Additional file 1

Overview of variables used in the latent class analysis, classified by health domains

Table 1. Psychology domain

Variable	Abbreviated version of variable	Response options (range)	Data type	Missing observa- tions, N (%)	Categorisation or reversing of variables (if performed)	Used in 'single- item' or 'summary- score' strategy	References
Based on all things you do to cope or deal with your pain, on an average day, how much are you able to decrease it?	Able to decrease pain	0=Can decrease it completely 10=Can't decrease it at all	Continuous	26 (2.8)	Original scale: 0=can't decrease it at all 10=can decrease it completely Item from the Örebro Musculoskeletal Pain Screening Questionnaire. Comment: Reverse-scored in the descriptive analysis and the profile plots to make a high score indicate a higher risk of a poor prognosis	Single-item & Summary- score	Reliability and validity of the full Örebro pain question- naire [1, 2]
How likely do you think it is that you would be fully recovered in 3 months?	Negative recovery belief	0=Likely to recover 1=Unsure-not at all likely	Dichotomous	13 (1.4)	Original scale: 0=not at all likely 10=very likely Comment: Dichotomised before the LCA due to highly skewed data distribution. Reverse-scored in the descriptive analysis and the profile plots to make a high score indicate a higher risk of a poor prognosis: 0=8-10 Likely to recover 1=0-7 Unsure-not at all likely	Single-item & Summary- score	Validity (Expecta- tions and association with outcome/ change over time) [3, 4]

To what extent do you feel socially isolated?	Feel socially isolated	0=not at all isolated 1=little to quite isolated	Dichotomous	11 (1.2)	Original scale: 0=not at all isolated 10=quite isolated Comment: Dichotomised before the LCA due to highly skewed data distribution: 0=0 Not at all isolated 1=1-10 Little-quite isolated	Single-item & Summary- score	Validity [5]
How strongly do you agree: Treatment is essential to decrease my pain?	Treatment not essential	0=completely agree 10=completely disagree	Continuous	20 (2.2)	Comment: For the descriptive analysis, the question was rephrased to: Treatment not essential	Single-item & Summary- score	None (own produc- tion)
It's not really safe for a person with a condition like mine to be physically active (SBT-5)	Not safe to be physically active	0=disagree 1=agree	Dichotomous	28 (3.0)		Single-item	See SBT sum-score
Worrying thoughts have been going through my mind a lot of the time (SBT-6)	Worrying thoughts a lot of the time	0=disagree 1=agree	Dichotomous	24 (2.6)		Single-item	See SBT sum-score
I feel that my back pain is terrible and it's never going to get any better (SBT-7)	Terrible back pain, will never get better	0=disagree 1=agree	Dichotomous	17 (1.8)		Single-item	See SBT sum-score
In general I have not enjoyed all the things I used to enjoy (SBT-8)	Not enjoyed things used to enjoy	0=disagree 1=agree	Dichotomous	19 (2.0)		Single-item	See SBT sum-score
Sum-score representing all questions related to the SBT Back Tool (9 questions) Psychological high risk group	High-risk group (SBT)	0=low-medium risk 1=high risk	Dichotomous	8 (0.9)	Original scale: 0=low risk (3 or less of total score) 1=medium risk (>3 of total score, but 3 or less on the psychological sub score, Q5-9) 2=high risk (>3 of total score and >3 on the psychological sub score, Q5-9) Comment: Dichotomised before the LCA to suit the classification to the psychological domain (psychological high risk group)	Summary- score	Validity [6-9]
I sleep less well because of my back problem (RMDQ-15)	Sleep less well	0=no 1=yes	Dichotomous	22 (2.4)		Single-item	See RMDQ sum-score

Because of my back problem, I am						
more irritable and bad tempered with people than usual (RMDQ-17)	More irritable with people than usual	0=no 1=yes	Dichotomous	17 (1.8)	Single-item	See RMDQ sum-score
I keep rubbing or holding areas of my body that hurt or are uncomfortable (RMDQ-21)	Rubbing/holding areas that hurt/are uncomfortable	0=no 1=yes	Dichotomous	15 (1.6)	Single-item	See RMDQ sum-score
I often express concern to other people over what might be happening to my health (RMDQ-23)	Often express concern	0=no 1=yes	Dichotomous	17 (1.8)	Single-item	See RMDQ sum-score
Physical activity might harm my back (FABQ-3)	Physical activity might harm back	0=completely disagree 3=unsure 6=completely agree	Ordinal	29 (3.1)	Single-item	See FABQ- pa sum- score
I should not do physical activities which (might) make my pain worse (FABQ-4)	Should not do physical activity which (might) make worse	0=completely disagree 3=unsure 6=completely agree	Ordinal	30 (3.2)	Single-item	See FABQ- pa sum- score
My work might harm my back (FABQ-11)	Work might harm back	0=completely disagree 3=unsure 6=completely agree	Ordinal	44* (5.2)	Single-item	See FABQ- pa sum- score
I should not do my normal work with my present pain (FABQ-12)	Should not do normal work with present pain	0=completely disagree 3=unsure 6=completely agree	Ordinal	41* (4.8)	Single-item	See FABQ- pa sum- score
l cannot do my normal work till my pain is treated (FABQ-14)	Cannot work till pain is treated	0=completely disagree 3=unsure 6=completely agree	Ordinal	43* (5.1)	Single-item & Summary- score	See FABQ- pa sum- score
Sum-score: Fear-avoidance beliefs about physical activity (FABQ-pa) (Questions 2,3,4,5)	FABQ-physical activity subscale	0=No fear-avoidance beliefs 24=high degree of fear- avoidance beliefs (The whole range is used)	Continuous	46 (5.0)	Summary- score	Validity and reliability [10-12]

Have you felt low in spirits or sad? (MDI-1)	Felt low in spirits/sad	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	7 (0.8)	3=slightly more than half the time 4=most of the time 5=all the time <i>Comment:</i>	Single-item	See MDI sum-score
Have you lost interest in your daily activities? (MDI-2)	Lost interest in daily activities	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	10 (1.1)		Single-item	See MDI sum-score
Have you felt lacking in energy and strength? (MDI-3)	Felt lacking in energy and strength	0=at no time 1=some of the time 2=slightly less than half the time 3=slightly more than half the time 4=Most of the time 5=All the time	Ordinal	5 (0.5)		Single-item	See MDI sum-score
Have you felt less self-confident? (MDI-4)	Felt less self-confident	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	9 (1.0)	Original scale: 0=at no time 1=some of the time 2=slightly less than half the time 3=slightly more than half the time	Single-item	See MDI sum-score
Have you had a bad conscience or feelings of guilt? (MDI-5)	Had a bad conscience	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	5 (0.5)	4=most of the time 5=all the time <i>Comment:</i> Trichotomised before the LCA due to highly skewed data distribution	Single-item	See MDI sum-score

Have you had difficulty in concentrating, e.g. when reading the newspaper or watching television? (MDI-7)	Had difficulty in concentrating	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	6 (0.6)		Single-item	See MDI sum-score
Have you felt very restless/subdued or slowed down? (MDI-8)	Felt very restless/subdued/ slowed down	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	6 (0.6)		Single-item	See MDI sum-score
Have you had trouble sleeping at night? (MDI-9)	Had trouble sleeping at night	0=at no time 1=some of the time 2=slightly less than half the time 3=slightly more than half the time 4=Most of the time 5=All the time See MDI- sum-score	Ordinal	6 (0.6)		Single-item	See MDI sum-score
Have you suffered from reduced/increased appetite? (MDI-10)	Have suffered from reduced/increased appetite	0=at no time 1=some of the time 2=slightly-all the time	Ordinal	6 (0.6)	Original scale: 0=at no time 1=some of the time 2=slightly less than half the time 3=slightly more than half the time 4=most of the time 5=all the time Comment: Trichotomised before the LCA due to highly skewed data distribution	Single-item	See MDI sum-score
Sum-score: Major Depression Inventory (10 questions) (MDI-6 not used in the single-item strategy, but was part of the summary-score)	Degree of depression	0=no depression 50=severe depression (37 is the highest score in the cohort)	Continuous	15 (1.6)	Original scale: Scored as a depression rating scale: Mild depression: 20-24 Moderate depression: 25-29 Severe depression: 30 or more	Summary- score	Depression rating scale (validity) [13]

LCA = Latent Class Analysis
FABQ-pa = Fear-Avoidance Beliefs Questionnaire, physical activity subscale
MDI = Major Depression Inventory
RMDQ = Roland-Morris Disability Questionnaire (23-item)
SBT = STarT Back Tool
*The questions were only to be answered if the patient was working. Calculation of missing data on those variables excludes: students, unemployed, early retirement/retirement and health-
related retirement

Table 2. Pain domain

Variable	Abbreviated version of variable	Response options (range)	Data type	Missing observa- tions, N (%)	Categorisation or reversing of variables (if performed)	Used in 'single- item' or 'summary- score' strategy	References
For how long has this episode of LBP lasted?	Duration of LBP	1=0-2 weeks 2=2-4 weeks 3=1-3 months 4=>3 months	Ordinal	18 (1.9)		Single-item & Summary- score	None (own produc- tion)
Back pain intensity on average the last week (Numeric Pain Rating Scale)	LBP intensity	0=no pain 10=worst imaginable pain	Continuous	25 (2.7)		Single-item & Summary- score	Validity and reliability [14, 15]
Leg pain intensity on average the last week (Numeric Pain Rating Scale)	Leg pain intensity	0=no pain 1=mild pain 2=moderate-worst imaginable pain	Ordinal	43 (4.6)	Original scale: 0=no pain 10=worst imaginable pain Comment: Trichotomised before the LCA due to highly skewed data distribution: 0=no pain 1=1-4 mild pain 2=>4 moderate - worst imaginable pain	Single-item & Summary- score	As above. Trichotomi- sation: [16, 17]

How many episodes of LBP have you had before this one?	Previous LBP episodes	0=no previous episodes 1=1-3 previous episodes 2=more than 3 previous episodes	Ordinal	19 (2.0)		Single-item & Summary- score	None (own produc- tion)
How many days have you had LBP within the last year?	More than 30 days of LBP last year	0=≤30 days 1=>30 days	Dichotomous	32 (3.4)		Single-item & Summary- score	None (own produc- tion)
My back pain has spread down my leg(s) at some time in the last 2 weeks (SBT-1)	Pain has spread down leg(s)	0=no 1=yes	Dichotomous	16 (1.7)		Single-item	See SBT sum-score
I have had pain in the shoulder or neck at some time in the last 2 weeks (SBT-2)	Shoulder/neck pain	0=no 1=yes	Dichotomous	20 (2.2)		Single-item	See SBT sum-score
Overall, how bothersome has your back pain been in the last 2 weeks? (SBT-9)	Very-extremely bothersome BP	0=no-moderately bothersome pain 1=very-extremely bothersome pain	Dichotomous	12 (1.3)	Original scale: 0=not at all 0=slightly 0=moderately 1=very much 1=extremely Comment: Dichotomised before the LCA as prescribed in the scoring instruction (0 and 1)	Single-item	See SBT sum-score
My back or leg is painful almost all the time (RMDQ-11)	Back/leg painful almost all the time	0=no 1=yes	Dichotomous	19 (2.0)		Single-item	See RMDQ sum-score
My pain was caused by physical activity (FABQ-1)	Pain caused by physical activity	0=completely disagree 3=unsure 6=completely agree	Ordinal	18 (1.9)		Single-item & Summary- score	Validity and reliability [10-12]
Physical activity makes my pain worse (FABQ-2)	Physical activity makes worse	0=completely disagree 3=unsure 6=completely agree	Ordinal	23 (2.5)		Single-item	See FABQ- pa sum- score

Pain distribution [#]	Pain distribution	0=back pain only 1=back pain and pain in one leg 2=back pain and pain in both legs 3=leg pain only	Multistate nominal	15 (1.6)	 Original scale: Variable created before the LCA based on the following three yes/no questions: Back pain Leg pain right Leg pain left Participants who did not report any pain, were recoded as missing data <i>Comment:</i> For the profile plots, the category 'back pain only' was reverse-scored so a high score indicated a higher risk of a poor prognosis (<i>not</i> only low back pain) 	Single-item & Summary- score	None (own produc- tion)
Back pain is not dominating? [#]	LBP not dominating	0=no 1=yes	Dichotomous	9 (1.0)	Original scale: Variable created before the LCA was 'dominating back pain' based on the following three yes/no questions: 1=dominating back pain (above gluteal fold) 0=dominating leg pain (below gluteal fold) 0=back pain equals leg pain <i>Comment:</i> For the descriptive analysis and profile plots, the variable was reverse-scored so a high score indicated a higher risk of a poor prognosis (<i>not</i> having dominating back pain = higher risk)	Single-item & Summary- score	None (own produc- tion)
No paraspinal pain onset [#]	No paraspinal pain onset	0=no 1=yes	Dichotomous	121* (13.2)	Original scale: Paraspinal pain onset, 1=yes Part of a test battery for 'facet joint syndrome'. Only to be asked if patients had dominating back pain. For the LCA, the variable was used in its original form Comment: For the descriptive analysis and	Single-item & Summary- score	Element of diagnostic classifica- tion [18, 19]

			profile plots, the variable was reverse-scored so a high score indicated a higher risk of a poor prognosis cf. the analysis (profile plots) showed, that patients seem to be worse off if <i>not</i> having paraspinal pain onset					
LCA = Latent Class Analysis LBP = Low back pain								
FABQ = Fear-Avoidance Beliefs Questionnaire								
RMDQ = Roland-Morris Disability Questionnaire (2	3-item)							
SBT = STarT Back Tool								
	* The question was only to be answered if there was dominating back pain and the amount of missing data reported relative to that							
[#] Variables from the clinician-reported questionna	re. All other variables are from the	patient self-reported baseline of	questionnaire					

Table 3. Activity domain

Variable	Abbreviated version of variable	Response options (range)	Data type	Missing observa- tions, N (%)	Categorisation or reversing of variables (if performed)	Used in 'single- item' or 'summary- score' strategy	References
I have only walked short distances because of my back pain (SBT-3)	Only walked short distances	0=disagree 1=agree	Dichotomous	29 (3.1)		Single-item	See SBT sum-score
In the last 2 weeks, I have dressed more slowly than usual because of back pain (SBT-4)	Dressed more slowly last two weeks	0=disagree 1=agree	Dichotomous	16 (1.7)		Single-item	See SBT sum-score
I change position frequently to try to get my back or leg comfortable (RMDQ-2)	Change position frequently	0=no 1=yes	Dichotomous	16 (1.7)		Single-item	See RMDQ sum-score
I walk more slowly than usual because of my back problem or leg pain (sciatica) (RMDQ-3)	Walk more slowly	0=no 1=yes	Dichotomous	20 (2.2)		Single-item	See RMDQ sum-score

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Because of my back problem, I am not doing any of the jobs that I usually do around the house (RMDQ-4)	Not doing usual jobs around the house	0=no 1=yes	Dichotomous	18 (1.9)	Single-item	See RMDQ sum-score
Because of my back problem, I use a handrail to get upstairs (RMDQ-5)	Use handrail to get upstairs	0=no 1=yes	Dichotomous	18 (1.9)	Single-item	See RMDQ sum-score
Because of my back problem, I have to hold on to something to get out of an easy chair (RMDQ-6)	Hold on to something to get out of an easy chair	0=no 1=yes	Dichotomous	16 (1.7)	Single-item	See RMDQ sum-score
I get dressed more slowly than usual because of my back problem or leg pain (sciatica) (RMDQ-7)	Get dressed more slowly	0=no 1=yes	Dichotomous	15 (1.6)	Single-item	See RMDQ sum-score
I only stand for short periods of time because of my back problem or leg pain (sciatica) (RMDQ-8)	Only stand for short periods of time	0=no 1=yes	Dichotomous	15 (1.6)	Single-item	See RMDQ sum-score
Because of my back problem, I try not to bend or kneel down (RMDQ-9)	Try not to bend or kneel down	0=no 1=yes	Dichotomous	17 (1.8)	Single-item	See RMDQ sum-score
I find it difficult to get out of a chair because of my back problem or leg pain (sciatica) (RMDQ-10)	Difficult to get out of a chair	0=no 1=yes	Dichotomous	14 (1.5)	Single-item	See RMDQ sum-score
I find it difficult to turn over in bed because of my back problem or leg pain (sciatica) (RMDQ-12)	Difficult to turn over in bed	0=no 1=yes	Dichotomous	18 (1.9)	Single-item	See RMDQ sum-score
I have trouble putting on my socks (or stockings) because of the pain in my back or leg (RMDQ-13)	Trouble putting on socks	0=no 1=yes	Dichotomous	16 (1.7)	Single-item	See RMDQ sum-score
I only walk short distances because of my back problem or leg pain (sciatica) (RMDQ-14)	Only walk short distances	0=no 1=yes	Dichotomous	16 (1.7)	Single-item	See RMDQ sum-score
I avoid heavy jobs around the house because of my back problem (RMDQ-16)	Avoid heavy jobs around the house	0=no 1=yes	Dichotomous	14 (1.5)	Single-item	See RMDQ sum-score
Because of my back problem, I go upstairs more slowly than usual (RMDQ-18)	Go upstairs more slowly	0=no 1=yes	Dichotomous	15 (1.6)	Single-item	See RMDQ sum-score

I stay in bed most of the time because of my back or leg pain (sciatica) (RMDQ-19)	Stay in bed most of the time	0=no 1=yes	Dichotomous	14 (1.5)		Single-item	See RMDQ sum-score
Because of my back problem, I am doing less of the daily work around the house than I would usually do (RMDQ-22)	Do less daily work around the house	0=no 1=yes	Dichotomous	15 (1.6)		Single-item	See RMDQ sum-score
Sum-score representing the Roland Morris Disability Questionnaire (23 questions), proportional score	Roland-Morris summary-score	0=no disability 100=severe disability (The whole range is used)	Continuous	14 (1.5)		Summary- score	Validity [20] Propor- tional recalcula- tion method [21]
I cannot do physical activities which (might) make my pain worse (FABQ-5)	Cannot do physical activities which (might) make pain worse	0=completely disagree 3=unsure 6=completely agree	Ordinal	34 (3.7)		Single-item	Validity and reliability [10-12]
l cannot do my normal work with my present pain (FABQ-13)	Cannot work with present pain	0=disagree 1=unsure 2=agree	Ordinal	41*(4.8)	Original scale: 0=completely disagree 3=unsure 6=completely agree Comment: Trichotomised before the LCA due to highly skewed data distribution (few observations answering other than 'disagree')	Single-item & Summary- score	Validity and reliability [10-12]
Best posture is to sit [#]	Best posture to sit	0=no 1=yes	Dichotomous	105** (11.5)	Original scale: As shown. The variable was part of a test battery for 'facet joint syndrome'. Only to be asked if patients had dominating back pain.	Single-item & Summary- score	Element of diagnostic classifica- tion [18, 19]
Best activity is <i>not</i> to walk [#]	Best activity is not to walk	0=no 1=yes	Dichotomous	119** (13.0)	Original scale: Best activity to walk, 1=yes Part of a test battery for 'facet joint syndrome'. Only to be asked if patients had dominating back pain.	Single-item & Summary- score	Element of diagnostic classifica- tion [18, 19]

	For the LCA, variable was used in its original form Comment:
	For the descriptive analysis and profile plots, the variable was
	reverse-scored so a high score
	indicated a higher risk of a poor
	prognosis cf. the analysis (profile plots) showed, that patients seem to
	be worse off if best activity was <i>not</i> to
	walk
LCA = Latent Class Analysis	

FABQ = Fear-Avoidance Beliefs Questionnaire

RMDQ = Roland-Morris Disability Questionnaire (23-item)

SBT = STarT Back Tool

*The questions were only to be answered if the patient was working. Calculation of missing data on those variables excludes: students, unemployed, early retirement/retirement and health-related retirement

** The questions were only to be answered if there was dominating back pain and the amount of missing data reported relative to that

[#]Variables from the clinician-reported questionnaire. All other variables are from the patient self-reported baseline questionnaire

Table 4. Participation domain

Variable	Abbreviated version of variable	Response options (range)	Data type	Missing observa- tions, N (%)	Categorisation or reversing of variables (if performed)	Used in 'single- item' or 'summary- score' strategy	References
Physical load at work	Physical workload	1=sitting 2=sitting and walking 3=light physical load 4=heavy physical load	Ordinal	49 (5.3)		Single-item & Summary- score	[22]
Days with sick leave the last month	Days with sick leave last month	0=0 days 1=1-5 days (workweek) 2=6-31 days	Ordinal	46 (5.0)	Original scale: 0-31 days, continuous scale (patient's noted a number themselves) Comment: Trichotomised before the LCA to an	Single-item & Summary- score	

					ordinal scale due to highly skewed data distribution (few observations had any days of sick leave)		
I stay at home most of the time because of my back problem or leg pain (sciatica) (RMDQ-1)	Stay home most of the time	0=no 1=yes	Dichotomous	18 (1.9)		Single-item	See RMDQ sum-score
Because of my back problem, my sexual activity is decreased (RMDQ-20)	Decreased sexual activity	0=no 1=yes	Dichotomous	31 (3.3)		Single-item	See RMDQ sum-score
My pain was caused by my work or by an accident at work (FABQ-6)	Pain caused by work/accident at work	0=disagree 1=unsure 2=agree	Ordinal	19* (2.1)	Original scale: 0=completely disagree 3=unsure 6=completely agree Comment: Trichotomised before the LCA due to the highly skewed data distribution (few observations answering other than 'disagree'): 0=disagree (0-2) 1=unsure (3) 2=agree (4-6)	Single-item	See FABQ- work sub scale
My work aggravated my pain (FABQ-7)	Work-aggravated pain	0=disagree 1=unsure 2=agree	Ordinal	19*(2.1)		Single-item	See FABQ- work sub scale
My work is too heavy for me (FABQ-9)	Work is too heavy	0=disagree 1=unsure 2=agree	Ordinal	40* (4.7)		Single-item	See FABQ- work sub scale
My work makes or would make my pain worse (FABQ-10)	Work makes/would make pain worse	0=disagree 1=unsure 2=agree	Ordinal	43*(5.1)		Single-item	See FABQ- work sub scale
Sum-score: Fear Avoidance Beliefs about work (FABQ-work) (Questions 6,7,9,10,11,12,15) (FABQ-15 not used in the single- item strategy, but was part of the summary-score)	FABQ-work subscale	0=no fear-avoidance beliefs 38=severe fear- avoidance beliefs (The whole range is used)	Continuous	55*(6.5)		Summary- score	Validity and reliability [10-12]

LCA = Latent Class Analysis

FABQ-w = Fear-Avoidance Beliefs Questionnaire, work subscale

RMDQ = Roland-Morris Disability Questionnaire (23-item)

*The questions were only to be answered if the patient was working. Calculation of missing data on those variables excludes: students, unemployed, early retirement/retirement and health-related retirement

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