Effects of multidisciplinary pain treatment can be predicted without elaborate questionnaires

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Abstract

Purpose Low back pain is one of the most common and expensive diseases of Western societies. Psychosocial factors such as low social status, depression, or work dissatisfaction are known to promote chronicity of low back pain. With a multidisciplinary approach, better outcomes can be achieved than with purely biomedical treatment. Optimal patient selection for multidisciplinary therapy reduces costs and labour. This study investigated whether elaborated questionnaires exceed simple items in predicting multimodal therapy success.

Methods In this prospective longitudinal clinical study, 330 patients were followed up for six months after multidisciplinary therapy. We applied the patient questionnaire Heidelberg Short Early Risk Assessment Questionnaire for the Prediction of Chronicity in Low Back Pain (HKF-R10) that is approved and established for predicting chronicity in patients with acute low back pain to forecast the therapeutic outcome. Outcome criteria were QOL, pain reduction and back to work.

Results With regard to outcome criteria, the HKF-R10 was unable to anticipate therapeutic success, but education level, depression, best pain condition, and helplessness predicted therapy success with an 80 % probability for QOL improvement.

Conclusions It is not necessary to confront patients with an extensive and complicated questionnaire to predict the outcome of multidisciplinary therapy. In fact,

assessing a few specific items allows better and easier prognosis estimation.

Keywords Multidisciplinary therapy · Low back pain · Chronicity · Questionnaire · Depression

Introduction

There is a high incidence and lifetime prevalence of acute low back pain (LBP) in Western societies [1]. With its associated disabilities and costs, LBP is a complex problem with an enormous socioeconomic impact [2, 3]. More than one third of all Germans develop chronic, recurrent or persisting LBP. Germany annually loses about 4 % of its labour force due to LBP [4], with expenses reaching up to 50 billion euros. Therefore, the most important treatment objective must be preventing chronicity, which is defined as the transition from an acute episode of LBP to a chronic, persisting or recurrent event.

The exact cause of LBP remains unclear in about 85 % of cases [5], yet multiple risk factors have been described that contribute to its chronicity. Risk factors are high self-reported pain, low physical activity, alcohol abuse, low social status, smoking, heavy physical work and low job satisfaction [6, 7]. Furthermore, psychological factors such as depression, inadequate pain management, fear avoidance beliefs and frequent doctor consultations play an important predictive role [8].

Studies show that 80 % of the costs incurred by LBP are attributable to the 10 % of patients who do not recover within a few weeks of onset and proceed to chronic LBP. Those patients benefit from multidisciplinary treatment, which leads to significantly better outcomes compared with a purely biomedical treatment [9]. To avoid the high costs of intensive multidisciplinary treatment and prevent the personal suffering

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associated with long-term disability, it is necessary to identify factors that predict therapeutic outcome, i.e. distinguish patients with a good chance of recovery from those at high risk for developing chronic LBP.

In 2001, the Heidelberg Short Early Risk Assessment Questionnaire for the Prediction of Chronicity in Low Back Pain (HKF-R10) was designed by Neubauer [10]. The HKF-R10 was developed as a short instrument based on 27 validated prognostic items to reliably predict chronicity following acute LBP. In a prospective design, ten factors, consisting of a total of 27 items, predicted persistent back pain six months after onset, with a sensitivity of 75.3 % and a specificity of 78.6 %. In Germany, this questionnaire is in frequent use by general practitioners and orthopaedic surgeons. It is of special interest whether or not there is, in fact, a demand for an elaborate questionnaire or whether a simple assessment of a few prognostic items obtains the same results. In our study we evaluated the HKF-R10 for predicting therapeutic outcome in patients with chronic LBP. We used two hypotheses that, if confirmed, indicates the questionnaire will be of greater importance with regard to predicting outcome after multidisciplinary treatment. Thereby, therapy could be optimised according to the predicted prognostic outcome and subsequently improve the patients' quality of life (QOL) and reduce expenses. To the authors' knowledge, this prospective clinical study with a six months duration is the first to evaluate the HKF-R10 for predicting the success of multidisciplinary biopsychosocial treatment in patients with chronic LBP.

Methods

Hypotheses

The following hypotheses were used to answer our research questions:

1. The HKF-R10 is appropriate to predict therapy success outcome criteria of QOL, pain reduction and back to work six months after a three week multidisciplinary treatment.
2. The prognostic value can be maintained if differently weighted items of the HKF-R10 calculated by logistic regression analyses are used.

Study design

Participants were included in a prospective cohort study with a follow-up of six months. Assessment and treatment were not altered for this study. Informed consent was obtained from all patients and the study approved by the ethics committee of the University of Heidelberg. All patients were referred to the outpatient clinic by their treating physician and examined without preselection by an insurance company.

Patients

Patients enrolled in this prospective longitudinal clinical study generally suffered a long history of LBP and had already undergone all conventional forms of biomedical treatment. Patients with multiple pain locations were excluded. In almost all cases, patients were referred due to failure of standard therapy with requests (first time) for admission to a biopsychosocial therapy. All met strict inclusion and exclusion criteria.

Inclusion criteria

Patients of working age (20–65 years) with equal distribution among the different age groups were enrolled. We included patients with LBP as the major symptom, defined as a disabling lumbar-spine-related pain of at least six weeks' duration that led to sick leave. Patients with chronicity grades II–IV according to von Korff et al. [11] were respected. Fluent German and the ability to participate in daily exercises prescribed by the therapy programme were further prerequisites.

Exclusion criteria

Excluded were patients with specific aetiology of LBP, such as tumour disease [diagnosed by history and radiographic/magnetic resonance imaging (MRI) examination], trauma fracture (diagnosed by history and radiographic/MRI examination), inflammatory systemic disease or infection, e.g. spondylodiscitis (diagnosed by blood count and radiographic evaluation/MRI), nucleus pulposus prolapse with corresponding radicular pain (clinical examination, MRI), structural pathology of the lumbar spine, e.g. spinal stenosis or spondylolisthesis (diagnosed by radiographic evaluation/MRI and clinical examination), rheumatological disease, acute neurological deficits or severe degenerative changes. Further exclusion criteria were serious cardiopulmonary, vascular or other internal medicine conditions or intentions for early retirement.

Study population

Three hundred ninety-five patients who met the inclusion and exclusion criteria were treated with a multidisciplinary therapy due to chronic LBP at the author's institution. All patients participated in the full treatment programme; 330 were available for the final outcome analysis. Table 1 shows baseline characteristics of the study population (227 women, 168 men; average age 44.3 years) that was prospectively followed up for six months. All patients received a standardised patient history questionnaire, internally called the Standardised Patient History Questionnaire (SPQ), which is a set of standardised and well-

Table 1 Baseline characteristics of patients with different grades of low back pain (LBP) chronicity (sociodemographic data, total=395)

Variable	Number (%)
Men	168 (42.5)
Age (years; mean $\pm$ SD)	44.25 $\pm$ 9.11
Marital status	
Married	251 (63.5)
Single	85 (21.5)
Divorced	41 (10.4)
Widowed	4 (1)
No data	14 (3.5)
Educational level	
Low	152 (38.5)
Intermediate	120 (30.4)
High	113 (28.6)
No data	10 (2.5)
Belief in return to work	231 (58.5)
No belief in return to work	46 (11.6)
No data	118 (29.9)
Self-rated health	
Outstanding	22 (5.6)
Very good	40 (10.1)
Good	13 (3.3)
Average	137 (34.7)
Poor	39 (9.9)
No data	144 (36.5)
Evaluation of pain	
Pain perception (last week, VAS, 0–100) (mean $\pm$ SD)	51.80 $\pm$ 20.41
Duration of current pain (months, mean $\pm$ SD)	69.72 $\pm$ 90.24
Comorbidity besides LBP	
No comorbidity	43 (11.2)
Headache	179 (46.6)
Shoulder/neck pain	259 (67.4)
Abdominal pain	83 (21.6)
Arthralgia	193 (50.2)
Other forms of pain	78 (20.3)
Physical activity limitations due to LBP	
No	9 (2.3)
Low	52 (13.4)
Average	222 (57.4)
High	103 (26.6)
Pain belief	
Somatic disease	282 (72.5)
Somatic overload	207 (53.2)
Trauma	42 (10.8)
Surgery	17 (4.4)
Time pressure	84 (21.6)
Workplace stress	143 (36.8)
Private concerns	93 (23.9)
Other	54 (13.9)

SD standard deviation, VAS visual analogue scale

evaluated questionnaires usually used to study patients with back pain and including the 27 items of the HKF-R10.

Multidisciplinary treatment

Patients meeting inclusion and exclusion criteria underwent a multidisciplinary therapy for five hours daily for three weeks. This integrated physical exercises, ergonomic training, psychotherapy, education, behavioural therapy and workplace-based interventions in individual therapy and in group sessions. Individual and group therapies were delivered by an interdisciplinary team of physicians, psychologists and physiotherapists. After completion of their treatment programmes, patients were discharged without further interventions by the hospital.

Posttreatment

Patients were permitted to contact the physician who had referred them for therapy, but they were advised to manage similar further pain episodes on their own without immediately contacting a physician. Further use of medical services after completion of the therapy programme was not monitored.

Questionnaires (independent variables)

Patient health status was assessed at two time points with the same set of questionnaires (SPQ): before treatment (T1) and at six months' follow-up (T2) after therapy. The SPQ comprises:

- General pain history: e.g. actual pain intensity [visual analogue scale (VAS)] from 0 (no pain) to 100 (extreme pain); duration of current pain; pain characteristic; received treatment
- Cognitive strategies of pain management Kieler Schmerz-Inventar (KSI) [12]
- Psychosomatic comorbidities applying the Modified Somatic Perception Questionnaire (MSPQ) [13, 14]
- Patient's subjective well-being Freiburger Persönlichkeitsinventar (FPI) [15]
- Work satisfaction using an inventory developed by Boos [16]
- LBP-caused daily life limitations in general and within the Roland-Morris questionnaire [17]
- Sociodemographic data
- HKF-R10

The 27 items of the HKF-R10 are:

- Average pain intensity during the last week (VAS 0–100)
- Ideal pain intensity after therapy (VAS 0–100)
- LBP for more than 1 week
- Academics
- Other pain
- Relief through massage

- Gender
- Least pain intensity during the last week (VAS)
- 14 of 34 items of the Kiel Pain Inventory with respect to thoughts and feeling regarding pain
- Five items of the Self-rating Depression Scale by Zung et al., with respect to the state of health within the last 14 days [18]

Outcome (dependent) variables

To evaluate therapeutic success at T2, outcome criteria QOL, pain reduction and back to work were used. QOL was assessed by the FPI subjective well-being scale (values between 0 and 12). Pain reduction depended on the item average pain intensity during the last week measured by the VAS. An improvement of pain was defined as a reduction of 20 % on the VAS from T1 to T2, back to work determined by the answer to the question: “Have you returned to your job?”

Statistical analysis

After statistical workup with SAS, 395 patients responded at T1 and 330 at T2. To test the first hypothesis: “The original HKF-R10 is appropriate to predict therapeutic success outcome criteria of QOL, pain reduction and back to work six months after a three week multidisciplinary treatment”, we weighted the 27 HKF-R10 items and scores were transformed into a HKF-R10 logit prognosis using a logit function delivering values between 0 and 1. Values >0.5 were regarded as good prognosis and values <0.5 as poor prognosis. To determine the prognostic significance of the HKF-R10, both HKF-R10 sum scores and logit scores were correlated with the outcome parameters of QOL, pain reduction and back to work. For better comparison, we defined the variable QOL

outcome as 1 at $T2 >6.75$ and 0 at $T2 <6.75$ derived from mean T1 QOL added to half the standard deviation (SD). Both correlations between sum scores and logit prognosis at T1 were not significant ($r=0.059$, $p>.2$ vs $r=0.050$, $p>.2$, respectively) (Table 2).

For the second hypothesis: “The prognostic value can be maintained if differently weighted items of the HKF-R10 calculated by logistic regression analyses are used”, each HKF-R10 item was tested for its influence on prognostic value with outcome criteria QOL, pain reduction and back to work. We additionally defined an independent variable of best pain condition, which was the sum of the items least pain intensity of last week and highest pain intensity acceptable after therapy. This variable was also correlated with outcome criteria according to logistic regression analyses (Table 3).

All tests were two-sided with a confidence interval of 95 %, calculated and generated with SAS.

Results

Outcome variables at six months

Verification of the first hypothesis

Six months after completion of therapy, the mean QOL parameter was reduced from 5.06 ± 3.53 (0–12) at T1 to 4.44 ± 3.43 at T2 (Table 2). The means of QOL, difference of QOL from T1 to T2, and QOL outcome showed no correlation to the HKF-R10 score, which did not anticipate the outcome. With regard to pain reduction, a comparison of pain levels at T1 and T2 showed an improvement from mean 51.95 ± 19.94 to 37.10 ± 23.96 . Correlation of pain reduction with the HKF-R10 prognosis was 0.05 and offered no significant difference ($p>0.20$). Six months after therapy, 14 % of patients ($n=218$)

Table 2 Predictive value of therapeutic success with the original Heidelberg Short Early Risk Assessment Questionnaire for the Prediction of Chronicity in Low Back Pain (HKF-R10) questionnaire

T1 before treatment, T2 6-months' follow-up, SD standard deviation, n.s. not significant

	Number	Mean	SD	Correlation coefficient	P value
Outcome criterion quality of life					
HKF score	295	25.88	18.94		
T1	328	5.06	3.53		
T2	328	4.44	3.43	0.059	n.s.
T2-T1	328	−0.63	2.54	0.030	n.s.
Outcome	328	0.26	0.44	0.050	n.s.
Outcome criterion pain reduction					
HKF score	295	25.88	18.94		
Reduction	323	0.46	0.50	0.05	n.s.
Outcome criterion back to work					
HKF score	271	25.64	18.93		
Return to work T2	291	0.75	0.43	−.126	0.04

Table 3 Correlation of selected Heidelberg Short Early Risk Assessment Questionnaire for the Prediction of Chronicity in Low Back Pain (HKF-R10) items with outcome criteria quality of life, pain reduction and back to work

	Number	Mean	SD	Correlation coefficient	P value
Outcome criterion quality of life					
HKF score					
Female	330	0.58	0.49	0.03	n.s.
Education	318	1.36	1.49	0.03	n.s.
Best pain condition	324	40.86	28.35	0.05	n.s.
Relief through massage	327	0.45	0.50	−0.04	n.s.
Catastrophizing	326	7.01	5.68	0.16	0.003
Helplessness	328	23.70	11.47	0.33	<0.0001
Depression	323	6.52	2.12	0.33	<0.0001
Outcome criterion pain reduction					
HKF score					
Female	330	0.58	0.49	0.14	0.01
Education	318	1.36	1.49	−0.04	n.s.
Best pain condition	324	40.86	28.35	0.17	0.003
Relief through massage	327	0.45	0.50	0.01	n.s.
Catastrophizing	326	7.01	5.68	0.02	n.s.
Helplessness	328	23.70	11.47	0.03	n.s.
Depression	323	6.52	2.12	−0.04	n.s.
Outcome criterion back to work					
HKF score					
Female	302	0.55	0.50	0.08	n.s.
Education	290	1.36	1.50	0.08	n.s.
Best pain condition	297	40.99	28.78	−0.23	<.0001
Relief through massage	301	0.44	0.50	−0.05	n.s.
Catastrophizing	298	7.01	5.64	−0.08	n.s.
Helplessness	300	23.52	11.56	−0.12	0.04
Depression	296	6.56	2.09	−0.14	0.02

SD standard deviation, n.s. not significant

had returned to their job. Testing the significance of the HKF-R10 prognosis and the outcome criterion back to work with the McNemar's test revealed a significant difference, with $\chi^2=175.20$ and $p<0.001$. Correlation of return to work at T2 with the mean HKF-R10 score (25.64 ± 18.93) shows a weak, negative correlation ($r=-0.126$) with significance ($p=0.04$).

Verification of the second hypothesis

We found a significant but weak correlation of the items catastrophizing, helplessness and depression with the outcome criterion QOL improvement (Table 3). The probability of a QOL improvement increases with lower values for helplessness and depression and better pain condition at T1. After logistic regression analyses, the four items helplessness, education level ($p=0.12$), depression, and best pain condition are able to predict a QOL improvement with a probability of 80 % (Table 4).

The items female and best pain condition slightly correlated with the outcome criterion pain reduction

after therapy (Table 3). Pain reduction can only be predicted by the item best pain condition with a probability of 60 % (Table 4) (61 % with all HKF-R10 items). There is a significant negative but weak correlation of helplessness and depression with the percentage of patients who returned to work (outcome criterion back to work), as well as a highly significant negative correlation of best pain condition (Table 3). After logistic regression analyses, the outcome criterion back to work can be predicted with 68 % by the items depression ($p=0.10$) and best pain condition, i.e. the lower the depression scale and best pain condition values, the better the prognosis towards return to work. The prognosis prediction can be minimally increased to 70 % by taking all HKF-R10 items into account.

Discussion and conclusions

In recent reviews, multidisciplinary treatment incorporating therapy components such as intensive physical exercises and

Table 4 Prognostic value of Heidelberg Short Early Risk Assessment Questionnaire for the Prediction of Chronicity in Low Back Pain (HKF-R10) items for outcome criteria quality of life, pain reduction and back to work (multiple logistic regression models)

	OR	P value
Outcome criterion quality of life		
Intercept		
Female	0.97	n.s.
Education	1.14	n.s.
Best pain condition	0.86	n.s.
Relief through massage	0.90	n.s.
Catastrophizing	0.94	n.s.
Helplessness	1.68	<0.0001
Depression	1.48	<0.0001
Outcome criterion pain reduction		
Intercept		
Female	1.09	n.s.
Education	0.98	n.s.
Best pain condition	1.25	0.003
Relief through massage	1.02	n.s.
Catastrophizing	0.97	n.s.
Helplessness	1.01	n.s.
Depression	0.93	n.s.
Outcome criterion back to work		
Intercept		
Female	1.11	n.s.
Education	1.04	n.s.
Best pain condition	0.73	0.0004
Relief through massage	0.97	n.s.
Catastrophizing	1	n.s.
Helplessness	0.96	n.s.
Depression	0.86	n.s.

OR odds ratio, n.s. not significant

behavioural interventions has become established for patients with chronic LBP because of higher success rates. Earlier studies at our institution show that patients benefit in all stages of chronicity from these components [19]. Yet, multidisciplinary treatment is costly in terms of labour and time, so that knowledge regarding factors influencing therapy outcome plays an important role.

This prospective clinical study intended to analyse whether a standardised pain questionnaire such as the HKF-R10, which was originally designed for predicting chronicity in patients with acute back pain, could also predict therapy success in 330 patients with chronic LBP six months after multidisciplinary treatment. Outcome criteria to evaluate therapy success were QOL,

pain reduction and back to work. These dependent outcome criteria were also used in studies by Lang and Lambeek [20, 21].

With the statistical analysis of the first hypothesis, we proved that the HKF-R10 in its original form is not appropriate to predict therapeutic success after six months in terms of QOL improvement and pain reduction. Neither can the outcome criterion back to work be anticipated, although there is a slight statistical coherence. However, with differently weighted items of the HKF-R10 after logistic regression analyses (education level, depression, helplessness, best pain condition), therapeutic success regarding QOL improvement can be predicted with an 80 % probability. The calculated prognosis is assumed to be better with lower values of helplessness, depression and best pain condition, whereas a low education level implicates a poor outcome. Surprisingly, taking more HKF-R10 items into account does not improve the prognostic value.

One common problem with instruments designed to predict therapeutic success from a multidimensional perspective is that they include many items and hence take a long time to complete. A large number of items increases the risk of internal dropout and makes it difficult for unmotivated patients to complete the questionnaire. The idea of focusing on basic, relevant information is not new. With regard to predicting chronicity in LBP patients, the Swedish Örebro Musculoskeletal Pain Screening Questionnaire by Linton and Hallden has already proved the importance of using few specific items [22]. Likewise, in this study, we demonstrate that anticipating biopsychosocial therapeutic success can be derived from asking specifically selected questions. Therefore, a shorter instrument can be generated that is easier to use and probably counteracts both internal and external dropouts.

In comparison with the original HKF-R10 study of 2006, the aspect best pain condition (Item: Least pain intensity during the last week) is ideal for forecasting chronicity as well as therapeutic success. This parallelism reveals the significance of optimism, hope and confidence towards convalescence regardless of acute or chronic situations. Moreover, the items education level, depression and helplessness were most relevant in the 2006 study.

Earlier studies evaluated prognostic factors for the outcome of multidisciplinary treatment of patients with LBP [23–25]. Keeley et al. showed that the parameters pain duration, depression and social problems caused by LBP were predictors for an improved QOL after six months. Tong et al. found that pain relief in hospitalised patients after the first four morning rounds anticipated outcome at discharge by 80 % [26]. The article by van der Hulst et al. summarises results of

studies dealing with this subject. The only factors they found to be predictive of therapeutic outcome were pain intensity (more pain and higher disability due to pain at baseline predicted worse results), work-related parameters (satisfaction with work, availability of present job, shorter time off work) and different coping strategies. Limitations of the studies evaluated were low numbers of patients analysed, measurement of only one or a few outcome criterion, lack of clear definition of inclusion and exclusion criteria and the therapy applied. Dionne et al. showed that a prediction rule using only five items exceeded the predictive value of the original 17-item version and was superior to physician prediction [27]. None of these studies announced a questionnaire to predict therapeutic outcome. In 1994, Chapman et al. evaluated the Minnesota Multiphasic Personality Inventory (MMPI), which was unable to predict success of interdisciplinary therapy. With the aim of reducing the frequent inconsistency of results found in the literature, our prospective clinical study shows that using only four items (helplessness, education level, depression, best pain condition), therapeutic success can be predicted by 80 % with regard to improved QOL and by 68 % concerning return to work. Extensive and complicated questionnaires do not improve predictability of multimodal therapeutic outcome. Additionally, our results

emphasise psychological factors in therapeutic success, as patients experiencing helplessness or depression show worse outcomes than those with positive coping strategies.

The HKF-R10 is an established screening tool for predicting chronicity in patients with acute LBP. However, its use with patients with chronic LBP, the two-page inventory does no better than simple items, such as pain assessment (VAS), in its prognostic value. The questionnaire loses its value when applied to a randomly assigned collective of patients with chronic LBP. The HKF-R10 should therefore be limited to screen for the risk of chronicity in patients with acute LBP. Elaborated questionnaires are not necessary to anticipate the outcome of multidisciplinary therapy for chronic LBP (Appendix).

Acknowledgments None.

Appendix

HKF-R 10

This questionnaire serves to better understand your pain and modify our therapy. Please answer the following questions.

1. Gender?

☐₁ female

☐₀ male

2. Academic level?

☐₀ no graduation

☐₂ Technical college

☐₄ University

☐₀ Secondary modern school

☐₃ High School

☐₄ Postgraduate (Dr.)

☐₁ Secondary school level

☐₃ College of higher education

3. Do you suffer from back pain for more than 8 days?

☐₀ Yes

☐₁ No

4. Do you suffer from **other** pain than back pain?

☐₁ No

☐₀ Yes, namely _____

5. What was your **average** pain level last week?

Please mark on the scale.

6. What was your **lowest** pain level last week?*Please mark on the scale.*

7. Define your pain level to be satisfied with the therapy?

8. Have you experienced relief of back pain due to massage?

☐₀ no ☐₁ yes ☐₀ not certain

9. Remember the last 2 weeks when you suffered from pain. How often did you think about the following issues?

	never	almost never	seldom	sometimes	often	almost always	always
a. What is the reason?	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
b. Why do I have to bear this?	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
c. They are not going to go away.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
d. This pain is ruining my life	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
e. What does it mean?	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
f. I hope it isn't cancer.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
g. I cannot stand it any longer.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
h. Maybe I have the same disease as...?	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
j. It will not get any better.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
k. It destroyed my day again.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
l. Life is not worth living with this pain.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
m. If it becomes worse, what will I do?	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
n. How much longer do I have to suffer?	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆
o. It could be a terrible disease.	☐ ₀	☐ ₁	☐ ₂	☐ ₃	☐ ₄	☐ ₅	☐ ₆

10. Describe your mood during the last 2 weeks?

	never	sometimes	often	always
a. I am sad and sorrowful.	☐ ₀	☐ ₁	☐ ₂	☐ ₃
b. I have to cry.	☐ ₀	☐ ₁	☐ ₂	☐ ₃
c. I have problems falling asleep.	☐ ₀	☐ ₁	☐ ₂	☐ ₃
d. I am nervous and cannot relax.	☐ ₀	☐ ₁	☐ ₂	☐ ₃
e. I still do what I always loved to do.	☐ ₀	☐ ₁	☐ ₂	☐ ₃

HKF-R 10-Analysis

Use a calculator:

There are 5 differently coloured boxes to be filled out:

<= raw values of the above questions
<= weighting
<= calculate the product
<= calculate the sum
<= temporary values

Patient with back pain (name): _____

questions:

	raw value		weighting		product
# 1		X	9	=
# 2		X	-6	=
# 3		X	-15	=
# 4		X	-14	=
# 5			0
6
7
sum questions 6 + 7	=	X	0.5	=
# 8		X	18	=
sum (questions 1 - 8) =
					temporary sum:

question 9

Item a: +	Item e: +
Item f: +	Item h: +
Item o: +
sum = X 1.5 =
Item b: +	Item c: +
Item d: +	Item g: +
Item j: +	Item k: +
Item l: +	Item m: +
Item n: +
sum = X -0.6 =

question 10:

Item a: +	Item b: +
Item c: +	Item d: +
Item e: 4 - Item raw value = +
sum = X 3.5 =
Total / Test Result =

Below you find the conclusion according to the Test Result:

Type	Test Result (TR):	Conclusion
Type A:	TR <= -2,5	unlikely to develop chronic pain
Type B:	-2,5 < TR <= 8	70% propability not to develop chronic pain
Type C:	8 < TR < 28	no assertion possible
Type D:	28 <= TR < 37	70% propability to develop chronic pain
Type E:	37 <= TR	likely to develop chronic pain

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