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Craving for benzodiazepines : the development of the benzodiazepine craving questionnaire

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Citation
Mol, A. J. J. (2007, September 20). *Craving for benzodiazepines : the development of the benzodiazepine craving questionnaire*. Department psychiatry, Medicine / Leiden University Medical Center (LUMC), Leiden University. Retrieved from https://hdl.handle.net/1887/12349

Version:	Corrected Publisher's Version
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Downloaded from:	https://hdl.handle.net/1887/12349

Note: To cite this publication please use the final published version (if applicable).

Chapter 3

Associations of benzodiazepine craving with other clinical variables in a population of general practice patients

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(Comprehensive Psychiatry 2005;46:353-360)

ABSTRACT

Background – The aim of this study was to (1) describe the characteristics of patients reporting craving for benzodiazepines (BZs) and (2) to search for associations between BZ craving and other clinical variables in a population of general practice (GP) patients who have made an attempt to discontinue their long-term BZ use.
Methods – The Benzodiazepine Craving Questionnaire (BCQ) and other self-report questionnaires were administered once to a population of 113 long-term and 80 former long-term GP BZ users participating in a large BZ reduction trial in GP. Cross-sectional data were gathered on self-reported BZ craving (BCQ), self-reported BZ dependence severity (Bendep-SRQ), psychopathology (General Health Questionnaire 12-item version; Medical Outcome Study Short-Form 36-item version), mood state (Profile of Mood States), personality (Dutch shortened MMPI), and lifestyle characteristics. Differences between patients who reported craving and patients who did not were analyzed univariately. Multivariate analyses were performed on variables significantly associated with craving, controlling for current use status.
Results – (1) Patients reporting craving differed significantly from patients not reporting craving on aspects of BZ dependence severity, psychopathology, negative mood state, and personality. (2) Negative mood and somatization were positively associated with BZ craving, although only the contribution of negative mood to craving was statistically significant for the total group of (former) BZ users (p = .002).
Conclusions – Self-reported negative mood and somatization are positively associated with BZ craving. In future BZ craving research, personality factors should be further explored.

INTRODUCTION

Craving is a psychobiological phenomenon that is regarded as an important aspect of dependence. In International Statistical Classification of Diseases, 10th Revision, but not in Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, a 'strong desire or compulsion' to use a drug is one of the diagnostic criteria for dependence.[1,2]

Empirical research and psychological theories and models on craving tend to focus on craving for alcohol, nicotine, cocaine, and opiates. From a theoretical perspective, the occurrence of craving has been associated grossly with (a) dependence and drug-use aspects (i.e., aversive aspects of the drug-withdrawal syndrome and positive reinforcing drug effects), (b) mood states, and (c) cognitive labeling (i.e., craving representing the cognitive labeling of physiological processes) (e.g. Refs [3-6]). Each theoretical model provides a different conceptualization of craving, but none of these models provide a full explanation of the craving phenomenon, suggesting that multiple mechanisms may be involved.[4,7] Experiments to compare theories with one another have not been conducted yet.

From an empirical perspective, there is evidence, although sometimes inconsistent, that craving is associated with (a) personality factors, such as sensation seeking, impulsiveness, neuroticism, extraversion;[11] (b) (situation specific) mood states;[8,10] (c) dependence;[9,10] (d) psychopathology (such as a general negative affective state, i.e. depressive symptomatology).[12]

Despite the accumulating evidence for benzodiazepines (BZs) to cause dependence e.g.[13,14]), and the fact that they are widely prescribed in the Western world,[15] craving research on BZs has hardly been done (for a discussion, see Ref [16]). In an attempt to fill this gap, the 32-item Benzodiazepine Craving Questionnaire (BCQ), the first multi-item instrument to assess BZ craving, was developed recently. The BCQ was based on the Questionnaire on Smoking Urges and the Cocaine Craving Questionnaire.[17,18] It proved to be a reliable and valid Rasch homogeneous self-report craving measure in a general practice (GP) population of long-term BZ users.[16]

The goal of the present study is (1) to expand our knowledge on BZ craving, that is, to describe the characteristics of patients experiencing BZ craving and to describe which subject-related variables were associated with BZ craving in a population of GP patients who recently discontinued their long-term BZ use or failed to do so. (2) We seek to determine to what length our data would support existing craving theories and empirical findings on craving occurrence. We used the BCQ as the measure for BZ craving. Based on associations frequently found with craving in other substances, associations with variables from the following domains were investigated with both univariate and multivariate approaches: BZ dependence (severity), psychopathology, mood state, personality, and lifestyle.

METHODS

Setting

Patients from a large study on the efficacy of a 2-part treatment intervention that aimed to reduce long-term BZ use in GP in the Netherlands completed a number of questionnaires.[19,20] The study was carried out between August 1998 and December 2001. Patients' responses to the BCQ at first assessment (baseline interview) formed the basis of the present study.

Subjects and procedure

We identified long-term BZ users (i.e., use for more than 3 months) by means of a computerized search for BZ prescriptions at 30 general practices with 55 GPs and a total of about 118000 patients. Exclusion criteria were current psychiatric treatment, current treatment for drug or alcohol dependence, medical history of psychosis, epilepsy, insufficient mastery of the Dutch language, or a terminal illness. Furthermore, patients could be excluded specifically on the GPs request, because of severe comorbidity or for psychosocial reasons. Patients who met the definition of long-term use (n = 2004) were sent a letter by their GP with the advice to discontinue their BZ use gradually.[19,21] Three months later, they were invited to consult their GP to evaluate their current BZ use status and the preceding period. At this consultation, the GP asked the respondents (n = 1321) to participate in the study. After full explanation of the study procedures, 317 patients provided written informed consent to participate in the study.

Sample size

Of the 317 patients who enrolled in the study, 28 patients dropped out before the first assessment. The remaining 289 patients participated in the baseline interview. Not all the patients could be given the BCQ at baseline, because of a delay in the development of the questionnaire. However, analysis showed that there were no significant differences between the patients who received the BCQ at baseline (n = 193) and the patients who had not received the BCQ (n = 82) or had received the BCQ but had missing BCQ values (n = 14). At the time of the interview, about 42% of the patients who received the BCQ at baseline had discontinued their use in the 3 months after receiving the letter from their GP (80/193).

Measures

During the baseline interview, the BCQ was administered.[16] Information on lifestyle was obtained: sociodemographic characteristics, nicotine, alcohol and caffeine use, and data from a questionnaire measuring the extent of problem drinking (alcohol users only).[22] Dependence characteristics were obtained assessing BZ use features, severity of BZ dependence (Bendep-SRQ),[23,24] and BZ withdrawal symptoms during discontinuation (BWSQ2).[25,26] We used the Dutch shortened MMPI (NVM) to assess personality traits: negativism, somatization, shyness, psychopathology, and extraversion,[27] and the Profile of Mood States (POMS) Dutch shortened version, to measure 5 short-term changeable mood

states (depression, anger, fatigue, vigor, and tension).[28] Presence and severity of psychopathology were assessed with the General Health Questionnaire 12-item version (GHQ-12), a measure of psychological well-being,[29] and the Medical Outcome Study Short-Form 36-item version (MOS SF-36), a measure of health-related quality of life on 8 different health domains (physical functioning, role functioning - physical problem, role functioning - emotional problem, vitality, mental health, social functioning, pain, and general health).[30] All questionnaires were multi-item, self-report scales with satisfactory reliability and validity. Specially trained interviewers interviewed the patients at their homes

Data analyses

All data analyses were done using SPSS 10.0.5 (SPSS Inc, Chicago, Ill). To analyze differences on independent variables between patients who reported craving and patients who did not, we used Pearson χ^2 test and Mann-Whitney *U* test. After controlling for potential interaction effects of current use status via bivariate logistic regression analysis, variables still significantly associated with craving were entered into a multivariate logistic regression analysis using forward and backward elimination procedures, with craving yes/no as the dependent variable. For explorative purposes, all *p*-values were initially set at .05. For the final multivariate tests, α was set to .003, correcting for multiple testing (Bonferroni correction).

RESULTS

Characteristics of the study participants

Table 1 shows the characteristics of the study participants who received the BCQ at baseline. The majority of patients were elderly, female, married, had a secondary-education level, and were living on a pension. About half of the patients used alcohol and/or nicotine, and the majority used caffeine. On average, BZ dosage did not exceed the therapeutic dosage recommended by the World Health Organization. Given the skewed distribution of the craving data, momentary craving for BZs was coded as a dichotomous variable: 0 if a patient reported no craving for BZs at all, and 1 if any craving for BZs was present. About 33% of the patients indicated experiencing craving to some extent.

However, the average BCQ score (i.e., the average craving severity) was low. Scores on the withdrawal symptoms questionnaire were lower than those found by Tyrer et al[25] in a population of putative pharmacological dependent patients. The overall average severity of BZ dependence in our population was low. Based on the norm scores of the Dutch Shortened MMPI for the general Dutch population, our patients scored high on somatization, above average on shyness, and below average on extraversion. Patients rated their overall health-related well-being or functioning about 10 to 20 points lower than the averages of the Dutch population.[31] Based on a cutoff rate of two third on the GHQ-12, 26% of the patients could be classified as 'psychiatric cases'.[32] As for the POMS

subscales, the proportion of patients in the fifth quintile was 40% for depression, 25% for anger, 36% for fatigue, 28% for having no vigor, and 29% for tension, based on the sex-adjusted norm scores for the Dutch population.[28]

Table 1 Subject characteristics of the BCQ population

	Total group (n = 193)	
	n/mean	%/SD
Background and lifestyle characteristics		
Female	131	67.9%
Age, mean (SD) in years	62.9	12.0
Marital status		
No relationship	13	6.7%
Steady relationship (including married)	127	65.8%
Divorced	10	5.2%
Widowed	43	22.3%
Living alone	61	31.6%
Highest level of education		
Primary level	61	31.6%
Secondary level	123	63.7%
Advanced	9	4.7%
Financial income		
Income by profession	27	14.0%
Benefit (unemployment or disability)	36	18.7%
Pension	90	46.6%
Partner's income	26	13.5%
Otherwise	14	7.3%
Nicotine use		
Nicotine users	80	41.5%
Mean (SD) cigarettes per day among cigarette smokers (n = 79)	16.5	10.9
Alcohol use		
Drinking alcohol	98	50.8%
Mean (SD) units per week among drinkers	9.6	8.4
Problem drinkers among drinkers[a]	16	16.3%
Cornel score (n = 98), mean (SD) total score	1.0	1.7
Caffeine use		
Caffeine users	130	67.4%
Mean (SD) units per day among caffeine users	4.4	2.8
Benzodiazepine use		
Duration, mean (SD) in months[b]	129.9	108.2
Daily dosage at assessment, mean (SD) in mg diazepam equivalents[c]	6.9	8.1
Daily dosage previous 3 months, mean (SD) mg diazepam equivalents[d]	6.7	6.9
Discontinued after letter from GP with advice to discontinue BZ use	80	41.5%
Craving		
Craving severity (BCQ), mean (SD) total score	1.2	3.2
No craving (total score = 0)	129	66.8%
Craving (total score > 0)	64	33.2%
Dependence characteristics		
Withdrawal symptoms (BWSQ2) (n = 191), mean (SD) total score	6.1	6.7
BZ dependence severity (Bendep-SRQ), mean (SD) total score		
Problematic use (n = 191)	1.2	1.2
Preoccupation (n = 192)	1.4	1.6
Lack of compliance (n = 192)	0.3	0.7
Withdrawal (n = 178)	1.1	1.6

Table continues on the next page

Table 1 continued	n/mean	%/SD
Personality characteristics		
Dutch Shortened MMPI (NVM), mean (SD) total score		
Negativism	12.2	7.5
Somatization	14.0	7.8
Shyness	10.5	7.1
Psychopathology	2.9	3.1
Extraversion	13.2	5.6
Psychopathology		
Psychological wellbeing (GHQ-12, Goldberg), mean (SD) total score (n = 192)	2.0	3.1
Health related quality of life (MOS SF-36), mean (SD) (range 0 - 100)		
Physical functioning	68	26
Role functioning – physical problem (n = 192)	60	41
Pain	64	25
General health perception	58	22
Vitality	58	23
Social functioning	66	21
Role functioning - emotional problem	69	40
Mental health	68	19
Mood state		
Short-term changeable mood states (POMS), mean (SD) total score		
Depression	12.8	6.2
Anger	11.0	5.1
Fatigue	12.2	5.9
Vigour	15.0	4.7
Tension	11.8	5.5

[a] Score ≥ 3 on Cornel Questionnaire.[22]

[b] Based on patients who discontinued and did not discontinue their BZ use in the previous 3 months.

[c] Current BZ users only.

[d] Based on recorded consumption extracted from the GP's clinical database.

Associations with BZ craving

The Bendep-SRQ subscale withdrawal was left out of the analyses because patients only filled in the withdrawal section of the Bendep-SRQ if they had ever discontinued or attempted to discontinue their BZ use in the past.

As many as 16 variables were found to be significantly correlated with craving in univariate analyses at $p < .05$. In the group that reported craving for BZs (n = 64), significantly fewer patients had discontinued their BZ use in the 3 months after receiving the letter from their GP than in the group that did not report craving (n = 129). Craving was reported by 22.5% (18/80) of the patients who had discontinued their use vs 40.7% (46/113) of those who had not. Of all patients who experienced craving, 71.8% (46/64) were still using BZs compared with 51.9% (67/129) of all patients who did not experience craving (see Table 2A). With respect to the subgroup that failed to discontinue its use (n = 113), patients reporting craving used BZs in significantly higher daily dosages than patients not reporting craving (see Table 2B).

Patients reporting craving scored significantly higher on the withdrawal symptoms

questionnaire and were significantly more often preoccupied with the availability of BZs. They also scored significantly higher on Dutch Shortened MMPI subscales negativism (respectively average vs below average as compared with the general Dutch population), somatization (very high vs high), and psychopathology (high vs average) than did patients who did not report craving. Patients reporting craving rated their health-related quality of life significantly lower on 4 of 8 subscales and about 15 to 30 points lower than the averages of the Dutch population. Thirty-nine percent of the patients reporting craving could be classified as 'psychiatric cases' vs 20% in the nonreporting group. Patients reporting craving scored significantly higher on POMS subscales depression, anger, fatigue, and tension. The proportions of patients in the fifth quintile were respectively 48% vs 36% for depression, 33% vs 21% for anger, 45% vs 31% for fatigue, and 39% vs 23% for tension (see Table 2B).

As about 42% of the population had discontinued their BZ use, which led to missing data on BZ dosage for these patients, mean daily BZ dosage was left out of further analyses. Patients who had discontinued BZ use and patients who were still using BZs differed significantly on BCQ sum scores. Therefore, it was important to rule out the potential interaction effect of current use status. Using bivariate logistic regression analyses, we did not detect an interaction effect. Subsequently, 8 variables were still significantly associated with craving (at $p < .05$ for explorative purposes) after correcting for current use status (see Table 2B).

These 8 variables were entered in a logistic regression analysis forward stepwise (Wald) procedure ($n = 192$) with craving yes/no as the dependent variable. Block I consisted of current use status (discontinued BZ use yes/no) and block II of the 8 variables. This analysis yielded 1 independent 'predictor': POMS depression (see Table 3A). We attempted to confirm this finding in a logistic regression analysis backward stepwise (Wald) procedure, with block I the current use status (discontinued BZ use yes/no) and block II the 8 variables. Two nonsignificant 'predictors' of craving were yielded: POMS subscale depression and Dutch Shortened MMPI subscale somatization (see Table 3B). After omitting depression from the list of variables and conducting another logistic regression forward stepwise (Wald) procedure analysis as described above, somatization remained as the sole significant 'predictor' of craving (see Table 3C). Reversed, after omitting somatization from the list of variables, depression remained as the sole 'predictor' of craving (see Table 3D).

Further analysis revealed a high and significant correlation between depression and somatization (Pearson = 0.51, $p < .001$). As the influence of block I current use status was not significant at $\alpha = .003$, we cannot pronounce upon its influence on depression, respectively, somatization, and craving.

Table 2A 2 × 2 table of results for craving yes/no and benzodiazepine use yes/no

n = 193			Benzodiazepine use		
			No	Yes	
Craving	**No**	n	62	67	*n* = 129
		Row %	48.1	51.9	
		Column %	77.5	59.3	
		Table %	32.1	34.7	
	Yes	n	18	46	*n* = 64
		Row %	28.1	71.9	
		Column %	22.5	40.7	
		Table %	9.3	23.8	
			n = 80	*n* = 113	

Table 2B Differences between patients reporting craving ('cravers') and patients not reporting craving ('noncravers')

	'noncravers' (n = 129)		'cravers' (n = 64)			
	n/mean	%/SD	n/mean	%/SD	significance	
Benzodiazepine use						
Discontinued BZ use after letter from GP	62	48.1%	18	28.1%	Pearson = 7.006, *df* = 1	*p* = .008
Daily dosage, mean (SD) mg diazepam equiv. (*n* = 67 vs. *n* = 46)[a]	5.2	4.6	9.3	11.2	*z* = -2.075	*p* = .038[b]
Dependence characteristics						
BWSQ2 mean (SD) total score (*n* = 128 vs *n* = 63)	5.4	6.3	7.5	7.2	*z* = -2.200	*p* = .028
Bendep-SRQ, mean (SD) total score						
Preoccupation (*n* = 128 vs *n* = 63)	1.2	1.5	1.8	1.7	*z* = -2.491	*p* = .013
Withdrawal (*n* = 117 vs *n* = 61)[b]	.8	1.5	1.7	1.7		
Personality characteristics						
Dutch Shortened MMPI, mean (SD) total score						
Negativism	11.1	6.8	14.3	8.5	*z* = -2.598	*p* = .009[c]
Somatization	12.7	7.0	16.6	8.7	*z* = -2.906	*p* = .004[c]
Psychopathology	2.6	2.8	3.6	3.6	*z* = -2.053	*p* = .040
Psychopathology						
GHQ-12, mean (SD) total score (*n* = 128 vs *n* = 64)	1.6	2.9	2.8	3.5	*z* = -2.799	*p* = .005[c]
MOS SF-36, mean (SD) (range 0 – 100)						
General health perception	60	21	54	21	*z* = -2.064	*p* = .039
Social functioning	68	20	60	22	*z* = -2.438	*p* = .015[c]
Role functioning - emotional problem	73	38	60	42	*z* = -2.209	*p* = .027[c]
Mental health	71	19	63	19	*z* = -3.406	*p* = .001[c]
Mood state						
POMS, mean (SD) total score						
Depression	11.7	5.2	14.9	7.3	*z* = -3.143	*p* = .002[c]
Anger	10.3	4.5	12.3	6.0	*z* = -2.156	*p* = .031[c]
Fatigue	11.6	5.8	13.4	6.0	*z* = -2.372	*p* = .018
Tension	11.2	5.2	13.1	5.9	*z* = -2.086	*p* = .037

[a] Current BZ users only.

[b] Left out of the analyses because of missing data and potential selection bias.

[c] These variables remained significant at p = .05 after correcting for current use status.

Table 3A Logistic regression forward stepwise (Wald) method

N = 192		Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Block 1	current use status	4.938	1	0.026	2.121	[1.093 – 4.118]
Block 2	depression	9.350	1	0.002	1.086	[1.030 – 1.144]
Step χ^2 = 10.1; *df* = 1; *p* = .001						
Block χ^2 = 10.1; *df* = 1; *p* = .001						
Model χ^2 = 17.5; *df* = 2; *p* < .001						

Table 3B Logistic regression backward stepwise (Wald) method

N = 192		Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Block 1	current use status	4.529	1	0.033	2.066	[1.059 – 4.029]
Block 2	somatization	3.015	1	0.082	1.042	[0.995 – 1.091]
	depression	3.643	1	0.056	1.059	[0.998 – 1.124]
Step 7:						
Step χ^2 = -1.2; *df* = 1; *p* = .268						
Block χ^2 = 13.1; *df* = 2; *p* = .001						
Model χ^2 = 20.6; *df* = 3; *p* < .001						

Table 3C Logistic regression forward stepwise (Wald) method without depression

N = 192		Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Block 1	current use status	5.252	1	0.022	2.168	[1.118 – 4.201]
Block 2	somatization	8.933	1	0.003	1.064	[1.022 – 1.108]
Step χ^2 = 9.4; *df* = 1; *p* = .002						
Block χ^2 = 9.4; *df* = 1; *p* = .002						
Model χ^2 = 16.8; *df* = 2; *p* < .001						

Table 3D Logistic regression forward stepwise (Wald) method without somatization

N = 192		Wald	df	Sig.	Exp(B)	95% CI for Exp(B)
Block 1	current use status	4.938	1	0.026	2.121	[1.093 – 4.118]
Block 2	depression	9.350	1	0.002	1.086	[1.030 – 1.144]
Step χ^2 = 10.1; *df* = 1; *p* = .001						
Block χ^2 = 10.1; *df* = 1; *p* = .001						
Model χ^2 = 17.5; *df* = 2; *p* < .001						

DISCUSSION

To the best of our knowledge, this is the first study in which the characteristics of a population of (former) BZ users reporting BZ craving are described. It is also the first study in which clinical variables associated with BZ craving are identified on the basis of cross-sectional data, gathered through self-report questionnaires in a GP population.

We found that patients who reported craving differed from patients who did not on aspects of 4 of the 5 examined domains (namely, BZ dependence, psychopathology, negative mood state, and personality). Patients reporting craving were worse off on all 4 domains. One apparent characteristic of patients reporting craving was the very high tendency to react to psychological strain with physical complaints (somatization) compared

with the general Dutch population. If patients had not discontinued their use in the previous 3 months, it was more likely that they reported craving at the time of the interview. Among patients who had not discontinued their BZ use and reported craving, the average BZ consumption at the time of the interview was higher than among patients who had not discontinued but did not report craving.

The second finding of this study was that self-reported depression and somatization, after correcting for BZ use status, were most strongly associated with BZ craving, although not statistically significant in the group as a whole. The fact that no single factor emerged appeared to be due to the high correlation between somatization, depression, and also current BZ use status. However, in the group as a whole, depression seemed to be the major contributor to BZ craving. This meant that patients with a negative mood going together with a feeling of personal inadequacy, unworthiness, and feelings of guilt have a higher chance in reporting craving and vice versa.

Our findings are in line with some laboratory and field studies that have looked at the influence of negative mood state on experienced craving and craving severity. For example, Litt et al[33] found that the presence of negative mood states alone appeared to be sufficient to elicit desire for alcohol in some subjects, regardless of other cues. Moreover, negative affect, both as a dispositional characteristic (e.g., neuroticism) and as a transient mood state, seems to play a key role in craving.[10]

In explanation of the relationship between somatization and BZ craving, we can turn to the cognitive labelling theories (e.g., Refs [34-36]), which are based on the cognition-arousal theory of emotion and applied to drug craving.[37] These theories state that craving represents the operation of an attributional process whereby physiological reactions are interpreted as desires to use the drug.[38] However, because of the absence of a formally developed cognitive labeling model of dependence, more specifically of craving, there are no published studies so far that directly test any predictions derived from such a model.[3]

We found a strong positive association between negative affect and somatization. Watson and Pennebaker[39] found negative affect to be associated with a broad range of subjective complaints, reflected in high scores on health complaint scales. One can hypothesize that patients with negative affect have an elevated bodily awareness, thus perceiving physical symptoms more quickly. In the case of BZ dependence or long-term use, patients may tend to focus on adverse bodily feelings and label them as a need for a BZ. Our study has stressed the need to specify the cognitive labeling model in craving research.

There are some limitations to our study. Because of a cross-sectional design, statements about causal relationships between craving and somatization or depression cannot be made. Future studies should make clear whether somatization and depression are predictors of BZ craving in longitudinal research. Secondly, a high score on the Dutch Shortened MMPI subscale somatization can be obtained when a patient has a somatic illness, without true somatization. Somatic comorbidity was not taken into account in this study. As the sum scores of the MOS SF-36 physical illness subscales are comparable for patients

experiencing craving and patients not experiencing craving, it is unlikely that the very high scores on somatization in patients who crave are primarily caused by physical illness. Thirdly, although we found somatization and depression as 2 joint associations with BZ craving, odds ratios are low, indicating modest relevance for clinical practice and some caution with respect to statements about applicability of existing craving theories and comparability to other studies. As our study took place in the patient's natural environment, it is difficult to compare our results to cue-reactivity studies that mainly took place in laboratories. Fourthly, the fact that craving could not be explained convincingly may be related to the fact that relatively few patients in our population reported BZ craving (33%) and that the average severity was low. This might be explained by some selection bias as patients experiencing higher craving and dependence on BZs may have refused to participate in the study. Possibly, more and more severe craving can be found in a (clinical) population with more (severe) affective complaints and lower physical and psychological well-being. On the other hand, the fact that all our patients expressed the wish to discontinue their BZ use makes it a clinically relevant population. Moreover, in contrast to some other studies that use single-item questionnaires or visual analogue scales with unknown psychometric properties to assess craving (e.g., Ref [10]), we used a multi-item Rasch homogeneous questionnaire with satisfactory psychometric properties.[16]

To conclude, our study has made a small but valuable contribution to filling the gap in BZ-craving research. As proposed by some researchers, personality may be seen as an important explanatory construct in many conceptualizations of craving and may account for individually different manifestations of craving.[7] Future research should be directed at concretizing this relationship between personality and BZ craving.

Acknowledgments

The authors wish to thank J Mulder for his contribution to the statistical analyses.

REFERENCES

1 World Health Organization. The ICD-10 classification of mental and behavioural disorders: diagnostic criteria for research. Geneva: World Health Organization; 1992.

2 American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. Washington (DC): American Psychiatric Association; 1994.

3 Tiffany ST. The role of cognitive factors in reactivity to drug cues. In: Drummond DC, Tiffany ST, Glautier S, Remington B, editors. Addictive Behaviour: Cue Exposure Theory and Practice. The Wiley Series in Clinical Psychology. Oxford (England): Wiley; 1995. p. 137-165.

4 Singleton EG, Gorelick DA. Mechanisms of alcohol craving and their clinical implications. In: Garlanter M, editor. Recent Developments in Alcoholism, volume 14: the Consequences of Alcoholism. New York: Plenum; 1998. p. 177-195.

5 Lowman CL, Hunt WA, Litten RZ, Drummond DC. Research perspectives on alcohol craving: an overview. Addiction 2000;95:S45 - S54.

6 Drummond DC. Theories of drug craving, ancient and modern. Addiction 2001;96: 33 - 46.

7 Verheul R, Van den Brink W, Geerlings P. A three-pathway psychobiological model of craving for alcohol. Alcohol Alcohol 1999;34:197 - 222.

8 Greeley JD, Swift W, Heather N. Depressed affect as a predictor of increased desire for alcohol in current drinkers of alcohol. Br J Addict 1992;87:1005-1012.

9 Greeley JD, Swift W. Reactivity of alcohol-related cues in heavy and light drinkers. J Stud Alcohol 1993;54:359 - 368.

10 Litt MD, Cooney NL, Morse P. Reactivity to alcohol-related stimuli in the laboratory and in the field: predictors of craving in treated alcoholics. Addiction 2000;95:889 - 900.

11 Reuter M, Netter P. The influence of personality on nicotine craving: a hierarchical multivariate statistical prediction model. Neuropsychobiology 2001;44:47 - 53.

12 Elman I, Karlsgodt KH, Gastfriend DR, Chabris CF, Breiter HC. Cocaine-primed craving and its relationship to depressive symptomatology in individuals with cocaine dependence. J Psychopharmacol 2002;16:163 - 167.

13 Kan CC, Breteler MHM, Zitman FG. High prevalence of benzodiazepine dependence in out-patient users, based on the DSM-III-R and ICD-10 criteria. Acta Psychiatr Scand 1997;96:85 - 93.

14 Lader M. History of benzodiazepine dependence. J Subst Abuse Treat 1991;8:53 -5 9.

15 Zandstra SM, Furer JW, Van de Lisdonk EH, Van 't Hof M, Bor JHJ, Van Weel C, et al. Different study criteria affect the prevalence of benzodiazepine use. Soc Psychiatry Psychiatr Epidemiol 2002;37:139 - 144.

16 Mol AJJ, Oude Voshaar RC, Gorgels WJMJ, Breteler MHM, Van Balkom AJLM, Van de Lisdonk EH, et al. Development and psychometric evaluation of the benzodiazepine craving questionnaire. Addiction 2003;98:1143 - 1152.

17 Tiffany ST, Drobes DJ. The development and initial validation of a questionnaire on smoking urges. Br J Addict 1991;86:1467 - 1476.
18 Tiffany ST, Singleton E, Haertzen CA, Henningfield JE. The development of a cocaine craving questionnaire. Drug Alcohol Depend 1993;34:19 - 28.
19 Oude Voshaar RC, Gorgels WJMJ, Mol AJJ, Van Balkom AJLM, Breteler MHM, Van de Lisdonk EH, et al. Predictors of relapse after discontinuation of long-term benzodiazepine use by minimal intervention; a 2-year follow-up study. Fam Pract 2003;20:370 -372.
20 Oude Voshaar RC, Gorgels WJMJ, Mol AJJ, Van Balkom AJLM, Van de Lisdonk EH, Breteler MHM, et al. Tapering off long-term benzodiazepine use with or without group cognitive-behavioural therapy: three-condition, randomised controlled trial. Br J Psychiatry 2003;182:498 - 504.
21 Cormack MA, Sweeney KG, Hughes-Jones H, Foot GA. Evaluation of an easy, cost-effective strategy for cutting benzodiazepine use in general practice. Br J Gen Pract 1994;44:5 - 8.
22 Cornel M, Knibbe RA, Van Zutphen WM, Drop MJ. Problem drinking in a general practice population: the construction of an interval scale for severity of problem drinking. J Stud Alcohol 1994;55:466-470.
23 Kan CC, Breteler MHM, Timmermans EA, Van der Ven AHGS, Zitman FG. Scalability, reliability, and validity of the benzodiazepine dependence self-report questionnaire in outpatient benzodiazepine users. Compr Psychiatry 1999;40:283 - 291.
24 Oude Voshaar RC, Mol AJJ, Gorgels WJMJ, Breteler MHM, Van Balkom AJLM, Van de Lisdonk EH, et al. Cross-validation, predictive validity, and time course of the Benzodiazepine Dependence Self-report Questionnaire in a Benzodiazepine Discontinuation Trial. Compr Psychiatry 2003;44:247 - 255.
25 Tyrer P, Murphy S, Riley P. The benzodiazepine withdrawal symptom questionnaire. J Affect Disord 1990;19:53 - 61.
26 Couvée JE, Zitman FG. The Benzodiazepine Withdrawal Symptom Questionnaire: psychometric evaluation of BWSQ during a discontinuation program in depressed chronic benzodiazepine users in general practice. Addiction 2002;97:337 - 345.
27 Luteijn F, Kok AR. NVM: Nederlandse Verkorte MMPI [NVM: Dutch shortened MMPI]. Lisse, the Netherlands: Swets & Zeitlinger BV; 1985.
28 Wald FDM, Mellenbergh GJ. De verkorte versie van de Nederlandse vertaling van de Profile of Mood States (POMS) [The shortened version of the Dutch translation of the Profile of Mood States (POMS)]. Ned Tijdschr Psychol 1990;45:86 - 90.
29 Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol Med 1997; 27:191 - 197.
30 Ware Jr JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. Med Care 1992;30:473 - 483.

31 Van der Zee KI, Sanderman R. Het meten van de algemene gezondheidstoestand met de RAND-36. Een handleiding [Measuring general health status with the RAND-36. Users manual]. Groningen, the Netherlands: Northern Center for Health Care Research; 1993.
32 Koeter MWJ, Ormel J. General Health Questionnaire. Nederlandse bewerking [General Health Questionnaire. Dutch adaptation]. Lisse, the Netherlands: Swets Test Services; 1998.
33 Litt MD, Cooney NL, Kadden RM, Gaupp L. Alcohol cue reactivity. Addict Behav 1990;15:137 - 146.
34 Kozlowski LT, Wilkinson DA. Use and misuse of the concept of craving by alcohol, tobacco, and drug researchers. Br J Addict 1987;82:31 - 45.
35 Shiffman S. Comments on Kozlowski & Wilkinson's 'Use and misuse of the concept of craving by alcohol, tobacco, and drug researchers'. Craving: don't let us throw the baby out with the bathwater. Br J Addict 1987;82:37 - 38.
36 Drummond DC, Cooper T, Glautier SP. Conditioned learning in alcohol dependence: implications for cue exposure treatment. Br J Addict 1990;85:725- 743.
37 Schachter S, Singer J. Cognitive, social, and physiological determinants of emotional state. Psychol Rev 1962;69:379 - 399.
38 Tiffany ST. A cognitive model of drug urges and drug-use behavior: role of automatic and nonautomatic processes. Psychol Rev 1990;97:147 - 168.
39 Watson D, Pennebaker W. Health complaints, stress, and distress: exploring the central role of negative affectivity. Psychol Rev 1989; 96:234 - 254.