

Insomnia in Patients with Chronic Pain



Linköping University
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Study based on the Swedish Quality Registry for Pain Rehabilitation (SQRP)

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Introduction

Chronic pain and insomnia has a bidirectional correlation. Although there is promising research on-going, understanding how they interact needs further study.

Anxiety and cognitive mechanisms inducing arousal (such as catastrophising) may play a great role both in mechanisms inducing and maintaining chronic pain and in primary insomnia.

The contribution of health aspects in the development of insomnia and chronic pain is poorly investigated.

Objectives

This study, based on the SQRP investigates the prevalence of insomnia and its relationships to other parameters/symptoms in chronic pain patients referred to a multidisciplinary pain centre.

In addition, this study examines the relative importance of insomnia for other parameters of health aspects.

- What is the prevalence of insomnia in a special population?
- What is the relationship of insomnia to other symptoms and health aspect in patients with chronic pain referred?

Methods

Patients with chronic pain conditions (n=845, 68% women, 32% men, avg. age 47±16 year) referred to a multidisciplinary pain centre in Linköping completed well-known and validated questionnaires covering aspects of symptoms, participation, and health. In addition, these patients completed the Insomnia Severity Index (ISI).

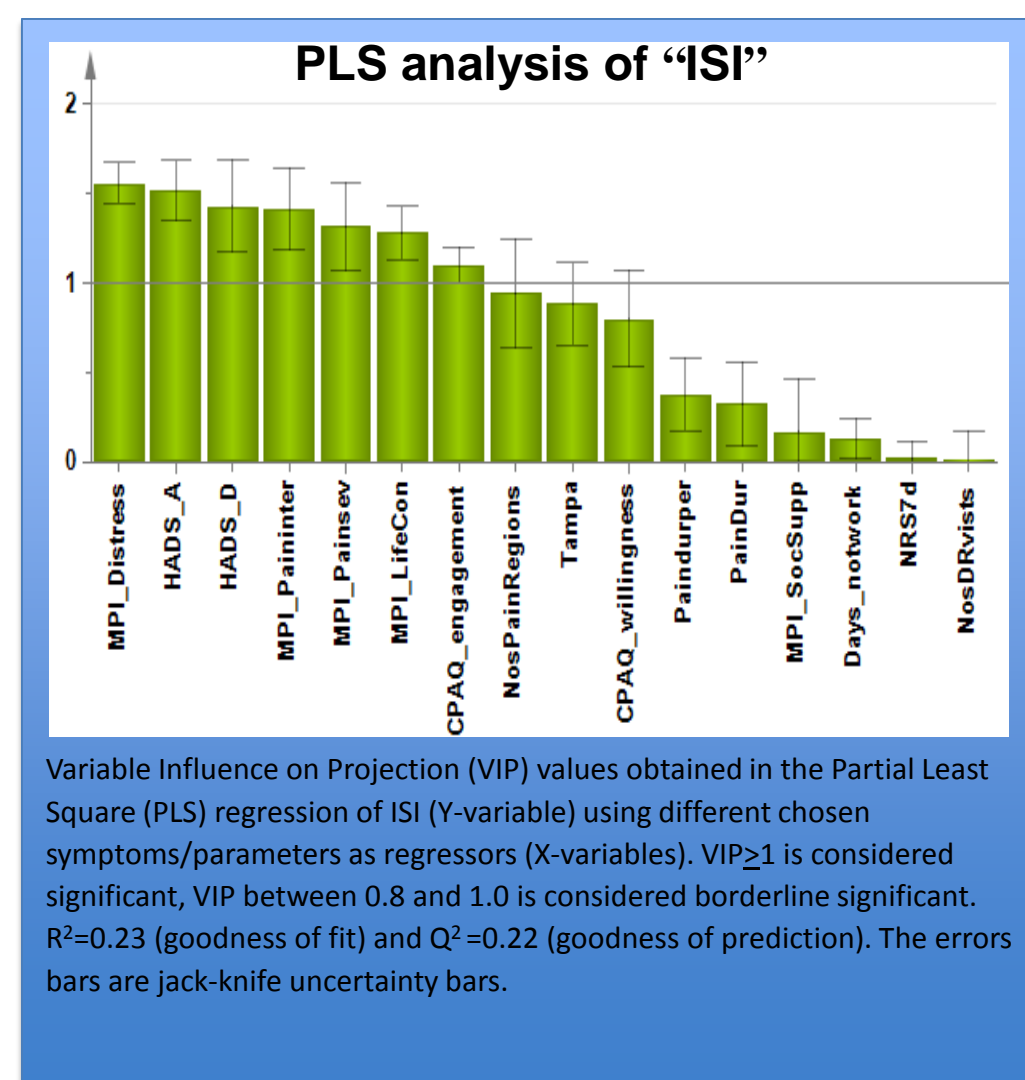
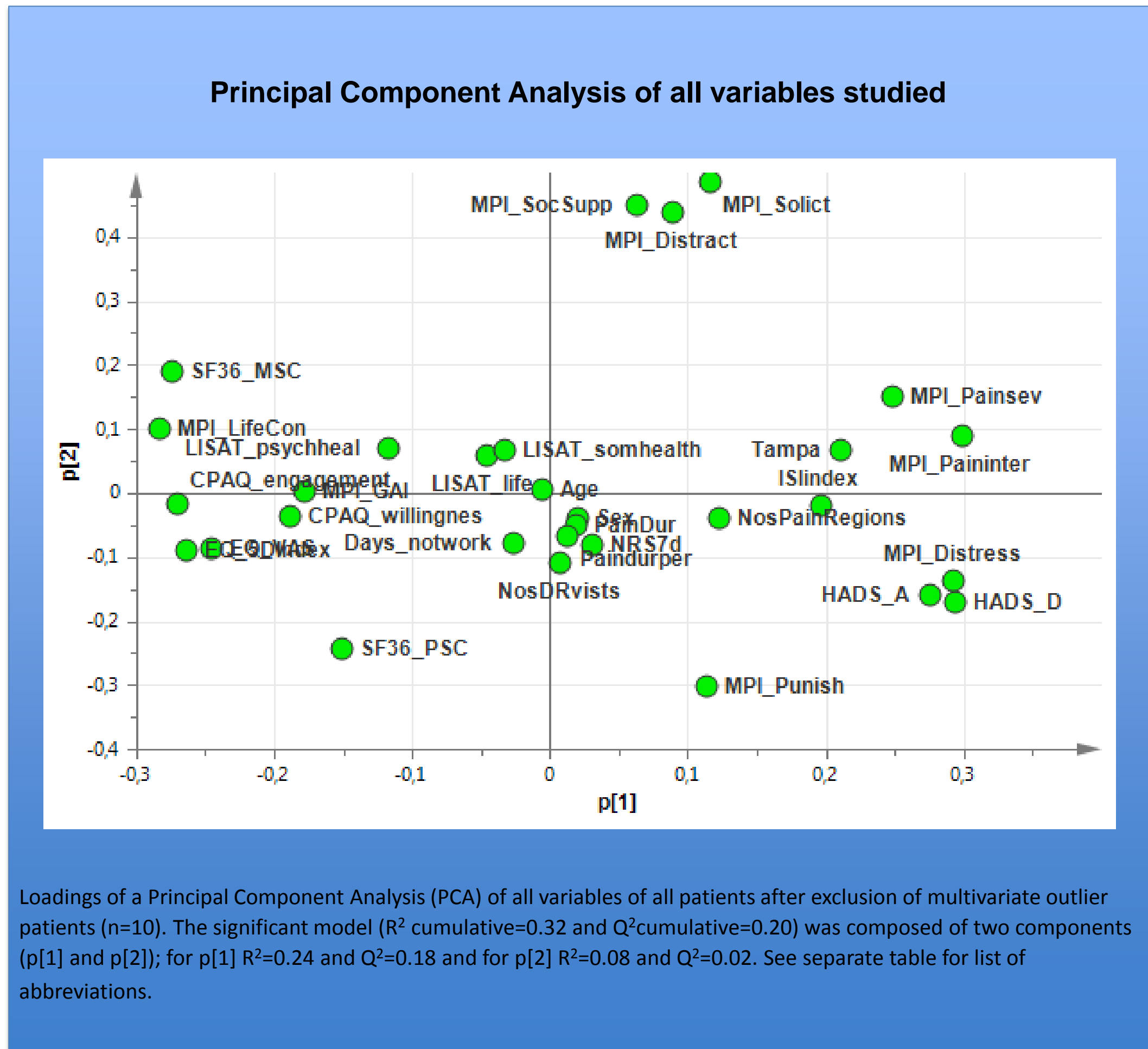
Statistics: ANOVA, Correlation analys, PCA and PLS analysis between variables.

Results

On average, the patients had a ISI score of 16.3±6.9. The distribution in the different subcategories of ISI shows that 14.1% had no clinically significant insomnia, 20.6% had sub-threshold insomnia, 41.0% had moderate clinical insomnia, and 24.3 % had severe clinical insomnia. Hence, the majority of the patients (65.3%) had clinical insomnia.

No significant difference in ISI existed between genders (men: 16.9±7.0 vs. women: 16.0±6.9; p=0.08). There was no significant difference in proportion of the four sub-categories of ISI between men and women (p=0.28). No significant correlation existed between ISI and age (r=0.014, p=0.685).

Subgroups of ISI analyzed by ANOVA for each variable shows that severe clinical insomnia was associated with the worst situation where significant differences were present (see table to the left).



PLS analysis of "EQ-5D VAS" and "SF36-MSC"

Dependent variable	EQ-5D VAS		SF36-MSC		
	VIP	CoeffCS	VIP	CoeffCS	
MPI-Paininter	1.66	-0.16	MPI-Distress	1.79	-0.23
MPI-Painsev	1.64	-0.21	HADS-A	1.70	-0.21
MPI-LifeCon	1.49	0.13	HADS-D	1.65	-0.18
CPAQ-engagement	1.48	0.14	MPI-LifeCon	1.41	0.12
HADS-D	1.38	-0.09	CPAQ-engagement	1.20	0.07
MPI-Distress	1.14	-0.01	MPI-Paininter	1.16	-0.03
HADS-A	0.99	0.02	CPAQ-willingness	0.97	0.08
Tampa	0.96	-0.05	ISI	0.95	-0.06
ISI	0.83	-0.02	Tampa	0.86	-0.03
CPAQ-willingness	0.72	-0.01	MPI-Painsev	0.75	0.05
NosPainRegions	0.69	-0.07	NosPainRegions	0.46	0.01
MPI-SocSupp	0.51	-0.08	Days-network	0.19	0.01
NosDRvists	0.20	0.06	NRS7d	0.14	0.00
PainDurPer	0.18	-0.03	PainDurPer	0.08	0.03
PainDur	0.15	-0.02	PainDur	0.05	0.03
Days-network	0.03	-0.04	MPI-SocSupp	0.03	0.07
NRS7d	0.01	0.03	NosDRvists	0.03	0.02
R^2	0.41		R^2	0.58	
Q^2	0.39		Q^2	0.57	

Partial Least Square (PLS) regressions of EQ-5D VAS and SF36-MSC as dependent variable (Y-variables) using the different parameters as regressors (X-variables). For each regressor, Variable Influence on Projection (VIP) is reported. Note the direction of the coefficient (+ or -). The two bottom rows report R^2 (goodness of fit) and Q^2 (goodness of prediction) values.

Variables	Subgroup of ISI		All		No clinically significant insomnia		Sub-threshold insomnia		Moderate clinical insomnia		Severe clinical insomnia		Statistics (ANOVA)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Age	46.7	15.7	47.0	18.9	46.5	17.3	47.0	15.3	46.3	12.7	46.3	12.7	.962
No. of days since not in work	2144	2597	2361	2544	2113	2706	2125	2492	2126	2749	2126	2749	.975
No. of visits to physician previous year	1.6	.6	1.4	.7	1.5	.7	1.6	.6	1.7	.5	1.7	.5	<.001*
Pain duration (days)	2954	3388	2176	2315	2858	3096	3172	3851	3138	3271	3138	3271	.057
Pain duration persistent pain (days)	2471	3237	1257	1565	2389	2478	2684	3913	2702	2967	2702	2967	.012*
Pain intensity previous 7 days	7.2	1.8	6.4	2.2	6.7	1.8	7.3	1.6	7.9	1.6	7.9	1.6	<.001*
No. of pain regions	12.4	8.6	9.2	7.3	11.2	8.0	12.5	8.4	15.1	9.4	15.1	9.4	<.001*
HADS-anxiety	8.5	5.0	5.8	4.5	7.2	4.3	8.7	4.8	11.1	5.0	11.1	5.0	<.001*
HADS-depression	8.4	4.7	6.3	4.5	7.0	4.4	8.5	4.3	10.9	4.7	10.9	4.7	<.001*
MPI pain severity	4.5	.97	4.1	1.2	4.3	1.0	4.6	.8	5.0	.9	5.0	.9	<.001*
MPI pain related interference	4.4	1.2	3.8	1.4	4.1	1.1	4.4	1.0	4.9	.9	4.9	.9	<.001*
MPI perceived life control	2.8	1.2	3.3	1.2	2.9	1.1	2.8	1.1	2.2	1.1	2.2	1.1	<.001*
MPI affective distress	3.4	1.4	2.6	1.4	2.9	1.4	3.4	1.3	4.1	1.2	4.1	1.2	<.001*
MPI perceived social support	4.2	1.3	4.2	1.4	4.2	1.3	4.2	1.3	4.3	1.5	4.3	1.5	.589
MPI punishing responses	1.8	1.4	1.5	1.2	1.7	1.3	1.8	1.4	2.1	1.5	2.1	1.5	.003*
MPI solicitous responses	2.9	1.4	2.6	1.4	2.7	1.4	2.9	1.3	3.4	1.6	3.4	1.6	<.001*
MPI distracting responses	2.5	1.2	2.3	1.2	2.5	1.3	2.4	1.1	2.6	1.3	2.6	1.3	.069
MPI general activity index	2.4	1.0	2.4	1.0	2.5	.92	2.5	.89	2.1	1.0	2.1	1.0	<.001*
CPAQ activity engagement	25.6	13.3	29.3	13.1	28.6	13.6	26.3	12.3	19.6	13.0	19.6	13.0	<.001*
CPAQ pain willingness	22.3	9.2	25.1	9.5	23.5	9.7	21.6	8.6	20.7	9.1	20.7	9.1	<.001*
Tampa	40.1	9.3	38.1	9.1	38.2	8.7	40.3	8.7	43.0	10.5	43.0	10.5	<.001*
LISAT-life	3.6	1.4	4.0	1.3	3.8	1.3	3.7	1.3	3.0	1.4	3.0	1.4	<.001*
LISAT-somhealth	2.3	1.3	2.7	1.3	2.5	1.3	2.3	1.2	2.0	1.2	2.0	1.2	<.001*
LISAT-psychhealth	3.6	1.5	4.3	1.4	3.9	1.4	3.6	1.5	3.0	1.4	3.0	1.4	<.001*
EQ-5D Index	.25	.32	.36	.36	.34	.31	.25	.30	.11	.28	.11	.28	<.001*
EQ-5D VAS (0-100)	40.4	20.6	45.2	20.2	46.5	21.5	40.8	19.3	31.7	19.4	31.7	19.4	<.001*
SF36-PSC	28.5	8.8	30.4	10.0	29.4	9.4	28.7	8.6	26.2	7.2	26.2	7.2	<.001*
SF36-MSC	36.6	13.1	43.4	12.0	40.2	12.9	36.0	12.6	30.5	11.9	30.5	11.9	<.001*

The four categories of ISI with respect to the investigated age, pain variables, psychological measures, and health aspects. To the right the result of the statistical evaluation (p-values) is given (ANOVA). Asterisks (*) denote significant differences between the four categories of ISI.

ISI correlated significantly with the following selected symptoms and parameters: HADS-A (r=0.39, p<0.001); HADS-D (r=0.37, p<0.001); NRS7d (r=0.31, p<0.001); CPAQ-engagement (r=-0.27, p<0.001); NosPainRegions (r=0.24, p<0.001); Tampa (r=0.22, p<0.001) and CPAQ-willingness (r=-0.19, p<0.001). Hence, the explained variance varied between 7% and 15%.

According to the results of multivariate correlations (Partial Least Square analysis) the variables most strongly correlated with ISI were three psychological variables, followed by two pain variables and two coping aspects. (see figure: PLS analysis of "ISI"). When considering the importance of insomnia and other common symptoms in chronic pain for two aspects of health, the importance of insomnia was limited (see figure: PLS analysis of "EQ-5D VAS" and "SF36-MSC").

List of abbreviations

Terms	Abbreviations
Swedish Quality Registry for Pain Rehabilitation	SQRP
Age	Age
Gender	Sex
Number of days since not in work	Days_network
Number of visits to physician previous year	NosDRvists
Numeric rating scale	NRS
Pain intensity previous 7 days	NRS7d
Number of pain regions	NosPainRegions
Pain duration (days)	PainDur
Pain duration persistent pain (days)	PainDurPer
Hospital Anxiety and Depression Scale	HADS
HADS anxiety	HADS-A
HADS depression	HADS-D
Multidimensional Pain Inventory	MPI
MPI pain severity	MPI-Painsev
MPI pain related interference in every day life	MPI-Paininter
MPI perceived life control	MPI-LifeCon
MPI affective distress	MPI-Distress
MPI perceived support from a spouse or significant others	MPI-SocSupp
MPI punishing responses from significant others	MPI-Punish
MPI solicitous responses from significant others	MPI-Solicit
MPI distracting responses from significant others	MPI-Distract
MPI general activity index	MPI-GAI
Chronic Pain Acceptance Questionnaire	CPAQ
CPAQ activity engagement	CPAQ-engagement
CPAQ pain willingness	CPAQ-willingness
The Tampa Scale for Kinesiophobia	Tampa
Life Satisfaction Questionnaire	LiSat-11
LISAT satisfaction in life	LiSat-life
LISAT satisfaction in somatic health	LiSat-somhealth
LISAT satisfaction in psychological health	LiSat-psychhealth
The Short Form Health Survey	SF36
SF36 physical summary component	SF36-PSC
SF36 mental (psychological) summary component	SF36-MSC
The European Quality of Life Instrument	EQ-5D
EQ-5D Index	Eq-5D Index
EQ-5D Visual Analogue Scale of today's health	Eq-5D VAS
Insomnia Severity Index	ISI

Conclusions

• The majority of patients (65.3%) had clinical insomnia according to established categories of the ISI.

• Insomnia correlated significantly but weakly with symptoms of pain, depression, anxiety, and coping; the strongest multivariate correlations were found with depression and anxiety followed by pain interference and pain severity.

• When considering the importance of insomnia and other symptoms / parameters for two chosen aspects of health (EQ-5D VAS and SF36-MSC) analyzed separately, the importance of insomnia was limited (borderline significant).

Practical implication:

One way to increase the effects of multimodal rehabilitation program designed for patients with chronic pain may be to include interventions directed directly towards insomnia and not only assume the positive indirect effects of interventions directed towards pain, depression, and anxiety.

