

Impact of Fibromyalgia ADL Pain on Cognitive Performance

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Background and Purpose

- Fibromyalgia (FM) – chronic widespread pain in at least 3 of 4 body quadrants and axials
- Estimated 10 million US; 3-6% worldwide affected by FM
 - Ratio of women to men who seek treatment is approximately 7 to 1
- Symptoms: Fatigue, non-restorative sleep, stiffness, pain, concentration problems
- Pain
 - Activities of daily living (ADLs) may be affected by chronic pain
 - Current research shows that FM pain can affect both physical and psychological functioning
 - Research suggests that pain impacts cognitive performance

Research Questions

- Does ADL pain in FM predict cognitive performance?
- If so, does ADL pain impact cognitive performance in general or is it specific to certain cognitive domains?

Method

Participants:

- 70 participants with FM
- 65 females, 5 males

Procedures

- Day 1 – Informed consent; demographics, medications, symptoms
- Day 2 – Beck Depression Inventory (BDI), cognitive tasks, physical tasks (not used in these analyses; reported elsewhere)

Table 1: Means (SDs) and ranges for age, BDI, anxiety, stiffness, ADL pain, and education

Variable	Mean (SD)	Range
Age	59.6 (7.6)	50-85
BDI	17.1 (9.1)	0-42
Anxiety	4.8 (2.1)	0-10
Stiffness	6.8 (2.6)	0-10
ADL pain	3.6 (.76)	2-5
Education		
Some high school	2	
High school/GED	4	
Some college	15	
College	23	
Graduate work or degree	26	

Cognitive Tasks

- *Everyday Problems Test (EPT) (18 items)*
 - *Time (seconds)*
 - Score (number correct)
- Mini-Mental State Exam
- Immediate recall T1, T2, T3
 - 10-item Word List (CERAD)
- *Stroop Color-Word Test*
 - *Time (seconds)*
- Digit Span Forward
- Digit Span Backward
- Trail Making Test A and B
- Delayed Recall (CERAD)
- Recognition (CERAD)
- Animal Fluency
- Digit Symbol Substitution Test

Symptom Measures

Pain – experience with bodily pain during activities of daily living (ADLs) in the past 4 weeks; ranked on a numeric rating scale from 1-5. (ADLs are functional tasks, such as grooming, feeding oneself, and dressing.)

Anxiety during the past week – ranked on numeric rating scale from 0-10.

Stiffness in the morning during the past week – ranked on numeric rating scale from 0-10.

Results

Initial correlations

- Age, level of education, BDI score, anxiety, and stiffness were significantly related to certain types of cognitive performance.
- These variables were controlled for in later analyses.

Table 2: Stepwise regression analysis predicting Everyday Problems Test completion time using constant and ADL pain

Predictor Variable	<i>B</i>	<i>SE B</i>	β
Constant	8.532	2.464	
Level of bodily pain during ADLs in past 4 weeks	1.615	.661	.298*

Note: Adjusted $R^2=.074^*$; Age, education, BDI score, and anxiety level included in initial model, but dropped because not significant.
* $p<.05$

Table 3: Stepwise regression analysis predicting Stroop C-W completion time using constant, age, stiffness, and ADL pain

Predictor Variable	<i>B</i>	<i>SE B</i>	β
Constant	8.532	2.464	
Age (years)	1.597	.516	.353**
Number that best describes anxiety level in past week	-4.516	1.491	-.367**
Level of bodily pain during ADLs in past 4 weeks	12.376	5.121	.300*

Note: Adjusted $R^2=.177^*$; Education, BDI score, and anxiety level included in initial model, but dropped because not significant.
* $p<.05$, ** $p<.01$

- Bodily pain during ADLs alone significantly predicted the time it took to complete the EPT ($p < .05$).
- Bodily pain during ADLs, along with age and stiffness level, significantly predicted the time it took to complete the Stroop C-W test ($p < .05$).
- No other cognitive measures were associated with pain.

Conclusions

- Pain in FM seems to impact cognitive performance specifically by inhibiting processing speed, especially on higher-level tasks.
- Greater bodily pain during ADLs in FM was associated with:
 - slower problem-solving within daily living domains
 - worse inhibitory functioning

Future Directions

- Investigate pain and cognitive performance in other clinical populations with chronic pain
- Use additional measures of pain and cognition
- Investigate whether there is also an association between instrumental activities of daily living pain and cognitive performance

Selected References

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