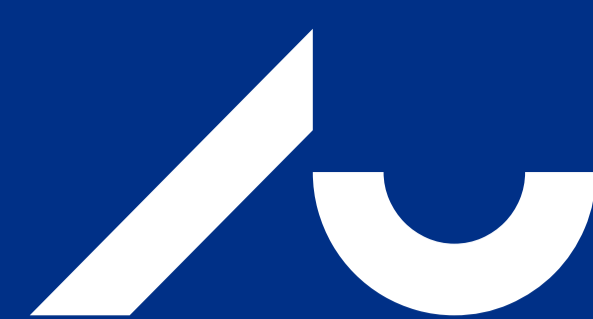# Modifiable predictors for acceptable symptom state and impression of change among musculoskeletal disorders in physical therapy patients: a prospective cohort study

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INTRODUCTION

Musculoskeletal disorders (MSD) constitute a significant proportion of the disease burden in Denmark. Of these complaints related to the lower-back, neck and shoulder, are the most common MSD presentations in primary care physical therapy.

This is the first study to explore and compare potential modifiable predictors for the patient perspective on improvements or acceptance of symptoms by well-defined and validated Patient Reported Outcome Measures.

But perceived remission has many constructs and different perspectives that may lead to potential discrepancies in predictors.

Based on the current literature a selection of 11(12) putative modifiable predictors are explored and subsequently confirmed for two distinct outcomes.

This prognostic study is conducted within the theoretical framework for explanatory prognosis studies suggested by AP. Jill Hayden as a two phase prognostic study. (See figure below).

Prognostic factor (Explanatory) studies

SUCCESSIVE PHASE OF INVESTIGATION

[A] [B] [C] [D] [E] [F] [G]
↓
[O]

Exploration: studies identify prognostic factors (e.g A to G) associated with low back pain outcome (O).

[A] → [O]
↑   ↑
([B], [D], [G], [H])

Confirmation: studies test the independent association of a prognostic factor (A= with low back pain outcome (O), controlling for potential confounders (B, D, G, H)

Hayden JA, Dunn KM, van dW, Shaw WS. What is the prognosis of back pain?
Best Practice & Research Clinical Rheumatology 2010

METHODS

In this prospective cohort study data where collected at five geographical regions of Denmark, by way of 21 physical therapy practices in the period from January to June 2016. Using an existing online Danish physical therapy Database www.fysdb.dk.

Outcomes where collected by email at 3 and 6 months follow up. Specified as the Patient Acceptable Symptom State (PASS) the overall state of acceptance Yes or No. And the Patient Global Impression of Change (PGIC) a 7-item rating scale from Much worse to Much better.

Generalized Estimating Equation (GEE) regression models was chosen for the confirmatory analysis because it allows for multiple outcomes and considers the correlation between 3- and 6 months' follow-up.

RESULTS

A total of 632 patients (78%) and 589 (73%) responded at the 3 months and 6 months questionnaires, respectively. Of the 632 responders at 3 month's 46 % and 66 % were classified as reaching PASS and PGIC, respectively. Of the 589 responders at 6 month's 56 % and 66 % were classified as reaching PASS and PGIC, correspondingly.

Self-predicted prognosis, general- and mental health, disability then coping were confirmed, as important and statistically robust predictors when assessing both outcomes.

Whereas pain, analgesics, sick leave and sleep was only predictive for achieving PASS.

Private/work health insurance, fear-avoidance beliefs and pain site were confirmed as not predictive at all. (Table).

Confirmation: Patient Acceptable Symptom State (PASS) and Patient Global Impression of Change (PGIC)

Putative predictors Categorise	PASS		PGIC	
	$OR_{Adjusted}$	95% CI	$OR_{Adjusted}$	95% CI
Preliminary primary complaint				
Neck	1.00		1.00	
Shoulder	0.97	0.67-1.42	1.23	0.80-1.91
Low back	0.77	0.54-1.08	0.91	0.62-1.34
General health				
Excellent	1.00		1.00	
Extremely well	0.72	0.39-1.34	0.66	0.32-1.37
Well	0.54*	0.30-0.98	0.58	0.28-1.17
Less than good	0.32*	0.16-0.64	0.43*	0.20-0.95
Bad	0.30*	0.10-0.92	0.29	0.09-1.02
Mental health score				
100-0[†]	0.99*	0.98-0.99	0.99*	0.98-1.00
Self-predicted prognosis				
0-10[†]	0.94*	0.89-0.99	0.89*	0.83-0.95
Disability score				
0-100[†]	0.98*	0.98-0.99	0.99*	0.99-1.00
Pain Intensity (Related to complaint) 0-10[†]	0.90*	0.84-0.96	0.94	0.87-1.02
Analgesics				
Occasionally or never	1.00		1.00	
At least once a week	0.56*	0.40-0.79	1.08	0.53-1.14
At least once a day	0.68*	0.48-0.99	0.78	0.72-1.62
Sleep Disturbance (Related to complaint) 0-10[†]	0.93*	0.89-0.98	0.98	0.93-1.04
Sick leave (Related to complaint)				
No at all	1.00	0.54-1.32	1.00	0.74-2.00
1-5 days the past month	0.84	0.28-0.75	1.22	0.42-1.40
> 5 days the past month	0.46*		0.77	
Coping				
0-10[†]	0.94*	0.89-1.00	0.92*	0.87-0.98
Fear-avoidance beliefs				
Low or no fear	1.00		1.00	
Moderate fear	0.77	0.54-1.09	0.96	0.65-1.41
High fear	0.75	0.53-1.06	1.03	0.69-1.54
Private/work health Insurance				
Yes	1.00		1.00	
No	1.02	0.74-1.40	0.97	0.70-1.34

*p-value < 0.05 Statistical significant Odds Ratios, [†]OR per 1 unit increase in scores, Abbreviations: *OR* Odds Ratio, *CI* Confidence interval, *OR^Adjusted* for Gender, Age (3 categories), Education, Duration of current pain, Multisite pain. *Disability score* is presented as a cumulated sum score pooled from Roland Morris Questionnaire (RMQ) for low back complaints. Neck Disability Index (NDI) for neck complaints. Disabilities of the Arm, Shoulder and Hand (Quick DASH) for shoulder complaints.

CONCLUSION

This study finds preliminary evidence for more intake variables are predictive for the state of PASS then PGIC. Thus, operationalization of one specific outcome cannot be highlighted as they may measure different aspects of perceived remission

To understand the prognosis of MSD generic predictors such as self-assessed prognosis, general and mental health seems of importance. Further development of more comprehensive predictive models to interpret these predictors will aid the understanding of the multifactorial and complex pathway for these patients.

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