Improving Mental Health by Restoring Physical Health:

Addressing Chronic Pain and Behavioral Health Issues Through a Functional Restoration Program

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BACKGROUND & OBJECTIVES

Background:

- An occupational medicine clinic uses a transdisciplinary biopsychosocial community model approach to help patients improve physical functionality.
- As the program's focus extends beyond functional restoration, it may lead to improvements in chronic pain and other behavioral health areas, in addition to enhancing physical health.
- Chronic pain often coexists with other behavioral health conditions. [1-2] Research suggests that an interdisciplinary treatment approach can reverse the trajectory of chronicity and disability. [3]

Objectives:

To determine if increased exposure to the program improves physical functionality, reduces clinically-significant pain, and reduces other behavioral health issues.

MATERIALS & METHODS

Data Source: Occupational medicine clinic data.

Inclusion Criteria: Patient initiated care with a transdisciplinary biopsychosocial therapeutic community model program between January 1, 2021, and December 31, 2024.

Exclusion Criteria: Patient had missing data; patient did not complete any hours with the program.

Outcomes:

- **Physical Functionality:** Change in carrying lift; change in overhead lift
- **Behavioral Health:** Binary variables indicating whether Brief Battery for Health Improvement 2 (BBHI 2) outcomes were clinically-significant (84th percentile or higher) at completion. Outcomes measured were pain, functional complaints, somatic complaints, anxiety, defensiveness, and depression.

Independent Variable: Hours of program participation (logged, base 2)

Control Variables:

- **Physical Functionality:** Gender, age, treatment location
- **Behavioral Health:** Gender, age, treatment location, and binary variables indicating whether BBHI 2 scores were clinically-significant at intake (pain, functional complaints, somatic complaints, anxiety, defensiveness, and depression)

Analyses:

- **Descriptive Statistics:** t-tests to assess significance of pre/post changes
- **Change in Physical Functionality:** Multivariable linear regressions used to assess the association between changes in physical functionality and program participation, considering the control variables
- **Behavioral Health Impact:** Multivariable logistic regressions used to assess the association between the clinical significance of the patient's behavioral health outcomes and program participation, considering the control variables

RESULTS

The sample included 336 patients. Program exposure hours were positively associated with improvements in carrying lift and overhead lift performance (Table 2). Increased program exposure significantly decreased the likelihood of clinically-significant pain complaints (OR: 0.74; CI: 0.59-0.92), functional complaints (OR: 0.79; CI: 0.64-0.96), somatic complaints (OR: 0.79; CI: 0.64-0.98), and anxiety (OR: 0.77; CI: 0.63-0.95) (Table 3).

CONCLUSION

Increased exposure to the program significantly enhanced physical functionality, reduced clinically-significant pain complaints, and improved behavioral health outcomes. By simultaneously addressing the mental and physical health of patients, the trajectory of chronicity and progressive disability can be ended.

References:

[1] Disorbio JM, Bruns D, Barolat G. Assessment and treatment of chronic pain. Practical Pain Management. 2006 Mar 1;6(2):1-0.

[2] Dahan A, van Velzen M, Niesters M. Comorbidities and the complexities of chronic pain. Anesthesiology. 2014 Oct 1;121(4):675-7.

[3] Hulla R, Brecht D, Stephens J, Salas E, Jones C, Gatchel R. The biopsychosocial approach and considerations involved in chronic pain. Healthy Aging Research. 2019;8(01):7-12.

Increased exposure to transdisciplinary biopsychosocial community model program significantly enhanced physical functionality, reduced clinically-significant pain complaints, and improved behavioral health outcomes.

Odds Ratio for Pain: 0.74
95% Confidence Interval: 0.59-0.92

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Table 1: Descriptive Statistics (N=336)

	Initiation / All	Completion	*p*-value of Change
Program hours, mean ± SD	160.3±129.1	-	-
Male patient, n (%)	148 (44.0)	-	-
Patient age, mean ± SD	54.9±11.2	-	-
Treatment in San Diego, n (%)	226 (67.2)	-	-
Carrying lift at initiation, mean ± SD	11.6±9.5	24.2±16.3	<0.01
Overhead lift at initiation, mean ± SD	7.1±7.2	17.6±13.4	<0.01
Pain complaints at initiation, mean ± SD	71.7±22.2	63.9±26.5	<0.01
Functional complaints at initiation, mean ± SD	87.2±12.5	74.8±21.0	<0.01
Somatic complaints at completion, mean ± SD	75.7±21.8	60.3±25.5	<0.01
Anxiety at initiation, mean ± SD	75.9±23.6	63.8±26.5	<0.01
Defensiveness, mean ± SD	22.0±19.8	31.4±21.4	<0.01
Depression, mean ± SD	70.8±22.5	59.1±24.3	<0.01

Patients spent a mean of 160.3 hours participating in the program. When compared using t-tests, patients' outcomes pre- versus post-participation significantly (p<0.01) changed for all measures. Patients experienced improvements in carrying lift, overhead lift, pain complaints, functional complaints, somatic complaints, anxiety, and depression.

Table 2: Associations with Outcomes for Physical Functionality Measures

	Change in Carrying Lift			Change in Overhead Lift		
	Est.	Std. Error	*p*-value	Est.	Std. Error	*p*-value
Intercept	9.55	4.46	0.03	6.58	9.55	0.28-0.77
Program hours (log 2)	4.46	0.45	<0.01	3.61	1.78	0.91-1.07
Male gender	0.03	1.12	<0.01	0.07	6.10	0.08-2.07
Age	6.58	0.05	<0.01	1.35	-0.19	0.61-23.28
Treatment in the San Diego Clinic	3.61	1.21	0.08	0.36	-2.10	0.97-1.34

Adjusted linear regressions found increased program participation was significantly (p<0.01) associated with greater improvement in carrying lift and overhead lift. Being male (p<0.01) and younger (p<0.01) was also associated with greater improvements in these outcomes. Treatment location was not significantly associated with outcomes.

Table 3: Odds Ratios for Associations with BBHI 2 Outcome Measures

	Clinically-Significant Pain	Clinically-Significant Functional C.	Clinically-Significant Somatic C.	Clinically-Significant Anxiety	Clinically-Significant Defensiveness	Clinically-Significant Depression
Program hours (log 2)	0.74 (0.59-0.92)	0.79 (0.64-0.96)	0.79 (0.64-0.98)	0.77 (0.63-0.95)	1.02 (0.60-1.73)	0.82 (0.63-1.06)
Pain complaints (initial sig.)	3.64 (2.07-6.41)	1.26 (0.74-2.12)	1.91 (1.08-3.40)	1.52 (0.88-2.65)	0.21 (0.02-1.86)	2.45 (1.16-5.15)
Functional complaints (initial sig.)	1.56 (0.74-3.29)	5.55 (2.72-11.31)	1.13 (0.54-2.37)	2.03 (0.98-4.19)	0.40 (0.11-1.53)	1.98 (0.62-6.37)
Somatic complaints (initial sig.)	1.90 (1.00-3.62)	1.54 (0.88-2.68)	1.81 (0.96-3.42)	1.92 (1.05-3.53)	2.14 (0.49-9.38)	2.54 (1.02-6.35)
Anxiety (initial sig.)	0.93 (0.48-1.80)	1.43 (0.81-2.52)	2.00 (1.04-3.85)	2.46 (1.33-4.56)	0.89 (0.20-4.01)	2.04 (0.81-5.10)
Defensiveness (initial sig.)	5.87 (1.10-31.36)	0.77 (0.08-7.23)	0.00 (0.00-Inf)	3.82 (0.65-22.33)	0.00 (0.00-Inf)	0.00 (0.00-Inf)
Depression (initial sig)	1.72 (0.92-3.21)	1.17 (0.66-2.07)	1.37 (0.75-2.51)	1.29 (0.72-2.32)	0.28 (0.03-2.57)	1.40 (0.67-2.94)
Male gender	0.70 (0.40-1.22)	0.76 (0.46-1.25)	0.70 (0.40-1.21)	1.57 (0.93-2.64)	0.64 (0.16-2.53)	1.05 (0.52-2.10)
Age	1.00 (0.98-1.03)	1.00 (0.98-1.03)	0.99 (0.97-1.01)	1.00 (0.98-1.02)	0.95 (0.90-1.00)	1.00 (0.97-1.03)
Treatment in San Diego	0.67 (0.37-1.19)	0.97 (0.57-1.65)	1.06 (0.59-1.92)	1.32 (0.75-2.35)	4.99 (0.59-42.35)	1.52 (0.69-3.38)

Adjusted logistic regressions found that increased program participation was significantly associated with patients being less likely to have clinically-significant pain complaints (OR: 0.74; 95% CI: 0.59-0.92), functional complaints (OR: 0.79; 95% CI: 0.64-0.96), somatic complaints (OR: 0.79; 95% CI: 0.64-0.98), and anxiety (OR: 0.77; 95% CI: 0.63-0.95). Patients' gender, age, and treatment location were not significantly associated with their likelihood of having clinically-significant BBHI 2 outcomes.