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The impact of attitudes and beliefs on length of benzodiazepine use: a study among inexperienced and experienced benzodiazepine users

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Abstract

Prolonged benzodiazepine use is a widespread phenomenon in medical practice. In the present article, we argue that psychological models may contribute to our understanding of benzodiazepine use. This study examined variables derived from the theory of planned behaviour and the health belief model in relation to the length of benzodiazepine use. Data were collected from a sample of all benzodiazepine users with a request for this medicine in the only pharmacy in a Dutch community ($N = 467$). Determinants of the length of benzodiazepine use were analysed separately for inexperienced and experienced users using structural equation modelling (SEM) analyses. For both groups, results showed that the intention to use benzodiazepines was a predictor of length of use. Attitudes towards benzodiazepine use had an indirect influence on length of use, through intentions. Furthermore, a positive attitude toward using benzodiazepines was related to the perceived norm of the prescriber. Experienced users were more inclined to consume benzodiazepines when they had less control over drug taking. In this group, the belief that benzodiazepine use leads to dependence was associated with less control over drug taking and a high intention to use the drug. In addition, older experienced users reported a higher intention to use the drug. For inexperienced users, the perceived attitude of the prescriber towards use of the medicine was a strong determinant. Finally, results of SEM-analyses showed that the model accounted for far more variance in behaviour for experienced users (67%), than for inexperienced users (18%). © 2002 Published by Elsevier Science Ltd.

Keywords: The Netherlands; Benzodiazepines; Drug use; Theory of planned behaviour; Health belief model

Introduction

The role of benzodiazepines in medical practice is controversial (Gabe & Bury, 1991). In the discussion about benzodiazepine prescribing and benzodiazepine use, some argue that the total consumption of benzodiazepines is too high and that there is a substantial risk of dependence (Catalan & Gath, 1985). Others argue that benzodiazepines are effective, safe, and cheap in short-term therapy (Shader & Greenblatt, 1993), and that the positive effects of the drug outweigh the risk of withdrawal reactions (Ballenger, Pecknold, Rickels, & Sellers, 1993). Benzodiazepines are used in short-term treatment of anxiety disorders and insomnia, and for seizures and muscle relaxation (Gillin & Byerly, 1990; Shader & Greenblatt, 1993). Current prescribing guidelines caution against long-term use (Ashton, 1994; Holbrook, Crowther, Lotter, Cheng, & King, 2000). Prolonged use can lead to a dependence syndrome, which is mainly characterised by withdrawal symptoms on stopping treatment.

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Despite recommendations for short-term use, long-term use is common in one-third of all benzodiazepine users, in particular for individuals at advanced age (Isacson, Carsjo, Bergman, & Blackburn, 1992; Jorm, Grayson, Creasy, Waite, & Broe, 2000; Van Hulten, Leufkens, & Bakker, 1998). About the long-term use of benzodiazepines, there is ongoing concern especially in light of the risks of dependency, falls and accidents, and impaired memory effects. Many studies have provided insight on the characteristics of different types of benzodiazepine users. In addition, a few studies have addressed health characteristics of benzodiazepine users showing higher scores for either physical or mental morbidity than in the general population (Olfson & Pincus, 1994; Simpson et al., 1990). The authors are not aware of any previous research about the *psychological* reasons for prolonged benzodiazepine use, or about the way patients cope with prolonged use and its potential effects. In order to examine psychological variables related to the length of benzodiazepine use, we chose the theory of planned behaviour (TPB) (Ajzen, 1991) adapted from the theory of reasoned action (TRA) (Ajzen & Fishbein, 1980) and the health belief model (HBM) (Rosenstock, 1996).

Theoretical models for predicting benzodiazepine use

The TRA has frequently been used to predict behaviour in the domain of disease and health (Ajzen & Fishbein, 1980). The theory deals with a person's attitude and the social norm towards the behaviour under consideration. The attitude is defined as a person's positive or negative evaluation of performing the behaviour in question. The social norm refers to the perceived social pressure of a relevant reference group, i.e., perceptions of significant others' expectations about whether one should engage in certain behaviour. A third determinant, perceived behavioural control, is incorporated in an extension of the TRA; namely the TPB (Ajzen, 1991; Ajzen & Madden, 1986). Perceived behavioural control reflects the extent to which a person feels capable of performing the behaviour under consideration. Behaviour occurs when the attitudes towards behaviour and social influence are positive, and when enough control exists to be able to perform the behaviour. Thus, a person's attitudes, normative beliefs and control beliefs are expected to predict the length of benzodiazepine use.

Specific attitudes and beliefs regarding a disease, which is the apparent reason to prescribe benzodiazepines, are not incorporated in the TPB as determinants of behaviour. In order to understand the use of benzodiazepines, insight is needed in disease-related determinants as well. Disease plays an important role in the HBM, which was originally designed to predict preventive health behaviour (Harrison, Mullen, & Green, 1992; Janz & Becker, 1984; Rosenstock, 1996). The perceived health threat plays a prominent role in the HBM. It includes the individual's perceived susceptibility to the particular disease and its perceived seriousness. Furthermore, the model states that a health action is determined by its perceived benefits minus its perceived costs.

As far as we know, neither one of these models has been utilised in the field of benzodiazepine use, although both models are frequently used to analyse, predict and develop health behaviour (Budd, Hughes, & Smith, 1996; Bond, Aiken, & Somerville, 1992; Deenen, 1996; Pellino, 1997; Stafleu, De Graaf, Van Staveren, & Schroots, 1991). In the current study, we use an integrative framework including the variables from the TPB and the HBM (Mullen, Hersey, & Iverson, 1987). In addition, we included an individual difference variable in our model, called the need for cognition. Cohen, Stotland, and Wolfe (1955) defined need for cognition as: "A need to structure relevant situations in meaningful, integrated ways. It is a need to understand and make reasonable the experiential world" (p. 291). Because the objective tests used to gauge individual differences in the need for cognition had never been described in detail or published, Cacioppo and Petty (Cacioppo & Petty, 1982; Cacioppo, Petty, Kao, & Rodriguez, 1986) developed and validated an assessment instrument to distinguish individuals who engage in and enjoy analytic activity from those who do not. We reasoned that individuals who enjoy thinking would have a less favourable attitude toward prolonged benzodiazepine use in view of the risk of dependency.

The present study

The central aim of this exploratory study is to examine which social-psychological factors are important in determining the length of benzodiazepine use. We used variables included in two widely used models of (health) behaviour, the TPB and the HBM, to analyse benzodiazepine use among experienced and inexperienced benzodiazepine users. The study tests the hypothesis that (general and health-related) attitudes and beliefs affect the length of benzodiazepine use indirectly, through their influence on the intention to use benzodiazepines. Furthermore, we hypothesise that our integrative model has more explanatory power for experienced users than for inexperienced users. The reason for this is that the attitudes and beliefs included in the model will be much more salient for the former group. Put differently, experienced users have had more time to reflect on the practice of benzodiazepine consumption than inexperienced users, who report their attitudes and beliefs after just having received their first

benzodiazepine prescription. Furthermore, from past habit, experienced users are likely to have developed intentions to use or not use benzodiazepine, which in turn guide their future use. Therefore, we analysed two different models, i.e., one model for experienced and one for inexperienced users. The results of the current study may have important practical implications. Information about which attitudes and beliefs are important in explaining variance in individuals' benzodiazepine use can be used to optimise medical and pharmaceutical care. In addition, results may be used as guidelines for the development of health education programmes regarding the use of benzodiazepines.

Material and methods

The sample

Data were obtained from individuals living in a community of approximately 13,500 inhabitants in the Northwest of the Netherlands, with 12,500 living in the central community and 1000 people living in the surrounding area. The inhabitants of this area use the health services in the central community. Six general practitioners (five males and one female) are responsible for primary care. Between November 1994 and March 1995, all patients in this area with a request for a benzodiazepine prescription in the single local pharmacy were invited to participate in the study. Informed consent was collected in the pharmacy. Trained research assistants delivered the self-administered questionnaire to patients' homes and collected the questionnaires after approximately 1 h. If required, the assistant could be consulted during completion of the questionnaire. In addition to self-reports, the pharmacy's computer records were utilised. These records contain virtually complete information on all prescription drug use. In the analyses, we differentiated between participants with and participants without experience of benzodiazepine use. An experienced user was defined as an individual who obtained at least one prescription for a benzodiazepine in the 365 days preceding the inclusion date according to the pharmacy data. Consequently, an inexperienced user was defined as an individual without any benzodiazepine prescription in the preceding 365 days.

Measurement of concepts

In The Netherlands, benzodiazepines can only be obtained in a pharmacy with a prescription. Benzodiazepine prescriptions complete with daily dose and length of use were dispensed in the pharmacy with a maximum usage length of 30 days. If prolongation is necessary, a repeat prescription has to be arranged at the doctor's practice. A drug was defined as a benzodiazepine if coded according to the anatomical therapeutic and chemical (ATC) classification system: N05BA (anxiolytics), N05CD (hypnotics), or N05CF and N05CG (benzodiazepine-related hypnotics) (WHO, 1993).

Outcome variable

Behaviour was measured in terms of the length of time people subsequently used benzodiazepines. More specifically, the cumulative number of benzodiazepine exposure days was assessed during a 12-month follow-up from the inclusion date. Benzodiazepine usage data were retrieved from an automated pharmacy database.

External covariates

Previous benzodiazepine use was measured by the number of retrospective exposure years before inclusion date, calculated from pharmacy data. A year was defined as an exposure year if there had been any benzodiazepine use.

Anxiolytic or hypnotic use was assessed at the time of inclusion.

TPB and HBM scales

The TPB and HBM variables were used to construct summated scales; internal consistency was measured by means of Cronbach's α.

Behavioural intention was measured with four items in which participants were asked what they planned to do in the near future. For example: Do you intend to take your medicine during the next 14 days? The answers ranged from 1, certainly not, to 5, certainly yes. The four items were combined in one index showing good internal consistency with a Cronbach's α of 0.88.

Attitudes were assessed with six items asking participants to rate on five-point bipolar scales their overall opinion about benzodiazepine use: 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 (Cronbach's $\alpha = 0.87$).

Perceived behavioural control was measured with five items. Sample items are: I have control over taking my medicine, and I can quit using this medication when I need to. The answers ranged from 1 (strongly disagree) to 5 (strongly agree) (Cronbach's $\alpha = 0.69$).

Perceived norm of the prescriber. A particularly relevant reference person regarding benzodiazepine use is the prescriber, namely the patients' doctor. The perceived norm of the prescriber was assessed using four items, such as The doctor thinks it is important that I use the drug and In case of the use of my medicine I act on the doctor's advice (1 = strongly disagree, 5 = strongly agree). Cronbach's α was moderate at 0.58.

Severity of the illness was measured with three items, namely, To what extent do your complaints form a problem for you? How severe are your complaints? To what extent do you worry about your complaints or problems? (1 = not at all, 5 = to a large extent). Cronbach's α was 0.87.

Perceived barriers related to the use of the drug were operationalized by focusing on the topic of dependence. Three items were used to measure perceived barriers, including: How large do you view the risk that you are hooked on the drug after short-term use? (1 = not at all, 5 = to a large extent). Cronbach's α was 0.81.

Need for cognition. Among the measures in the questionnaire was the abbreviated Need for Cognition Scale (Cacioppo et al., 1984). This scale consists of 18 statements and measures the individual's tendency to engage in and enjoy thinking. The items were translated into Dutch and slightly adjusted to ensure comprehension. Example items are: I like to think about difficult and important things, I would prefer complex to simple problems, and Thinking is not my idea of fun. Participants rated how characteristic each of the 18 statements was of themselves on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Afterwards, the answers were recoded such that higher scores referred to a higher need for cognition (nCog). Cronbach's α was 0.60.

Statistical analysis

Data were analysed using the statistical programs SPSS for Windows, Release 6.1 (SPSS Inc., Chicago, USA) and LISREL 8 (Jöreskog & Sörbom, 1993). Structural equation modelling (SEM) analyses were conducted to estimate the relationships among the variables. The data were analysed for experienced ($N = 360$) and inexperienced ($N = 107$) benzodiazepine users separately. Because of the large number of items and the relatively small sample sizes, a simultaneous consideration of all observed variables would result in under-identification problems and insufficient power of the results (cf. Bentler & Chou, 1987). Therefore, all variables were included in the structural equation model as separate observed or manifest variables. No latent constructs were included. Missing data in the composite scales were removed by mean imputation implemented in LISREL software (Little & Rubin, 1987). The value to be substituted is obtained from other cases with similar response patterns over a set of covariates. Because of the skewness and the non-normality of the data, we used polyserial and polychoric correlations (computed with PRELIS), and used the weighted least-squares method to estimate the regression coefficients. The modelling process of the path analyses was started by constraining all parameters to zero, except the coefficient of the path from intention to behaviour. Modification indices were used to relax the parameter constraints that improved the fit maximally. The final model was chosen using overall model-fit indices of the fit between the data and the reproduced model, such as the chi-square value, the adjusted goodness-of-fit-index (AGFI), the root mean square residual (RMR), the modification indices, and the distribution of residuals. The results are presented in standardised betas and gammas. In the text, these parameters are called path coefficients (PC).

Results

Descriptive statistics

Of the total group of 605 eligible benzodiazepine users, 127 refused to participate (response was 79%). Those who did not respond had a similar age and gender distribution as the participants. The data of 11 participants could not be used, because their follow-up data were incomplete. The final sample included a group of 360 current benzodiazepine users and a group of 107 inexperienced users.

Table 1 presents the characteristics of the study population. As compared to experienced users, inexperienced users were more often male, predominantly younger, and more often anxiolytic users. Within the experienced users, we distinguished three categories of previous use (1 year, 2–5 years, 6 or more years). The category 'six years or more' included 61% of the experienced users. No gender differences were found between the three categories. Age and use of anxiolytics or hypnotics varies across these categories, such that the category 'six years or more' included older participants and more hypnotic users.

Table 2 presents the means and standard deviations of the variables included in our integrated model for inexperienced and experienced benzodiazepine users separately. As shown in Table 2, there were significant differences between the two groups on all psychological variables, except the perceived severity of the disease.

Model testing

Indications for the hypothesised differences between the two groups were found in the results of Tables 1 and 2. Therefore, we analysed two different models. Intercorrelations among included variables are presented in Table 3 and 4. In both models, the path coefficients were significant if the z-score was greater than 1.96, $p < 0.05$.

Experienced users

A preliminary model with all TPB and HBM variables showed no satisfying fit to the data, $\chi^2 = 1162.02$, $p = 0.001$, AGFI = 0.78, RMR = 0.17. Subsequently, we

modified this model resulting in a parsimonious model, including six TPB and HBM variables, namely intention, attitude, perceived behavioural control, norm of the physician, perceived barriers, and severity of the illness, $\chi^2 = 141.55, p = 0.01$, AGFI = 0.93, RMR = 0.14. The inclusion of additional paths led to an improvement in fit. In this model, the following paths were included: age-intention, age-norm of the physician, gender-intention, and attitude-perceived behavioural control. This model fitted adequately to the data, $\chi^2 = 55.06$, $p = 0.14$, AGFI = 0.98, although the root mean square residual value was still relatively high, RMR = 0.17. The fit of the model was further improved by including a path from nCog to attitude, from anxiolytic or hypnotic use to perceived barriers, and from previous use to intention.

In the final model for experienced benzodiazepine users, the AGFI was 0.98, indicating a good fit between model and data. The chi-square value was 33.27 with 42 degrees of freedom, $p = 0.83$, and the RMR was 0.10. This model explained no less than 67% of the variance in length of benzodiazepine use. As can be seen in Fig. 1, the strongest predictor of benzodiazepine use was the intention to use benzodiazepines (path coefficient = 0.69). Another important predictor of benzodiazepine use was perceived behavioural control (path coefficient = −0.41). Both relationships are in line with the TPB (Ajzen, 1991). Perceived behavioural control, in turn, was predicted by the belief that benzodiazepine use leads to dependence (−0.34). These two latter path coefficients were negative, indicating that persons believed they have less control over benzodiazepine use when they think these drugs have a high dependence potential. Subsequently, they consumed more benzodiazepines when they had less control over drug taking. Furthermore, participants showed a higher intention to use benzodiazepines when they believed benzodiazepines have a high dependence potential (0.34). Older participants reported greater intentions to use benzodiazepines (0.44). The attitude had an impact on intention (0.26) and was, in turn, predicted by the perceived norm of the physician (0.26) and by need for cognition (0.19). Finally, the use of hypnotics was associated with the belief that benzodiazepine use leads to dependence.

Table 1
Sample characteristics

	Experienced users ($N = 360$)		Inexperienced users ($N = 107$)		
	N	%	*N*	%	p^a
Gender					0.01
Male	92	25.6	41	38.3	
Female	268	74.4	66	61.7	
Age (years)					0.001
<45	51	14.2	45	42.1	
45–59	113	31.4	44	41.1	
60+	196	54.5	18	16.8	
Previous use (years)					—
1	53	14.7	—		
2–5	89	24.7	—		
6+	218	60.6	—		
Anxiolytic/hypnotic					0.001
Anxiolytic	195	54.2	79	73.8	
Hypnotic	165	45.8	28	26.2	

[a] *p*-Value of *t* test (age) and chi-square test (gender, anxiolytic/hypnotic).

Inexperienced users

For the group of initial benzodiazepine users, we were not able to compute a model with all HBM and TPB variables because of non-convergent solutions caused by too many variables. Consequently, a model with a

Table 2
Means and standard deviations of the variables included in the study for experienced ($N = 360$) and inexperienced benzodiazepine users ($N = 107$) separately

	Experienced users		Inexperienced users		
	Mean	SD	Mean	SD	p^a
Behaviour (length of BZD use in days)	235.93	120.03	37.54	68.39	0.001
Intention	4.50	0.77	3.41	1.16	0.001
Attitude	3.64	0.57	3.36	0.59	0.001
Behavioural control	3.65	0.95	4.40	0.69	0.001
Social norm GP	3.31	1.00	3.61	0.99	0.01
Severity disease	3.26	0.99	3.27	0.96	n.s.
Dependence potential	3.48	1.13	2.34	0.95	0.001
Need for cognition	56.87	9.10	53.91	7.78	0.001
Age (in years)	60.62	14.76	46.89	14.32	0.001

[a] *p*-Value of *t* test for two independent means.

Table 3
Experienced benzodiazepine (BZD) users, intercorrelations of variables

	1	2	3	4	5	6	7	8	09	10	11	12
1. Attitude	—											
2. Norm physician	0.30	—										
3. Perc. Beh. control	−0.05	−0.11	—									
4. Severity illness	−0.19	−0.01	−0.16	—								
5. Barrier (dependence)	0.15	0.09	−0.47	0.09	—							
6. Intention	0.14	0.13	−0.33	0.15	0.38	—						
7. Length of BZD use	0.22	0.11	−0.52	0.05	0.50	0.57	—					
8. Age	0.20	0.22	−0.08	−0.19	0.15	0.17	0.32	—				
9. Previous use (years)	0.05	0.09	−0.02	−0.08	0.04	−0.07	0.11	0.04	—			
10. Need for cognition	0.20	0.09	−0.03	−0.10	0.14	0.13	0.16	0.31	−0.06	—		
11. Anxiolytic/hypnotic	0.06	0.04	−0.05	0.00	0.05	0.00	0.15	0.25	−0.11	0.23	—	
12. Female/male	0.13	0.05	0.11	−0.15	0.05	0.13	0.11	0.13	0.06	0.17	0.26	—

Table 4
Inexperienced benzodiazepine (BZD) users, intercorrelations of variables

	1	2	3	4	5	6	7	8	9	10	11
1. Attitude	—										
2. Norm physician	0.17	—									
3. Perc. Beh. control	−0.11	−0.61	—								
4. Severity illness	−0.04	0.14	−0.21	—							
5. Barrier (dependence)	−0.11	−0.15	−0.16	0.14	—						
6. Intention	0.32	0.20	−0.11	0.01	−0.09	—					
7. Length of BZD use	0.08	0.07	−0.11	0.03	0.01	0.24	—				
8. Female/male	−0.05	−0.40	0.19	−0.07	0.30	−0.12	0.19	—			
9. Age	0.18	0.10	−0.05	−0.29	−0.09	0.17	0.28	−0.02	—		
10. Need for cognition	0.07	0.04	−0.07	0.01	−0.14	0.04	0.10	−0.03	0.17	—	
11. Anxiolytic/hypnotic	−0.13	0.05	−0.10	−0.12	0.29	0.23	0.37	0.05	0.17	−0.11	—

limited number of TPB variables, namely intention, attitude, and norm of the physician, could be computed. This model did not fit adequately to the data, $\chi^2(46) = 804.38, p = 0.001$, AGFI = 0.25, and RMR = 0.17. The final model for initial benzodiazepine users was computed by adding the path from age to physician norm, from gender (male/female) to intention and to length of benzodiazepine use, and finally from anxiolytic or hypnotic use to attitude, intention and length of benzodiazepine use. Fig. 2 presents the results of the structural equation analysis for initial benzodiazepine users.

The final revised model fit the data very well, $\chi^2(40) = 21.56, p = 0.99$, AGFI = 0.98, and RMR = 0.15. The model explained 18% of the variance in the behaviour of inexperienced users (length of benzodiazepine use). Intention was again a significant predictor of behaviour, although the path coefficient had a lower value (0.21) than the one found for experienced users (0.69). In addition, gender (0.17) and type of benzodiazepine (hypnotics, 0.30) were significantly related to behaviour. The attitude toward benzodiazepine use was strongly related to the intention to use benzodiazepines (0.45). Other predictors of the intention were the use of hypnotics (0.27) and gender (−0.11). In addition, the attitude was strongly influenced by the norm of the physician (0.56) and by use of hypnotics (−0.14). Finally, participants' age was associated with the perceived norm of the physician (0.56).

Discussion

Results of this exploratory study about social psychological reasons of benzodiazepine use showed several interesting variables related to the length of benzodiazepine use among inexperienced and experienced users. These variables were derived from the TPB

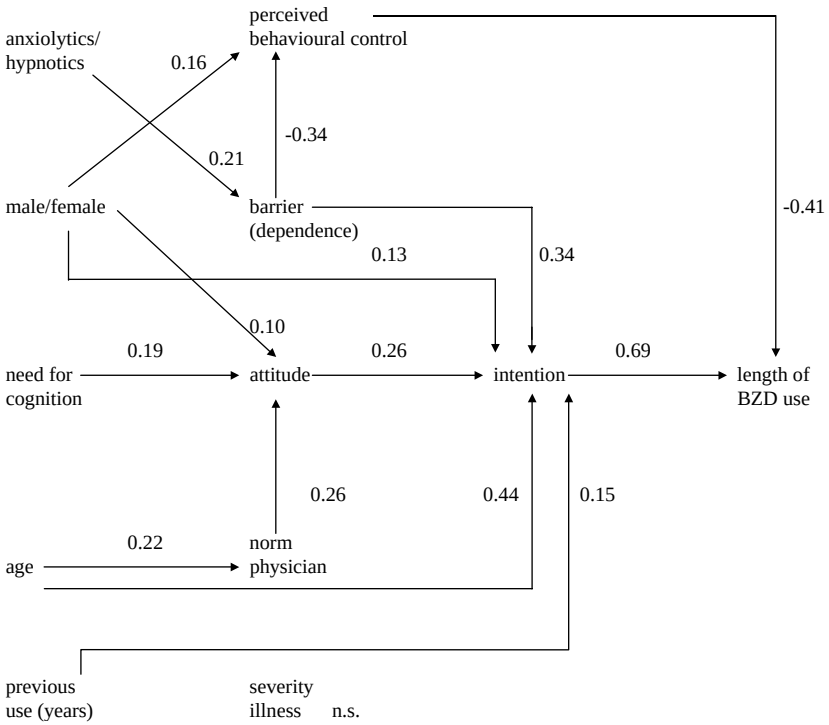

Fig. 1. Experienced benzodiazepine (BZD) users, LISREL structural equation model with standardised regression coefficients.

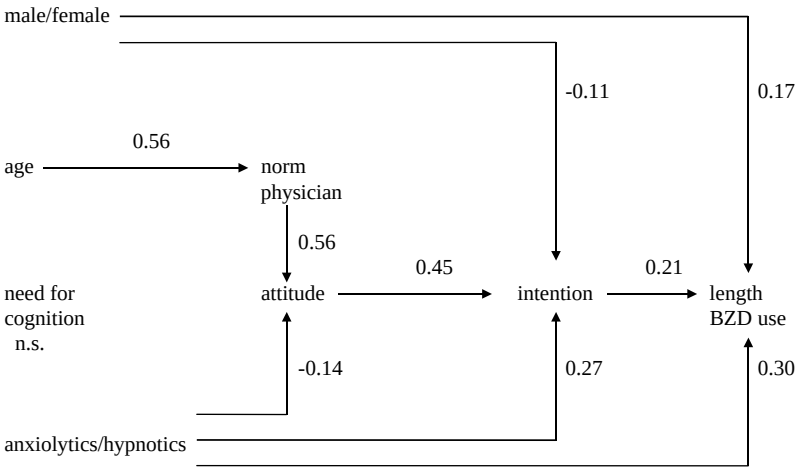

Fig. 2. Inexperienced benzodiazepine (BZD) users, LISREL structural equation model with standardised regression coefficients.

(Ajzen, 1991) and the HBM (Rosenstock, 1996), and were combined with background variables. We tested our integrated model for inexperienced and experienced benzodiazepine users separately. Users were defined as experienced if they obtained at least one prescription for a benzodiazepine in the year preceding inclusion. Behaviour, defined as length of benzodiazepine use during one follow-up year, could be accurately recorded because the study was based in a pharmacy with a complete database of all drug prescriptions in the region.

Some limitations of the study should be pointed out. Because pharmacy records are more reliable than self-reports of benzodiazepine use, we have used the former assuming that it approximates actual use (Lau, De Boer, Beuning, & Porsius, 1997). Some of the variables employed in this study had a somewhat low degree of

internal consistency. Moreover, the meaning of two variables, perceived behavioural control and perceived barriers, showed some overlap. However, in our models the two variables did behave in a different way. Another limitation was the small sample of users; the test had only limited power.

The variance explained in the behaviour was rather large (67%) for experienced benzodiazepine users, and relatively low for inexperienced users (18%). This difference in explained variance is in line with predictions: We argued that the general and health-related beliefs and attitudes included in the model would be more salient for experienced users. Experienced users have had more time to reflect on the practice of benzodiazepine consumption than inexperienced users, who reported their attitudes and beliefs after just having received their first benzodiazepine prescription.

For both groups, the intention to use benzodiazepines mediated the impact of several other predictors of the length of benzodiazepine use. Consistent with our previous argument that beliefs regarding benzodiazepine use are more salient for experienced users than for inexperienced users, the intention had a much stronger impact on the behaviour during the 12-month follow-up for the former group. Given their extensive past experience with the drug, they were able to form realistic intentions that translated into future use. Intentions are clearly much less strongly predictive of future drug use for inexperienced users. This is a major limitation of the TPB and TRA. For inexperienced users, particularly the attitude toward benzodiazepine use had an indirect influence on behaviour through intentions. Attitudes were most strongly determined by the norm of the physician. At the moment of the first benzodiazepine prescribing, we can imagine that the recently formed attitude is affected by the norm of the physician.

In addition, we found a very strong direct, positive association between age and intention to use benzodiazepines among experienced users. This finding needs attention because it is well known that the elderly are a population at risk of long-term benzodiazepine use (Isacson et al., 1992; Isacson, 1997; Rojas-Fernandez, Carver, & Tronks, 1999). Moreover, Simon, Von Korff, Barlow, Pabiniak, and Wagner (1996) have noted that age is already a predictor of initial prescribing of benzodiazepines. Long-term use among the elderly may reflect different features such as reduced mental and physical health of the aged, dependence, and a more lenient attitude on the part of the prescriber towards benzodiazepine use in the elderly (Simon et al., 1996). In another study among a group of 6921 patients in the same community, increased age, and the occurrence of chronic disease was found to be clearly associated with benzodiazepine use (Van Hulten, Heerdink, Bakker, & Leufkens, 1999). The reduced health of the elderly might explain a greater need for benzodiazepine use. Interestingly, our findings did not provide evidence for a significant impact of severity of the illness itself on benzodiazepine use. The clinical characteristics of the older benzodiazepine user may constitute an underlying motive for prolonged benzodiazepine use.

Older inexperienced and experienced participants reported a higher influence of the physician on the inclination to use benzodiazepines. We suggest this perceived norm is related to observations that the elderly are more inclined to abide by orders and to accept information provided by an authority such as a physician (Haug, 1979). One can argue that benzodiazepine use in the elderly may be prolonged by the combination of a lenient attitude on the part of the prescriber regarding use in the elderly, and elderly patients' perception that the doctor approves its use.

Furthermore, in both models the perceived norm of the doctor regarding the use of benzodiazepines had a positive impact on the attitude toward using benzodiazepines. The weaker relations between age, perceived norm of the physician, and attitude in the model of experienced users indicate that the influence of the physician declines relative to other factors with increasing experience. The observation in another Dutch study that almost all repeat prescriptions of benzodiazepines were issued by the general practitioner's assistant can partly clarify this declining influence (Van der Waals, Mohrs, & Foets, 1993).

With regard to dependence, experienced users reported a higher intention to use and less control over use when they believed benzodiazepines have a high dependence potential. Moreover, the perception that benzodiazepine use is under one's own control showed a *direct negative* relationship with length of benzodiazepine use. Persons are more prone to using benzodiazepines when they perceive themselves as having limited control over benzodiazepine consumption. For inexperienced users, dependence and behavioural control did not have an impact on the intention to use or use of benzodiazepines.

For experienced users, the use of hypnotics—in contrast to the use of anxiolytics—was associated with the belief that benzodiazepine use leads to dependence, indicating that these users of hypnotics are more sensitive to the idea of dependence than users of anxiolytics. It is conceivable that after initiation, benzodiazepine users continue use because of benefits at the start of use. Once an experienced user, they become aware of dependence. The implication is that more information about risks of benzodiazepine dependence should be given at the initial usage period, like at the first repeat prescription.

In our findings for inexperienced users, hypnotic use was negatively related to attitudes, but positively related to intention or behaviour. Thus a negative attitude to drug use may arise from warnings against the side effects

of these medicines, like drug dependency. However, despite this negative attitude, their great need for a sleeping pill to overcome insomnia presumably led to higher levels of intentions and use.

We conclude that our integrated model provides insight into variables describing and predicting the behaviour of benzodiazepine use. In particularly, the model of experienced users provided a good description of the drug-taking behaviour including predictors such as age, dependency-related variables, and attitude-related variables. For inexperienced users we found fewer determinants of length of benzodiazepine use. Not surprisingly, for inexperienced users, their own and their prescribers' perceived attitude were strong determinants. Results of both models outline a perceived image of the physician in favour of benzodiazepine use. We believe that the physician plays a crucial role in shaping a patient's attitude towards a drug, in particular towards a limited length of use and, in case of prolonged use, dose escalation. At initiation of use and at each benzodiazepine repeat prescription, we recommend that physicians and pharmacists provide information about limited length of use, thus reducing positive attitudes and dependence. In short, it is important that pharmacists and physicians clearly explain the risks and benefits of benzodiazepine therapy.

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