and is composed for one person in particular. Tailored information, therefore, mimics the process of individual counselling and feedback, to the extent that it can be provided through a written text. The expertise of the counsellor is documented in the computer program. In other words, computerized patient education involves adaptation of the content information to relevant patient characteristics, while at the same time it can be applied on a large scale. Computerized patient education brings with it, on the one hand, personalization, and on the other hand, applicability to large groups. If such a tool proved to be effective in terms of reducing benzodiazepines, it could be broadly implemented in the Dutch health care system without a great deal of effort on the part of the general practitioner or pharmacist.

A key to a solution

The purpose of this thesis is to tackle the problem of chronic use of benzodiazepines by increasing and improving education by developing a computer program which automatically produces educational letters without the interposition of the health practitioner. In order to produce educational letters with such a computer program, we have to use information which it is known will result in behavioural change. In order words, the educational letters need to contain information aimed at increasing motivation and advising

patients about how to reduce or quit their chronic use of benzodiazepines. However, it is necessary to use a theoretical framework that has been successful in developing interventions.

The Precede/Proceed model

Health educators have recognized the importance of careful theory-based intervention planning, because the effectiveness of health promotion interventions is influenced by the quality of their planning (53). Thus, in order to develop such a computer program which produces educational letters, it is important that it is based on a sound model. The project prescribed in the present thesis was therefore developed according to the principles of the Precede/Proceed model. A simplified version of the Precede/Proceed planning model (54) was used as the framework for this thesis. The Precede/Proceed model has proven to lead to significant improvements in interventions for smoking cessation (55), in health promotion campaigns (56) and in intervention with pharmacists to encourage patients to regularly use their hypertension medication (57). The model consists of two phases. The Precede part describes several phases in analyzing the health problem. The Proceed phase focuses on intervention development and implementation (see figure 1).

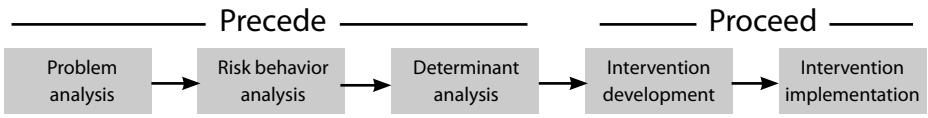


Figure 1 Precede/Proceed Model for planned health promotion (43)

Phases I and II – Problem analysis and risk behaviour analysis

According to the Precede/Proceed model, the first step (i.e., Phase I – problem analysis) in health promotion planning is the identification of a health problem that is serious and prevalent enough to justify spending time, money and other resources on developing and implementing an intervention. In the second step (i.e., Phase II – risk behaviour analysis), specific risk factors for the health problem in question should be identified, as should the groups of people who are exposed to these risk factors. So far, regarding these two phases, this chapter has shown that benzodiazepine use is a health problem which has serious negative consequences on health. This chapter has also shown that three groups are involved in the problem of chronic use of benzodiazepines: general practitioners, pharmacists and patients. General practitioners and pharmacists are involved in chronic benzodiazepine use because they often offer insufficient education and treatment methods. Patients are the ones who ultimately make the decision about using the prescribed drugs or not. To that end, Phases I and II have been described in this chapter, and we therefore proceed with Phase III.

Phase III – Determinant analysis

The third step (i.e., Phase III – determinant analysis) in planned health promotion is to investigate the psychosocial determinants of chronic benzodiazepine use. In order to influence chronic use of benzodiazepines successfully, it is necessary to gain insight into the psychosocial determinants of the target groups when engaging or persisting in that particular behaviour. As mentioned in the previous section, there are three different parties involved in benzodiazepine use, namely general practitioners, pharmacists and patients. Psychosocial determinant analyses will be conducted among these groups. First of all, it is important to know which psychosocial determinants are related to the intention of the general practitioners and pharmacists to educate their patients about the disadvantages of benzodiazepine use (Chapter 2).

And in order to educate the patient properly, it is also important to know the determinants related to benzodiazepine use (Chapters 3 and 4). The determinants that turn out to be related to benzodiazepine use and cessation can then be used in the development of the computer program which produces tailored patient education letters (Phase IV). The tailored letters then contain information developed to change those determinants which are related to benzodiazepine cessation. In order to find out which determinants we have to target in the tailored letters, we used in this thesis determinants which are derived from two health theories, determinants which are frequently used to explain health behaviour (52;53).

Which determinants?

The determinants studied in this thesis have been derived from the Theory of Planned Behaviour (58) and Social Cognitive Theory (59). These two theories have proven to be successful in explaining a number of different health behaviours (60). The two theories assume that the most important determinant in behaviour is a person's intention to change his or her behaviour. This behavioural intention represents a person's motivation in the sense of his or her plans to actually change behaviour. Intention is, in turn, assumed to be most directly determined by three types of cognitive factors: attitudes, social influences and self-efficacy. Self-efficacy expectations are people's perceptions of the extent to which they are able to successfully accomplish a specific task (e.g., to cope with anxiety without benzodiazepines). Attitudes are the overall evaluations of the behaviour by the individual based on beliefs and evaluations and, lastly, social norms consist of a person's perception about whether significant others think he or she should perform a certain behaviour. Figure 2 visualizes this model.

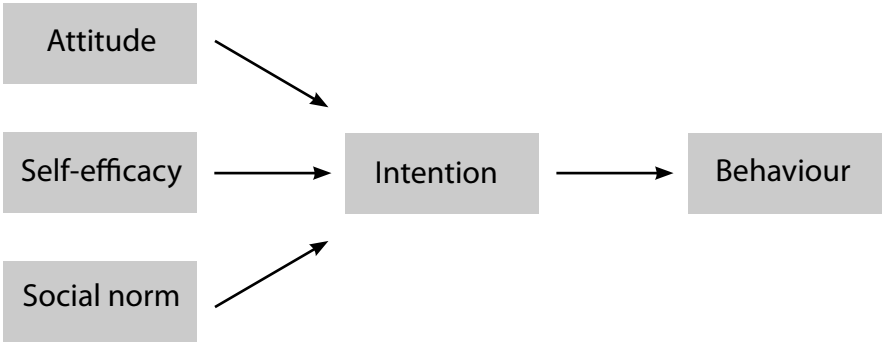


Figure 2 The main determinants derived from Theory of Planned Behaviour and Social Cognitive Theory (58;59)

Thus, the three concepts (attitude, self-efficacy and social norm) predict one's intention to perform a certain kind of behaviour. Intention is the major predictor of behavioural change. The different determinant analyses described in Chapters 2 and 4 used the above theory in order to find out the factors which are responsible for predicting the intention to educate and benzodiazepine cessation.

Besides the determinants described above, in chapter 3 we used another theory in explaining benzodiazepine use. A psychological model that has often been used to explain illness behaviour is the Common Sense Model (CSM) of Leventhal (61). According to the CSM, illness behaviour can be explained by patients' own perceptions of their illness. The illness perceptions of the CSM include five key attributes: identity, cause, consequences, control or cure, and timeline. In the present study we will assess the illness perceptions with regard to the illness (or mental health problem) that motivated the initiation of the use of benzodiazepines. Identity refers to the specific set of complaints that signal the specific illness. Cause refers to a person's beliefs about the origin of the illness that motivated the initiation of benzodiazepine use. Consequences are ideas about the short and long-term outcomes of the illness. Control or cure refers to beliefs about the extent to which one can control or cure the illness. Lastly, timeline concerns ideas about whether the illness is acute or chronic in nature.

Studies that examine the CSM model have provided support for the hypothesis that a strong illness identity (the attribution of many complaints to the illness), as well as a belief in a long duration for and serious consequences of an illness, have a negative effect on the well-being of patients (62;63). In the case of benzodiazepine use, it could be the case that illness perceptions do apply for benzodiazepine users, in that perceptions lead to reduced well-being which will ultimately result in drug seeking behaviour, like benzodiazepine use. In addition, patients who perceive their illness as more serious (patients who attribute more complaints to their illness, rate the consequences as more severe, perceive less control over their illness, and think that the illness will last a long time) use more benzodiazepines as a coping behaviour. Therefore, in the research presented in chapter 3, we have assessed illness perceptions with regard to illness "as it would be were they

not to use benzodiazepines." Knowledge of the illness perceptions held by patients can also be used for the development of an intervention to stimulate patient education. A better understanding of the perceptions of patients may improve the quality of decision-making with regard to the most desired and appropriate treatment for a patient's problems. These illness beliefs have been studied in chapter 3.

Phase IV – Intervention development

Phase IV in the Precede/Proceed model deals with intervention development (Chapter 5). On the basis of the results of the previous phases, an intervention can be developed which is aimed at changing behaviour. To capture the problem of chronic benzodiazepine use, three groups have to be targeted: general practitioners, pharmacists and patients. Interventions can be developed to target these three groups. However, this thesis will only focus on changing the behaviour of the patient. The results of chapter 2, which deals with the determinants related to the intention of the general practitioner and pharmacist, will not be used in the intervention. Changing behaviour can be achieved by changing the psychosocial determinants, that is, those determinants which have proven to be related to benzodiazepine use and cessation. Thus, the determinants that turned out to be related in Phase III described in chapter 3 and 4 are used for Phase IV: the development of the intervention. The next step is to describe the development of the intervention, computer-tailored education, in more detail.

Computer tailored education

Computer tailored education is aimed at a specific person and based on determinants of behavioural change (as described in phase III (chapters 3 and 4)). These determinants are assessed for everyone individually by means of a questionnaire. The computer-tailoring intervention is developed using the method of Dijkstra & De Vries (64). The tailoring included three mechanisms that have the potential to be effective; personalization, feedback and adaptation. Personalization was applied by starting with the participant's surname (e.g., "Dear Ms. Brown,') and by mentioning twice in the text the type of benzodiazepine that the individual used. Feedback was provided on statements made by patients in the individual assessment. For example: "You think that benzodiazepines really help you to get a good night's sleep." Feedback was also given on the determinants, which were measured in Phase III of the Precede/Proceed model (i.e. attitude, self-efficacy and social norm). Adaptation implies that information was adapted to the individual. For example, if self-efficacy is low, then the participant receives a message about how to increase his or her self-efficacy.

The computer program generates the tailored education letters. The core of this program consists of different sets of decision rules. A decision rule is a connection between an answer to an item in the questionnaire and a message text. For example, if self-efficacy is low, then the participant receives a message text about how to increase his or her self-efficacy. The computer program combines all these different message texts into one coherent intervention message and offers it in an attractive layout. Depending on

the individual item scores, the letters then contain specific combinations of information based on the different determinants (see also Figure 3).

Each letter started with an introduction explaining the goal and the rationale of the information. Subsequently, the three main determinants of discontinuing usage were addressed. The information was designed to: 1) increase the perceptions of the positive outcome expectations of discontinuing benzodiazepine use (for example, it was argued that patients may function better cognitively and may evaluate themselves more positively); 2) lower the perceptions of the positive outcome expectations of the use of benzodiazepines (this was done by explaining the development of tolerance and a possible placebo effect), and 3) increase self-efficacy expectations with regard to discontinuing usage (this was done by offering several skills to reach abstinence, such as making a plan to cut down benzodiazepine use and by offering alternatives in order to cope with worrying thoughts). Thee three mechanisms will also increase well-being, which will ultimately result in better decision-making by the patient

In this project, two different interventions will be examined: single tailored letters and multiple tailored letters. The single tailored letter intervention consisted of one letter of 5 to 6 pages of information (approximately 1200 words) in which all of these three psychological determinants were addressed in the above order of presentation. The multiple tailored letter intervention consisted of three letters of about 3 pages each (approximately 400 words),

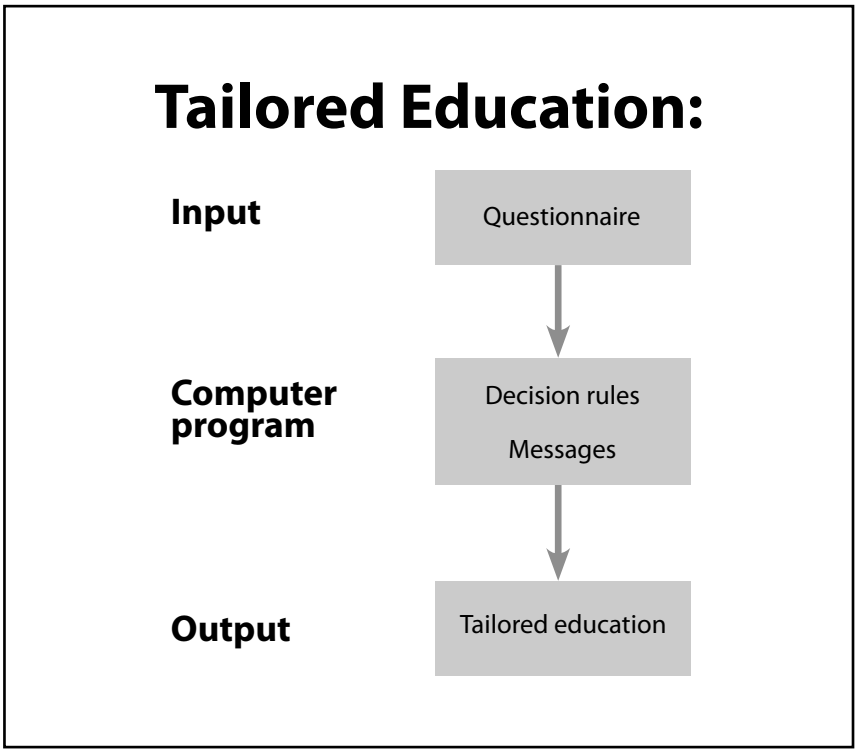


Figure 3 The process of tailored education

sent at intervals of one month. In the multiple tailored intervention, the first tailored letter was designed to increase the perceptions of the positive outcome expectations of discontinuing benzodiazepine usage and to lower the perceptions of the positive outcome expectations of the use of benzodiazepines. The second tailored letter was designed to increase self-efficacy expectations with regard to discontinuing usage, while the content of the third letter provided more skills for discontinuing usage, or provided a summary of the information in the first two letters, depending on the individual needs detected in the third assessment. In addition, in the introduction of the second and third letter, participants were provided with progress feedback: individual changes in benzodiazepine use were mentioned.

Phase V

Phase V deals with intervention implementation. If the intervention proves to be effective, the intervention will be ready for implementation. Before that, an implementation study is needed to find out how the intervention can best be implemented. Effective health education and promotion programs will have little impact if they are never used or if they are discontinued while still needed to create the desired health impact. In chapter 6, the issue of implementation of the computer program for tailored patient education will be briefly mentioned in Chapter 6. An inventory was conducted among different health care organizations in the Netherlands to find out the possibilities. A company can for example put the computer program on their website and invite their insured, for example, to visit their website. A qualitative study among general practitioners and pharmacists was conducted to find out if both groups are positive about the intervention and what would be the best way according to them to implement it.

Outline of this thesis

The focus of this thesis is twofold. The first part entails capturing the benzodiazepine problem by focusing on three different parties: pharmacists, general practitioners and patients. The pharmacists' viewpoint and the general practitioners' viewpoint on benzodiazepine use will be described in Chapter 2. In this chapter, a cross-sectional survey using a questionnaire was conducted among 339 general practitioners and 149 pharmacists. This study investigated which psychological factors predicted the intention to educate their patients about benzodiazepine use. The patients' viewpoint will then be described in Chapters 3 and 4 and these results will be used in the intervention. Chapter 3 deals with the perceptions of the patients about the reasons why they are using benzodiazepines (the illness beliefs), while Chapter 4 focuses on the psychosocial determinants of benzodiazepine cessation. More specifically, Chapter 3 describes the role of illness beliefs on benzodiazepine use in a longitudinal study among 356 benzodiazepine users, while Chapter 4 examines the determinants of benzodiazepine cessation in a longitudinal study among the same group of participants as described in Chapter 3.

In the second part of this thesis, the solution aimed at the reduction of chronic use of benzodiazepines in the Netherlands will be examined, namely computer-generated tailored education letters about benzodiazepines. The results of this study will be presented in Chapter 5. This chapter describes a randomized-controlled trial among 508 benzodiazepine users in order to examine the effectiveness of two types of computerized patient education letters about benzodiazepines. Finally, Chapter 6 describes the implementation study which was conducted in order to find out the best way to implement the tailored education program (phase V of the Precede/Proceed model). This chapter also summarizes the main findings of this thesis, and the implications are discussed. Lastly, the limitations of our study and suggestions for future research are presented in this chapter.

Because most of the chapters were written to be published as research papers, they are self-explanatory outside the context of this thesis. Due to this structure, some information may be redundant or may overlap. Table 1 provides an overview of the studies that were conducted in the context of the present thesis.

Table 1 Overview of the studies presented in this thesis

Chapter	Design	Methods	Sample	Study objective
2	Cross-sectional	Questionnaire	333 GPs 135 Ps	Determinants of intention to educate about benzodiazepines
3	Longitudinal	Questionnaire	Same sample of 356 patients	Role of illness beliefs on benzodiazepine use
4	Longitudinal	Questionnaire		Determinants of benzodiazepine cessation
5	RCT	Questionnaire	508 patients	Effects of computer-generated tailored education about benzodiazepines

Note. GPs = General practitioners Ps = Pharmacists

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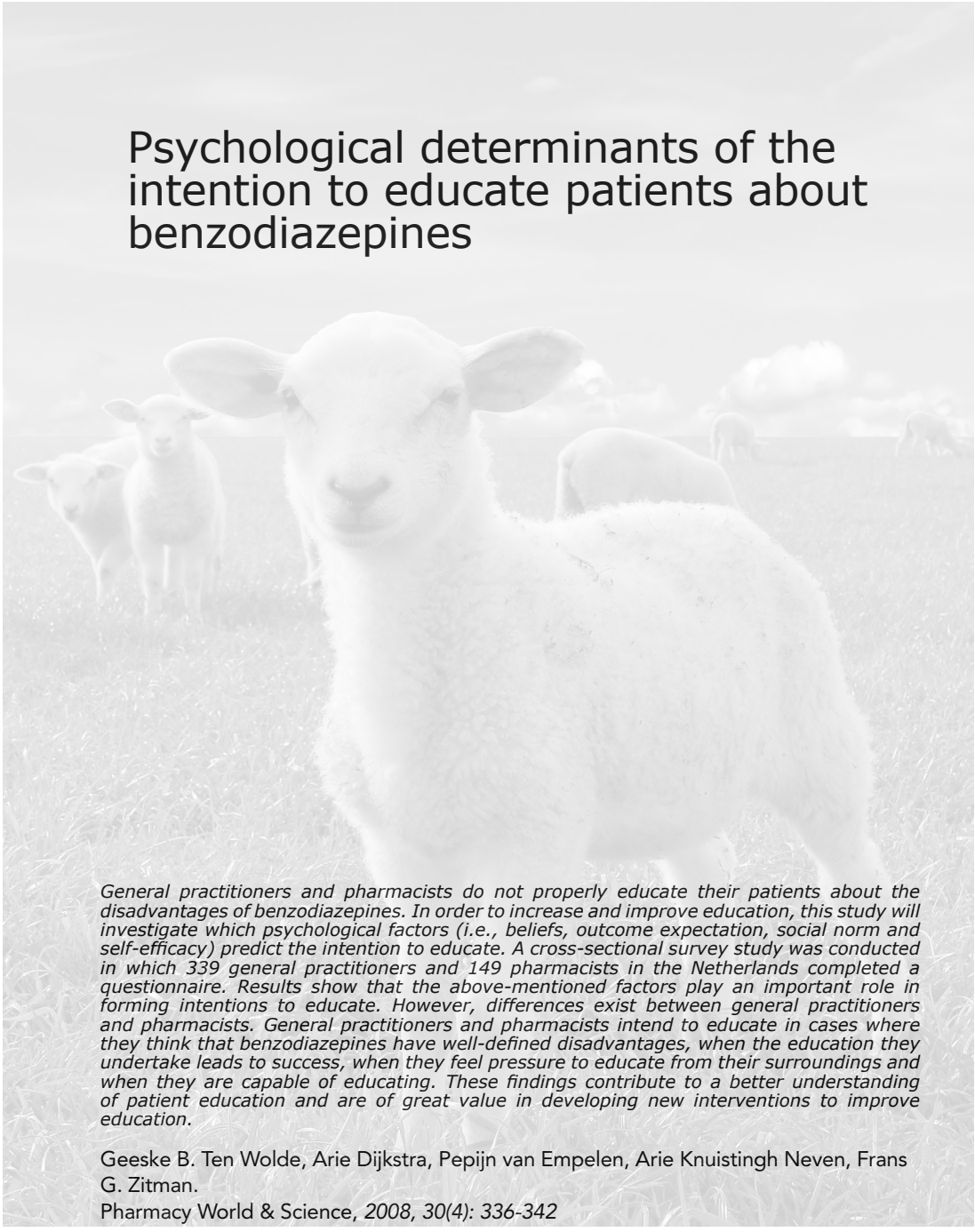
CHAPTER 2

Psychological determinants of the intention to educate patients about benzodiazepines



General practitioners and pharmacists do not properly educate their patients about the disadvantages of benzodiazepines. In order to increase and improve education, this study will investigate which psychological factors (i.e., beliefs, outcome expectation, social norm and self-efficacy) predict the intention to educate. A cross-sectional survey study was conducted in which 339 general practitioners and 149 pharmacists in the Netherlands completed a questionnaire. Results show that the above-mentioned factors play an important role in forming intentions to educate. However, differences exist between general practitioners and pharmacists. General practitioners and pharmacists intend to educate in cases where they think that benzodiazepines have well-defined disadvantages, when the education they undertake leads to success, when they feel pressure to educate from their surroundings and when they are capable of educating. These findings contribute to a better understanding of patient education and are of great value in developing new interventions to improve education.

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Introduction

Benzodiazepines are commonly prescribed drugs aimed at the short-term relief of severe, disabling anxiety or insomnia. The use of benzodiazepines has only been proven effective when used short term (1-5). Long-term use is not only non-effective, it can even be problematic because it is related to several negative health effects such as addiction, falls, hip fractures, phases of depression and impaired cognition (6-17). Because of this, guidelines for general practitioners have been established, for example, by the Dutch College of General Practitioners (NHG) regarding how and when to prescribe benzodiazepines to patients. Benzodiazepines for sleep disorders, for instance, are recommended for at most ten to fourteen days (18).

Despite these recommendations, 10-15% of the population uses benzodiazepines on a regular basis, and 3% uses them chronically (19). The elderly are the most common users: 42% of all users are 65 or older. They take 2.9 times more benzodiazepines than their younger counterparts. Those who are 75 years or older take even four times as much (20;21). The number of prescriptions for benzodiazepines in 2003 was almost eleven million and continues to grow by one percent each year (22;23). In addition, other European and non-European countries like the United States have to contend with widespread use of benzodiazepines (24). Given the long-term adverse effects of benzodiazepine use and the high costs associated with the high number of prescriptions, it is essential that both prescriptions for benzodiazepines be reduced and that patients be well informed about the (in)effectiveness and (adverse) effects of long-term benzodiazepine use.

The latter is often lacking: it is known that the education offered by health practitioners to patients is often inadequate and that alternatives like counselling or referral to other services are not offered in most instances (25;26). Two groups can be distinguished in patient education: general practitioners and pharmacists. Although they have different roles, they are both responsible for informing and educating patients about the use of drugs. In the Netherlands pharmacists and general practitioners need to comply with the same law of medicine (27).

Today, it is known that education about the disadvantages of benzodiazepine use is often non-existent: 80% of prescription refills are handed out by the assistant instead of general practitioners seeing the patient themselves (22). As a result, most patients are not educated at all. This is surprising because education would result in more satisfied patients, along with a better understanding of the pros and cons of medication, and more compliance to treatment (28-30). It is also known that when they do educate, general practitioners and pharmacists can play a vital role in changing patients' attitudes towards medicine use. For instance, it has been shown that pharmacists can play an important role in changing the drug attitudes of depressive patients (31). Thus, we can conclude that educating by both general practitioners and pharmacists the benzodiazepine user can have positive results in terms of the goal of reducing the amount of benzodiazepines.

But why is it that general practitioners and pharmacists do not educate their patients well? In case of general practitioners on the one hand, it is known

that they lack the time (30;32-34). In addition to this, the workload of the general practitioner is even higher when health problems are psychological or social in nature, as these problems take up more time than physical problems (35;36). This is the case with benzodiazepines: the reasons why patients start taking benzodiazepines mostly stem from stress, trauma or acute anxiety (30). High prescription levels of benzodiazepines are also related to the uncertainty of general practitioners about suggesting alternatives (30;37). And they are unwilling to raise the issue of benzodiazepine withdrawal because they view an intervention as pointless (30). Although pharmacists, on the other hand, are eager to undertake an extended role in health education, it is still uncommon for them to educate their patients, like drawing attention to leaflets displayed, or to actively provide patients with verbal education. Besides this, they are not always certain in educating patients about the effects and possible disadvantages of drugs in general (38;39). In order to stimulate patient education by both general practitioners and pharmacists about benzodiazepine use it is important to develop an intervention that is based on the psychological causes behind educating behaviour. It is important, therefore, for an intervention to be developed that targets these psychological causes related to educating patients.

Behaviour change – from not educating patients to educating them properly – starts with the formulation of the intention to educate. Intentions to perform specific behaviours have been shown to be the most powerful psychological predictors of actual behaviour (40;41). To distil the psychological determinants of the intention to educate, we will make use of psychological determinants derived from different models (i.e., Theory of Planned Behaviour (42), Protection Motivation Theory (43), and Social Cognitive Theory (44)). These models have been shown to have good predictive value in a diversity of behaviours such as individual health behaviour like tobacco use (45) and drinking behaviour (46;47), but also in predicting behaviour of individuals at other societal levels such as teachers providing sex education (48) or predicting the intention to vote for law enforcement by politicians (49). The above models all acknowledge that intention is the most proximal determinant of behaviour and that intention is in turn predicted by beliefs, outcome expectations (positive and negative), social norm and self-efficacy. Therefore, the aim of this study is to assess the psychological factors that predict the intention of general practitioners and pharmacists to educate their patients about benzodiazepine use.

Method

Participants and design

A cross-sectional survey study was conducted in order to assess the psychological determinants of intention to educate by general practitioners and pharmacists. Addresses of general practitioners and pharmacists were selected from an electronic version of the Dutch telephone directory. In total 999 general practitioners and 605 pharmacists were randomly chosen. Surveys were then sent to these general practitioners and pharmacists.

Questionnaire

The questionnaire assessed demographic data such as age, the amount of time the general practitioners and pharmacists were active in their profession, the number of patients they had in their files, and the number of prescriptions were handed over.

Intention, beliefs, outcome expectations, social norm and self-efficacy were measured on a five-point scale: 'definitely not' (1), 'probably not' (2), 'neutral' (3), 'probably yes' (4), and 'definitely yes' (5). Intention was measured with two questions. The two questions were: 'In the next twelve months are you planning to educate patients who start taking benzodiazepines or renew their use, about the disadvantages of benzodiazepines?' and 'In the next twelve months are you planning to educate patients who are already taking benzodiazepines?'

Beliefs, outcome expectations, social norm and self-efficacy were measured as follows. The beliefs regarding benzodiazepine use were response-efficacy and disadvantages. Response-efficacy was measured with two items, for example, 'Benzodiazepines are not effective'. Disadvantages were measured by three items. One example was 'Patients who use benzodiazepines for more than three months become addicted to them'. The psychological factors towards patient education were outcome expectations, social norm and self-efficacy. Positive outcome expectations were measured by three items. One item was 'If I educate my patients about the disadvantages of benzodiazepines, they will benefit from that'. Negative outcome expectations were also measured by means of three items. One example was 'If I educate my patients about the disadvantages of benzodiazepines, this will present a risk for the doctor-patient relationship'. Three items refer to social norm. One example is 'Do you think that KNMP (Royal Dutch Pharmaceutical Society, an association for and by pharmacists in the Netherlands) or NHG (Dutch College of General Practitioners) expects you to educate about benzodiazepines'. Lastly, self-efficacy was measured by one item 'It is difficult to educate patients about the disadvantages of benzodiazepines' (recoded).

Results

A total of 339 general practitioners (34%) and 149 (25%) pharmacists completed and returned the questionnaires. The mean age of the general practitioner was 48.5 years and that of the pharmacist was 39 years. Their average practice experience was 17.3 and 12.5 years respectively. An average of 2,545 patients were enrolled at the general practice. At the pharmacy, there were 10,037 patients with 80,653 prescriptions dispensed per year.

Reliability analyses showed that Cronbach's Alpha's were low to high: intention (2 items, α=.66), response-efficacy (2 items, α=.76), disadvantages (3 items, α=.62), positive outcome expectations (3 items, α=.75), negative outcome expectations (3 items, α=.63), and social norm (3 items, α=.58).

Table 1 gives a summary of the differences in mean scores and standard deviations on the psychological factors between general practitioners and pharmacists. *t*-tests were conducted to examine differences between the psychological factors of general practitioners and pharmacists. Significant

differences were found for intention ($t(478)=12.1$; $p<.001$), negative outcome expectations ($t(476)=2.8$; $p<.05$), social norm ($t(476)=4.0$; $p<.001$) and self-efficacy ($t(471)=4.5$; $p<.001$). These differences suggest that general practitioners have a more positive intention (95.5% of the general practitioners were intending to educate in contrast to 72.1% of the pharmacists), that they expect more negative outcomes when they do educate, that they experience a more positive social norm and that they feel more capable of educating their patients than do pharmacists. They did not differ significantly on both sets of beliefs on the effects of benzodiazepines (response efficacy and disadvantages), nor on positive outcomes they expect from educating patients.

Table 1 Differences in mean scores (*M*) and standard deviations (*SD*) on the psychological factors between general practitioners and pharmacists

			General practitioner	Pharmacist			
	Items	Range	*M* (*SD*)	*M* (*SD*)	*df*	*t*	*p*
Intention	2	1-5	4.0 (0.8)	3.1 (0.8)	478	12.1	<.001
Response-efficacy	2	1-5	4.1 (1.0)	4.0 (1.1)	477	.7	.48
Disadvantages	3	1-5	4.3 (0.7)	4.3 (0.7)	478	.4	.69
Positive outcome expectation	3	1-5	2.5 (0.8)	2.4 (0.9)	477	-1.1	.28
Negative outcome expectation	3	1-5	2.5 (1.0)	2.2 (1.0)	476	2.8	<.05
Social Norm	3	1-5	3.8 (0.8)	3.5 (0.8)	476	4.0	<.001
Self-efficacy	1	1-5	1.9 (1.1)	2.4 (1.0)	471	4.5	<.001

Separate regression analyses were conducted for general practitioners and pharmacists whereby intention was regressed on response efficacy, disadvantages, outcome expectations (positive and negative), social norm and self-efficacy (Table 2). For the general practitioners, the regression of intention to educate explained a variance of $R^2=.15$, with disadvantages, negative outcome expectations, social norm and self-efficacy being significant determinants. When we looked at the pharmacists, the regression yielded an R^2 of .22, with only positive outcome expectations and social norm being significant determinants. Thus, general practitioners' intention to educate was higher when they saw more disadvantages from benzodiazepine use, when they expected less negative outcomes from their education, when they perceived more social pressure to educate, and when they thought they were more capable of educating. Pharmacists' intention to educate was higher, on the other hand, when they saw more positive outcomes for their education efforts, and when they perceived more social pressure to educate.

Table 2 Regression of intention on the psychological factors for general practitioners and pharmacists.

	Intention to educate					
	General Practitioner			Pharmacist		
	ß	*p*	R^2 (*F*)	*ß*	*p*	R^2 (*F*)
Response-efficacy	.02	.75	.15 (9.8)	.06	.53	.22 (6.1)
Disadvantages	.27	.00		.12	.19	
Positive outcome expectation	-.01	.87		.19	.03	
Negative outcome expectation	-.11	.03		-.07	.36	
Social Norm	.12	.03		.23	.01	
Self-efficacy	-.14	.01		.12	.17	

Discussion

In the present study predictors of intended benzodiazepine education were examined among general practitioners and pharmacists. The main findings were that beliefs, outcome expectations (positive and negative), social norm and self-efficacy played a role in forming intentions to educate. However, differences existed among practitioners. In the case of general practitioners, intention was predicted by beliefs, negative outcome expectations, social norm and self-efficacy, whereas intention of pharmacists to educate was only predicted by positive outcome expectations and social norm. These findings suggest that when persuading/reinforcing general practitioners and pharmacists to educate, different information needs to be provided to each group in order to ensure patient education.

A possible explanation for the differences found between general practitioners and pharmacists is the fact that general practitioners are actually educating on a daily basis, while this is not the case with pharmacists. In the present study, 91% of the general practitioners indicated that they educated their patients when these started taking benzodiazepines, contrary to 47% of the pharmacists. In the Netherlands pharmacists, unlike general practitioners, are since July 2007 under an obligation to educate (27). As such, the differences in psychological determinants found may be related to the (lack of) experience that general practitioners and pharmacists have regarding patient education. In other words, due to the experience of general practitioners, they are more likely to report the barriers and negative consequences of patient education, while pharmacists, on the other hand, might base their expectations on hypothetical situations, not having experienced the drawbacks of educating patients. Another possibility is that general practitioners have a more personal relationship with their patients than pharmacists have. Thus, general practitioners know the difficulties patients experience in quitting benzodiazepines. Although these explanations are speculative, it seems probable that these differences found would imply practical differences for general practitioners and pharmacists.

Practice implications

Because it is now known that beliefs, outcome expectations, social norm and self-efficacy are responsible for the intention to educate, this knowledge can be used in order to get the general practitioner and pharmacist to be more motivated in educating their patients. These determinants must now be translated into practical strategies. First of all, in order to get the general practitioners and pharmacists to realise the importance of educating, it is necessary to increase their awareness by extending their knowledge about the desirability of patient education on benzodiazepine use. Beliefs and outcome expectancies can change due to new persuasive arguments, and as a result of the enhancement of the salience of information already possessed and along with linking beliefs with personal values (50). This can be achieved, for example, by information leaflets, pamphlets, seminars, lectures and so on. From this study, it is particularly important to keep the differences between these two kinds of practitioners in mind. For the general practitioners it is especially important to reduce negative outcome expectations by telling them that education will not harm the relationship with others (such as the relationship with the patient or pharmacist) and that education will not require too much time and effort on the long-term. For the pharmacist, on the other hand, it is particularly important to promote the positive outcomes of educating by for example underlining the fact that education will result in less benzodiazepine use, that patients will have a lower risk of falling and that the patient will benefit as a result.

Secondly, methods of influencing social norms are anchored in providing information on group norms (51). General practitioners and pharmacists are also likely to increase or sustain their education efforts towards benzodiazepine users when important social influences are activated, such as professional federations like the Royal Dutch Pharmaceutical Society and the Dutch Society of General Practice. These federations can put policies into place, which ensure that (recurrent) patient education and monitoring becomes part of daily practice. And finally, methods for self-efficacy enhancement include skills training, mastery experience and modelling. All this must be combined with feedback and reinforcement. It is widely known that in order to increase confidence (i.e., self-efficacy) people need encouragement and successful experiences (52).

The present findings have addressed determinants that need to be targeted in order to facilitate an intervention that ensures patient education of general practitioners and pharmacists. Additional factors such as, for example, environmental factors, need to be formulated in further studies. These will then contribute to a deeper understanding of how benzodiazepine education interventions can be best implemented. Thus, more research is necessary.

Instead of looking at possible solutions for improving the education of general practitioners and pharmacists, it is also important to look at other ways to have patients educated. As has been described elsewhere (35;53-55), it also turns out in this study, that general practitioners and pharmacists suffer from time constraints: more than 38% of the respondents think that educating patients takes too much time. For that reason it is important that

work be taken off the practitioners' hands. A tool which educates patients automatically would therefore be handy. It is known that writing a standard letter to patients already reduces benzodiazepine intake (56-59). However, personalized letters produced by a computer program, meaning without even seeing the patient, appear to be even more effective (60).

Limitations

Caution is warranted in interpreting the results of this study. First, low to high Cronbach's Alphas were found and low variances were found in the scales representing intention to educate and psychological factors predicting intention to educate. This may be due to the fact that the number of items for each factor was limited. This was done intentionally to increase response rate as it is known that health practitioners are not likely to participate (61). The questionnaire was therefore minimized to attract them. The sample used in this study might also cause a stir. Around 70% of those who received questionnaires did not respond. However, according to Swanborn, a response rate of 30% is not bad for this type of research in the Netherlands (62). Also, it is known that response rates among health practitioners are low due to time constraints, among other things (61). Also comparing our participants with the Dutch population it is known that a general practitioner in the Netherlands has on average 2,053 patients per practice (63). According to the Foundation for Pharmaceutical Statistics (22) Dutch pharmacies on average attend to 8,700 patients per pharmacy and process 73,800 prescriptions a year. It thus looks like we were dealing with a representative sample. Most importantly, studies are still important in order to identify common problems in health care systems (64). This also applies to the present study: it tries to find an answer to why general practitioners and pharmacists do not educate as they should.

Conclusion

In the present study predictors of intended benzodiazepine education were examined among general practitioners and pharmacists. The main findings were that beliefs, outcome expectations (positive and negative), social norm and self-efficacy played a role in forming intentions to educate. However, differences existed among practitioners. This study is the first Dutch study that has mapped the psychological factors of intention to educate patients about benzodiazepines. A start has thus been made in understanding the motives of general practitioners and pharmacists when it comes to educating.

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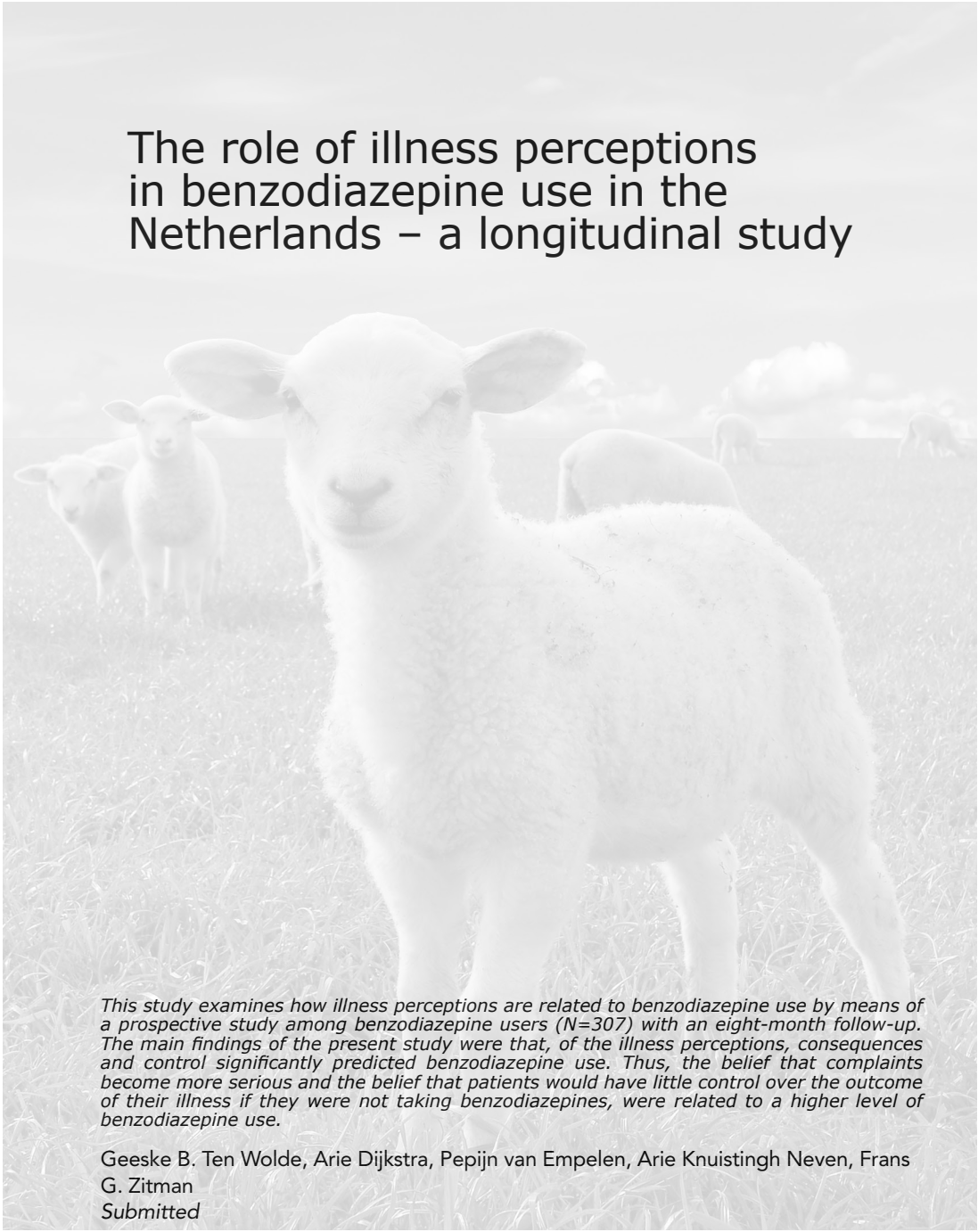
CHAPTER 3

The role of illness perceptions in benzodiazepine use in the Netherlands – a longitudinal study



This study examines how illness perceptions are related to benzodiazepine use by means of a prospective study among benzodiazepine users (N=307) with an eight-month follow-up. The main findings of the present study were that, of the illness perceptions, consequences and control significantly predicted benzodiazepine use. Thus, the belief that complaints become more serious and the belief that patients would have little control over the outcome of their illness if they were not taking benzodiazepines, were related to a higher level of benzodiazepine use.

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Submitted

Introduction

Benzodiazepines are one of the most prescribed classes of drugs in the Netherlands (1). They are most often prescribed for short-term relief of anxiety or insomnia. Other countries in Europe, the United States and Canada also contend with the widespread use of benzodiazepines (2). The general concern of public and medical circles related to the large numbers of individuals who regularly take benzodiazepines (3) has led to a consensus that long-term benzodiazepine use should be discouraged. Research is especially focused on how to withdraw from these drugs and, in particular, on the influence of psychological factors on withdrawal difficulties and relapse (4;5). However, little is known about the psychological factors that are involved in patients' decisions to quit, to continue or to increase their use of benzodiazepines. Although the patient is not the only actor in the problem of widespread use of benzodiazepines – doctors and pharmacists are also involved – the patient's perspective is of central importance as it largely determines the information that doctors need in their professional decision to continue or discontinue benzodiazepine prescription. But above all, it is the patient who determines to take the pill or not. Knowledge of a patient's perspective on the use of benzodiazepines is essential for an efficacious influence on patients' decision-making. The present study aims to contribute to this body of knowledge. Specifically, we will focus on the patients' ideas about the illness for which they use benzodiazepines. It will be investigated to what extent these ideas are related to benzodiazepine use, as a manner of coping with the illness (e.g., insomnia or anxiety).

A psychological model that has often been used to explain illness behaviour is the Common Sense Model (CSM) of Leventhal (6). According to the CSM, illness behaviour can be explained by patients' own perceptions of their illness. The illness perceptions of the CSM include five key attributes: identity, cause, consequences, control or cure, and timeline. In the present study, we will assess the illness perceptions with regard to the illness (i.e., mental health problem) that motivated the initiation of the use of benzodiazepines. *Identity* refers to the specific set of complaints that signal the specific illness. *Cause* refers to a person's beliefs about the origin of the illness that motivated the initiation of benzodiazepine use. *Consequences* are ideas about the short and long-term outcomes of the illness. *Control or cure* refers to beliefs about the extent to which one can control or cure the illness. Lastly, *timeline* concerns ideas about whether the illness is acute or chronic in nature. Thus, several dimensions can be distinguished in the patients' perspectives on their illness. These perceptions of different aspects of their illness form the basis for patients' emotional and behavioural reactions towards their illness.

Studies that examine the CSM model have provided support for the hypothesis that a strong illness identity (the attribution of many complaints to the illness), as well as a belief in a long duration and serious consequences of an illness, have a negative effect on the well-being of patients (7;8). In addition, illness beliefs have been shown to influence patients' behaviours.

In the present study of benzodiazepine users, we aim to predict benzodiazepine intake. It is expected that when patients perceive the illness

for which they have been prescribed benzodiazepines as more serious, they will use a higher dose of benzodiazepine. More specifically, we expect that when patients attribute more complaints to their illness, rate the consequences as more severe, perceive less control over their illness, and think that the illness will last longer, they will use a higher dose. This seriousness of the illness is thought to be related to dosing because a higher dose is needed to make the illness bearable. The more serious the illness, the stronger a cure is needed. Thus, illness beliefs refer indirectly to the functions of the benzodiazepine use. As mentioned before, perceptions of seriousness of the illness lower well-being (7;8). It may be that some manifestations of this lowered well-being are similar to the illness for which the benzodiazepines are prescribed. For example, patients may worry and have sleep problems when they realize that their illness has serious consequences, will last longer and is not under their control. These emotional reactions to their illness may also be cured with benzodiazepines. Thus, the more seriously patients perceive their illness, the lower their well-being will be and the more benzodiazepines they will use to cope with the emotional reactions to their illness.

Knowledge of a patient's illness perceptions can be used for the development of patient education interventions. In other illness behaviours ,the interventions based on illness perceptions look promising (9-13). These interventions were aimed at changing illness perceptions. For example, Petrie et al. (10) conducted a study among patients who had suffered from a myocardial infarction. The intervention caused positive changes in patients' illness perceptions. Thus, knowing the illness perceptions of benzodiazepine users could enable patients to become more aware of their illness (the reason why they need benzodiazepines) and ultimately motivate them to cope with their health problems without the use of benzodiazepines. A better understanding of these patients' perceptions may improve the quality of the decision-making process with regard to the most desired and appropriate treatment for a patient's problems.

In the present study, we examine how illness perceptions are related to benzodiazepine use. The hypothesis is that patients' beliefs about their illness influence benzodiazepine use. Because patients' beliefs about their illness may be influenced by the fact that they use benzodiazepines, we specifically asked patients about their illness "were they not to use benzodiazepines." For example, patients might rate the consequences of their illness as moderate when they use benzodiazepines, but as severe if they were not using benzodiazepines. Furthermore, they may feel in control of their condition when they use benzodiazepines but out of control when benzodiazepines are not considered.

In this prospective study, illness beliefs assessed at baseline were used to predict benzodiazepine use after nine months. Although during a nine-months interval several other factors might influence benzodiazepine use (e.g., changes in complaints, social influences, doctors recommendations), we expect that baseline illness beliefs will still be related to benzodiazepine in a sample of chronic benzodiazepine users. Thus, attributing more complaints to their illness (identity), rating the consequences as more severe (consequences), perceiving less control over their illness (control), and

thinking that the duration of their illness will be longer, will result in using a higher dose of benzodiazepines.

Methods

Procedure

A longitudinal study was conducted using two measurements. The first questionnaire (T1) was sent out to 653 chronic benzodiazepine users, who had consented to participate voluntarily by responding to advertisements in local newspapers and magazines throughout the Netherlands. In the advertisements, chronic benzodiazepines users were invited to participate, with chronic benzodiazepine use defined as daily use for more than 3 months. It was explicitly stated that it was not necessary to discontinue benzodiazepines to join the study. All subjects participating had a chance of winning ten bonus prizes amounting to €25. The questionnaire was sent out with a request to return it within two weeks in the prepaid envelope, which was included as well. Five hundred and thirty-nine benzodiazepine users returned the T1 questionnaire (response rate 83%). After nine months the second questionnaire (T2) was sent out with 479 users returning it (attrition rate 87%). A missing value analysis was conducted for the independent variables. In line with Van Kesteren et al. (14), participants with missing values exceeding 10% of all items of the variables included in this study were excluded from further analyses. Also, the participants who did not fill in the amount of benzodiazepines at follow-up were excluded. This resulted in a sample of 307 (66%) users.

Questionnaire

The demographic variables measured were age, gender and educational level. Educational level was categorized as low, medium or high. Schooling systems in the Netherlands refer to vocational training as low, advanced vocational training as medium, and college/university training as high. Besides demographic characteristics, the participants were asked which benzodiazepine(s) they were using, how many milligrams per week, and for how long they had been using benzodiazepines. The baseline questionnaire also measured the illness perceptions.

To measure illness perceptions, a modified version of the Illness Perception Questionnaire (IPQ) (15) was used. In its original form, this theoretically derived measure comprises five scales that assess the five components of cognitive representations of illnesses.. The measure is designed to be flexible enough to be modifiable for use in a wide range of illnesses and has good psychometric properties including validation of the scales of form factor analysis and discriminant validity among groups of people diagnosed with different physical health problems. The IPQ was modified for the purpose of the present study by replacing the word 'illness' by the words 'the reason why you are taking benzodiazepines'. The five scales are identity, cause, consequences, control/cure and timeline. The identity scale assessed the reasons why people were taking benzodiazepines. Patients

were asked to indicate on a checklist of thirteen complaints, which of these complaints they believed would be part of their illness were they not to use benzodiazepines.

Cause, consequences, cure/control and timeline were rated on a five-point Likert-type scale ranging from 'strongly disagree' (1) to 'strongly agree' (5). The total number of items was twenty. 'Cause' was divided into psychological causes and non-psychological causes. The 'psychological causes' were measured with five items referring to patients' ideas about the likely psychological cause(s) of their illness (α = .75). An example of a psychological cause is 'Stress plays a big role in the reason why I have to take benzodiazepines.' 'Non-psychological causes' had three items measuring the patient's beliefs about the likely non-psychological causes of the illness (α = .74). An example of a non-psychological cause is 'Food plays a big role in the reason why I have to take benzodiazepines.' 'Consequences' contains five items measuring a patient's perception of illness severity and its impact on all areas of functioning (α = .67). An example of such an item is 'If I did not take benzodiazepines, my illness would become serious.' 'Control/cure' had three items measuring a patient's beliefs about how amenable the illness was to control or cure (α = .73). An example is 'If I did not take benzodiazepines, my illness would not disappear by itself.' Finally, the 'timeline' scale consists of four items measuring patients' perceptions of the likely duration of their illness (α = .84). An example is 'If I did not take benzodiazepines, my illness would continue forever'. The reliability of all scales was satisfactory (α > .73), with the exception of Consequences (α = .67).

The follow-up self-report questionnaire measured benzodiazepine use. In this short questionnaire, participants were asked which benzodiazepine(s) and how many milligrams per week they were using. All medication was transferred to an equivalent dose of diazepam using the conversion table of Zitman and Couvée (16). For participants taking more than one benzodiazepine, the dosages were summed up. The present study is a "low demand" study, meaning that participants were explicitly told that it was not necessary for them to quit if they joined the study. This implies that the participants were under no social pressure to change their behaviour in either direction and the above self-report questionnaires are therefore expected to be valid (17).

Attrition analysis

Of the 539 participants at T1, 307 returned a properly completed T2 questionnaire . Dropouts were compared with the remaining participants on the basis of gender, level of education, age and length of use. Chi-square analyses for categorical variables and one-way ANOVAs for quantitative variables revealed that dropouts did not differ significantly with age, gender, level of education and length of use. Only the amount of milligrams of benzodiazepines differed (F (1, 539)=7,22, p<.01): participants who took more benzodiazepines (M=182,82) dropped out significantly more often (M=182,82 mg diazepam equivalents versus M=99,31 mg diazepam equivalents).

Results

Participant characteristics

Of the total sample (*N*=307), the majority were female (80.7 %) and the mean age was 56.5 years. Most participants had had a low level of education (45.7 %), while the rest had had a medium (25.4%) or high level of education (28.9%). Participants used benzodiazepines on average for more than twelve years (range 1-50) and had a weekly dose of 75.8 milligrams of diazepam equivalents.

Illness Perceptions

Of the identity scale, most participants reported one complaint (28.7%), 17.7% reported two, and 20.8% reported three complaints. Complaints that are mentioned are presented in Table 1. Sleeplessness (72.3%), tension (48.9%) and anxiety (29.6%) were the complaints most mentioned. Means, standard deviations and inter-correlations between the illness perceptions are depicted in Table 2. With regard to the *identity* of the illness, patients attributed a mean of 2.94 out of thirteen complaints to their illness. The perceived *causes* of the illness for which they used benzodiazepines that was most often reported (the ones with the greatest proportion of participants who agreed or strongly agreed) were 'Stress plays a big role in the reason why I have to take benzodiazepines' (73.9%) and 'My psychological state plays a big role in the reason why I have to take benzodiazepines' (69.8%). The mean scores on all the scales were between 2.14 and 3.77 (see Table 2). The illness will have negative consequences if not treated with benzodiazepines (*M*=3.50). Also, they did not believe that they could control or cure their illness (*M*=2.14) and they believed that their illness would have a longer duration if they did not take benzodiazepines (*M*=3.77).

Table 1 Illness identity (*N* = 307)

Complaints	%	Complaints	%
Sleeplessness	72.3	Muscle ache	16.0
Tension	48.9	Pain	15.6
Worrying	31.6	Physical problems	9.8
Anxiety	29.6	Relational problems	9.1
Overstrain	17.9	Family problems	8.8
Panic	17.3	Epilepsy	0.3
Psychiatric	16.3		

To detect relationships among the illness perceptions, Pearson correlations were computed (see Table 2). The correlation matrix shows small to medium correlations (18): the illness perceptions do significantly correlate with each other, with values ranging between .14 and .37 ($p<.05$) in the expected directions. This indicates that the scales refer to different aspects of the perception of the same illness. The correlations show that patients with a strong illness identity (those who attributed more complaints to the reason why they started benzodiazepines) believed that the illness would result in more serious consequences ($r=.27$), and longer duration ($r=.14$) if they were

not to take benzodiazepines. Psychological cause significantly correlates with identity, consequences and timeline, meaning that patients believing that the cause of the illness is psychological in nature attribute more complaints to the reason why they started benzodiazepines (*r*=.34), that the illness result in more serious consequences (*r*=.27) and will last longer (*r*=.14). Control/cure significantly correlates with consequences: patients believing that the illness will have serious consequences if not treated with benzodiazepines also believed that they would have less control over their illness (*r*=-.14). Control/cure also significantly correlates with timeline (*r*=-23): patients who believe that they have less control over their illness also believe that the illness would have a longer duration if they were not to take benzodiazepines. Lastly, timeline significantly correlates with consequences (*r*=.32). Thus, patients who believe that the illness would have serious consequences if it were not treated also believed that the illness would have a longer duration.

Table 2 Means and correlations for illness perceptions and benzodiazepine use at T2 (*N*=307)

	(1)	(2)	(3)	(4)	(5)
Illness Identity (1)	1.00				
Psychological cause (2)	.34**	1.00			
Consequences (3)	.27**	.37**	1.00		
Control/Cure (4)	-.08	-.03	-.14**	1.00	
Timeline (5)	.14*	.13**	.32**	-.23**	1.00
Mean	2.92	3.59	3.51	2.15	3.75
Standard Deviation	1.92	1.18	1.00	1.06	1.08
Range	1-11	1-5	1-5	1-5	1-5

**. Correlation is significant at the 0.01 level (two-tailed)

*. Correlation is significant at the 0.05 level (two-tailed)

Prediction of level of benzodiazepine use at T2

Table 3 presents the results of a two-step hierarchical regression analysis, in which the illness perceptions were regressed onto benzodiazepine use at T2. In Step 1 we entered the three demographic variables. Because we are primarily interested in which illness beliefs are related to amount of use and because past behaviour is a predictor for future behaviour (19), we did not enter benzodiazepine use at T1 in Step 1. It appeared that gender, age and educational level predicted benzodiazepine use at T2 (R^2 = .08; p < .01). In Step 2 the illness perceptions were entered. These variables added 6% to the explained variance (R^2 = .14; p < .01) with consequences (β = .18; p < .01) and control (β = .14; p < .05) being significant predictors of benzodiazepine use at T2.

Table 3 Linear multiple regression analyses predicting benzodiazepine use at T2

Step	Variables entered	ß	ß
1	Gender	.19**	.19**
	Age	-.22**	-.16
	Educational level	-.13*	-.11
	Length of use	.10	.04
2	Illness identity		.09
	Psychological cause		.02
	Consequences		.18**
	Control/cure		.14*
	Timeline		.04
R^2		.08	.14
R^2 Change			.07
Model *F*		6.10**	5.09**

** $p < .01$ * $p < .05$

Discussion

The main findings of the present study were that, of the illness perceptions, consequences and control significantly predicted benzodiazepine use. Thus, the belief that complaints become more serious and the belief that patients would have little control over the outcome of their illness if they were not taking benzodiazepines, were related to a higher level of benzodiazepine use. This is in line with other studies describing the role of illness perceptions in health outcome (20-24). Although the data are prospective, the causal direction of the relationship cannot be interpreted with certainty. For instance, it cannot be ruled out that when patients use a higher dose of benzodiazepine, they strategically construe their illness as more serious. However, on the basis of theoretical considerations and empirical evidence, it is very plausible that illness beliefs have effects on well-being (7;8) and on behaviour (25).

The variance in benzodiazepine dosing that could be explained by the illness beliefs was only 6 % (R^2 =.06). Nevertheless, 6 % has a significant and relevant contribution when taking into account the large number of patients using benzodiazepines. In the Netherlands, 10-15% of the population use benzodiazepines on a regular basis, and 3% use them chronically (3). The number of prescriptions for benzodiazepines in 2003 was almost 11 million and the number of prescriptions for benzodiazepines is growing by 1% each year (1;20). In other words, if interventions were to succeed in changing illness beliefs in the direction of the illness being less serious, a maximum reduction of 6 % in benzodiazepine use would make a substantial difference. In addition, the 6 % variance must be considered against the background of other possible influences on dosing, such as doctors' recommendations and social influences. Although many factors could have influenced and probably did actually influence benzodiazepine use between T1 and T2, the patients' beliefs survived all these influences. This means that a patient's perception of how the illness would be if he or she did not use benzodiazepines may be a robust and central factor in explaining benzodiazepine use.

The correlational results shed some light on the validity of the measures. The more complaints were perceived as being related to their illness, the more

severely patients perceived their illness, as indicated by positive relations with the dimensions consequences and timeline. In addition, the longer patients thought their illness would last if they no longer used benzodiazepines, the less control they perceived and the more severely they evaluated their illness. The correlations were small to moderate and all in expected directions.

The sample consisted of chronic benzodiazepine users; they used benzodiazepines for an average period of twelve years. Many patients reported sleeplessness, tension, worry and anxiety as the main problems for which they used benzodiazepines. Most patients reported more than one complaint to be the reason for their use. These percentages do not necessarily reflect the actual medical indications for which they use the medicine but they illustrate the patients' perspective. The fact that the present sample used benzodiazepines chronically is reflected by the high agreement to statements that, if they no longer used benzodiazepines, their illness would have severe consequences and would last longer. In addition, patients showed low agreement with the statements on having control on their illness. The combination of high seriousness (consequences and lasting longer) and low control in the case of no longer using benzodiazepines indicates their reliance on benzodiazepines.

Illness beliefs are expected to be related to benzodiazepine dosing through two different but related pathways. Firstly, the more serious an illness is perceived to be, the more intensive a cure should be to be effective. Secondly, the more serious an illness is perceived to be, the stronger the emotional reactions to the illness will be and the more benzodiazepines might be used to lower this distress. These relations are plausible but were not addressed in the present study. Future studies could include measures of medicine functions and well-being to test the hypothesized mediation.

To conclude, this study suggests that of the illness perceptions, consequences and control/cure predict benzodiazepine use. Interventions can now be developed in order to change these illness perceptions which may result in improved patient decision-making and adequate coping behaviour, which, in turn, may reduce reliance on benzodiazepines. On the one hand, interventions might aim at lowering the negativity of the consequences of the illness. For a large part this might be done by providing patients with alternative means to cope with their illness. In the case of benzodiazepine use, many patients might benefit from skills to lower worrying, to decrease distress or to support a good night's sleep. On the other hand, interventions might aim to lower the perceived functions of benzodiazepine use, for example, to educate them about the tolerance patients develop for benzodiazepines that results in lowered effectiveness. In intervention studies it has been shown that self-management programs can produce significant improvements (29). Our findings contribute to the knowledge needed to decide which cognitions should then be targeted in such interventions.

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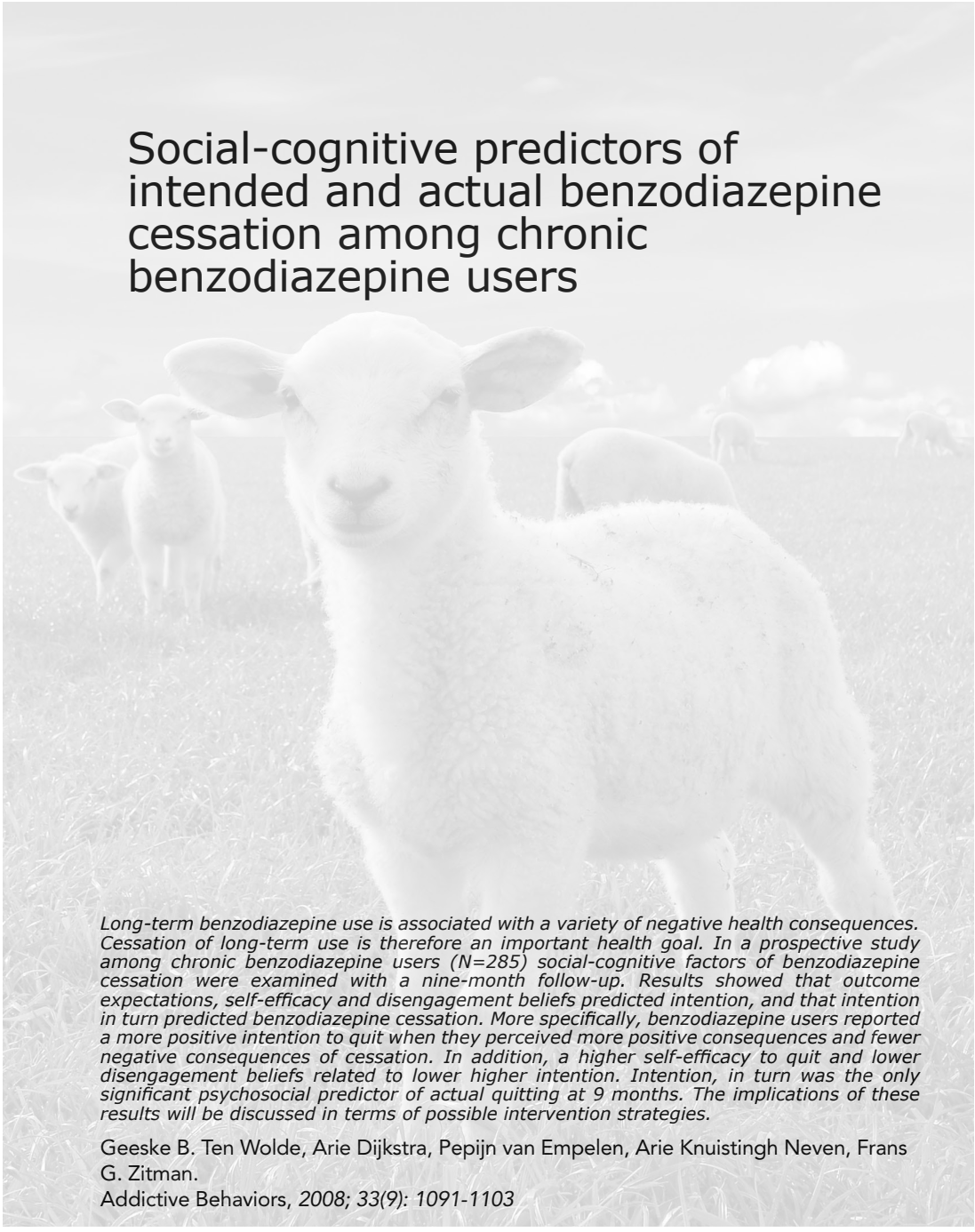
CHAPTER 4

Social-cognitive predictors of intended and actual benzodiazepine cessation among chronic benzodiazepine users



Long-term benzodiazepine use is associated with a variety of negative health consequences. Cessation of long-term use is therefore an important health goal. In a prospective study among chronic benzodiazepine users (N=285) social-cognitive factors of benzodiazepine cessation were examined with a nine-month follow-up. Results showed that outcome expectations, self-efficacy and disengagement beliefs predicted intention, and that intention in turn predicted benzodiazepine cessation. More specifically, benzodiazepine users reported a more positive intention to quit when they perceived more positive consequences and fewer negative consequences of cessation. In addition, a higher self-efficacy to quit and lower disengagement beliefs related to lower higher intention. Intention, in turn was the only significant psychosocial predictor of actual quitting at 9 months. The implications of these results will be discussed in terms of possible intervention strategies.

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Introduction

Benzodiazepines are commonly prescribed drugs aimed at the short-term relief of severe disabling anxiety or insomnia (1-4). However, recommendations only support short-term use of benzodiazepines, and caution against the long-term use of benzodiazepines. Long-term use of benzodiazepines is not only non-effective, it can even be problematic, because it is related to several negative health effects such as addiction, falls, hip fractures, phases of depression and impaired cognition (2;5-9).

Despite the recommendation, ten to fifteen percent of the population in the Netherlands uses benzodiazepines on a regular basis, and three percent uses them chronically (10), particularly the older-aged population (e.g. 11). Similar findings have been reported in other western countries (12). In addition, the number of prescriptions for benzodiazepines in 2003 was almost eleven million and this number is growing by one percent each year (13).

Hence, it is important to reduce the (chronic) use of benzodiazepines. It should be noticed, however, that information on factors that explain the (chronic) use of benzodiazepines among the patient population is limited, and is mainly focused on demographic or personality differences (14-16). These studies provide useful information to understand which people are more likely to be at-risk, but they provide limited information for intervention development given that most factors described are not modifiable. Social-cognitive models, such as the Theory of Planned Behavior (17) or Social Cognitive Theory (18) have shown to be useful in explaining health and risk behaviors (19), and interventions aimed at changing behavior via changes in cognitions have shown to be effective in establishing (health) behavior changes (20). However, the number of studies that have addressed social-cognitive factors of benzodiazepine use is limited. To our knowledge only two studies have examined social-cognitive determinants of benzodiazepine use. Van Hulten and colleagues (21) showed that benzodiazepine use could be explained by an patient's intention to use benzodiazepines. Intention is seen as an indication of a person's readiness to perform a given behavior, and it is considered to be the most immediate antecedent of behavior (22). Intentions in turn could be explained by a patient's attitudes (i.e., their overall evaluation of benzodiazepine use in terms of advantages and disadvantages). Attitudes were influenced by the perception that the general practitioner approved the use of benzodiazepines (i.e., perceived social norm). In another study Van Hulten and colleagues found (23) that intention to use was a predictor of length of use. These results are certainly of interest when explaining benzodiazepine use. However, when developing interventions, the focus of interest should be on benzodiazepine *cessation* rather than benzodiazepine *use*. It has been shown that predictors of use or non-use are likely to be different (24).

The present study therefore aimed at examining social-cognitive predictors of benzodiazepine cessation. In accordance with social cognitive models, intention was expected to be the most proximal determinant of behavior. Intention, in turn, was predicted by outcome expectations (i.e., beliefs about quitting or non-use of benzodiazepines) self-efficacy (e.g., perceived

capability of quitting), and social norms (perception of support or pressure of others to quit) (22;25).

Besides these aforementioned determinants it has been suggested that disengagement beliefs (25) is an important factor, especially with regard to risk-reduction behaviors. Disengagement beliefs are justifications aimed at lowering perceived health threats. These beliefs (or excuses) may be true in themselves, but they do not comprise a valid reason for engaging in risky behavior (e.g., "You only live once"). In the context of cigarette smoking, several studies have found that disengagement beliefs are negatively related to intentions to quit and actual quit attempts (26-29). Given the parallels between smoking cessation and benzodiazepine cessation it is likely that these disengagement beliefs negatively affect intended and actual benzodiazepine cessation.

In summary, the present study aimed at gaining an understanding of social-cognitive factors of benzodiazepine cessation among chronic benzodiazepine users. It was examined whether (intended) benzodiazepine cessation could be explained by outcome expectations, self-efficacy, social norms and disengagement beliefs.

Methods

Procedure

A prospective study with a nine month follow-up was carried out. Chronic benzodiazepine users were recruited by means of advertisements. Advertisements were placed in local newspapers and magazines throughout the Netherlands. In the advertisement, chronic benzodiazepine users were invited to participate. It was explicitly stated that it was not necessary to quit. In addition, chronic benzodiazepine use was defined in the advertisement as daily use for at least 3 months. This definition is used by the Dutch college of general practitioners (2). All participating subjects had a chance of winning ten bonus prizes amounting to €25. Six hundred and fifty-three chronic benzodiazepine users had consented to participate voluntarily by responding to these advertisements. The first questionnaire (T1) was sent out with a request to return it within two weeks in the prepaid envelope, which was also included. Five hundred and thirty-nine benzodiazepine users returned this questionnaire (T1; response rate 83%). After nine months a second questionnaire (T2) was sent out, which was returned by 479 users (response rate 89%). Of these 479 users, 149 were excluded because they did not fill in the questionnaire properly, resulting in a final sample of 285 benzodiazepine users (60%).

Questionnaire

The demographic variables measured were age, gender and educational level. Educational level was categorized as lower, medium or higher. Schooling systems in the Netherlands refer to vocational training as lower, advanced vocational training as medium, and college/university training as higher education. Besides demographic characteristics, the participants

were also asked which type of benzodiazepine and how many milligrams per week they were using. In order to predict intention at T1, the cognitive variables (i.e., intention, outcome expectations, self-efficacy, social norms and disengagement beliefs) were measured at T1. Benzodiazepine usage was measured at T2 in order to find out which of the cognitive variables at T1 will predict benzodiazepine cessation at T2.

Table 1 shows examples of items of how the cognitive constructs were measured at T1, including the number of items and Cronbach's Alphas. All Cronbach's Alphas were satisfactory (α > .77).

At T2 benzodiazepine cessation was measured. First, people were asked to fill out the question: "Are you still using benzodiazepines?" with multiple answering options: "No", "Yes, but I reduced the amount of benzodiazepines", "Yes, I still take the same amount of benzodiazepines", or "Yes, I increased the amount of benzodiazepines". The first two answering categories were coded as having reduced the amount of benzodiazepines (0), whereas the latter two categories were coded as no attempts to reduce benzodiazepine use (1).

The present study was a 'low-demand' study (30), meaning that the participants are under no social pressure to change their behavior in either direction. Therefore, the above self-report questionnaires were expected to be valid.

Table 1 Examples of items in questionnaire

Construct + examples of item	# items	α
Intention How likely is it that you are going to stop within one month How likely is it that you are going to stop within six months How likely is it that you are going to stop within 1 year	3	.86
Positive outcome expectations If I stop taking benzodiazepines, ... I would be proud of myself .. I would be pleased with myself… .. I would be	18	.94
Short-term negative outcome expectations If I did not use the medicine, ... I would suffer from a feeling of discomfort	12	.93
Long-term negative outcome expectations If I did not use the medicine for a long time, my sleep would be worse	10	.92
Self-efficacy If you were to try to stop taking benzodiazepines, would you be capable of doing so if you have slept worse the night before?	25	.96
Social norm What do you think your partner thinks about your benzodiazepine use?	7	.90
Disengagement beliefs Maybe it's better not to use this medicine, but nobody is perfect We all do something stupid sometimes	12	.77

Participant characteristics

Table 2 shows that the majority (81.4%) of the participants was female, 44.9% of the participants had a lower education, 26.4% of the participants had a medium education, and 28.7% of the participants had a higher education.

According to the participants, 97.4% of the general practitioners, 67.1% of their families, 67.1% of their friends and 40% of their acquaintances knew about their benzodiazepine intake. In order to be able to make comparisons between people with regard to benzodiazepine use, all medication was transferred to an equivalent dose of diazepam using the conversion table of Zitman and Couvée (31). For participants taking more than one benzodiazepine, the dosages were summed up. Participants on average used benzodiazepines for more than eleven years (range 1-50) and had a weekly dose of 75.3-milligram diazepam equivalents. These numbers are similar to figures of representative samples reported elsewhere (32;33), and therefore the group seems representative of the total population of benzodiazepine users in The Netherlands. At T2, 27 (7.6%) of the users stopped their benzodiazepine intake and 110 (30.9%) of them reduced their intake.

Table 2 Participant characteristics at T1 (*N*=356)

	Total
Demographic variables	
Gender (female)	81.4 %
Age (years) (mean (*SD*))	55.4 (13.7)
Educational level:	
Low	44.9 %
Middle	26.4 %
High	28.7 %
Benzodiazepine usage	
Duration of use (years)(mean (*SD*))	11.3 (10.6)
Weekly dose in mg diazepam equivalent (mean (*SD*))	75.3 (90.5)
Top 3:	
Oxazepam	26.0 %
Temazepam	16.5 %
Diazepam	10.6 %

Attrition analysis

Dropouts were compared with the remaining participants on the basis of gender, level of education, age, intention, self-efficacy, social norm, outcome expectations (positive and negative) and disengagement beliefs. Chi-square analyses for categorical variables and one-way ANOVAs for quantitative variables revealed that dropouts differed significantly in gender and education. There were comparatively more men dropping out (χ^2 (531,1)=4.53, p<.05); 23% of men versus 15% of women dropped out. In addition, more participants with a lower education (29 %) dropped out, as compared to, with a lower education dropped out, as compared to participant with a middle (13%) or higher education (14%, χ^2(529,2)=12.73, p<.01). The amount of milligram benzodiazepines also differed (F(341)=7.22, p<.05): Participants who took more benzodiazepines (M=183 (SD=353) dropped out more often as compared to the ones who still participated at T2 (M=99, SD=250).

Results

Cognitive variables

Table 3 shows the mean scores and standard deviations of the different cognitive variables and provides a correlation matrix of these variables. The intention to quit was below the scale midpoint (*M*=3.0, *SD*=2.1), indicating that patients did not have plans to quit their benzodiazepine intake in the near future. They also reported lower agreement with positive outcomes from quitting (*M*=2.8, *SD*=1.1), while they did expect negative outcomes from quitting (*M*=2.1 (*SD*=0.9) and *M*=2.3 (*SD*=1.0)). Self-efficacy was low, indicating that participants were not confident about quitting (*M*=3.6, *SD*=1.3). Looking at social norms, participants did think they could readily take benzodiazepines, regardless of the opinion of family and significant others (*M*=4.7, *SD*=1.6). The above suggests that benzodiazepine users do not perceive advantages from quitting, but, on the contrary, they rather expect barriers blocking their quitting. Hence, on average, perceived disadvantages of quitting seem to outweigh the perceived advantages of quitting.

The correlation matrix firstly shows that five of the six variables significantly correlate with intention, with values ranging between .14 and .40 ($p<.05$) in the expected direction. Only negative outcomes on the short-term did not correlate with intention. Noteworthy, self-efficacy correlates negatively with disengagement beliefs, suggesting that people with lower self-efficacy report more agreement with disengagement beliefs. Additionally, positive outcome expectations correlated poorly with negative outcome expectations in the long-term ($r=.10$, $p<.05$) and no significant correlation was found between positive outcome expectations and disengagement beliefs. Hence, the different expectations seem to represent unique factors.

Table 3 Means and correlations for cognitive variables and intention (*N*=285)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intention (1)	1.00						
Positive outcomes (2)	.40**	1.00					
Negative outcomes – Short-term (3)	-.00	.29**	1.00				
Negative outcomes – Long-term (4)	-.17*	.10*	.58**	1.00			
Self-efficacy (5)	.16*	-.15*	-.27**	-.19**	1.00		
Social norm (6)	-.14*	-.31**	-.20**	-.13*	.06	1.00	
Disengagement beliefs (7)	-.23**	-.01	-.09	.09	-.23**	.11*	1.00
Mean	3.0	2.8	2.1	2.3	3.6	4.7	3.4
Standard deviation	2.1	1.1	0.9	1.0	1.3	1.6	0.9
Range	1-7	1-5	1-4	1-4	1-7	1-7	1-5

** $p < .001$ * $p < .05$

Prediction of intention by the cognitive variables

Next, hierarchical regression analyses were conducted regressing intention on the predictor variables. In Step 1 demographics (gender, age, and educational level), the amount of diazepam equivalents and length of use were entered, explaining five percent of the variance of the intention to quit. Length of

use was the only significant predictor of intention (see table 4). In Step 2 outcome expectations, self-efficacy, social norm, and disengagement beliefs were entered. This step explained an additional 26% of variance (Total R^2 = .31, p < .001), with length of use, positive outcome expectations, long-term negative outcome expectations, self-efficacy, and disengagement beliefs being significant predictors (see table 4). In other words, perceiving benefits of quitting, feeling self-efficacious, and expecting lower negative long-term outcomes and less disengagement beliefs, were related to a higher intention to quit.

Table 4 Linear multiple regression analyses predicting intention at T1 (*N*=285)

Step	Variables entered	ß	ß
1	Gender (0=female, 1= male)	-.09	-.09
	Age	-.06	.02
	Educational level	-.01	-.03
	Diazepam	.04	-.03
	Length	-.16*	-.18*
2	Positive outcomes		.44**
	Negative outcomes – Short-term		.03
	Negative outcomes – Long-term		-.20*
	Self-efficacy		.14*
	Social norm		-.03
	Disengagement beliefs		-.15*
R^2		.05	.31
R^2 Change			.26
Model *F*		2.76*	10.9**

** p < .001 * p < .05

Prediction of behavior at T2 by means of the cognitive variables

Table 5 presents the results of a hierarchical logistic regression, in which benzodiazepine cessation at T2 was regressed on the social-cognitive variables. In the first step the demographic variables were entered. The regression analysis showed that none of the demographic variables predicted benzodiazepine cessation. In step 2 the cognitive variables, except for intention, were entered. The cognitive variables (outcome expectations, self-efficacy, social norm, and disengagement beliefs) explained 10.9% of the variance. From these cognitive variables only disengagement beliefs (β = -.45, p < .05) significantly predicted benzodiazepine cessation. Finally, intention was entered in the third step. Intention was entered as a separate additional step, given that intention is suggested to mediate the effect of the other social-cognitive variables. Intention showed to be the strongest predictor of benzodiazepine cessation, whereby intention added 8% to the explained variance (total R^2 (Nagelkerke) = .17; p < .001). When intention was added (β = .21, p < .01), disengagement beliefs were no longer significant, suggesting possible mediation via intention.

Table 5 Logistic multiple regression analyses predicting benzodiazepine cessation at T2 (0 = no, 1 = yes) (*N*=285)

Step	Variables entered	ß	*ORs*	95%*CI*	ß	*ORs*	95%*CI*	ß	*ORs*	95%*CI*
1	Gender (0=female, 1= male)	.49	1.63	.89-3.01	.56	1.74	.92-3.29	.75	2.12*	1.09-4.14
	Age	-.02	.98	.96-1.00	-.01	.99	.97-1.02	-.01	.99	.97-1.01
	Educational level	.29	1.33	.90-1.98	.12	1.13	.74-1.70	.16	1.17	.76-1.80
	Diazepam	.00	1.00	1.00-1.00	.00	1.00	1.00-1.00	.00	1.00	1.00-1.00
	Length	.00	1.00	1.00-1.00	.00	1.00	1.00-1.00	.00	1.00	1.00-1.00
2	Positive outcomes				.09	1.09	.85-1.39	-.18	.83	.63-1.11
	Negative outcomes–Short-term				-.24	.79	.52-1.19	-.28	.76	.49-1.16
	Negative outcomes–Long-term				.06	1.06	.76-1.48	.21	1.24	.86-1.77
	Self-efficacy				.11	1.11	.89-1.39	.04	1.04	.83-1.31
	Social norm				.04	1.04	.88-1.23	.06	1.06	.89-1.26
	Disengagement				-.45	.64*	.45- .90	-.35	.70	.49-1.01
3	Intention T1							.33	1.39**	1.19-1.62
R^2		.05			.09			.17		
χ^2		9.68			19.64*			38.43**		

** $p < .001$ * $p < .05$

Discussion

The aim of the present study was to examine which social-cognitive factors predicted benzodiazepine cessation. First of all, it appeared that most participants showed low motivation (i.e., intention) to quit benzodiazepine intake. On average, the benzodiazepine users in the sample did not perceive advantages of quitting benzodiazepines. In accordance, the majority of people in this study continued their benzodiazepine intake follow-up. More specifically, 61.5% of all the participants had not quit or reduced their benzodiazepine intake at T2. The study also showed that length of use, outcome expectations, self-efficacy, and disengagement beliefs did explain intentions to stop taking benzodiazepines, with benzodiazepine users who did quit or reduce their benzodiazepine intake being more likely to report positive expectations and outcomes of quitting, expected less negative long-term outcomes, were more self-efficacious about quitting, and finally reported lower agreement with the disengagement beliefs, and a more positive intention to quit. In turn, intention was the only predictor for actual quitting behavior, which is in line with the Theory of Planned Behavior (17).

Length of use was negatively related to intended quitting. In other words, people were less inclined to quit when having a longer history of benzodiazepine use. Nevertheless, it needs to be pointed out that intention was predicted by other factors even after the inclusion of length of use, suggestion that intention is malleable to change. Likewise, intention predicted actual quitting, even after the inclusion of length of use. Hence, although length of use decreases the likelihood of quitting, which have been reported elsewhere (34), the present study suggests that change is likely even among habitual users.

The negative relationship of disengagement beliefs with both intended and actual behavior, suggests a need to target the disengagement beliefs. Disengagement beliefs are suggested to be a coping strategy to deal with experienced self-threat, and they are likely to be used as a strategy in contexts were people experience difficulty to change their behavior (35). Noteworthy, disengagement beliefs were negatively related to self-efficacy.

As such, one way to lower disengagement beliefs is by increasing self-efficacy and skills to reduce or quit the use of benzodiazepines. When patients know how to change their behavior and feel capable to do so, keeping a positive self by actually changing their behavior is more likely, and hence they may not need to restore a threatened self by justify their behavior. Another way to reduce the negative effect of disengagement beliefs is by using self-affirmation strategies in order to encourage people to accept self-threatening information. Self-affirmation theory (36) suggests that people are motivated to protect their self-integrity (and as such people may use disengagement beliefs). The theory, however, also suggests that if people perceive other ways in which they can affirm and maintain a positive self-view, they are more likely to accept other personally-relevant, but threatening information. In accordance, Sherman and colleagues (37) showed that when people who received personally relevant health information, but who were enabled to self-affirm, both perceived greater risk and changed their behavior (e.g., buying condoms when receiving and AIDS education video). Those people who received similar information and were not self-affirmed did not show these changes. Likewise, Harris and Napper (38) observed in a study on the link between alcohol and breast cancer that women who self-affirmed in an unrelated domain increased durable health information acceptance. Thus, a self-affirmation strategy may be useful to encourage people to accept self-threatening health information instead of using disengagement beliefs in order to justify their behavior.

In predicting intentions, only negative outcome expectations in the short term (the withdrawal symptoms) and social norms did not appear to be significant social-cognitive determinants. Expecting withdrawal symptoms was thus not related to intended quitting behavior. It could be that benzodiazepine users did not consider the fact that they would have a temporary feeling of discomfort when they decided to quit their benzodiazepine intake or it could be that they thought it was less important than other factors. Especially the return of complaints in the long term was important in creating the intention to quit. It is known that some of the withdrawal symptoms, such as nervousness, irritability, sleep disturbance, dizziness and tremor, overlap with the symptoms of anxiety and insomnia, and so can be seen as the return of the disorder being treated in the first place (39).

Social norms did not explain intended quitting. Social norms has more often shown to be a weak predictor of intention (40). In addition, the weak relationship between social norms and intention might be explained by the number of participants who reported that their social environment is unaware of their benzodiazepines intake. In accordance, Haafkens (41) also described in a social case study that female benzodiazepine users regulated the dosage themselves, i.e., without consulting others, and these women did not talk about drug-taking patterns with any other people in their environment, not even with close friends. This unawareness of the surrounding of the patient might indirectly explain the long-term use of benzodiazepines, given that the social environment does not support the avoidance of chronic use.

Limitations of the study

The explained variance in intention and behavior we found are comparable to explained variances found in other studies (40). The low explained variance can be due to the fact that we still lack understanding of other cognitive, affective and behavioral factors predicting benzodiazepine cessation. An extension with other factors should therefore be considered. This is in line with results found by Godin and Kok (42), who reviewed the applications of the theory of planned behavior in the area of health behavior. They stress the importance of other factors, like personal norms, in explaining health behavior. Just as it is known that a lot of benzodiazepine users (around 50%) become addicted according to the DSM-III-R and ICD-10 substance dependence criteria (8), irrational, impulsive or affective components could also relate to benzodiazepine use.

One could also criticize the reliability of the self-reports of benzodiazepine users. However, Velicer et al. (43) showed for smoking that self-report was a reliable measurement. In addition, we believe that given the number of people who report continuing their use of benzodiazepines shows that possible bias due to social desirability may be limited. Of importance, participants were pointed out the confidentiality of the their responses and it was pointed out that participation did not require quitting their benzodiazepine use. Finally, other measurements, such as prescription reports by the general practitioner or pharmacist are also subject to reliability threats, given that patients do not necessarily get their medication directly from them (44).

We did not differentiate chronic use into problematic use (or abuse) and misuse in the present study, although we do acknowledge that is of interest to see whether determinants of benzodiazepine cessation are different for these two groups. However, from a public health standpoint, regardless of differences in use, the long-term use of benzodiazepine is problematic per se, given the likely occurrence of tolerance. As such, public health interventions should be directed at the group as a whole. In order for interventions to be effective, it is vital to have an understanding of the reasons people have to continue their use of benzodiazepines and what may stimulate their motivation to discontinue use. By means of our approach we think we have been able to provide such information, both for people who misuse or abuse benzodiazepines. However, it will be interesting to address differences between the two groups in future studies. Finally, although 83 % of the initial population returned the questionnaire at the final measurement, a large part of questionnaires was not properly completed, resulting in a final sample of 258 benzodiazepine users at T2. This drop-out created some bias as described in the attrition analysis. To prevent this to happen, in future studies the length of the questionnaire should be reduced.

It should be noted that the present study is one of the first studies which tries to explain benzodiazepine cessation. It sheds light on several important cognitions related to benzodiazepine cessation, as such providing valuable information for interventions.

Implications

The present study suggests that in order to motivate people further, it is essential to strengthen people's intention to quit. This can be achieved by reducing misconceptions about the prolonged effects and benefits of benzodiazepine use, while at the same time giving people information about the possible adverse effects, and to lower disengagement beliefs. Persuasive communication has shown to be a valuable method to change existing beliefs (45), for instance by linking beliefs with personal values. Furthermore, as mentioned earlier, self-affirmation may be used as a strategy to reduce maladaptive emotional coping responses. In addition, self-efficacy has to be increased. Self-efficacy enhancement may include skills training, mastery experience and modeling. It is essential that people are provided with feedback and reinforcement in order to increase self-efficacy (46). Self-efficacy enhancement is likely to result in behavioral changes, and lowering the need for disengagement beliefs.

A possible way to address the determinants, and to incorporate the change methods mentioned is the use of tailored interventions. A computer-tailored intervention aimed at cognitive predictors of benzodiazepine cessation showed to be effective in increasing cessation rates among chronic benzodiazepine users (47). Moreover, computer-tailored education has proven to be successful in various kinds of complex health behaviors (48-50). Tailoring is based on decision rules that take into account individual variables for deciding what information will have the strongest persuasive power for an individual, and it incorporates self-referent information (51). More specifically, tailoring ensures that interventions are adapted to beliefs of people, and ensures that people are less likely to deny the information, because the intervention is based on their self-informed pre-existing opinions.

To conclude, the present study was one of the first studies to address cognitive predictors of benzodiazepine cessations. The findings ensure a better understanding of why people do (not) quit their long-term use of benzodiazepines, and hence, this study is likely to contribute to the aim to reduce health care problems and costs among this prevalent group.

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CHAPTER 5

Long-term effectiveness of computer-generated tailored patient education on benzodiazepines: a randomized controlled trial

Chronic benzodiazepine use is highly prevalent and is associated with a variety of negative health consequences. The present study examined the long-term effectiveness of a tailored patient education intervention on benzodiazepine use. A randomized controlled trial was conducted comprising three arms, comparing (1) a single tailored intervention; (2) a multiple tailored intervention and (3) a general practitioner-letter. The post-test took place after twelve months. Five hundred and eight patients using benzodiazepines were recruited by their general practitioners and randomly assigned to one of the three groups. Two tailored interventions, the single tailored intervention (patients received one tailored letter) and the multiple tailored intervention (patients received three sequential tailored letters at intervals of one month), were compared to a short general practitioner-letter that modelled usual care. The tailored interventions not only provided different and more information than the general practitioner letter, they were also personalized and adapted to individual baseline characteristics. The information in both tailored interventions was the same, but in the multiple tailored intervention the information was provided to the participants spread over three occasions. In the multiple tailored intervention, the second and the third tailored letters were based on short and standardized telephone interviews. Measurements: Benzodiazepine cessation at post-test was the outcome measure.The results showed that participants receiving the tailored interventions were twice as likely to have quit benzodiazepine use compared to the general practitioner-letter. Particularly among participants with the intention to discontinue usage at baseline, both tailored interventions led to high percentages of those who actually discontinued usage (single tailored intervention 51.7%; multiple tailored intervention 35.6%; general practitioner-letter 14.5%). It was concluded that tailored patient education can be an effective tool for reducing benzodiazepine use, and can be implemented easily.

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Introduction

Benzodiazepines are one of the most frequently prescribed drugs. In 1998, approximately 11.6 million prescriptions for benzodiazepines were written in the Netherlands (1). In addition, other European and non-European countries, such as the United States, have to contend with widespread use of benzodiazepines (2). Benzodiazepines are only effective for the short-term treatment of insomnia and anxiety (3-7). Long-term use is not only non-effective, but is also associated with several negative side-effects such as addiction, cognitive decline, falls and accidents (8-16). Because of these problems, there is a strong desire to be able to control the use of benzodiazepines.

Two different treatment strategies are in circulation for decreasing the amount of benzodiazepines used (17). In minimal interventions, general practitioners may invite patients to discontinue their long-term benzodiazepine usage on their own by making them aware of the negative consequences of continued usage. Systematic discontinuation programs, on the other hand, are more intensive interventions in which patients discontinue their benzodiazepine doses gradually under the guidance of a general practitioner. Although both strategies have been shown to be effective (17), they are in many instances not offered to patients (18;19). As a result, patients are not given the opportunity to reduce their intake with the support of the general practitioner. This is partly due to the fact that general practitioners are subject to time constraints (20-23). It has also been suggested that the high levels of benzodiazepine intake are mainly the result of general practitioners failing to consider or feeling unable to suggest alternative strategies besides the continuation of benzodiazepines (20;24). It is, therefore, important to develop a tool which is feasible for general practitioners to use and more likely to be accepted by them, and which is at the same time effective in educating patients in order to reduce benzodiazepine intake.

Computer-tailored patient education could be such a tool. In other health behaviours, including addictive behaviours such as smoking, it has been shown that computerized tailored information can be more effective than no information and more effective than usual care (25-28). Computer-tailored information is directed at the individual by taking into account individual baseline characteristics. Tailored information, therefore, mimics the process of individual counselling and feedback, but the expertise of the counsellor is now documented in a computer program. In other words, this computerized patient education entails, on the one hand, individualization of information and, on the other hand, offers the possibility to apply it to large groups of patients. Once a computer system for tailored patient education is developed, the costs of large scale application are relatively low. It could, therefore, be an excellent tool in educating patients because it reduces the workload of the general practitioner and at the same time educates patients automatically.

The aim of this study was to test whether two different and newly developed computer-tailored interventions to educate patients were more effective than an existing patient education letter (the general practitioner-letter) in reducing benzodiazepine use. The intervention objectives of both

tailored interventions were based on the Social Cognitive Theory (29). In this comprehensive psychological theory, expectations of outcomes of a behaviour and perceptions of self-efficacy are the main determinants of behaviour, and these determinants therefore need to be changed in order to change a particular behaviour. Studies on psychosocial determinants of benzodiazepine use have indeed shown that outcome expectations and self-efficacy expectations are important predictors of benzodiazepine cessation (30). In addition, the information developed to change outcome and self-efficacy expectations was tailored to individual characteristics using the methodology of Dijkstra and De Vries (31). This means that individual data were fed into a computer system that composed a coherent letter that took into account several individual characteristics, such as name, gender, type of benzodiazepine used, outcome expectations and self-efficacy expectations.

All in all, the tailored interventions were developed to be more effective than the general practitioner-letter by adding three elements. Firstly, the tailored interventions aimed at changing psychological factors defined by the Social Cognitive Theory, while the general practitioner-letter was developed to only inform and advice patients. Secondly, the content and formulations of the information in the tailored interventions were adapted to the individual, while the general practitioner-letter was the same for all patients. Thirdly, the tailored interventions included more information than the general practitioner-letter. It contained information on more different topics and on skills to cope with anxiety or sleep problems and information on how to discontinue benzodiazepine use.

Although the objectives of both tailored interventions and the extent of the tailoring were the same, in the multiple tailored intervention the information was divided over three letters and was sent to the participants at intervals of one month. The rationale for developing and testing two systems that differ mainly in the time interval in which the determinants are addressed lies in the observation that decision-making and behavioural change take place over time and require time in order to become effective. In the present multiple tailored letter intervention, this notion was operationalized simply by spreading the information over three occasions. The resulting hypotheses were as follows: 1) the tailored interventions are more effective than the general practitioner-letter, and 2) multiple tailored intervention is more effective than single tailored intervention.

Methods

Study design

A three-pronged randomized controlled trial was used, which compared: (1) a single tailored letter intervention; (2) a multiple tailored letter intervention and (3) a general practitioner-letter (Figure 1). The study protocol was approved by the Local Ethics Research Committees of Leiden University Medical Center.

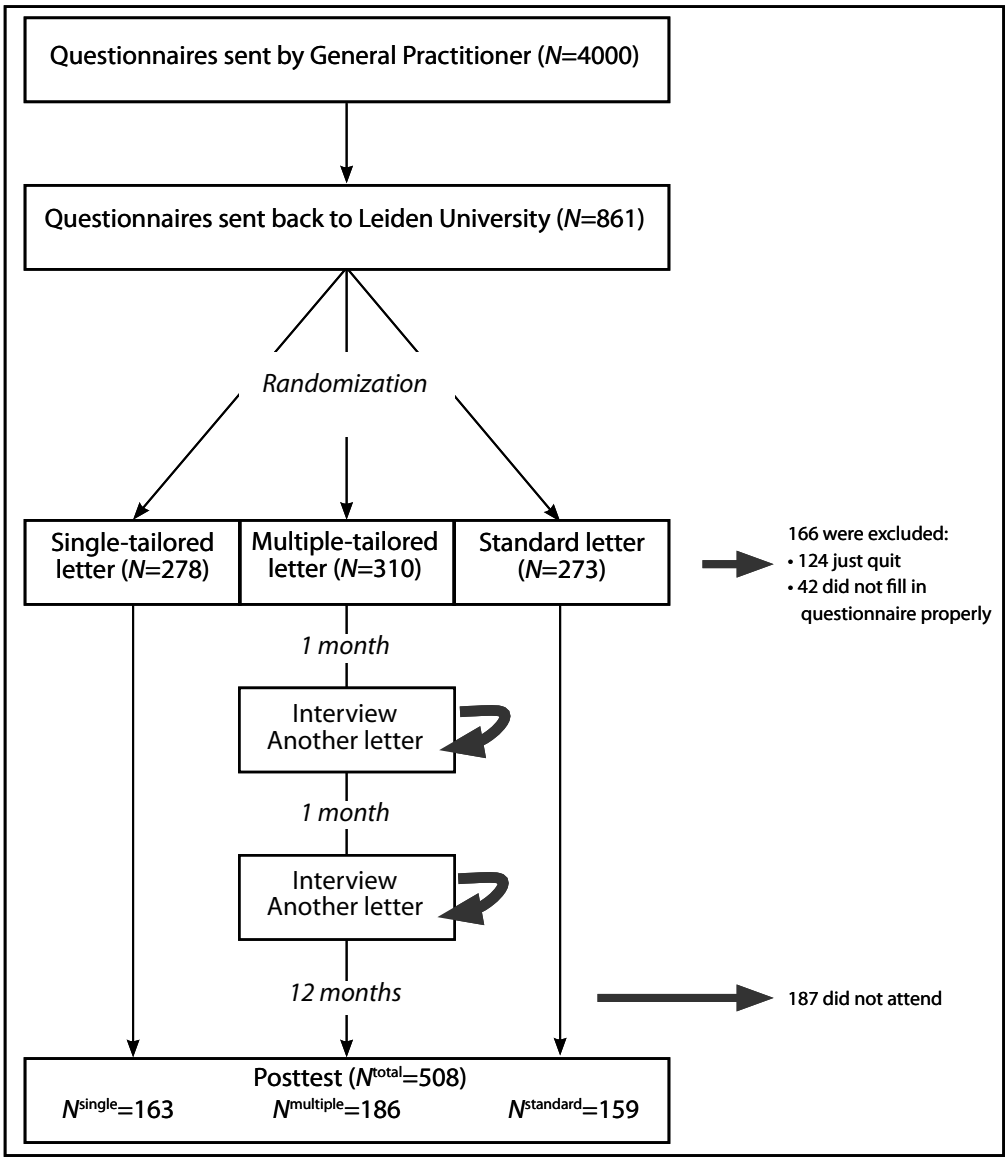

Figure 1 Flow diagram

Recruitment

Chronic benzodiazepine users were recruited via thirty general practitioners throughout the Netherlands. The general practitioners were originally randomly selected from an electronic version of the Dutch telephone directory and received €200 compensation for their participation. The general practitioners were phoned and asked how many chronic benzodiazepine users they had in their patient database. Five general practitioners declined participation on behalf of certain of their patients. The reported reasons for declining

were that patients had severe co-morbidity or psychosocial problems. As a consequence, an estimated fifty patients were excluded.

The general practitioners' assistants forwarded packages to their chronic benzodiazepine users. The packages contained, firstly, an informed consent form. Secondly, they contained one A4 sheet of information in which the procedure was explained. Thirdly, a pre-test questionnaire was added in order to produce the (first) tailored letter. Lastly, a prepaid envelope was added so that the patient could return the informed consent form and the questionnaire to the researcher. Four thousand packages were sent to patients using benzodiazepines. The patients who returned the pre-test questionnaires were randomly assigned to one of the three conditions. The data on the participants in the tailored interventions were imported into the computer program, which produced the tailored letters. All letters were sent to the participants within one week. The additional two subsequent letters in the multiple tailored intervention were each based on a separate individual assessment through a standardized telephone interview of a maximum of ten minutes. The post-test questionnaire was sent out after twelve months.

The tailored intervention

Both tailored interventions were developed on the basis of the methodology offered by Dijkstra and De Vries (31). Each letter was based on an individual assessment. The individual data were fed into a computer program in which an individually tailored letter was composed on the basis of rules about what information would be appropriate to include given a specific response on the individual assessment.

Each letter started with an introduction explaining the goal and the rationale of the information. Subsequently, the three main determinants of discontinuing usage were addressed. The information was designed to: 1) increase the perceptions of the positive outcome expectations of discontinuing benzodiazepine use (for example, it was argued that patients may function better cognitively and may evaluate themselves more positively); 2) lower the perceptions of the positive outcome expectations of the use of benzodiazepines (this was done by explaining the development of tolerance and a possible placebo effect), and 3) increase self-efficacy expectations with regard to discontinuing usage (this was done by offering several skills to reach abstinence, such as making a plan to cut down benzodiazepine use and by offering alternatives in order to cope with worrying thoughts).

The single tailored letter intervention consisted of one letter of 5 to 6 pages of information (approximately 1200 words) in which all of these three psychological determinants were addressed in the above order of presentation. The multiple tailored letter intervention consisted of three letters of about 3 pages each (approximately 400 words), sent at intervals of one month. In the multiple tailored intervention, the first tailored letter was designed to increase the perceptions of the positive outcome expectations of discontinuing benzodiazepine usage and to lower the perceptions of the positive outcome expectations of the use of benzodiazepines. The second tailored letter was designed to increase self-efficacy expectations with regard to discontinuing usage, while the content of the third letter provided more

skills for discontinuing usage, or provided a summary of the information in the first two letters, depending on the individual needs detected in the third assessment. In addition, in the introduction of the second and third letter, participants were provided with progress feedback: individual changes in benzodiazepine use were mentioned.

The tailoring included the three working mechanisms that have the potential to be effective; personalization, feedback and adaptation. Personalization was applied by starting with the participant's surname (e.g., "Dear ms. Brown,') and by mentioning twice in the text the type of benzodiazepine that the individual used. Feedback was provided on statements made by patients in the individual assessment. For example: "You think that benzodiazepines really help you to get a good night's sleep." Adaptation was used, for example, by taking into account the self-reported indication for the use of benzodiazepines when tolerance was addressed and persuasive arguments were provided.

The general practitioner-letter

The results of the two tailored letters were compared to the results of an existing letter that general practitioners in the Netherlands can use to inform their patients about benzodiazepine (the general practitioner-letter for benzodiazepine discontinuation) (32). This letter was the same for all patients and it only pinpointed the disadvantages of benzodiazepine use (such as the chance of becoming addicted) and they contained a short advice on how to discontinue benzodiazepine use. The letter consisted of approximately 200 words. Gorgels and others (33) demonstrated that this letter caused a reduction of 24% (versus 5% in the non-intervention group) in the first six months.

Measurements

In addition to demographic characteristics (age and gender), the type of benzodiazepine used, the dose and the indication for the use, the determinants were assessed in the pre-test questionnaire as follows:

Intention was measured using three items. An example of such an item was: 'How likely is it that you are going to stop within six months?', with a seven-point response scale from 'definitely not planning to do so' (1) to 'definitely planning to do so' (7)(α =.96). There were six items measuring positive outcome expectations (α =.80), such as: 'If I stopped taking benzodiazepines, I would be proud of myself.' The negative outcome expectations were measured by eight items (α = .88). An example of such an item was: 'If I did not use the medicine, I would suffer from a feeling of discomfort.' The answers could be given on a five-point scale from 'I totally disagree' (1) to 'I totally agree' (5). Self-efficacy expectations were assessed using eight items (α = .92). An example was: 'If you were to try to stop taking benzodiazepines, would you be capable of doing so if you had slept worse the night before?' on a seven-point scale from 'definitely not' (1) to 'definitely yes' (7).

The post-test measured benzodiazepine cessation with the question: 'Are you using benzodiazepines?' with two response options: No (0) and Yes

(1). The present study is a "low demand" study (34). This implies that the participants are under no social pressure to change their behaviour in either direction. In the letter inviting participation it was explicitly stated that it was not necessary to discontinue usage. Therefore, the above self-report was expected to be valid (34).

Statistical methods

A randomization analysis was conducted to check the comparability of the different conditions at baseline. This was done by chi-square statistics for categorical and dichotomous variables, while *t*-tests were used for continuous variables. An attrition analysis was conducted to see whether there were differences in baseline scores between the participants who remained in the study and those who withdrew at post-test. This was done by analyses of variance and chi-square. Finally, to check the effectiveness of the tailored letters, logistic regression analyses were conducted with benzodiazepine cessation at post-test as the dependent variable ('0'- did not quit and '1' – did quit) and condition as the independent variable. All comparisons between the intervention conditions were adjusted for age, gender and benzodiazepine dose (in diazepam equivalents).

Results

General

Of the packages which were sent to general practitioners, 861 pre-test questionnaires were returned (22%). These respondents were randomly assigned to one of the three conditions. Of these participants, 166 were excluded because they had just discontinued their benzodiazepine intake (n=124) or did not complete the questionnaire properly (n=42), leaving a total of 695 participants (81%), with 228 in the single tailored intervention, 256 in the multiple tailored intervention, and 211 in the non-tailored intervention. Of these 256 participants in the multiple-tailored intervention, 207 received a telephone interview (81 %) and the subsequent letter. Of these participants, 156 received another telephone interview as well as the third tailored letter (75 %). Only the participants who were approached with the telephone interview received the tailored letters. After twelve months, the post-test questionnaire was sent out to all the participants who received the first letter. Five hundred and eight participants returned the post-test questionnaire (response rate 73.1%), with 163 in the single-tailored intervention, 186 in the multiple-tailored intervention, and 159 in the non-tailored intervention (see also Figure 1).

Baseline characteristics

Looking at the characteristics, 68.1% were female and the mean age at pre-test was 62.3 years. In order to be able to compare benzodiazepine use, all medication dosages were transferred to an equivalent dose of diazepam using the conversion table of Zitman and Couvee (35). For participants taking more than one benzodiazepine, the dosages were summed up. The data showed that the mean usage of benzodiazepines was over eight years, with

an average of 49.3 milligrams of diazepam equivalents per week. 15.8% used more than one type of benzodiazepine. The most frequently used types of benzodiazepines were oxazepam (30.7%), temazepam (26.5%) and diazepam (10.7%). When looking at the baseline scores, most patients had no plans to discontinue usage (*M*=2.2). They also expected positive outcomes (*M*=2.9), as well as negative outcomes (*M*=2.3) for benzodiazepine cessation, and on average participants perceived their capability to discontinue usage as low (*M*=3.0) (see also Table 1).

Table 1 Baseline characteristics of the study participants (*N*=695) at baseline assessment in the three intervention conditions.

	Total	Single tailored letter intervention	Multiple tailored letter intervention	General practitioner-letter	*p*
Demographic variables					
Gender (female)	68.1%	67.9%	71.0%	65.2%	.41
Age (years) (mean (*SD*))	62.3 (14.2)	61.6 (14.0)	62.5 (14.8)	63.0 (13.6)	.61
Benzodiazepine usage:					
Duration of use (years)(mean (*SD*))	8.1 (10.6)	8.3 (11.1)	7.8 (9.8)	8.0 (11.1)	.88
Weekly dose in mg diazepam equivalent (mean (*SD*))	49.3 (70.8)	55.3 (66.6)	47.8 (86.9)	43.1 (50.9)	.19
Poly use: > 1 benzodiazepine	15.8%	18.4%	16.7%	11.6%	.13
Top 3:					.22
Oxazepam	30.7%	26.3%	27.7%	28.8%	
Temazepam	26.5%	22.3%	26.1%	23.1%	
Diazepam	10.7%	8.0%	9.5%	10.6%	
Diazepam: ≥70mg/week	26.2%	30.4%	22.5%	24.5%	.13
Indication					.15
Sleep	53.1%	57.5%	47.4%	55.6%	
Anxiety	25.1%	22.2%	28.5%	23.9%	
Physical	10.4%	10.9%	9.5%	11.7%	
Mental	11.3%	9.5%	14.6%	8.8%	
Cognitions:					
Intention to discontinue (mean (*SD*))	2.2 (1.9)	2.2 (1.9)	2.2 (2.0)	2.1 (1.9)	.75
Positive outcome expectation (mean (*SD*))	2.9 (1.2)	2.9 (1.3)	2.8 (1.3)	2.9 (1.2)	.96
Negative outcome expectation (mean (*SD*))	2.3 (1.2)	2.3 (1.2)	2.3 (1.2)	2.4 (1.3)	.53
Self-efficacy (mean (*SD*))	3.0 (1.5)	3.0 (1.5)	2.9 (1.5)	2.9 (1.5)	.57

Randomization and attrition

Randomization analyses showed that the participants in the conditions at pre-test did not differ among the different conditions for all baseline measurements listed in Table 1. The attrition analyses only showed that those who provided no or incomplete data at follow-up used a significantly higher weekly dose of diazepam equivalents ($F(694)=18.1$, $p=.00$).

Main analyses

The logistic regression analysis showed a significant main effect of condition ($\chi^2(6, N=475) = 48.43$; $p=.025$). In the single tailored intervention condition, 24.5% reported no longer using benzodiazepines, in the multiple tailored intervention condition the percentage was 23.7%, while in the general practitioner-letter condition the percentage of those who had discontinued use was 14.5%. The contrast between the single letter and the general practitioner-letter was significant ($p<.05$), while the difference between the multiple tailored letter and the general practitioner-letter approached significance ($p=.053$). There was no significant difference between the two tailored interventions.

Table 2 Percentage of benzodiazepine cessation per condition and the *OR* of the comparison of the two tailored interventions with the general practitioner-letter.

	%	*OR*	95% *C.I.*	*p*-value
Single tailored letter intervention	24.5%	2.3	1.21 – 4.24	.007
Multiple tailored letter intervention	23.7%	2.1	1.11 – 3.76	.01
General practitioner-letter	14.5%	1.0		

Moderating effects

Moderation analyses were conducted in order to test in whom the tailored interventions were most effective. The following were tested as potential moderators: age, gender, benzodiazepine dose, outcome expectations, self-efficacy expectations and the intention to discontinue the use of benzodiazepines. A logistic regression model was constructed for each of these potential moderators, including the covariates, the potential moderator (for continuous variables dichotomized by a median split), the factor condition and the interaction between the potential moderator and the factor condition. Only the interaction with pre-test intention to discontinue usage was significant ($\chi^2(8, N=485) = 61.45$, $p=.003$), signifying that the relative effects of the three interventions differed depending on whether participants were high or low on intention. Sixty-two percent ($n=289$) of the participants had no intention to discontinue usage (they had the lowest score on all three items that comprised the intention measure). Within this subgroup there was no main effect of condition and the percentages for the single tailored intervention, the multiple tailored intervention and the general practitioner-letter were 9.7 %, 15.2 %, and 14.1 %, respectively. However, among the remaining patients ($N=186$) - who had the intention of discontinuing usage - the main effect of condition was significant ($\chi^2(6, N=185) = 29.65$, $p=.000$). The percentages for the single tailored intervention, the multiple tailored intervention and the general practitioner-letter were 51.7%, 35.6%, and 14.5%, respectively. Contrasts showed that both tailored interventions were more effective than the general practitioner-letter ($p<.0001$). People who had received the single-tailored letter were 6.7 times more likely to have discontinued benzodiazepine use than those participants who received a general practitioner-letter. People who received the multiple-tailored letter were 3.8 times more likely to have discontinued the use of benzodiazepines than the general practitioner-letter (see Table 3). Although the percentage of

those who discontinued usage in both tailored intervention conditions differed by 15%, the difference was not significant.

Table 3 Percentage of benzodiazepine cessation per condition for patients with a high intention and the *OR* of the comparison of the two tailored interventions with the non-tailored intervention

	%	*OR*	95% *C.I.*	*p*-value
Single tailoring	51.7%	6.7	2.58 – 17.50	.000
Multiple tailoring	35.6%	3.8	1.51 – 9.54	.005
General practitioner-letter	14.5%	1.0		

Analyses including withdrawals

Because attrition at post-test could be predicted by the weekly dose of diazepam equivalents, the present results could be influenced by selective withdrawals. One way to address this problem was to use the last known measurement (pre-test) for each participant who withdrew as a substitute for the post-test measurement and to repeat all analyses. This 'intention to treat analyses' (36) revealed that none of the results changed qualitatively. Only minor changes in *OR* and *p*-values emerged.

Discussion

The results of the present study showed that both tailored letters were more effective than the general practitioner-letter. Roughly, both tailored letters led to 10% more individuals discontinuing usage after twelve months. The difference between the tailored letters and the general practitioner-letter was particularly pronounced for participants with an intention to discontinue their benzodiazepine use: the single tailored letter led to an almost sevenfold likelihood (the multiple tailored letter an almost fourfold likelihood) of the patient having discontinued usage after twelve months compared to the general practitioner-letter. A positive intention to discontinue usage may be a measure of involvement in the topic of discontinuing benzodiazepine use and this may have led to more thorough reading (central processing) of the information, leading to larger differences among the conditions. In other words, people with a positive intention read the information so well that the differences became apparent.

In contrast, in participants with no intention to discontinue usage, the tailored letters were no more effective than the general practitioner-letter. These patients may have read the information only superficially and all three interventions may have been experienced as advocating something "they just are not motivated for." Apart from the lack of differences between the interventions, the cessation rate among this group was only 13%, compared to 34% in the participants with an intention to discontinue usage. The group of low intenders may comprise a "hard core" group of benzodiazepine users. This group may need more intensive guidance, directed at increasing the motivation to discontinue usage . Motivational interviewing in face-to-face counselling may be needed to start the process of change (37). One additional observation is that the effects of the general practitioner-letter were low and

independent of the intention to discontinue usage (14.1 % among patient with no intention and 14.5 % in patients with an intention). This suggests that this simple letter does not have the ingredients that can activate a patient's existing intention to discontinue usage.

The single tailored intervention and the multiple tailored intervention did not differ significantly, despite the fact that the latter intervention consisted of three assessments and three subsequent letters. The rationale of spreading the information over time was that the process of change takes time. That is, for the cognitions that underlie behaviour to change, people need to attend to and process information, and to integrate it in their existing views of, for example, the consequences of their current behaviour. Stage models, such as the Transtheoretical model (38) explicitly acknowledge this phenomenon and implicate that interventions should be matched to stage. However, the information in our multiple tailored intervention was spread over time but not matched to stage because, as yet, little is known about stages in benzodiazepine cessation. Instead, the three letters followed the simple rationale that, first, people to decide to change (first letter; weighing positive and negative outcome expectations) and after that they need to know how they can change (second letter; providing means to discontinue usage to increase self-efficacy). The third letter referred to both earlier letters. We must conclude that this particular way of integrating time in the delivery of the intervention did not prove to be more effective than the information it contained, as it did not perform better than delivering the information at once. On the other hand, it may also be caused by the fact that at least 20% of the patients in the multiple tailored intervention could not be reached for one of both telephone interviews and, therefore, did not receive the second or third tailored letter.

In the present study, a treatment package design was applied (39), meaning that each intervention contained several different potential change ingredients. This treatment package design is powerful because it provides effectiveness information of realistic interventions, including possible synergistic effects of working ingredients. The present study showed that compared to the existing general practitioner-letter, the effectiveness of a patient education "package" could be significantly increased by: 1) using a comprehensive psychological theory and targeting the factors specified by the theory; 2) tailoring the information to the individual and; 3) providing more information on more relevant topics including information on how to change. Only a dismantling design in which a separate test is carried out on each of the elements on which the tailored interventions differed from the general practitioner-letter can provide definite answers on why the tailored interventions were more effective.

The present study has at least two potential limitations. The first limitation is the selection of patients. The first and largest selection that may have occurred concerns the non-response to the initial invitation that was sent to the patients from the general practitioner's office. However, the participants who did return a usable pre-test questionnaire were largely comparable to the less selective sample recruited by Gorgels and others (33) on age (around 62 years), on proportion of female patients (around 70%) and on the top three

benzodiazepines (1. oxazepam; 2. temazepam; 3. diazepam). These figures at least suggest that no selection occurred on these basic variables. The second selection that may have occurred concerns the level of withdrawals during the trial. The attrition analysis showed that those who withdrew from the trial used a higher weekly dose of benzodiazepines. Thus, some selection was found. However, firstly, benzodiazepine dose was not a moderator of the effects of the interventions, meaning that the pattern of results was not influenced by the dose. Secondly, in all analyses, benzodiazepine dose was included as a covariate. In sum, although some selection may have taken place, we argue that it was small and, more importantly, had little influence on the comparative effectiveness of the interventions.

In conclusion, the present findings show that a tailored intervention providing information on a broad range of topics and based on a comprehensive psychological theory can be a useful instrument to influence benzodiazepine use. A web-based version of the single tailored intervention with limited access (password provided to patients by the general-practitioner or psychiatrist) is now published on the internet. The strength of such minimal interventions lies in their broad reach. Because the method is easy and cheap to apply, many patients can be exposed to the information, and relevant effects can be achieved at population level.

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CHAPTER 6

Summary and general discussion

The aim of this thesis is to contribute to a solution to the problem of chronic benzodiazepine use. To map the problem, to find the behavioural and psychological causes of the problem and to develop an effective intervention, a simplified version of the Precede/Proceed model was used. The purpose of this final chapter is to relate and integrate all the findings from the different studies described in the various chapters.

Summary of the main findings

Because of the problems associated with chronic benzodiazepine use, there is impetus to prevent and reduce chronic benzodiazepine use (Chapter 1). In this thesis, chronic use of benzodiazepines is defined as daily use for more than 3 months. The overall aim of the research presented in this thesis was to develop a 'tailor-made' intervention in order to reduce chronic use. A tailored intervention should be more effective than a standardized intervention, because the information - that should lead to psychological changes and, subsequently, to behavioural changes - is tailored to the characteristics of an individual.

Because it is known that there is often a lack of patient education regarding benzodiazepine use (1)(see also chapter 1), we examined in Chapter 2 how general practitioners and pharmacists actually think about benzodiazepine use. In order to increase and improve patient education, we investigated the psychological determinants related to the intention of the general practitioner and pharmacist to provide patient education about benzodiazepine use. This study revealed that intention was predicted by outcome expectations, social norm and self-efficacy. It became apparent that general practitioners and pharmacists have the intention to educate when they think that benzodiazepines have well-defined disadvantages, when the education they undertake leads to success, when they feel pressure to educate from their social environment, and when they feel capable of educating. Another important finding was that more than 38% of the respondents thought that educating patients took too much time. It might be desirable to have a tool available to remove the burden of this task from the practitioner.

In summary, chapter 1 presented the facts about all the disadvantages of chronic benzodiazepine use. Chapter 2 has shown that there is a need for a tool to educate patients, that takes the work out of practitioners' hands. Together, these chapters suggest: 1) that there is a need for interventions to reduce chronic benzodiazepine use and; 2) that one way to support the broad dissemination of information on chronic use is to apply tailored patient education on a large scale. To be able to develop such an intervention, the psychological determinants of patients' benzodiazepine use and cessation should be studied. This was done in chapters 3 and 4.

Thus, before developing tailored patient education, it is first of all important to know how benzodiazepine users themselves judge their benzodiazepine use, how they look at their illness and what their reasons are for using benzodiazepines and particular quantities of benzodiazepines. Patients are, after all, the ones who make the decision whether or not to use the drug once it is prescribed and to regulate the dose. A psychological model that has often been used to explain illness behaviour is the Common Sense Model of Leventhal (2). According to this model, illness behaviour can be explained by patients' own perceptions of their illness. So, in Chapter 3 we looked at the illness perceptions with regard to the complaints or illness underlying benzodiazepine use. The extent to which these perceptions were related to the dose of benzodiazepine use was tested. To this end, we asked patients how they would feel about their complaints or illness "were they

not to use benzodiazepines." The main findings of this chapter were that, out of the illness perceptions, 'consequences' and 'control' significantly predicted benzodiazepine use. Thus, the belief that their complaints would become more serious and the belief that patients had little control over the outcome of their complaints if they did not take benzodiazepines resulted in using a higher dose of benzodiazepines. These illness perceptions show that benzodiazepine users believe in the necessity of using benzodiazepines; they rely on benzodiazepines.

While chapter 3 provided insight into the psychology of benzodiazepine *dosing*, chapter 4 aimed to increase insight into the psychosocial determinants of benzodiazepine *cessation*. The computer-tailored intervention should target and change the psychosocial determinants that underlie benzodiazepine cessation. Chapter 4 showed that benzodiazepine users had a greater intention to quit and were more likely to quit their benzodiazepine intake if they perceived many positive consequences of cessation, while at the same time perceiving few negative consequences. In addition, higher self-efficacy was associated with cessation. These determinants of benzodiazepine cessation (i.e., self-efficacy and outcome expectations) were translated into intervention objectives, which were then operationalized into intervention texts that were stored on the computer. The output of the computer program – letters with tailored patient education composed of these different stored texts - was tested in chapter 5.

Tailored patient education mimics the process of individual counselling and feedback, to the extent that it can be provided through a written text. The expertise of the counsellor is documented in the computer program. In other words, computerized patient education involves adaptation of the content information to relevant patient characteristics, while at the same time it can be applied on a large scale. Even small effects can have a broad reach when applied on a large scale. And because counselling can now be given without seeing a counsellor, computer-tailored patient education is relatively low-cost.

The computer program produced two different tailored letters: single-tailored letters and multiple-tailored letters. Single-tailored letters consisted of one letter of advice and multiple-tailored letters consisted of three different letters with a one-month interval. The multiple-tailored letters took into account the changes in benzodiazepine use over time. The aim of Chapter 5 was to compare the two different interventions with each other and to compare their effect with that of a standardized/non-tailored letter. The results showed that tailored letters were twice as effective as non-tailored letters in quitting benzodiazepine use, especially in the case of patients who were already intending to quit. We found, however, no differences between single and multiple-tailored letters.

The findings reported in the above summarized chapters raise several theoretical, practical and methodological issues to be discussed. To start with, some salient theoretical issues will be dealt with below.

Theoretical issues

The first issue concerns our conceptualization and the measurement of the illness beliefs assessed in the study presented in chapter 3. The illness beliefs were assessed by asking patients to imagine that they would not use benzodiazepines (or other tranquilizers or sedatives). The basic idea was that illness beliefs are related to behaviour because they indirectly refer to anticipated outcomes of the behaviour of using benzodiazepines.

Illness beliefs are expected to be related to benzodiazepine dosing through two different but related pathways. Firstly, the more seriously an illness is perceived, the more intensive a cure should be in order to be effective. Secondly, the more seriously an illness is perceived, the stronger the emotional reactions towards the illness will be and the more benzodiazepines may be used to lower this distress. Both pathways assume that the more seriously the illness is perceived, the higher the dose of benzodiazepines needed to cope with the illness or the reactions to the illness. This implicates that benzodiazepines are perceived as having desired effects. These effects can be considered to be the functions of benzodiazepine use and they comprise the core reason why patients engage in the behaviour of benzodiazepine use. If patients experience the desired relief of complaints or negative emotional reactions to their illness, this reinforces their benzodiazepine use.

Illness beliefs were assessed as the anticipation of the consequences and control if patients "were not to use benzodiazepines." This latter addition was done for the following reason. In most chronic physical illnesses, such as rheumatoid arthritis, diabetes and asthma, it may be clear to patients that the basic state (genetic constitution) and progress of the pathology are not cured by the medication. Therefore, the beliefs about their illness may be relatively independent of the use and the effects of their medication. In contrast, in the case of complaints of anxiety and sleeping problems, this may be less clear. That is, these complaints are often temporary, they tend to fluctuate over time and are often contingent on environmental and social events. Furthermore, many patients self-medicate benzodiazepines; they use them "when necessary". In addition, the illnesses or complaints for which benzodiazepines are prescribed are less clearly labelled. Most chronic physical illnesses have a clear identity and when a patient says that he has rheumatoid arthritis, this label is significant. In contrast, the complaints for which benzodiazepine users use their medication are less clearly defined and the illness label, when applied, is less clear. We argue that all these characteristics of the illnesses or complaints for which patients use their benzodiazepines make it more difficult for patients to distinguish between their illness or complaints on the one hand and the medication effects on the other hand. Therefore, the statement if you "were not to use benzodiazepines" was used to support patients in reporting their illness beliefs without being medicated. In conclusion, the study presented in chapter 3 shows that illness beliefs assessed in a 'conditional format' predict medication use.

Another issue that deserves greater attention is the finding in chapter 5 that dividing the tailored information into three different subsequent parts (letters) did not result in more quitters. The single tailored intervention and

the multiple tailored intervention did not differ significantly, despite the fact that the latter intervention consisted of three assessments and three subsequent letters. The rationale of spreading the information over time was that the process of change takes time. That is, for the cognitions that underlie behaviour to change, people need to attend to and process information, and to integrate it in their existing views of, for example, the consequences of their current behaviour. Stage models, such as the Transtheoretical model (5) explicitly acknowledge this phenomenon and implicate that interventions should be matched to stage. However, the information in our multiple tailored intervention was spread over time but not matched to stage because, as yet, little is known about stages in benzodiazepine cessation. Instead, the three letters followed the simple decision-making rationale that, first, people decide to change (first letter; weighing positive and negative outcome expectations) and after that they need to know how they can change (second letter; providing means to discontinue usage to increase self-efficacy). The third letter referred to both earlier letters. We must conclude that this particular way of integrating time in the delivery of the intervention did not prove to be more effective than the information it contained, as it did not perform better than delivering the information at once. Other studies have also shown the above result (6;7).

Two explanations may be suggested for the lack of difference in effects between the single and the multiple tailored letters. Firstly, the multiple tailored intervention may have contained elements that inhibit change. At least two elements that were not included in the single tailored intervention could be responsible for this. Firstly, the second and third letter contained feedback on changes in benzodiazepine use. It may be that these conclusions over time were perceived as a kind of "big brother is watching you," which may have raised psychological defences. Secondly, and probably more importantly, the participants in the multiple tailored letter condition were contacted twice by telephone. The short contact may have deflected participants away from confrontation on problems of benzodiazepine use, which could have resulted in patients making up argumentations which contradict the message. Motivated counter-argumentation can then lead to denial of the message of the need to reduce their benzodiazepine intake. It is known in other health risk behaviours that these processes can occur (8). A second explanation for the lack of difference between the single and the multiple interventions may be the following. The multiple tailored intervention was based on the idea of change over time. However, it may be that the month interval between the subsequent letters did not fit the actual change in time. For example, the change in psychological factors underlying benzodiazepine use and cessation might take days or weeks, not months. In addition, it may be that in some people the information came just in time but in others it was mismatched to their need for information. The findings discussed here stress our almost complete lack of understanding of the speed of psychological and behavioural change.

Another issue that deserves further elaboration is why the single tailored intervention was more effective then the standardized general practitioner letter that served as the "usual care" control group. For a correct understanding

of the meaning of these results it is important to conceptualize the design as a "treatment package design" (Kazdin, 1986). That is, the design was not a test of the principle of tailoring information. It was a design to test whether one treatment package (one intervention) was more effective than another treatment package. In such a design, it is not of primary interest what elements in a package are responsible for its effects but only whether one package is more effective than the other. Still, for theoretical purposes and for further intervention development, it is of interest to find out why the single tailored intervention was more effective than the GP letter. There are at least three possibilities. Firstly, it may have been the amount of information. The single tailored intervention simply provided more text. This means that readers were assimilating the information longer. Instead of 30 seconds to read the GP letter, reading the single tailored intervention may have taken as long as five minutes. Secondly, the text was longer because it provided more arguments and recommendations. It may be that this led to a stronger motivation and to more perceived control compared to the GP letter. Thirdly, the tailoring of the information may, of course, have contributed to the greater effectiveness of the single tailored letter. Tailoring may lead to stronger self-referent encoding and , therefore, to greater psychological change.

Future studies could apply different dismantling designs to answer these questions and designs that can detect mediational changes, that is, the psychological changes that interventions bring about.

Practical implications

Study 2 suggested the need for developing a tool that educates patients and at the same time takes the work out of the hands of practitioners. This is why a computer-tailored education program was developed, which then proved to be effective.

Computerized patient education letters help the general practitioner and pharmacist to educate their patients more systematically, which can result in better physician-patient relationships. It is well known that there are positive benefits from good doctor-patient communications (8). Patients who receive more information about the diagnosis, the causes of a disease, or possible treatments and what these entail, are more satisfied than patients who receive less information (9). And that is exactly what this program also offers: information for the patient.

The two computerized tailored patient education letters can quite easily be implemented in the Dutch healthcare system. Before actually implementing the intervention, though, according to the Precede/Proceed model (see Chapter 1) it is important to conduct further research in how such an intervention can best be made. The last phase of the Precede/Proceed model is planning an intervention component to ensure that the program developed in the previous steps will be used and maintained over time for as long as it is needed. Effective health education and promotion programs will have little impact if they are never used or if they are discontinued while still needed to create the desired health impact (10). Without a planned intervention, the health promotion program may stay on the developers' shelf if it is not

adopted, or on the organization's shelf if it is adopted but not implemented. Systematic planning for each stage of the implementation of the program is thus essential if the program is to have optimal effects on the population for which we have designed it (11;12).

To be able to implement this program, all the people and organizations that are involved in the implementation and their motivations and barriers must be mapped. Dijkstra and Buunk (13) describe the implementation route in order to successfully organize and optimize the implementation. The implementation route consists of three steps: 1) mapping the actors; 2) assessing the motivations and the barriers for actors; and 3) identifying relevant policies. When the actors, organizations and policies have been identified and the motivation and barriers have been mapped, the program can be implemented. Because of this, we conducted an implementation study to find out which actors are involved, the opinion of these actors regarding the program, and the different policies related to it in order to find out where this program can best be implemented (see report of the Health Care Insurance Board (14). The results of this report were that the intervention could be implemented centrally (by one company in the Netherlands) or de-centrally (at the practice of the general practitioner or pharmacist). A qualitative study among general practitioners and pharmacists showed that both groups were positive about the intervention and the best way would be to have it embedded in their own computer information systems. The benefit of this use is that general practitioners and pharmacists are acquainted with their system. Medication reports could also be kept up-to-date in such a system. Besides the implementation in their own computer system, the Internet would also be an appropriate medium. It would then be accessible everywhere, and automatic updates are available of the patient's medical history.

Such a web-based intervention should be implemented centrally. The intervention is then managed by one company or institute, such as, for example, a health insurance company. Another inventory (interviewing different companies in the Netherlands) showed that the various companies in the Netherlands were positive about managing such an intervention. A company can put our computer program on their website and invite their insured, for example, to visit their website. Another possibility is that a national campaign could invite benzodiazepine users to fill out a tailoring questionnaire, after which they will receive tailored patient education.

It is especially important that the program be adopted and delivered to the intended patients and ultimately routinized and institutionalized (15). Before actually implementing it, for instance, on the website of a company in the Netherlands, it is important to know first of all if the letters are also effective when the program is web-based. This is the reason why the program is now being tested in a practical setting: A company in the Netherlands has made our program web-based and is now testing it.

Methodological issues

One potential limitation pertains to the reliance on self-reporting measurements of benzodiazepine use. Self-reporting data may be subject to socially desirable and inaccurate responses. However, in the light of the dependence liability of benzodiazepines, the validity of the self-reporting assessment is valid according Geiselmann and Linden (16). They in fact found an average compliance coefficient of 0.8. Also, Oude Voshaar (17;18) found agreement of reported data and recorded benzodiazepine consumption at the end of follow-up. In addition to this, we have to bear in mind that prescription data in patient records should also be interpreted with some caution. Not all patients take their medication as prescribed. It cannot be guaranteed that patients take their drugs exactly in accordance with the general practitioner's recommendations. There is also the possibility that patients may get their benzodiazepines from other sources. A report in the Netherlands showed that 89% of all prescriptions come from general practitioners (1). The rest come from other sources.

In the determinant study of benzodiazepine use (Chapter 4) and the study about illness beliefs (Chapter 3), participants were recruited using advertisements in magazines and local newspapers. This might have led to a select sample of benzodiazepine users, which could then have had a negative effect on the ability to generalize the results. However, offering the chance to win a bonus prize of € 25 might well have resolved this. It can be argued that using such a tempting prize could motivate benzodiazepine users who do not want to quit either. Thus, it could be the case that offering such a sum of money might lead to less-biased benzodiazepine users. One indication that the selection may not be large is the finding that in both populations of benzodiazepine users that were recruited, high proportions of participants had low to very low intentions to quit their use.

Out of the 4,000 packages with informed consent materials and the pre-test questionnaire that general practitioners were provided with to send to their patients, 861 patients returned the pre-test questionnaire. This selection was mainly due to non-response of the patients who were approached. Besides patients who did not want to participate, some general practitioners also excluded patients. This was explicitly allowed because it was considered that it was the general practitioner who should ultimately decide who could use a tailored education letter and who could not. Some patients could not be approached according to their general practitioner because of their personal problems. It was not the opportune moment to ask them to participate in the study. There was a further group of patients who were suffering from dementia. They could not fill out the questionnaire properly and read the tailored letters. Thus, the first selection was done by the general practitioner, the second selection was caused by non-response. A third selection of patients took place because only a proportion of the patients who responded at the pre-test (n=861) also responded at the twelve months post-test (n=537). This selection was due to drop-out. Because of these three selections, the ability to generalize the present findings cannot be assessed precisely. However, these selections are not by definition problematic for the validity

of the findings reported in chapter 5. Firstly, the selection caused by the GP may even be seen as increasing the ecological validity: when the tailoring program is ultimately used in practice, it will be the general practitioner who decides who can be educated and who not. Secondly, as mentioned above, a large proportion of the pre-test respondents had no or only a low motivation to quit benzodiazepine use. Thus, the selection was seemingly not made - or made only to a limited extent - on the basis of the motivation to quit. In addition, in the actual use of our tailoring program, it is possible that the same selection of patients will be willing to receive tailored patient education. Again, this selection may not seriously threaten ecological validity. Thirdly, the selection due to drop-out did not differ for the conditions. Thus, the relative findings of effectiveness are not influenced by the drop-out. In conclusion, the threat for the ecological validity (or ability to generalize) caused by the selection may not be large if in future applications of the tailoring program a similar procedure will be used as in this study.

Suggestions for future studies

The present thesis has demonstrated the effectiveness of computerized patient education letters. Many questions have been answered and, despite an extensive research base for the application of the model used in this thesis, there is still a range of issues for future work to address. This section will highlight some of these.

One step forward might be to ask the patients whether they switched from benzodiazepines to alcohol, nicotine or other psychotropic drugs, since we know that individuals who engage in one form of addictive behaviour are more likely to engage in others as well (15). It could be that future interventions have to target multiple behaviours instead of focusing on one. That is, it should be ruled out that people stop benzodiazepine use but increase their drinking.

More sub-group analyses could have been conducted. In the thesis of Oude Voshaar (18), the biggest impact was on patients using more than 10 mg diazepam equivalent before receiving the letters. And patients who used more than 10 mg diazepam equivalent, who drank more than two units of alcohol a day, or who scored 3 or more on the Lack of Compliance scale of the Bendep-SRQ had a significantly higher risk of failing in the long term. Another suggestion for further research would therefore be to carry out more sub-group analyses. Besides, the fact that this would increase our insight into the medical, psychological and behavioural moderators of intervention effects and help build our theory on intervention effects, sub-group analyses may be used for policy decisions with regard to cost-effectiveness. For example, sub-group analyses may reveal the characteristics of patients with the biggest chance of benefiting from tailored patient education. Chapter 5 revealed one such sub-group, patients with an intention to change. In the other patients, the tailored interventions did not out-perform the GP letter, and cessation percentages remained low. These patients might be selected and approached to join another or a more intensive treatment.

We could also have looked at determinant change. One would expect that, for example, self-confidence would have increased after reading our tailored letters. In other words, were the letters successful in building up patient confidence and in convincing patients to be more positive about cessation as well as more negative about the effectiveness of benzodiazepines? In the study of Oenema (19), only slight changes in determinants were detected in the short-term follow-up. It could be the case that people need a period of time to assimilate all the information they have received. It would be interesting to measure the determinants and behaviour across different time points.

Although there are not many interventions for benzodiazepine reduction that have translated psychological and behavioural theories from a social-cognitive perspective into educational interventions, this thesis has succeeded in using theories in an effective computerized patient education program. The Precede/Proceed model supported the use of theories in intervention development. Also, we have demonstrated the application of these theories in the development of a computer program aimed at benzodiazepine cessation. Other computerized tailoring for other medication can now be considered as well. Computerized tailoring can help general practitioners to educate their patients about other health changes such as reducing alcohol consumption, increasing intake of healthier food, or physical exercise.

Future research could be done in order to determine whether there is an element of patient education (recognition of the picture, gender, content, or other elements), which especially determines its effectiveness. Such research would be advantageous because, after such research, the intervention could possibly be adapted so as to be more effective or to be just as effective in a shorter intervention; alternatively, it might well be that some information turns out to be conflicting. On the one hand, the letters have an understanding of the patient's situation, but on the other hand the letters contain criticism. It would then also be possible to apply these results to any other behaviour that people want to change by means of a tailored intervention. On the one hand, this issue concerns general insight into bringing psychological and behavioural change using minimal, no-contact interventions that can be provided on a large scale. On the other hand, the issue concerns further research into the tailoring ingredients of tailored interventions. For example, the present tailoring program has been developed only in a basic version. It could be improved by a more tailored appearance, by including more personal characteristics (such as culture), or by including more feedback on the questionnaire. This could improve its effectiveness. Many questions with regard to tailored patient education letters have not yet been answered. Answers to these questions will partly come from experimental studies in a controlled laboratory setting.

In conclusion

Computer-tailored interventions are a promising line of endeavour for educating patients in medical settings. In this thesis it turned out that the effectiveness of computer-tailored patient education letters was twice that of

standard letters. Moreover, for patients already motivated to quit, the letters were even more effective. Although there is still a lot of work to be done, there is little doubt that tailored interventions can be useful tools to support health practitioners in educating patients.

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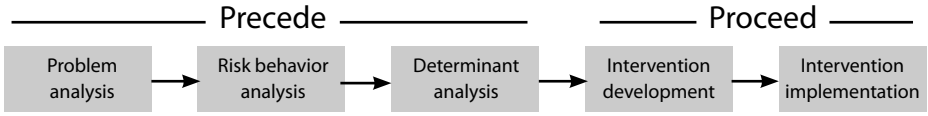
Nederlandse samenvatting

Benzodiazepinen zijn geneesmiddelen die vooral bij angstklachten en slaapstoornissen worden voorgeschreven. Ze vormen de op één na meest voorgeschreven middelen in Nederland. Tien tot 15 % van de bevolking gebruikt één of meer van deze middelen incidenteel of regelmatig. Naar schatting worden benzodiazepinen door 3 à 4 % van de Nederlanders chronisch gebruikt, oftewel dagelijks en langer dan drie maanden. Hoewel benzodiazepinen geen dure geneesmiddelen zijn, kosten zij jaarlijks meer dan 24 miljoen euro. Eén van de oorzaken van de hoge kosten ligt in het langdurige gebruik van benzodiazepinen. De Centrale Medische Pharmaceutische Commissie van de Ziekenfondsraad maakt in 1982 al duidelijk dat langdurig gebruik van deze geneesmiddelen – naast de hoge kosten – ongewenst is om twee redenen: 1) langdurig gebruik leidt tot lichamelijke en psychologische verslaving en 2) bij langdurig gebruik bestaat er een verhoogde kans dat de onderliggende problematiek niet adequaat behandeld wordt. Het is dus van belang om het benzodiazepinegebruik in Nederland te verlagen. Het doel van dit proefschrift was om een bijdrage te leveren aan een oplossing voor het terugdringen van het chronisch benzodiazepinegebruik.

Theoretisch kader

Om het probleem goed in kaart te brengen en om op planmatige wijze een interventie te ontwikkelen, is in dit proefschrift gebruik gemaakt van het Precede/Proceed model (zie Figuur 1). Dit model wordt vaak gehanteerd om interventies ter bevordering van de gezondheid te ontwikkelen en te evalueren.



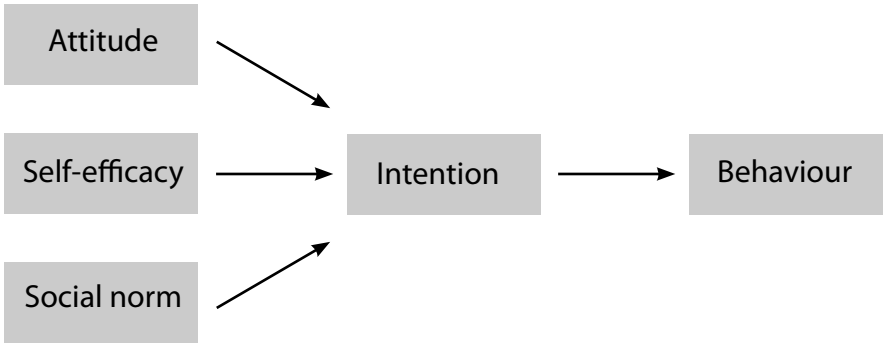
Figuur 1 Precede/Proceed Model

Het doel was om effectievere voorlichting te ontwikkelen dan de standaardvoorlichting die er nu is, en wel met geïndividualiseerde patiëntenvoorlichting. Deze geïndividualiseerde patiëntenvoorlichting heeft als streven het beslissingsproces van de patiënt met betrekking tot het benzodiazepinegebruik en het stoppen daarmee te ondersteunen. Deze manier van voorlichten houdt dus rekening met de verschillende karakteristieken van de patiënt.

Alvorens deze interventie te ontwikkelen, dien je volgens het Precede/Proceed Model eerst het probleem in kaart te brengen: probleemanalyse, risicoanalyse en determinantenanalyses. Deze verschillende fasen worden in de eerste vier hoofdstukken beschreven. Het eerste hoofdstuk gaat over de problematiek rond benzodiazepinegebruik en die andere drie hoofdstukken gaan in op de determinanten van voorlichting over benzodiazepinen (hoofdstuk 2), determinanten van benzodiazepinegebruik (hoofdstuk 3) en determinanten

van het stoppen met benzodiazepinen (hoofdstuk 4). De determinanten die gebruikt zijn in hoofdstuk twee en vier komen van de Theory of Planned Behaviour en Social Cognitive Theory. Deze twee theorieën zijn succesvol gebleken in het verklaren van verschillende gezondheidsgedragingen. De twee theorieën gaan ervan uit dat intentie de belangrijkste determinant is van gedragsverandering, waarbij intentie wordt gezien als de motivatie om gedrag te veranderen. En intentie wordt op haar beurt weer bepaald door drie cognities: te weten attitude, social norm en self-efficacy.

Attitude is de manier waarop mensen tegen gedragsverandering aankijken. Bijvoorbeeld, patiënten kunnen positieve uitkomstverwachtingen hebben van het stoppen met benzodiazepinen. Zo kunnen zij bijwerkingen zoals geheugenverlies verwachten als zij zouden stoppen met benzodiazepinen. Patiënten kunnen echter ook negatieve uitkomstverwachtingen hebben van stoppen; patiënten zijn bijvoorbeeld bang voor de ontwenningsverschijnselen. Patiënten die veel positieve en weinig negatieve uitkomsten verwachten zijn hebben een grotere kans succesvol hun gedrag te veranderen. Social norm verwijst naar de druk die iemand voelt om gedrag te moeten veranderen. Als een patiënt het gevoel heeft dat andere mensen vinden dat hij/zij het gebruik zou moeten staken, is de kans groter dat hij/zij zal stoppen. Self-efficacy verwijst naar de mate waarin een patiënt het gevoel heeft in staat te zijn om zijn gedrag te veranderen. Als een huisarts bijvoorbeeld denkt goede voorlichting over benzodiazepinen te kunnen geven, is de kans groter dat hij ook daadwerkelijk gaat voorlichten. Het bovenstaande wordt weergegeven in figuur 2.



Figuur 2 De determinanten van de Theory of Planned Behaviour en Social Cognitive Theory

Om het kort samen te vatten wordt intentie dus voorspeld door de drie factoren (attitude, self-efficacy and social norm) en is intentie de grootste voorspeller van daadwerkelijke gedragsverandering.

Naast de determinanten die hierboven zijn beschreven, is er ook nog gebruik gemaakt van een ander model; een model dat vaak gebruikt wordt om ziektegedrag te verklaren. Dit model is het Common Sense Model van Leventhal. Volgens dit model kan ziektegedrag verklaard worden door de perceptie die patiënten zelf hebben van de ziekte. Er zijn 5 ziektepercepties:

identity (welke klachten liggen ten grondslag aan de ziekte), cause, (wat is de oorzaak van de ziekte), consequences (wat zijn uitkomsten op korte en lange termijn), control/cure (mate van controle over de ziekte) en timeline (is ziekte acuut of chronisch van aard).

Uitkomsten

Aangezien het bekend is dat er vaak te weinig wordt voorgelicht over benzodiazepinen, is allereerst in hoofdstuk 2 gekeken hoe huisartsen en apothekers tegen benzodiazepinegebruik aankijken. Om patiëntenvoorlichting te verbeteren, is er ook onderzocht welke psychologische determinanten gerelateerd zijn aan de intentie van de huisarts en apotheker om patiënten voor te lichten.

Uit hoofdstuk 2 kwam naar voren dat intentie voorspeld wordt door uitkomstverwachtingen, sociale norm en eigen-effectiviteit. Dit betekent dat huisartsen en apothekers voornemens zijn om voor te lichten als zij vinden dat aan benzodiazepinen veel nadelen kleven, als zij vinden dat hun voorlichting ook tot een succes zal leiden (attitude), als zij druk voelen vanuit hun omgeving tot het geven van voorlichting (social norm) en als laatste moeten huisartsen en apothekers zichzelf in staat achten tot het geven van goede voorlichting (self-efficacy). Een ander belangrijke uitkomst die naar voren komt uit dit hoofdstuk is dat meer dan 38 % van de respondenten vindt dat het voorlichten van patiënten te veel tijd kost. Het zou dus om die reden ook wenselijk zijn om een computerprogramma te ontwikkelen om deze voorlichtingstaak van de huisarts en apotheker te vereenvoudigen. Daar voorziet geïndividualiseerde patiëntenvoorlichting ook in. Namelijk, het computerprogramma produceert voorlichting op maat, zonder tussenkomst van een huisarts of apotheker. Dit hoofdstuk heeft mede aanleiding gegeven voor de ontwikkeling van geïndividualiseerde patiëntenvoorlichting.

Alvorens een dergelijk computer programma te ontwikkelen, is het belangrijk te weten hoe benzodiazepinegebruikers tegen het gebruik aankijken. En welke factoren voorspellen benzodiazepinegebruik De patiënt is per slot van rekening, diegene die uiteindelijk besluit wel of niet een benzodiazepine te gaan slikken en om de dosis te veranderen. Een psychologisch model dat vaak wordt gebruikt om ziektegedrag te verklaren, is het Common Sense Model of Leventhal. Zoals al besproken kan volgens dit model ziektegedrag verklaard worden door de percepties van de patiënt zelf. Daarom is in hoofdstuk 3 gekeken naar de ziektepercepties ten aanzien van de klachten die onderliggend zijn aan de reden waarom ze benzodiazepinen gebruiken. Oftewel, in dit hoofdstuk is gekeken welke ziektepercepties gerelateerd zijn aan benzodiazepinegebruik. Om dit te kunnen onderzoek zijn patiënten gevraagd hoe zij zich zouden voelen als zij geen benzodiazepinen zouden slikken. Uit het hoofdstuk komt naar voren dat "consequences" en "control/ cure" de ziektepercepties zijn die het benzodiazepinegedrag voorspellen. Patiënten nemen meer benzodiazepinen als zij denken dat de ziekte grote consequenties heeft, dat de klachten serieuzer worden en als zij denken dat zij weinig controle hebben over hun klachten. De ziektepercepties laten dus zien dat patiënten sterk geloven in de noodzaak van benzodiazepinen.

Zij denken ze nodig te hebben om met hun ziekte (de reden waarom ze dus benzodiazepinen gebruiken) om te gaan.

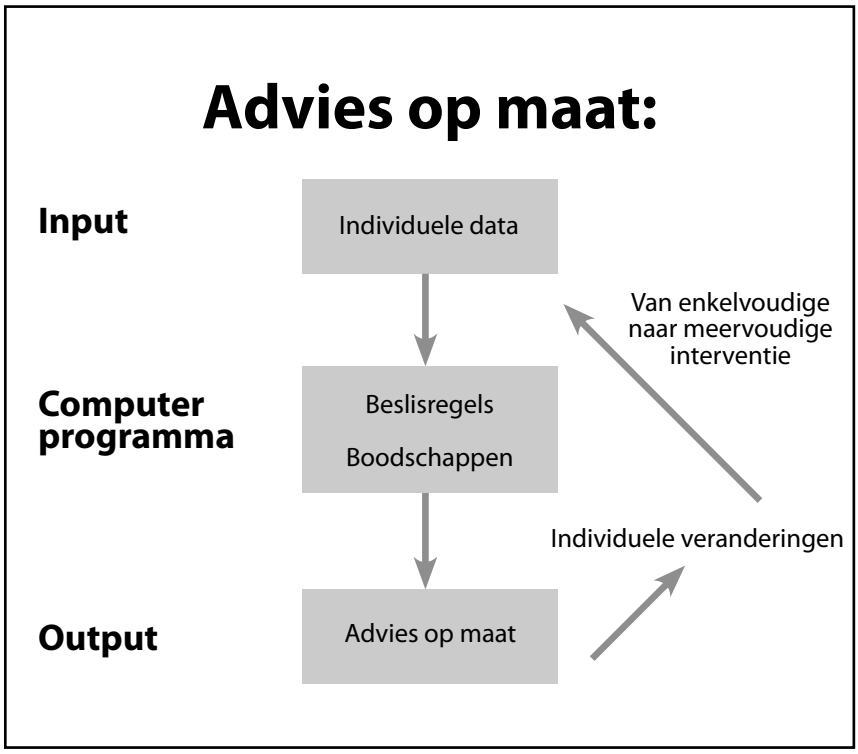
Terwijl hoofdstuk 3 ons inzicht heeft gegeven in de psychologie van het gebruik van benzodiazepinen, heeft hoofdstuk 4 getracht inzicht te geven in de psychosociale determinanten van het stoppen met benzodiazepinen. Het uiteindelijke computerprogramma zal zich dan op deze determinanten moeten richten om zo gedragsverandering te realiseren. Hoofdstuk 4 laat zien dat patiënten een hogere intentie hebben en eerder stoppen als zij veel positieve uitkomsten denken te zullen ervaren, en weinig negatieve uitkomsten. Ook was een hoge mate van eigen-effectiviteit een significante voorspeller van het stoppen met benzodiazepinen.

Ontwikkeling van geïndividualiseerde voorlichting

De determinanten van het stoppen van benzodiazepinen (eigen-effectiviteit en uitkomstverwachtingen) zijn meegenomen in de ontwikkeling van het computerprogramma dat voorlichting op maat produceert. Bijvoorbeeld, als eigen-effectiviteit laag is (de patiënt denkt niet te kunnen stoppen/minderen), dan krijgt de patiënt de vaardigheden en tips om zijn zelfvertrouwen te vergroten. In het computerprogramma zijn de verschillende antwoorden verbonden met verschillende boodschapteksten. Het uiteindelijke advies op maat zijn dan de verschillende boodschappenteksten achter elkaar gezet. Geïndividualiseerde patiëntenvoorlichting imiteert het proces van individuele counseling en feedback, alleen zit de expertise van de counsellor nu in het computerprogramma. Er zijn twee soorten adviezen op maat. De enkelvoudige geïndividualiseerde interventie bestaat uit één meting en op grond daarvan één geïndividualiseerde interventiebrief. Daarnaast is er de meervoudige geïndividualiseerde interventie. Deze bestaat uit drie maal één geïndividualiseerde interventiebrief gebaseerd op drie maal een meting (zie ook figuur 3).

Effectiviteit van geïndividualiseerde voorlichting

De effectiviteit van de adviezen is onderzocht in hoofdstuk 5. Het computerprogramma produceert twee verschillende adviezen op maat: enkelvoudige adviezen op maat en meervoudige adviezen. Enkelvoudige adviezen bestaat uit 1 brief en de meervoudige bestond uit 3 verschillende brieven met een 1-maand interval. De meervoudige neemt dan ook de veranderingen over tijd mee. Het doel van hoofdstuk 5 was om de twee verschillende interventies met elkaar te vergelijken en om de twee verschillende adviezen op maat te vergelijken met een standaardadvies, een advies dat niet op maat is gemaakt. De resultaten laten zien dat patiënten die de adviezen op maat hebben gelezen een twee keer zo grote kans hebben om te stoppen dan de patiënten die het standaardadvies hebben gekregen, vooral voor mensen die al een intentie hadden om te stoppen (deze patiënten hebben zelfs een zes keer zo grote kans). Er waren echter geen verschillen tussen de enkelvoudige en meervoudige adviezen op maat.



Figuur 3 ontwikkeling van adviezen op maat

Tot slot

In het laatste hoofdstuk van dit proefschrift (hoofdstuk 6) worden de belangrijkste resultaten van de verschillende onderzoeken samengevat en aan elkaar gerelateerd. Aangezien de adviezen op maat een effectieve methode voor voorlichting is gebleken, is tevens een implementatiestudie gedaan. Deze implementatiestudie is ook in dit laatste hoofdstuk beschreven. Hieruit kwam naar voren dat als het programma geïmplementeerd dient te worden in de Nederlandse gezondheidszorg, dat huisartsen en apothekers daar positief tegenover zullen staan. Zij willen het programma dan het liefst geïncorporeerd hebben in hun eigen huisartsen informatie systeem. Zij zien dan ook graag dat het benzodiazepinegebruik up-to-date wordt gehouden. Daarnaast zien zij internet ook als een handige portal voor in de toekomst, aangezien nu nog niet alle huisartsen en apothekers met internet werken. Concluderend kan gezegd worden dat de adviezen op maat goede hulpmiddelen zijn om patiënten goed voor te lichten en gedragingen ten positieve te doen veranderen. Ze kunnen op grote schaal worden ingezet op een relatief goedkope manier (namelijk zonder tussenkomst van een hulpverlener).

Dankwoord

Tuurlijk, het is waar. Iedereen heeft mij enorm geholpen (alle collega's op de unie en daarbuiten, alle huisartsen en apothekers, alle benzodiazepinegebruikers, alle vrienden en vriendinnen, familie, ..) en daar ben ik jullie allemaal zeer dankbaar voor. Edoch, er zijn vele leukere verhalen te vertellen dan dankbetuigingen alom. Dus vandaar.

Pepijn van Empelen, de praatjes over auto's, auto's en nog eens auto's waren leuker dan alle praatjes over de psychosociale determinanten van vrouwelijke benzodiazepinegebruikers op leeftijd. Misschien, als ik ooit de vruchten weet te plukken van deze exercitie, dan zal ik aan je denken in mijn Z3 coupé :-).

Sigrid Wiggelinkhuijsen. Wat vind ik het jammer dat ik niet meer met jou werk. We hebben het heel lang weten te rekken door allerlei nieuwe klusjes te verzinnen. Tuurlijk, er werd hard gewerkt en zo, maar er werd toch vooral uitgekeken naar het ontbijtje met sigaret, koffie met sigaret en een cryptogrammetje hier en een cryptogrammetje daar. De pret kon niet op. Vooral die laatste dingen (eigenlijk vooral het eerste niet) waren het leukst! Jan Frommé en Manuel Groeneweg, jullie hebben mij meegeholpen met het schrijven van het softwareprogramma. Daar ben ik heel blij mee.

Alle nieuwe collega's bij ResCon, dank jullie wel dat jullie mij zoveel leuk werk bieden en ook dank voor alle hulp die jullie mij hebben gegeven met stellingen en promotiebesognes. Daisy, ook jij hebt een rol van belang gespeeld: Als ik aan het proefschrift werkte en hun vader ook aan de slag moest, dan paste jij vol geduld en liefde op Guus en Boele. Het gevolg is dat ze nu op straat bij elke jonge meid met een paardenstaart, vol enthousiasme roepen: daar is Daisy!

Alle Maxima-roeisters (en een beetje YES natuurlijk), bedankt! Zonder het roeien en alle lol daaromheen had ik allang het bijltje erbij neergelegd. Jammer dat we, nu het proefschrift af is, nooit meer de Amstel onveilig maken. En Josien, *my love*, keten zonder jou (bij Yer) zal nooit hetzelfde zijn.

Inez, eerste generatie kamergenoot en eetgezelschapsdame, het was altijd heel gezellig. Ik kijk nu al uit naar de viering van deze verdediging, want dan word ik gefêteerd door jou en Barbara, toch? Ik zal de Michelin-gids eerdaags alvast even openslaan. En Clara en Ilke, tweede generatie kamergenoten, ook met jullie was het gezellig. Het heeft niet lang mogen duren, maar krachtig was het zeker.

Selma en Barbara, als mijn broer en zus geen paranimfen zouden zijn geweest, dan zou ik jullie hebben gevraagd. Barbara, haha.. ik denk dat als onze mailcontacten zouden worden gebundeld, wij al 10x de dikte van dit proefschrift zouden bereiken. Ik vind het jammer dat we niet meer een congres kunnen uitzoeken waar we alletwee naar toe kunnen. Zo'n congres à la KOS zal ik niet snel vergeten! En Selma, het was liefde op het eerste gezicht. Ik weet nog dat we elkaar op de eerste dag van Geologie zagen. Jij was een kakker met een bobline en een rode gewatteerde jas. Wie had gedacht dat ik het nu zo fijn zou vinden dat je bij mij om de hoek woont.

Nou Jet en Piet, zus en broer, de cirkel is rond. We zijn nu alledrie gepromoveerd. Pieter Rein beet het spits af, met Jet (Marije) en ik als paranimfen, in jurk getooid met een hoedje schuin op ons hoofd. Bij Marije waren Pieter en ik de paranimfen, beiden in rokkostuum gestoken. Ik ben dus reuze benieuwd hoe jullie als paranimf zullen verschijnen. En het is een fijne gedachte dat als ik dreig te verzaken, jullie met gemak de verdediging op jullie kunnen (en zullen!) nemen. En Piet, ik ben blij dat ik toch nog net iets eerder ga promoveren dan dat jij gaat oreren, ook al scheelt het maar een haartje.

Pappa en mamma (jaja..nog steeds met dubbel p en m): Zoals jullie het zelf zouden zeggen: Wie had dat gedacht (dat ik zou promoveren)? Maar hier is dan toch het bewijs. Joehoe.

En dan eindig ik met een variatie op mijn welbekende gedicht:

De lucht is blauw, het gras is groen
Altijd zal de dikste (en natste) zoen
Gaan naar Boele Guus en Jeroen!

Curriculum vitae

Geeske Brecht ten Wolde was born on July, 13th in 1973 in Soest, the Netherlands. She completed her pre-university education in Veendam (Groningen) before starting Biological Psychology at the University of Amsterdam (after a short sidestep, determining little stones at the department of Geology at the VU University Amsterdam). In 1998 she graduated from the Netherlands Institute for Brain Research. After that, she worked in a commercial working environment for a couple of years before starting her dissertation. In February 2002, she finally started on a PhD-project at the department of Clinical and Health Psychology in Leiden. During this project, in 2005 and 2006, she joined a start-up company as a consultant to create a software program aimed at changing bad lifestyles. Finally, she re-entered the commercial field again as a consultant of ResCon, a research and consultancy firm in health care.