University of Southern Denmark

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Citation for pulished version (APA):
Chang, N. H. S. (2022). *Clustering multi-site pain diagrams*. Poster session præsenteret ved IASP 2022 World congress on pain, Toronto, Canada.

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PWD46: Clustering multi-site pain diagrams

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1. What does the distribution of pain tell us about spinal pain patients in relation to pain and psychological factors?

2. Objectives
• Identify subgroups of patients with back pain based on their pain diagrams
• Describe cross-sectional characteristics of subgroups

3. Materials and methods
Latent class analysis (LCA) was used on a free-handed pain diagram from **21.123** spinal pain patients consulted in the Spine Centre of Southern Denmark. Diagrams were post-defined into 46 anatomical regions. LCA model with best model estimates and entropy were chosen (BIC = 611251, Entropy = 0.95).
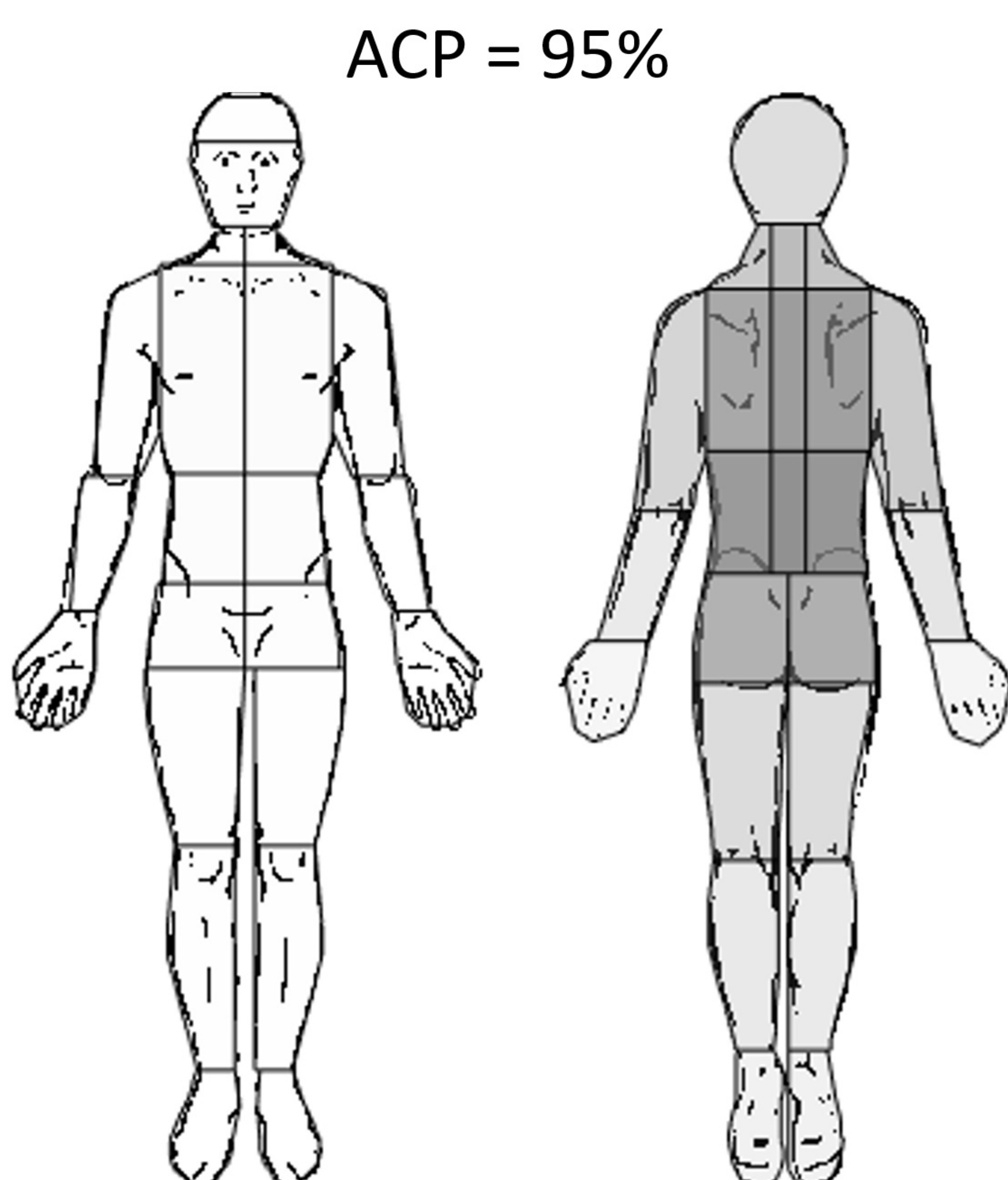
5. Conclusion
• LCA provided five distinct clusters based on pain diagrams
• Five clusters were classified into clinical patient profiles
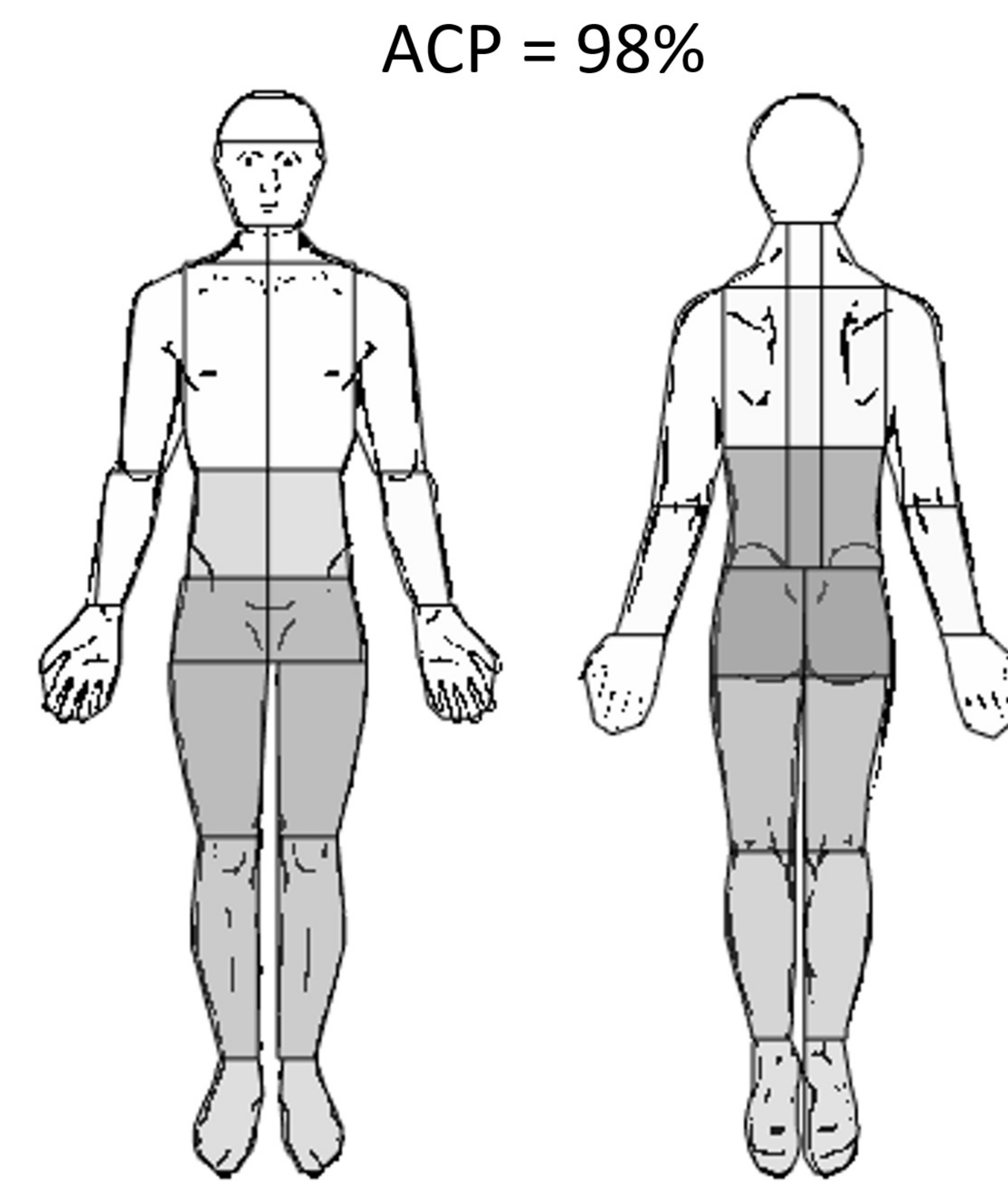• There is a significant difference between clusters on pain scores and psychological factors.

4.

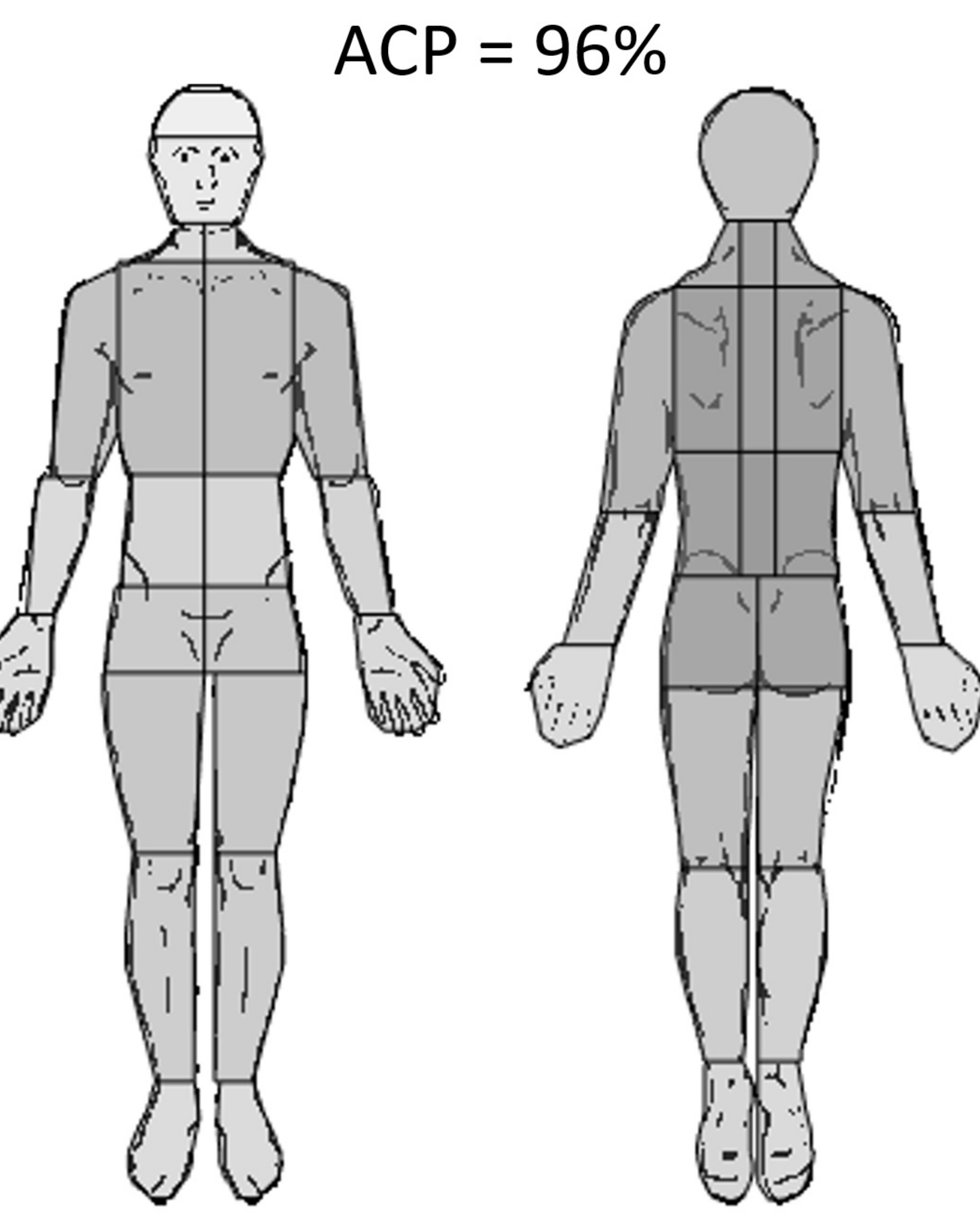CLUSTERS

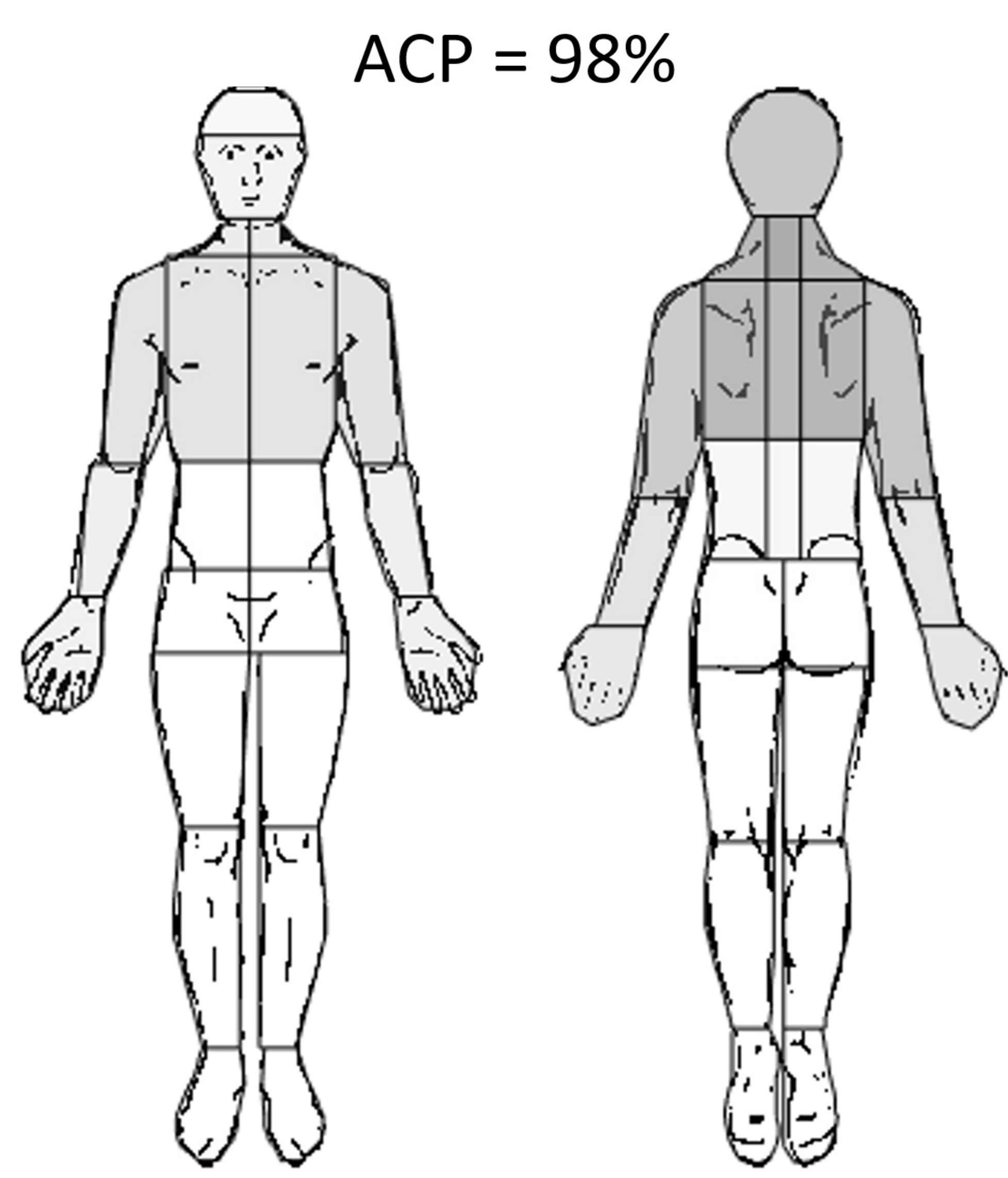**Class 1 (13 %)** whole spine pain   ACP = 95%

Class 2 (23 %) diffuse LBP + leg pain   ACP = 98%

Class 3 (7 %) whole body pain   ACP = 96%

Class 4 (19 %) local MBP/neck pain   ACP = 98%

Class 5 (38 %) local LBP   ACP = 97%

ACP = Average class probability
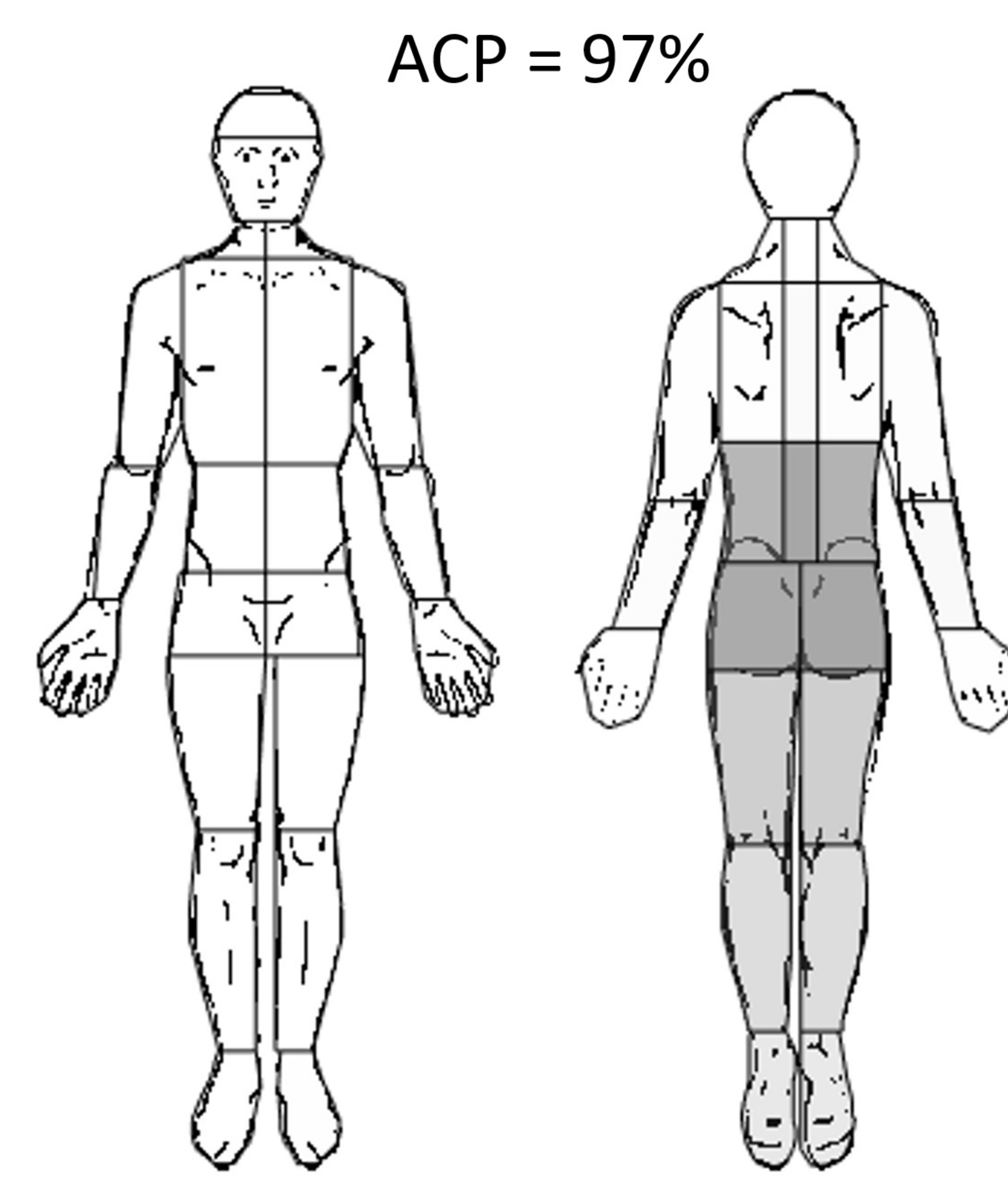
Baseline characteristics of patients

|	All patients n=21.123	Whole spine pain n=2849 (13%)	Diffuse low back + leg pain n=4707 (23%)	Whole body pain n=1477 (7%)	Local MBP/neck pain n=3966 (19%)	Local LBP n=8124 (38%)	p-values and pair-wise comparisons (p <.05) p adj. = Tukey's HSD test ◆ Kruskal-Wallis rank sum test
Sex, Females (%)	56.0%	58.0%	58.4%	65.6%	56.6%	52%	p < .000 all comparisons
Age, years mean (SD)	53.7 (16.3)	48.0 (16.5)	56.5 (15.6)	48.1 (14.5)	51.5 (14.1)	56.1 (16.9)	p < .000 all comparisons except Whole Spine vs. Whole body (p adj. = 0.99), Diffuse LBP + leg pain vs. Local LBP (p adj. = 0.76)
Number of pain sites, median (IQR)	7 (5-11)	10 (8-12)	9 (7-12)	20 (16-24)	7 (4-10)	5 (3-7)	◆ p < .000 all Comparisons (Wilcoxon rank sum test)
Pain intensity*, 0-100 scale median (IQR)	60 (42-75.8)	57 (40-73)	65 (48-78)	70 (57-82)	58 (40-75)	57 (40-73)	p < .000 all comparisons except Whole Spine vs. Local MBP/neck (p adj. = 1.0), Whole Spine vs. Local LBP (p adj. = 0.46), Local MBP/neck vs. Local LBP (p adj. = 0.34)
Activity limitation**, 0-100 scale median (IQR)	34 (23-48)	36 (24-48)	36 (24-50)	42 (30-54)	34 (22-46)	32 (22-46)	p < .05 all comparisons except Local MBP/neck vs. Local LBP (p adj. = 0.29)

*Pain intensity is calculated as a sum of six scores (back pain and leg or arm pain in three scenarios (now, typical and worst) divided by the maximum total score times 100. 190 patients in total have missing values and is excluded from the analysis. **Activity limitation is calculated from 10 ODI questions, with the same method as Pain intensity (*). In total 779 patients have missing values and is excluded from the analysis.

Pain scores in each class
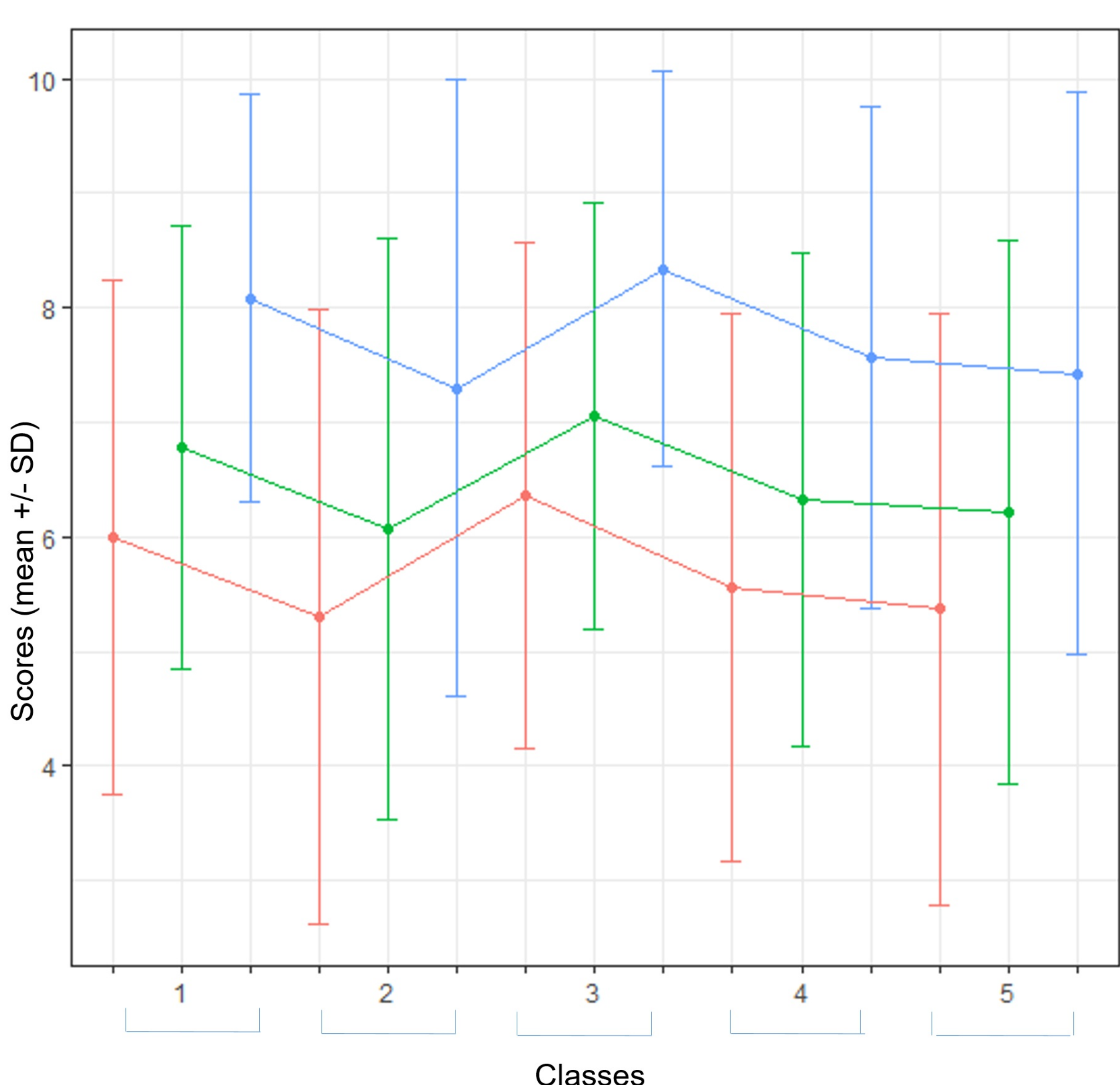
Painscales: Pain now   Typical pain   Worst pain
NRS 0-10 scale

Psychologial scores in each class
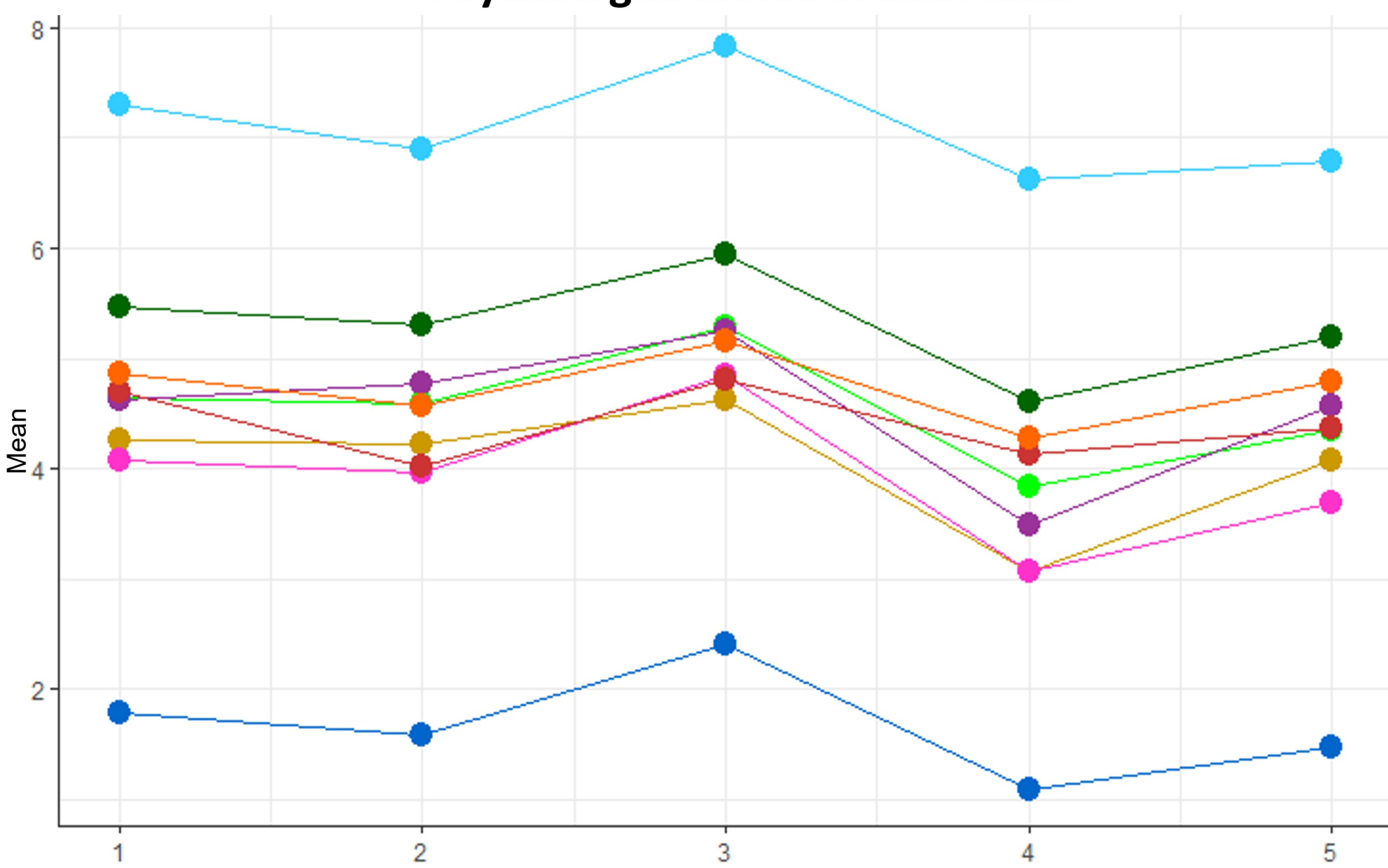
Psychological factors: anxiety   depression – sad, hopeless   depression – lack of interest   catastrophisation – never better   catastrophisation – cannot anymore   risk of persistent pain   Fear of movement – damage   Fear of movement – worsening   social isolation   NRS: 0-10 scale

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The authors have no conflicts of interest to declare