Validation and reliability of the German version of the Chronic Pain Grade questionnaire in primary care back pain patients

Validität und Reliabilität der deutschen Version des "Chronic Pain Grade Questionnaire" bei Rückenschmerzpatienten aus der primärärztlichen Versorgung

Abstract

In 1992 Von Korff and his co-workers developed a simple, brief questionnaire to assess the severity of chronic pain problems, the Chronic Pain Grade (CPG). The present study was conducted to analyse the psychometric properties of the translated German version of the CPG within a population of primary care back pain patients (n=130). Factor analysis yielded two factors which accounted for 72% of the variance of the questionnaire. The first factor 'Disability Score' (53.56% of the variance) revealed a good internal consistency (alpha=.88), the internal consistency of the second factor 'Characteristic Pain Intensity' was moderate (alpha=.68). The reliability of the whole instrument was good (alpha=.82). The CPG and its subscales show moderate to high relations with other instruments assessing the patient's disability (FFbH-R, Pain Disability Index PDI). Additionally weak to moderate but significant correlations were found between the CPG and other measures of grading and staging chronic pain (MPSS, RGS). Further, positive correlations between the CPG and both, the frequency of doctor visits and the frequent use of pain medication have been seen. The reported findings suggest, that the German version of the CPG is a reliable, valid and useful instrument if a brief, simple method of grading the severity of chronic pain is needed. The German version leads to a better comparability between German and English language studies and facilitates an international collaboration in this field of research.

Keywords: low back pain, chronicity, grading, disability, validation

Zusammenfassung

Von Korff et al. entwickelten 1992 einen einfachen, kurzen Fragebogen zur Erfassung des Schweregrades von chronischen Schmerzerkrankungen, den „Chronic Pain Grade" (CPG). Die hier vorgestellte Studie wurde durchgeführt, um die psychometrischen Eigenschaften der deutschen Übersetzung des CPG an einer Stichprobe chronischer Rückenschmerzpatienten aus der primärärztlichen Versorgung (n=130) zu überprüfen. Eine Faktorenanalyse führte zu zwei Faktoren, die insgesamt 72% der Varianz aufklären. Der erste Faktor „Disability Score" (53.56% Varianzaufklärung) weist eine gute innere Konsistenz auf (Cronbach's alpha = .88), die Reliabilität des zweiten Faktors „Characteristic Pain Intensity" ist zufriedenstellend (Cronbach's alpha = .68). Die innere Konsistenz für das gesamte Verfahren ist gut (Cronbach's alpha = .82). Der CPG und seine Subskalen weisen mittlere bis hohe Korrelationen mit weiteren Instrumenten zur Erfassung von körperlicher bzw. psychosozialer Beeinträchtigung auf (Funktionsfragebogen Hannover-Rücken FFbH-R, PDI). Des Weiteren konnten schwache bis mäßige, aber statistisch signifikante Korrelationen mit anderen Staging- bzw. Grading-Instrumenten (MPSS,

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RGS) gefunden werden. Schließlich zeigten sich mit zunehmendem Schweregrad im CPG eine Zunahme der Anzahl von Arztbesuchen sowie eine vermehrte Einnahme von Schmerzmedikamenten. Die deutsche Version des CPG erwies sich damit als ein reliables und valides Instrument zur Erhebung des Schweregrades chronischer Schmerzen, welches einfach in der Handhabung ist und die Vergleichbarkeit zwischen englisch- und deutschsprachigen Forschungsarbeiten erleichtert.

Introduction

Chronic low back pain is an important cause of personal suffering and disability with a number of aversive social consequences. Life-time incidence of acute, so called "unspecific", low back pain in western industrial nations varies between 60% and 85% respectively [1], [2]. However the underlying problem consists of its disposition to relapse and persist. As chronic pain is now accepted as a multidimensional state, pain intensity, pain persistence and pain-related disability may each be important attributes of this condition. Nevertheless a global measure of chronic pain severity is needed that summarizes different pain measures for several purposes: on the one hand it could be used to facilitate the communication among both clinicians and scientists. At present, study samples for example are characterized in a very heterogeneous way: in some studies the patients are asked about their momentary pain using visual analogue scales, others ask for pain in the last few days (or weeks, months) using a numerical rating scale. Furthermore, definitions and observed time periods vary considerably across different studies of chronic pain conditions. Finally a global measure of chronic pain severity could lead to a simple approach to describe the complex phenomenon of "chronification" in a generally accepted way. As chronic pain is an individual experience, which involves biological, psychological and social dimensions [3], a multidimensional, subjective measure of severity is likely to be most valid [4].

Von Korff et al. [4] developed a simple questionnaire based on measures of pain intensity and pain related disability, which has been validated in interview-based research in the USA ("The Chronic Pain Grade, CPG", [4]) as well as in postal research in the UK [5], [6]. The authors suggest a hierarchical model of pain severity in which pain intensity represents the lower range of pain severity whereas measures of pain related disability were expected to scale the upper range of severity. The CPG consists of 7 items providing a score which enables chronic back pain patients to be classified into one of four hierarchical categories corresponding to pain intensity or disability: Grade I, low disability - low pain intensity; Grade II, low disability - high pain intensity; Grade III, high disability - moderately limiting; Grade IV, high disability - severely limiting. Although Grade III and IV were assumed to be associated with high pain intensity, Von Korff et al. have found a limited number of patients with low or moderate pain intensity within these both grades. In addition to the categorical grading scheme, the CPG further contains numerical self-rating scores for characteristic pain intensity (CPI) and disability score (DS) [4], [6].

In its initial validation, Von Korff and his colleagues demonstrated that the CPG was positively associated with independent measures of pain-related disability, severity of depressive symptoms, measured with the SCL90-R depression subscale [7], frequent use of doctor visits and opioids for pain and with unemployment in primary care back pain patients. Furthermore they have shown that the pain intensity and disability items formed an unidimensional scale with good psychometric properties (Cronbach's alpha = .84). Smith et al. [5] validated the CPG in a postal survey of 293 patients in a General Practice setting (see also [8]). By confirmatory factor analysis they confirmed the CPG as an unidimensional scale with an internal consistency coefficient (Cronbach's alpha) of .91. Moreover the CPG displayed significant correlations of r=-.84 with the Bodily Pain Scale of the SF-36 [9], and correlations between r=-.49 and r=-.65 with the physical function, social function, physical role and emotional role scales of the a.m. instrument. Finally, the CPG was significantly associated with use of health care and medicines for pain. Recent studies could prove the CPG's ability to assess change over time [10] and the CPG's validity in patients with spinal cord injuries [11] and cerebral palsy [12].

Up to now, there exists no German language self-report instrument which is comparably short and which would have been validated in primary care patients. The major aim of the present study was to analyse and report the psychometric properties of the German language version of the CPG within a population of primary care back pain sufferers.

Subjects and methods

Subjects and study setting

Data for this research were obtained as part of a longitudinal psychosocial intervention study of primary care back pain patients in the area of Bochum (Ruhr-District), Germany. Subjects were recruited in General and Orthopaedics Practices respectively. The whole sample consisted of 167 consecutive Chronic Low Back Pain (CLBP) outpatients with low back pain with none or minor organic findings. Eligible Patients had made a visit for back pain (defined as thoracic and lumbar pain with or without distal radiation) to a participating practice. Subjects were required to be between 18 and 65 years and suffering from persistent or recurrent pain for at least three months.

Exclusion criteria were severe injuries of the back (e.g. neoplasms, fractures, herniated discs, which required immediate surgery). 7 patients were excluded due to severe diagnoses, 15 patients due to pain duration of less than 3 months and 15 patients due to age. Finally 130 Patients fulfilled all inclusion criteria. Self report data were obtained by a personal computer based self report instrument [13] which included a detailed medical history and several psychometric and pain-related questionnaires (s.b.).

Self report components

Medical history
The medical history contained detailed questions about pain (e.g. current duration, location, further pain sites) and some questions of pain related treatment (e.g. frequent use of pain medication, frequency of pain related doctor visits).

Chronic Pain Grade
The German version of the Chronic Pain Grade Questionnaire [4] was identical in terms of instruction and format with the original English version (see Appendices A (Figure 1) and B (Figure 2) for the original and German version). The translation of the CPG was carried out by the first author and examined by a native speaker who had no knowledge of the CPG. It consists of 6 items regarding pain intensity or disability, which were answered on an 11-point numerical self rating scale ranging from "0" to "10". Further, the number of days with disability during the past 3 months were assessed. The scoring rules were adapted from the original version, which has been validated based on the technique of Mokken analysis, a scaling method similar to Guttman Scale analysis [4]. By this technique the authors confirmed that pain disability and intensity measures formed a reliable hierarchical scale.

Convergent validity

Disability and functional impairment
In a further view of concurrent validity two measures of self-perceived disability were ascertained. The Pain Disability Index (PDI, [14]) is a 7 item inventory that asks the respondent to rate the degree to which pain interferes with functioning in different areas of daily life: family/home responsibilities, recreation, social activity, occupation, sexual behaviour, self-care and life-support activity. Each item score ranges from 0 (no interference) to 10 (total interference). Thus, the total PDI score ranges from 0 to 70. The German version of the PDI was found to be valid and reliable (Cronbach's Alpha =.88) in chronic pain patients [15].

The Funktionsfragebogen Hannover-Rücken FFbH-R is a self-report measure consisting of 12 items representing physical activities of daily living [16]. The patient is asked to rate if he or she is able to perform these activities (e.g., to put on one's socks) on a 3-point scale (1=yes, 2=yes, but with trouble, 3=no, or only with help). The overall score is expressed by an aggregate value of functional capacity ranging from 0 to 100 percent. The FFbH-R was found to be valid and reliable (Cronbach's alpha =.90) in

its initial validation study [16] and has been used in both national and international studies [17], [18].

Additional instruments assessing the severity of chronic pain problems
Two further instruments for grading and staging the severity of chronic pain conditions were introduced investigating convergent validity. Raspe and colleagues [19] proposed a simple grading scheme for current back pain that combines two variables, actual pain intensity and self-reported physical functioning (Raspe Grading Scheme, RGS). The first is measured by an 11-point numeric rating scale (0=currently no back pain to 10=intolerable back pain), the latter by the FFbH-R [16]. The proposed grading scheme allows to classify back pain patients into 4 hierarchical grades of current back pain (grade 0= no back pain present, grade 1= back pain with low intensity (<5) and low disability (functional capacity, FFbH-R >70%, s.b.), grade 2= back pain with high intensity (>5) or high disability (FFbH-R < 71%), grade 3= back pain with high intensity and high disability). The authors reported first data regarding prognostic validity: they found that low back pain patients with grade III had an increased risk of experiencing severe back pain one year later [17].

Gerbershagen and co-workers conceptualized "chronicity" within an operationally defined staging scheme (Mainz Pain Staging System, MPSS, [20]). The assessment is based on four dimensions ("axes"): the first axis describes temporal aspects of pain (pattern of occurrence, duration, fluctuation of pain intensity), the second contains spatial aspects of pain (pain extent), in the third axis drug taking behaviour is ascertained (drug use, number of drug withdrawal treatments) and the last axis contains detailed information about the patients utilization of the health care system (number of changes of the personal physician, pain-related hospitalizations, pain-related surgeries, pain-related rehabilitations). A complex scoring system results in an additive index ranging from 4 to 12 points. Finally this score leads to one of three stages, which are assumed to represent different phases in the process of chronification: the higher the stage the more extensive therapeutical interventions and the less likely full recovery from chronic pain. The MPSS is widely used in German pain clinic inpatients and has found some validation support [20], [21].

Behavioural measures
With increasing level of severity of the pain problem, as operationalized by the CPG, it can be assumed, that patients intensify their efforts in the use of and seeking for medical treatment. Therefore as behavioural measures in the sense of increasing level of severity the frequent use of pain medications was assessed by a three point likert-scale (0=no medication, 1=up to three times per week (occasionally), 3=everyday). Additionally the frequency of pain-related doctor visits was assessed by a five point likert-scale (1=never, 2=1 up to 5 times, 3=6 up to 10 times, 4=11 up to 20 times, 5=more than 20 times).

Table 1: Sociodemographic characteristics of the sample (n=130)

Variable	Percent	N
Age		
18-25	6.9	9
26-35	14.6	19
36-45	33.1	43
46-55	29.2	38
56-65	16.2	21
Gender		
Male	38.5	50
Female	61.5	80
Marital Status		
single	22.3	29
married	56.9	74
cohabiting	10.8	14
divorced	8.5	11
widowed	1.5	2
Educational level		
Low (8 or 9 years of schooling /„Hauptschule")	20.8	27
Intermediate (10 or 12 years of schooling/ „Realschule", „Fachoberschule")	33.1	43
High (13 years of schooling / „Gymnasium")		
Other („andere Schule")	41.5	54
	4.6	6
Occupational training		
Apprenticeship („Lehre")	56.2	73
Master craftsman's /engineer's school („Meister-/Technikerschule")	6.9	9
Polytechnic-college („Fachhochschule")	6.9	9
University („Universitaet")	19.2	25
Other vocational training („andere Berufsausbildung")	8.5	11
No vocational training („keine Berufsausbildung")	1.5	2
Occupational status		
‚fulltime job'	53.1	69
‚part-time job (about 20h/week)'	17.7	23
‚part-time job (less than 20h/week)'	1.5	2
‘homemaker'	11.5	15
‘training'	6.9	9
‘retirement'	9.2	12

Data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS, Version 11.0) for Windows. Internal consistency of the translated version of the CPG was assessed with Cronbach's alpha [22]. Factor structure was evaluated using factor analysis (principal component, varimax rotation following) on 130 Patients. The relationship between the Chronic Pain Grade and further staging and disability instruments were identified by correlational analyses (Pearson's r and Spearman's Rho respectively) in order to demonstrate validity of the German language CPG. In case of multiple testing Bonferroni's adjustment of the alpha-level was used.

Results

Sample description

The sample characteristics (sociodemographic data and medical history) are summarized in Table 1 and Table 2 respectively. Mean age was 43,8 (SD 10,7), 61,5% were female. 43.9% of the sample had secondary school qualifications, 51.5% higher education qualifications, only 1.5% had received no occupational training and the majority of the sample (68.4%) was employed at the time of recruitment (Table 1). 89 participants reported back pain (68.5%) and 3 (2.3%) leg pain solely, whereas 38 patients suffered from back pain with radiation (29.2%). A vast number of the study sample reported a pain duration greater than 9 months (n=96, 73.8%). The mean pain intensity was 4.50 (SD=1.86) for back pain and 4.03 (SD=2.02) for leg pain respectively (Table 2).

The distributions for the CPG, RGS and MPSS are also shown in Table 2. More than a half of the sample was assigned to CGP I (26.9%) and II (28.5%), thereby reporting lower and high pain intensity levels, both combined with low disability. 21.5% of the patients suffered from moderately limiting back pain (Grade III) and 23.1% severely limiting pain (Grade IV). For the Raspe Grading Scheme the corresponding values were 51.5% (Grade I), 33.8% (Grade II) and 14.6% (Grade III) respectively. Finally 27.7% of the participants were assigned to MPSS Stage I, 68.5% to Stage II and only 3.8% (n=5) patients to Stage III.

Table 2: Pain characteristics of the sample (n=130)

Variable		N
Chronic Pain Grade (CPG)	Percent	
Low disability		
Low Pain intensity (I)	26.9	35
High Pain intensity (II)	28.5	37
High disability		
Moderately limiting (III)	21.5	28
Severely limiting (IV)	23.1	30
Pain site	Percent	
Back pain	68.5	89
Back pain with radiation	29.2	38
Radiating leg pain	2.3	3
Pain duration (past 12 months)	Percent	
3-6 months	17.7	23
6-9 months	8.5	11
> 9 months	73.8	96
Pain intensity (past 7 days)	Mean (SD)	
Back pain	4.50 (1.86)	127
Leg pain	4.03 (2.02)	41
Raspe Grading Scheme (RGS)	Percent	
Grade I	51.5	67
Grade II	33.8	44
Grade III	14.6	19
Mainz Pain Staging Scheme (MPSS)	Percent	
Stage I	27.7	36
Stage II	68.5	89
Stage III	3.8	5

Table 3: Results of the principle component analysis with varimax rotation of 6 items of the CPG (n=130)

Factor 1 (variance explained 53.56%) Items	"Disability Score" Loading	"Characteristic Pain Intensity" Loading	M	SD
Interference with daily activities	.875	.257	4.83	2.26
Change of ability to take part in recreational, social and family activities	.858	.195	3.87	2.62
Change of ability to work	.894	.131	4.34	2.71
Factor 2 (variance explained 19.13%) Items			M	SD
Actual pain intensity	.001	.860	3.32	2.08
Mean pain intensity	.275	.792	5.11	1.61
Worst pain intensity	.398	.583	7.32	1.81

Factor analysis

Factor analysis was carried out to examine the factorial structure of the German version of the CPG. Whereas all other items were answered by a 11-point numerical self rating scale, item 4 asks for the number of disability days ("number of days", see Appendix A (Figure 1)). This item demonstrated a skewed distribution: 42.3% of the answers accounted for 1 ("0-6 days"). Therefore item 4 was excluded from principal component analysis. Items were accepted on the final factors if they had a loading of more than 0.50 on the corresponding factor. The analysis revealed a two-factor solution (eigenvalues 3.22, 1.15; screen test). Both factors consisted of three items (see Table 3 for M, SD and factor loadings). The first factor ("Disability Score DS") accounted for 53.56% of the explained variance and represents the patients rating of the grade of disability in different areas of daily life he or she is suffering from. The second factor ("Characteristic Pain Intensity CPI") accounted for 19.13% of the explained

Table 4

Chronic Pain Grade: item-total correlations (total scale)

Question No.	1	2	3	5	6	7
Pearson's r	0.36	0.51	0.55	0.76	0.69	0.68

Chronic Pain Grade: item-total correlations (subscale "characteristic pain intensity")

Question No.	1	2	3
Pearson's r	0.49	0.58	0.43

Chronic Pain Grade: item-total correlations (subscale "disability score")

Question No.	5	6	7
Pearson's r	0.78	0.76	0.78

variance, representing the patients rating of his medium pain intensity. Subscales were calculated as proposed by Von Korff et al. [4]. The intercorrelation between the two subscales was r=.48. In spite of this moderate relation we chose to maintain two factors in view of the results of the factor analysis and textual considerations: the factor CPI consists of items concerning rather physical aspects of pain whereas DS is more likely to represent the interferences caused by chronic pain in daily life.

Reliability

Cronbach's alpha was 0.82 for the total scale, and the item-total correlations were moderate up to high (see Table 4). The lowest item-total correlation was .36 for item 1, a measure of current pain intensity, the highest item-total correlation was found for item 4 (r=.76), a measure of pain-related interference of the patients daily activities. Both subscales of the German language CPG showed satisfying to good internal consistency. Cronbach's alpha was .88 for the first factor ("Disability Score") and .68 for the second factor ("Characteristic Pain Intensity"). Item-total correlations for the subscales were moderate up to high (see Table 4). The lowest item-total correlation (to subscale "characteristic pain intensity") was .43 for item 3, a measure of worst pain intensity, the highest item-total correlation was found for item 6 (r=.78), a measure of pain-related interference of the patients usual ability to work.

Validity

Exploring the hierarchical relationship between pain intensity and disability as proposed by Von Korff and colleagues [4], Figure 3 shows the distribution of Chronic Pain Grade and Characteristic Pain Intensity (CPI). By definition, all patients with CPG grade I display low pain intensity (CPI< 50) and all patients with Grade II report high pain intensity (CPI>=50). Both grades consist of low disability (less than 3 disability points). 66.7% of the patients with CPG III and 90% of the patients with CPG IV

reported CPI greater than 50. Considering the unequal distribution of gender in the presented study sample, Kruskal-Wallis tests and unpaired t-tests have been carried out to debar possible differences in the CPG and its subscales respectively. The results revealed no gender differences.

Table 5 shows the Spearman's Rho correlation coefficients for the correlation of the CPG and its subscales, Characteristic Pain Intensity (CPI) and Disability Score (DS). In view of inflating α-error by multiple testing, Bonferroni's adjustment to the α-level was used. Dividing α by the number of tests carried out, the adjusted α resulted in α=p<0.005 (0.05/10). The CPG showed significant correlations with its subscales. Spearman's Rho coefficients were 0.52 related to CPI and 0.81 to DS respectively.

In a further view of concurrent validity, the CPG, CPI and DS were correlated with other clinical variables. In case of correlations between the total CPG and other measures Spearman's Rho for ordinal data was used. For other correlational analyses, Pearson's product-moment coefficients were conducted. Table 6 shows the bivariate correlations of the CPG total scale, the Disability Score (DS), the Characteristic Pain Intensity (CPI) and other clinical variables.

As seen in Table 6, the relation between the CPG, and both other staging systems, the Mainz Pain Staging System (MPSS) and the Raspe Grading Scheme (RGS) was moderate but statistically significant. DS and CPI were also significantly associated with the RGS, whereas only the DS was correlated with the MPSS. No significant relations were seen for the CPI and the MPSS.

Further, the CPG as well as the subscales DS and CPI displayed highly significant relations to the both disability measures FFbH-R and PDI. The correlation coefficients representing the relation between the CPG and the DS on the one hand and the PDI on the other were higher compared to the relations between CPG/DS and the FFbH-R. Moreover, the CPI revealed a comparatively low correlation with the PDI. No correlation was found for the relationship between CPG, DS, CPI and the duration of pain.

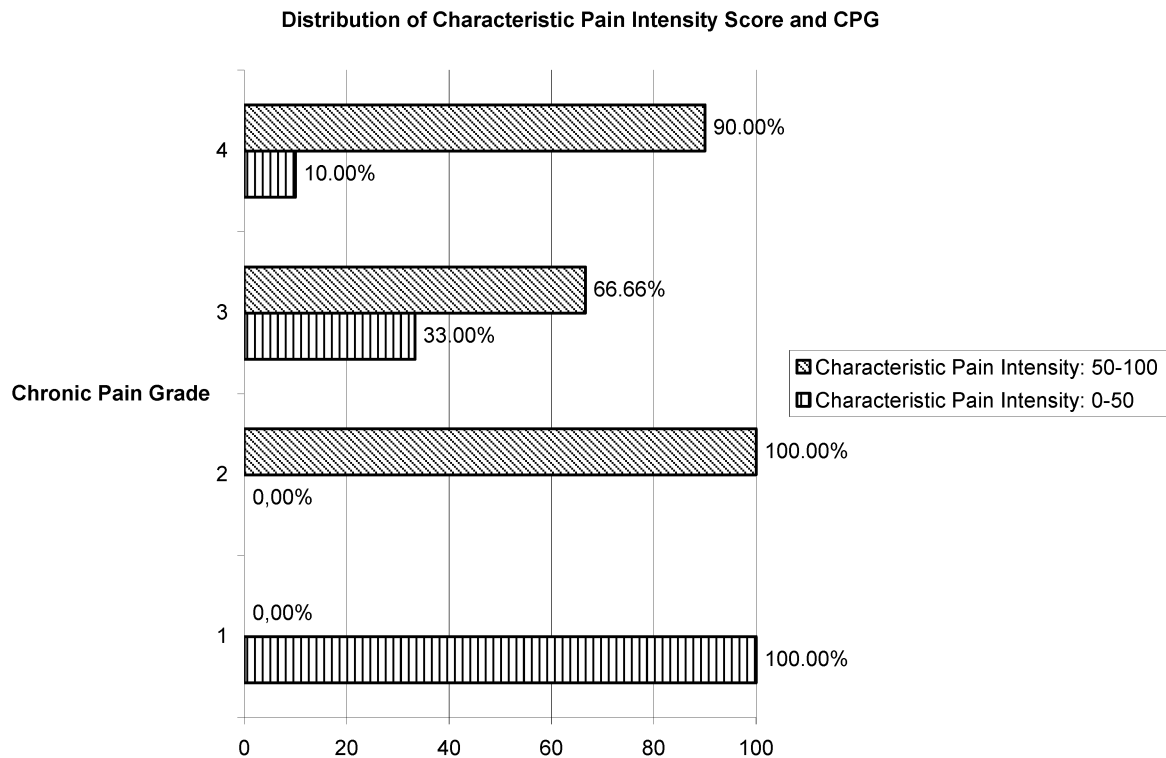**Distribution of Characteristic Pain Intensity Score and CPG**

Figure 3: Distribution of Characteristic Pain Intensity Score and CPG. By definition all patients with CPG I and II reported characteristic pain intensity less than 50 and greater than 50 respectively. 66.7% of the patients with CPG III and 90% of the patients with CPG IV reported characteristic pain intensity greater than 50.

Table 5: Spearman's Rho Correlation coefficients for the correlation of the Chronic Pain Grade (CPG) and its subscales

	CPG	
DS[1]	0.81	**
CPI[2]	0.52	**

Significance was Bonferroni adjusted: ** $p < 0.005$; ns (not significant)
1: DS=Disability Score
2: CPI=Characteristic Pain Intensity

Table 6: Spearman's Rho and Pearson's Correlation coefficients for the correlation of the CPG and other clinical variables

	CPG[1]		DS[2]		CPI[3]	
RGS[4]	0.32[#]	**	0.39[#]	**	0.66[#]	**
MPSS[5]	0.23[#]	**	0.26[#]	**	0.15[#]	ns
FFbH-R[6]	-0.34[#]	**	-0.41[*]	**	-0.45[*]	**
PDI[7]	0.56[#]	**	0.68[*]	**	0.34[*]	**
Pain duration	-0.18[#]	Ns	-0.04[*]	ns	0.02[*]	Ns

Significance was Bonferroni adjusted: ** $p < 0.005$; ns (not significant); [#]=Spearman's Rho; [*]=Pearson's r
1: CPG=Chronic Pain Grade (total scale)
2: DS=Disability score
3: CPI=Characteristic pain intensity
4: RGS=Raspe Grading Scheme
5: MPSS=Mainz Pain Staging Scheme
6: FFbH-R=Funktionsfragebogen Hannover
7: PDI=Pain Disability Index

Table 7: Spearman's Rho Correlation coefficients for the correlation of the CPG, subscales and behavioural measures

	CPG[1]		DS[2]		CPI[3]	
Pain medication	0.16	ns	0.19	ns	0.22	**
Doctor visits	0.28	**	0.24	**	0.13	ns

Significance was Bonferroni adjusted: ** p<0.005; ns (not significant)
1: CPG=Chronic Pain Grade (total scale)
2: DS=Disability score
3: CPI=Characteristic pain intensity

Finally, the CPG and its two subscales were correlated with behavioural measures, e.g. the frequency of pain medication use and the frequency of doctor visits. As shown in Table 7, the higher the CPG and the DS, the higher the number of doctor visits. However, this was not valid for the CPI. The frequency of pain medication use demonstrated a slight but statistically significant relationship with the CPI but not with the DS or the CPG.

Discussion

The present study was conducted to analyse the psychometric properties of the German version of the Chronic Pain Grade CPG [4] within a population of primary care back pain patients. In accordance with the results of Von Korff et al. [4] our findings support the usefulness of a brief and simple description of a hierarchical grading of chronic pain in terms of pain intensity and disability in primary care back pain patients.

However, in contrast to former studies [4], [5] the factor analysis of our data suggested a two-factor solution accounting for 72.7% of the explained variance. The first factor ("Disability Score DS"; 53.6% explained variance) represents the patient's perceived disability due to back pain in major areas of daily life during the past six months. The second factor ("Characteristic Pain Intensity CPI"; 19.1% explained variance) depicts the patients mean pain intensity during the prior three months. Both subscales revealed satisfying internal consistency. The internal consistency of the CPG, treated as a four-point categorical measure in terms of a grading scheme was good (Cronbach's alpha=.82). It is worth noting that the two subscales display a significant positive intercorrelation of r =.48. On the one hand, this intercorrelation is low enough to use both subscales as separate measures, as the results of factors analysis and eigenvalues suggested, but this correlation is also high enough to use the Chronic Pain Grade as an overall measure. Up to now, several authors applied both, the CPI and the DS in their studies [5], [23]; yet Von Korff himself recommended the use of two subscale scores depending on the aims of study interests [4], [6] even though emphasizing the unidimensional structure of the CPG. In their initial validation study, the authors reported comparable intercorrelations between the two subscales (r= .45 to .58). Independently of the question of using an unidimensional or a two factor solution our data suggest that it is justified to apply both, the CPG as a categorical measure and also the two subscales CPI and DS.

In view of concurrent validity we found that the CPG and its subscales were significantly correlated with other clinical variables. The strongest relations were found for the PDI and the FFbH-R, two measures of self-perceived physical capacity (FFbH-R) and disability in daily life (PDI), indicating the CPG's proximities to the concept of disability. This result was supported by a more detailed analyses of the results. The relation of the CPG with the PDI was higher (r = .56) than with the FFbH-R (r = -.34). The high correlation between the CPG and the PDI was due to a high relation between the PDI and DS (r = .68), whereas CPI and PDI only displayed a moderate correlation (r = .34). These results may refer to a higher correspondence between the CPG and the PDI with regard to the concept of pain-related disability as restrictions in several activities of daily life. In contrast, the FFbH-R mainly measures disability as a concept which is stronger related to concrete physical activities, such as sitting or walking. Furthermore, the relevant time span differs. Whereas the CPG aims at the last three months, the FFbH refer to the last seven days.

Against our expectations, the results regarding the interrelation between the CPG and other measures of staging chronic pain were conflicting. The correlation with the Raspe Grading Scheme RGS [24] was only moderate (r=.32). This may be due to the fact, that besides a measure of pain intensity, which refers to *actual* pain, the FFbH is a central component of the RGS. Within the CPG, the item 1 "actual pain intensity" also showed the lowest correlation with the total scale (r = .36). Therefore the moderate correlation between the CPG and the RGS becomes plausible.

A further aspect refers to the different meaning of the stages. With regard to stage I, there is a good correspondence between the RGS and the CPG. In both instruments stage I refers to low pain intensity and low disability. In contrast, stage II measures different aspects. Whereas stage II of the RGS refers to high pain intensity *or* high disability, the CPG aims only at high pain intensity accompanied by low disability. As Von Korff pointed out [4], patients in this stage may be especially interesting because of this pain/disability pattern. Stage III of the RGS refers to the cases of high pain intensity and high disability, whereas the grades III and IV of the CPG merely consist of moderate or high disability, irrespective of the intensity of pain. As one consequence, these both grades could include patients with low *or* high pain intensity. Indeed, the results of the present study revealed that 33% of the patients in grade III and 10% of grade IV displayed low pain intensity in spite of moderate or high disability.

In addition, the correlation between the CPG and the MPSS [20] was found to be weak but statistically significant (r=.23). This also can be explained by different underlying conceptions of the two measures: unlike the CPG, the MPSS was developed to assess the complex phenomenon of chronicity and its multidimensionality including various behavioural measures such as the number of physicians visited, the number of hospitalizations and pain-related surgeries in pain clinic samples. The results indicate that there is no homogenous concept of the severity of chronic pain. Possibly, the CPG, RGS and MPSS are instruments that are useful for different purposes: in the present study it could be shown that the CPG is a suitable measure for the examined sample composed of primary care patients suffering from chronic back pain. As Von Korff et al. [4] pointed out, the CPG may be especially more suited for primary care patients with a moderate disability compared to pain clinic patients, who possibly will need greater differentiation at the highest levels of disability. Further, the MPSS will realize a better differentiation within pain clinical inpatients, whereas the RGS may be especially valid for patients with short time pain of less than three months. These both groups, patients with short time pain as well as pain clinic patients were not represented within our sample. Further, comparative studies are required to answer the questions about the different purposes of different measures of chronification, chronic pain or the severity of chronic pain. At this point is has to be retained that the German version of the CPG is a reliable and valid measure at least for samples similar to that of the present study. This is also supported by its independency of the duration of pain and its positive correlations with behavioural measures as frequency of doctor visits and use of pain medication which is consistent with the findings of earlier research [4], [5], [6], [8].

Limitations of the present study

There are several limitations that have to be considered regarding the presented results. We applied grading to a non-randomly ascertained primary care sample. It can be assumed that the motivation of the patient's voluntary taking part in a study differs in random population samples imputing randomly ascertained patients a tendency to aggravate self perceived severity. Furthermore, the results of our study are limited to patients with so called "unspecific" low back pain with none or minor organic findings lasting at least three months. However the prevalence rates, which were between 60 and 85% [1], [2], suggest the importance of this subgroup of back pain patients and we found similar distributions of different pain grades compared to other research groups [4], [5]. A further limitation was due to age. As this research was part of a larger psychosocial intervention study, which was conducted in patients between 18 and 65 years, especially older patients were not represented in the present sample. Furthermore, we have to ask about the CPG's ability to assess change over time in clinical trials considering the results of Elliott et al. [10]. We agree with

Von Korff's appraisal that primary care patients probably will display a greater dynamic change in their pain status compared to pain clinic patients [4]. To answer these questions longitudinal studies on both samples are necessary.

Finally this study was part of a larger intervention study whose results will be published later.

Nevertheless the reported findings implicate that the German version of the Chronic Pain Grade is a reliable, valid and useful instrument if a brief, simple method of grading the severity of chronic pain is needed. Furthermore it can be easily assessed and is able to facilitate the communication among English speaking and German speaking researchers.

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Appendix A

Graded Chronic Pain Scale

1. On how many days in the last six months have had [ANATOMICAL SITE] pain?

PAIN DAYS

____ ____ ____

IF PAIN NOT PRESENT IN THE PRIOR SIX MONTHS, SKIP THE REMAINING QUESTIONS

2. How would you rate your *[ANATOMICAL SITE]* pain on a 0 to 10 scale at the present time, that is right now, where 0 is "no pain" and 10 is "pain as bad as could be"?

										PAIN AS BAD
NO PAIN										COULD BE
0	1	2	3	4	5	6	7	8	9	10

3. In the past six months (or three months), how intense was your worst pain rated on a 0 to 10 scale where 0 is "no pain" and 10 is "pain as bad as could be"?

										PAIN AS BAD
NO PAIN										COULD BE
0	1	2	3	4	5	6	7	8	9	10

4. In the past six months (or three months), on the average, how intense was your pain rated on a 0 to 10 scale where 0 is "no pain" and 10 is "pain as bad as could be"? [That is, your usual pain at times you were experiencing pain].

										PAIN AS BAD
NO PAIN										COULD BE
0	1	2	3	4	5	6	7	8	9	10

5. About how many days in the last six months (or three months) have you been kept from your usual activities (work, school or housework) because of *[ANATOMICAL SITE]* pain?

DISABILITY DAYS

____ ____ ____

6. In the past six months (or three months), how much has *[ANATOMICAL SITE]* pain interfered with your daily activities rated on a 0 to 10 scale where 0 is "no interference" and 10 is "unable to carry on any activities"?

										UNABLE TO
NO										CARRY ON ANY
INTERFERENCE										ACTIVITIES
0	1	2	3	4	5	6	7	8	9	10

7. In the past six months (or three months), how much has *[ANATOMICAL SITE]* pain interfered with your ability to take part in recreational, social and family activities where 0 is "no interference" and 10 is "unable to carry on any activities"?

										UNABLE TO
NO										CARRY ON ANY
INTERFERENCE										ACTIVITIES
0	1	2	3	4	5	6	7	8	9	10

8. In the past six months (or three months), how much has *[ANATOMICAL SITE]* pain interfered with your ability to work (including housework) where 0 is "no interference" and 10 is "unable to carry on any activities"?

										UNABLE TO
NO										CARRY ON ANY
INTERFERENCE										ACTIVITIES
0	1	2	3	4	5	6	7	8	9	10

Figure 1: Appendix A

Appendix B

Chronic Pain Grade

(Klasen, Hallner, Schaub, Willburger & Hasenbring, 2004)

1. Wie würden Sie Ihre **momentanen** Rückenschmerzen, d.h. **jetzt im Augenblick**, auf einer Skala einschätzen, wenn *0 = kein Schmerz* und *10 = stärkster vorstellbarer Schmerz* bedeuten?

    0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10
    kein   stärkster
    Schmerz   vorstellbarer
                                                                   Schmerz

2. Wie würden Sie Ihre **stärksten** Rückenschmerzen **in den letzten 3 Monaten** einschätzen, wenn *0 = kein Schmerz* und *10 = stärkster vorstellbarer Schmerz* bedeuten?

    0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10
    kein   stärkster
    Schmerz   vorstellbarer
                                                                   Schmerz

3. Wie stark waren Ihre Rückenschmerzen **in den letzten 3 Monaten im Durchschnitt**, wenn 0 = *kein Schmerz* und 10 = *stärkster* vorstellbarer *Schmerz* bedeuten?

    0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10
    kein   stärkster
    Schmerz   vorstellbarer
                                                                   Schmerz

4. An wie vielen Tagen konnten Sie **in den letzten 3 Monaten** aufgrund von Rückenschmerzen nicht Ihren **üblichen Aktivitäten** nachgehen (z.B. Arbeit, Schule, Haushalt)?

    an etwa _____ Tagen

5. In welchem Maße haben Rückenschmerzen **in den letzten 3 Monaten** Ihre **alltäglichen Aktivitäten** (Ankleiden, Waschen, Essen, Einkaufen etc.) beeinträchtigt, wenn *0 = keine Beeinträchtigung* und *10 = keine Aktivitäten mehr möglich* bedeuten?

    0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10
    keine Beein-   keine
    trächtigung   Aktivität
                                                                   mehr
                                                                   möglich

6. In welchem Maße haben Rückenschmerzen **in den letzten 3 Monaten** Ihre **Freizeitaktivitäten** oder **Unternehmungen** im **Familien- und Freundeskreis** beeinträchtigt, wenn *0 = keine Beeinträchtigung* und *10 = keine Aktivitäten mehr möglich* bedeuten?

    0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10
    keine Beein-   keine
    trächtigung   Aktivität
                                                                   mehr
                                                                   möglich

7. In welchem Maße haben Rückenschmerzen **in den letzten 3 Monaten** Ihre **Arbeitsfähigkeit** (einschließlich Hausarbeit) beeinträchtigt, wenn *0 = keine Beeinträchtigung* und *10 = keine Aktivitäten mehr möglich* bedeuten?

    0 – 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9 – 10
    keine Beein-   keine
    trächtigung   Aktivität
                                                                   mehr
                                                                   möglich

Figure 2: Appendix B