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Determinants of change in the intention to use benzodiazepines

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Abstract
Objective: To examine attitudes and beliefs associated with changes in the intention to use benzodiazepines during the six-month period after first benzodiazepine use.
Design: Population-based 6-month follow-up with 3 measurement points (baseline, 2 weeks after inclusion, 6 months after inclusion).
Setting: Starting or initial benzodiazepine users were included during a period of 4 months from November 1994 in the only pharmacy of a Dutch community of 13,500 people.
Measures: Variables proposed by the Model of Planned Behaviour and the Health Belief Model. Drug exposure data from automated pharmacy records.
Results: At baseline, the intention to use benzodiazepines was primarily predicted by the perceived norm of the general practitioner regarding benzodiazepine use, and by the participants' own attitudes. After fourteen days, the determinants of change in the intention to use benzodiazepines were the initially perceived norm of the general practitioner and the change in the severity of participants' illnesses. After six months, the change in the severity of the illness and the perceived health benefits of benzodiazepines at the time of inclusion were the main determinants of the change in the intention to use benzodiazepines between the second and third measurement point. The intention to use benzodiazepines showed a decrease during follow-up. The three intention measures were significant predictors of actual benzodiazepine use during the year following baseline assessment.
Conclusion: The study sheds light on interesting determinants of decrease or increase in the intention to use during the six-month period after first benzodiazepine use.

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Introduction

In discussions about the use of benzodiazepine agents, their long-term use and the accompanying potential for dependency gives rise to concern [1-3]. Few scholars doubt that prolonged benzodiazepine use can lead to a dependence syndrome, which is mainly characterized by withdrawal symptoms on stopping treatment [4-8]. The issues of prolonged use and dependence have motivated efforts to reduce their prescription and their length of use [9, 10]. Ideally, benzodiazepines are prescribed for a limited period of time. For example, in the Netherlands, hypnotics are recommended for 10 to 14 days of continuous use at most [11, 12]. In case of benzodiazepine prescribing, the physician has the task to persuade a patient to stop the pharmacotherapy as soon as possible after starting it. However, health care providers are usually accustomed to persuading the patient of the advantages of accepting and using a medicine instead of limiting the use of a medicine [13]. Any decision-making about prevention of needless prolonged use and rational duration of benzodiazepine use should take place in the primary care setting, because general practitioners are the main prescribers of benzodiazepines [14-16]. In contrast, a Dutch study observed that almost all repeat requests for benzodiazepines were issued by the general practitioner's assistant [14]. When general practitioners delegate this aspect of their practice to assistants, there is minimal contact between doctors and patients regarding prolonged benzodiazepine use. Thus, in the Netherlands prolongation of benzodiazepine use is a process in which users' own initiative seems crucially important.

This suggests that persuasion efforts aimed at limiting benzodiazepine use may profit from information about the reasons why benzodiazepine users prolong their use. More specifically, general practitioners, pharmacists, and important others who instruct the medicine user should utilize patients' attitudes and beliefs regarding benzodiazepine use as starting points in order to persuade the patient to engage in a rational, limited length of use [17]. In order to explore the factors that influence the intention to use benzodiazepines, the present study used variables from the Model of Planned Behavior (MPB) [see 18, 19] and the health belief model (HBM) [20]. Both are well known and frequently used to predict and understand a wide range of health-related behaviors, including the use of drugs other than benzodiazepines [21-26].

The MPB and HBM are based on the assumption that individuals are rational decision makers, use the available information, and consider the implications of the behavior in question before they undertake action. In both models, the main determinant of a certain behavior is the intention to perform that behavior. In the MPB, behavioral intentions are determined by three factors: attitudes, subjective norms and perceived behavioral control. Attitudes refer to the person's favorable or unfavorable evaluation of a certain behavior. Subjective norms concern the perceived social pressure of important others to perform the behavior. Finally, perceived behavioral control refers to the degree to which a person feels capable of performing the behavior in question [see 18, 19, for a more complete description of this model].

The HBM assumes that the willingness to engage in health-related behavior depends on the perceived threat of the disease under consideration and on the result of a cost-benefit analysis of the health-related behavior. In recent reformulations of the HBM, behavioral intentions are assumed to be the proximal determinant of the behavior [27]. Behavioral intentions, in turn, are themselves predicted by the following factors: the susceptibility to the illness, the severity of the illness, the perceived benefits of the therapy, and the

barriers associated with the therapy (costs). Some HBM studies have also included internal or external cues which prompt health action (cues to action).

As far as we know, there has been no research applying factors from the MPB and HBM models to examine the motivations and social cognitions of benzodiazepine users. The variables proposed by the MPB and HBM were utilized in the present exploratory study, which examines the following central question: which social-psychological determinants are associated with changes in the inclination to use benzodiazepines over time?

The target population of this study was a group of initial benzodiazepine users. Particularly in the initial period of benzodiazepine prescribing, the risk that a person might become part of the core of long-term users should be minimized. Initial users usually receive much attention from general practitioners and pharmacists during a short period following the initial prescription. Thus, advice regarding the prevention of long-term use can be implemented during that period.

Material and methods

Design, sample and procedure

The study design was a population-based six-month follow-up with three measurement points (baseline, two weeks after inclusion, and six months after inclusion). We chose three time points, because we expected different determinants of (changes in) behavioral intention at the three measurement points. Over time, benzodiazepine users will get accustomed to taking their medicines. For example, it is quite conceivable that initially the general practitioner will play a crucial role in the decision to use benzodiazepines, whereas after six months the severity of the disease will be more important. The measurement point of two weeks after inclusion was chosen because it is recommended to prescribe a hypnotic for 10 to 14 days [11, 12].

We focused on change in intention to use benzodiazepines over time. Knowledge of determinants of decrease or increase in the intention to use can be helpful in the monitoring of the patient. It was not possible to use changes in behavior as the outcome variable. However, several studies applying the MPB and HBM have shown that behavioral intentions are good predictors of actual behavior [18, 28, 29].

Data were obtained from participants living in an entire area of approximately 13,500 inhabitants in the north-west of the Netherlands. In this area, the 6 responsible general practitioners send their prescriptions automatically to the only local pharmacy by means of a computer network. After the consultation with the doctor has taken place, prescriptions are received in the pharmacy before the patient arrives. During the period of this descriptive study, the local practitioners or pharmacists did not make any important intervention to change the use of benzodiazepines or to facilitate other (i.e., non-benzodiazepine) therapies. As usual, all dispensed benzodiazepines were labelled with the daily dose and a warning for impaired driving ability. Initially dispensed benzodiazepines were provided with a patient information leaflet. During the inclusion period of four months from November 1994, all persons in the area, who were initially prescribed a benzodiazepine, were invited by the pharmacy to participate in the study.

Benzodiazepine use was defined as initial if there was an absence of use in the 365 days preceding inclusion. As soon as the prescription appeared in the pharmacy, a member of the team of trained research assistants asked the patient to give informed consent. Approaching participants happened personally in the pharmacy, or by telephone. At the same day, a research assistant delivered the self-administered questionnaire at the participants' home and collected the questionnaire after approximately one hour. If required, the assistant could be consulted during completion of the questionnaire. During follow-up, i.e. at the second and third measurement point, the same procedure was followed.

Measures

The self-administered questionnaire covered demographic characteristics such as age, gender, marital status, education, and employment. It also included items to measure the constructs from the MPB and the HBM. Each of the model variables was measured at each of the three measurement points (T0, T1, T2).

Behavioral intention was measured by one item asking participants what they planned to do in the near future: "Do you intend to take your medicine during the next 14 days?" The answers ranged from 1= "certainly not" to 5= "certainly yes".

Model of Planned Behavior (MPB) variables

Attitudes were measured by six items asking participants to indicate on a 5-point semantic differential scale what their overall opinion about benzodiazepine use was: "I think that using this kind of medicine is": very bad-very good, absolutely useless-very useful, very unpleasant-very pleasant, very dangerous-very safe, very foolish-very wise, absolutely needless-absolutely necessary. The answers were summed to form the attitude measure. The internal consistency of this measure was high. Cronbach's alpha was 0.86 at T0, 0.79 at T1 and 0.85 at T2.

Subjective norms were calculated by multiplying two measures: normative beliefs about using benzodiazepines and motivations to comply [18]. Normative beliefs were assessed by asking the likelihood that three salient others (family, friends and "most people who are important to me") would approve of benzodiazepine use. Three corresponding items asked how motivated the participant was to comply with these beliefs (e.g., "Regarding medicine use, I follow the advice of my friends"). Cronbach's alpha for this scale was 0.73 at T0, 0.84 at T1 and 0.78 at T2.

The *perceived norm of the prescriber* regarding benzodiazepine use was constructed as an additional indicator of subjective norms. This variable was measured by asking participants four questions, for example "The doctor thinks it is important that I use the drug". The answers ranged from 1= "strongly disagree" to 5= "strongly agree". This scale had a moderate internal consistency. Cronbach's alpha of this measure was 0.65 at T0, 0.57 at T1 and 0.62 at T2.

Perceived behavioral control was measured by five belief items, for example, "I have control over taking my medicine", "When I have to quit using this medicine, that's no problem for me". The answers ranged from 1= "strongly disagree" to 5= "strongly agree". This scale had a moderate internal consistency. Cronbach's alpha was 0.58 at T0, 0.52 at T1, and 0.66 at T2.

Health Belief Model (HBM) variables

Severity of the illness was measured by three questions, for example, "To what extent do your complaints form a problem for you?" (1= not at all, 5= to a large extent). Cronbach's alpha was 0.87 at T0, 0.87 at T1 and 0.88 at T2.

Vulnerability to the particular illness was assessed by asking: "What do you think is the risk that your problem will return if you stop using this medicine?" (1= no risk, 5= certainly at risk).

Health benefits of benzodiazepine use was measured with five items, e.g. "This kind of medicine is a good help to solve my problems" and "This is a medicine because of which I can function well". The answers ranged from 1= "strongly disagree" to 5= "strongly agree". Cronbach's alpha was 0.78 at T0, 0.81 at T1 and 0.83 at T2.

Perceived barriers regarding the use of the drug were queried with regard to two topics. The first was on *dependence*, using three items, including "How large do you think is the risk that you will get addicted to the drug after short-term use?" (1= not at all, 5= to a large extent). Cronbach's alpha was 0.73 at T0, 0.70 at T1 and 0.74 at T2. The second type of barriers referred to two important *side effects of benzodiazepines*, namely memory impairment and psychomotor performance impairment ("How large do you think is the risk that you will get memory impairment after use of the drug?"). Cronbach's alpha of this second measure was 0.71 at T0, 0.65 at T1 and 0.76 at T2.

Length of benzodiazepine use

Benzodiazepine usage data were retrieved from the automated pharmacy data. Drugs were defined as a benzodiazepine if they were coded according to the Anatomical Therapeutic and Chemical (ATC) classification system: N05BA (anxiolytics), N05CD (hypnotics), or N05CF and N05CG (benzodiazepine-related hypnotics) [30]. Because of reliability of pharmacy data, the assumption has been made that prescribed use approximates actual benzodiazepine use [31]. Prevalence of benzodiazepine use was collected for a period of 12 months before and after inclusion. Length of benzodiazepine use was recorded in days cumulatively during one year after inclusion.

Analyses

We examined missing data in a univariate analysis. Missing data in the composite scales were removed by multiple imputation. We chose to analyse three distinct models: a model with the behavioral intention at baseline (T0) as the outcome variable; a model with the change in behavioral intention between T0 and T1 (two weeks after inclusion) as the outcome variable; and a model with the change in behavioral intention between T1 and T2 (six months after inclusion) as the outcome variable

The three models were analysed by multiple backward linear regression [32]. Before analyses, scores were standardized. In the first model, we examined at inclusion the baseline determinants of the intention to use benzodiazepines. Moreover, we used ordinal regression in the first model to check the impact of violation of the normality assumption. The results of this ordinal regression were similar to the ordinary regression. In the other two models, determinants of change in intention were examined. The independent variables of these models consisted of two sets: baseline variables and change score-variables. Change scores were computed by the difference of the variables between the present and the previous measurement (between T1 and T0 and between T2 and T1). Paired *t* tests were carried out at each measurement point in order to preselect the significant change scores.

Data analyses were conducted by using the statistical program package SPSS for Windows, Release 6.1.3, procedure Regression (SPSS Inc., Chicago, USA) and SPIDA, Version 6 (Statistical Computing Laboratory, Eastwood Australia).

Results

Sample characteristics

In this study, 159 persons with an initial benzodiazepine prescription were invited to participate. A total of 41 persons refused to take part (mean age 50 years [SD=13.87], 37% were men). The resulting response rate was 74 per cent. The non-responders had a similar age and gender distribution to the respondents. Eleven participants provided incomplete follow-up data. Therefore, we decided to use the complete data of 107 starting benzodiazepine users in the analyses. The majority of the participants were female (62%). Mean age of the participants was 47 years (SD=14; median 48 years) and did not differ between the two genders.

Descriptive statistics

Table 1 provides an overview of the mean values of each variable at the start, after 14 days, and after six months of follow-up. As can be seen from this table, intention to use benzodiazepines decreased during follow-up, as did the reported severity of participants' illness. Consistently, 14 days after inclusion, the attitude, the perceived norm of the general practitioner to use benzodiazepines and the perceived benefits of benzodiazepines showed a significant decrease. No change was found for subjective norms of important others, behavioral control, vulnerability or barriers (the perceived side effects and perceived dependence on benzodiazepines). An inconsistent finding was that the overall opinion regarding benzodiazepine use (attitude) showed a small but significant positive change during the T1-T2 interval.

Determinants of change in intention

One model of intention to use benzodiazepines at baseline and two models of change in intention dur-

Table 1 *Summary statistics on the MPB & HBM scales during six-month follow-up of initial benzodiazepine (BZD) users (N=107)*

	T 0 [1]) *M (SD)*	*T 1 [2])* *M (SD) [a]*	*T 2 [3])* *M (SD) [b]*
Behavioral intention	3.67 (1.41)	2.82 (1.48) ***	2.45 (1.31) ***
Attitude	3.36 (0.58)	3.27 (0.50) *	3.38 (0.52) **
Social norm	4.32 (2.62)	4.63 (2.68)	4.33 (3.03)
Norm GP	3.55 (1.02)	3.32 (0.92) ***	3.25 (0.92)
Behavioral control	4.40 (0.71)	4.48 (0.57)	4.48 (0.70)
Severity illness	3.33 (0.96)	3.15 (1.00) **	2.58 (1.03) ***
Vulnerability	3.60 (1.15)	3.41 (1.35)	3.23 (1.38)
Benefits BZD	3.15 (0.98)	2.87 (0.99) ***	3.01 (1.05)
Drug dependence	2.39 (0.94)	2.41 (0.99)	2.49 (1.10)
Drug side effects	2.55 (0.96)	2.60 (1.07)	2.61 (1.06)

[1]) T 0 = Measurement at start of benzodiazepine use
[2]) T 1 = Measurement 14 days after inclusion
[3]) T 2 = Measurement six months after inclusion
[a]) The significance of the *t* test for paired samples at T 1 and T 0
[b]) The significance of the *t* test for paired samples at T 2 and T 1
*** $P < 0.01$, ** $P < 0.05$, * $P < 0.10$

ing follow-up were analysed as described above. Partly due to limited power, only a few determinants explaining unique variance in (changes in) behavioral intentions were found. The final results of the three analyses are displayed in Table 2, 3 and 4. The analysis of the determinants of the intention to use at the time of inclusion revealed two important predictors: the perceived norm of the general practitioner to use benzodiazepines and participants' personal attitudes. A closer inspection of the impact of these variables on behavioral intentions revealed a significant interaction effect ($F[3,88]=7.15$, $P<0.01$). The effect of the reported norm of the doctor to use these medicines varied across different strata of attitude (e.g., a strong, middle, or weak attitude). The intention to use seems to increase most with increasing pressure of the doctor when the attitude is least favorable. Table 2 presents the beta coefficients for attitude, the norm of the general practitioner and the interaction term. Inclusion of the interaction term resulted in a significant increase in the total amount of explained variance in behavioral intentions; the squared multiple correlation rose by five per cent.

Table 3 presents the results of the second model. After 14 days, the two main determinants of change in intention were the initial perceived norm of the doctor to use and the change in the perceived severity of the illness. An interesting finding was that participants' decreased inclination to use benzodiazepines was associated with a relatively stronger influence of the doctor regarding benzodiazepine use. Table 4 presents the results of the third model. As can seen from this table, after six months, the change in the severity of the participants' illness and the perceived health benefits at the time of inclusion were the only determinants of change in the intention to use benzodiazepines.

Actual benzodiazepine use

Pharmacy records showed very skewed data of cumulative length of benzodiazepine use with a mean of 37 days (SD=68; median 14; maximum 353). Seventy-two per cent of the participants used the medicine during 30 cumulative days or less, 23 per cent used it for a period between 30 and 181 cumulative days and five percent used it longer than 180 cumulative days. A multiple regression model, including the three intention measures (T0; T1; T2) as determinants and the length of benzodiazepine use as the criterion variable, resulted in a highly significant solution ($F[3,97]=26.00$, $P< 0.001$). The beta-weights of the each of the intention measures were as follows: beta intention T0: 0.60, $P<0.001$; beta intention T1-T0: 0.72, $p<0.001$; beta intention T2-T1: 0.47, $P<0.001$. The total amount of variance explained in benzodiazepine use was 67 per cent.

Discussion

This six-month follow-up study among initial benzodiazepine users in an entire Dutch community employed variables from the Model of Planned Behavior (MPB) and the health belief model (HBM) to predict the baseline intention and changes in the intention to use benzodiazepines.

Apparently, this is one of the first studies in the field of benzodiazepine users with a follow-up design examining attitude and beliefs in relation to the intention to use. The intention to use benzodiazepines seems to be important because prolongation of benzodiazepine use is a process in which users' own initiative is very important. Some limitations of the study should clearly be pointed out. First of all, the study concentrated on certainly valuable data of intention to use benzodiazepines because it was not possible to use (change in) behavior as the outcome. Additionally, in a separate analysis, intention to use was an important determinant of the length of benzodiazepine use. Length of use was calculated from pharmacy data. Because of the accurate pharmacy records and the reliability of pharmacy records, the assumption has been made that prescribed use approximates actual benzodiazepine use [31].

Secondly, there was still a considerable amount of the variance in the model unexplained, although we believe that the model was capable of explaining a

Table 2 *Determinants of intention to use at T 0, including an interaction effect (by multiple regression)*

Intention to use at start, T 0	*R^2=0.20* *Beta*	*F[3,88]=7.16**** *Sig*
Attitude T 0	0.21	**
Norm GP T 0	0.21	**
Norm GP T 0 * Attitude T 0	-0.29	***

****P*< 0.01, ** *P*< 0.05

Table 3 *Determinants of the change in intention to use benzodiazepines during first 14 days during follow-up (multiple backward regression)*

Δ T 1-T 0 intention [1)]	*R^2=0.16* *Beta*	*F[3,95]=5.60 **** *Sig*
Norm GP T 0	-0.24	***
Δ T 1-T 0 attitude	0.17	*
Δ T 1-T 0 severity illness	0.23	**

[1] Δ T 1-T 0 or change T 1-T 0 is the difference between the variables at 14 days after inclusion (T 1) and the variable at inclusion (T 0)
*** *P*< 0.01, ***P*<0.05, **P*<0.10

Table 4 *Determinants of the change in intention to use benzodiazepines during follow-up from 14 days to six months after inclusion (multiple backward regression)*

Δ T 2-T 1 intention [1)]	R^2=0.19 Beta	F[3,88]=6.86 *** Sig
Benefits BZD T 0	0.19	**
Δ T 2-T 1 attitude	0.15	n.s
Δ T 2-T 1 severity illness	0.36	***

[1)] Δ T 2-T 1 or change T 2-T 1 is the difference between the variables at six months after inclusion (T 2) and the variable at 14 days after inclusion (T 1)
*** *P*< 0.01, ***P*<0.05

substantive amount of the variance in the intention to use benzodiazepines. We suggest that the relatively small amount of variance in intention to use can be explained by the unfamiliarity with the new drug and the newly formed attitudes and beliefs. Moreover, the sample used in the present study was relatively small; the test had only limited power. It is quite conceivable that a larger sample with increased power would have revealed a larger set of determinants of changes in the inclination to use benzodiazepines. In addition, some of the variables employed in this study had a somewhat low degree of internal consistency. It is possible that the error variance in some of these variables prevented them from being important predictors of benzodiazepine use. Nevertheless, the present study sheds light on the most important usage motives of initial benzodiazepine users.

An important finding is that the norm of the general practitioner regarding benzodiazepine use was a crucial predictor of behavioral intentions at baseline and of the change in intentions during the first 14 days after inclusion. This finding indicates the important role of the prescriber at initiation of benzodiazepine therapy. At that moment, participants had no experience with benzodiazepines. Therefore, the professional opinion of the physician may have prevailed over the patients' own opinions. The effect of the opinion of the practitioner on the intention to use could not be considered independent of the initial attitude, because we found a highly significant interaction effect. Participants' initial personal attitude only affected the intention to use benzodiazepines when they believed that their general practitioner regarded benzodiazepine use as not important.

During the first 14 days, a relatively stronger influence of the doctor regarding benzodiazepine use turned out to be associated with participants' decreased inclination to use benzodiazepines. Presumably, one of the reasons is that the general practitioner strongly advised to start benzodiazepine use, though for a limited length of time. The finding that the intention to use benzodiazepines decreased during follow-up is in line with the recommendations for short-term use.

Change in the severity of the illness was positively associated with the change in intention. In the first six months, participants have the inclination to reduce their benzodiazepine use as soon as their condition improves. In a similar vein, they have an increase in the inclination to use when the severity of the illness increases. Several studies mentioned the relation between ill health and benzodiazepine use [33-36]. Mant *et al.* reported the significance of the number of patient health problems predicting the prescribing of a benzodiazepine [37]. In light of our finding, the mental and physical morbidity of long-term benzodi-

azepine users, which has been reported to be higher than in the general population [33-35], is suggested to be an important reason for prolongation of use. In general, the relation between illness and intended use of a medicine seems obvious. However, in the case of benzodiazepines, the number of appropriate indications for use is limited. In most of these indications, the length of benzodiazepine use should be short, since the risks and benefits of long-term use of benzodiazepines are debatable [38]. Taking into account the recommendations of short-term use, increase in the severity of the illness does not necessarily imply continuation of benzodiazepine use. Interestingly, drug dependence was not associated with the (-change in) intention to use. Probably it will be a factor in a later stage of prolonged benzodiazepine use.

After six months, the perceived benefits of benzodiazepines at the start of use turned out to be a determinant of an increase in intention. This finding indicates the importance of the initial opinion of the benzodiazepine user during the course of benzodiazepine use. In accordance with that finding, the study of Haafkens showed that long-term users maintained their initial belief that benzodiazepines were beneficial to them [39].

In conclusion, the start of therapy is a key period to shape patients' drug attitude and beliefs. In that period, the anticipated duration of treatment can be related to the risks of benzodiazepine use such as dependence and difficulty to discontinue. Physician and pharmacist should actively support the benzodiazepine user throughout the decision process with respect to using or stopping in order to minimize the risk of needless long-term use.

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