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The Role of Psychosomatic Traits in Tailored workup for Anterior Cervical Discectomy and Fusion – a Case-series

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ACDF is widely employed for treating cervical spondylosis. Various studies have reported non-success rates in terms of alleviating disability and pain. Psychological factors have increasingly emerged as critical determinants of surgical outcomes in various medical fields. However, the extent of their influence in the context of ACDF remains insufficiently explored.

Assess the influence of psychosomatic traits on long-term pain, disability, and quality-of-life outcomes.

Case-series.

Retrospective case-series of prospectively collected data from 76 consecutive patients who underwent ACDF with PEEK inter-fixed cages. Preoperative psychological traits were assessed using the Symptom Checklist 90 (SCL-90) questionnaire. ODI, VAS, NDI, EuroQol-5D (EQ-5D) and SF-36 were collected preoperatively, one-month postoperatively, and at least one year after the surgical procedure.

Median FU (IQR) was 581 (413) days. Correlation analyses revealed associations between psychosomatic traits and various pre-operative and post-operative outcome measures. Univariate analyses showed statistically significant influence of several psychosomatic traits and Global Severity Index (GSI) over final follow-up (fFU) ODI, VAS, NDI, EQ-5D and SF-36. Linear regression analyses demonstrated the exclusive influence of GSI over fFU ODI, VAS and SF-36; while it exhibited a stronger weight towards fFU NDI and EQ-5D respect to correspondent preoperative values.

This study highlights the significance of psychosomatic traits in predicting ACDF outcomes and emphasizes their value in the preoperative workup to counsel patients about realistic expectations. The findings underscore the need to consider psychological profiles in preoperative workup, opening avenues for research into medications and psychological therapies. Recognizing the impact of psychosocial elements affects treatment strategies, fostering tailored surgical approaches and patient care.

Fig. 1

Table 1. Demographic parameters.

Variable	
Age	51.8 ± 10
Male/Female	32 (42.1%)/44 (57.9%)
BMI	25.5 ± 4.4
Follow-up (days), median (IQR)	581 (413)
Preop-ODI	0.4 ± 0.2
Preop-VAS	7.3 ± 1.8
Preop-NDI	0.6 ± 0.2
Preop-SF-36	45.2 ± 19.2
Preop-EQ-5D	0.5 ± 0.2
Preop-GSI	0.6 ± 0.6
Somatization	1.3 ± 0.8
Obsessive-compulsive	0.9 ± 0.8
Interpersonal sensitivity	0.4 ± 0.5
Depression	0.7 ± 0.7
Anxiety	0.6 ± 0.7
Hostility	0.4 ± 0.6
Phobic anxiety	0.4 ± 0.7
Paranoid ideation	0.5 ± 0.6
Psychoticism	0.3 ± 0.5

Fig. 2

Table 2. Baseline and follow-up ODI, NDI, VAS, SF-36, EQ-5D

Variable	Baseline	Follow-up	p-value
ODI	0.4 ± 0.2	0.2 ± 0.2	p<0.001
VAS	7.3 ± 1.8	3.6 ± 2.8	p<0.001
NDI	0.6 ± 0.2	0.3 ± 0.2	p<0.001
SF-36	45.2 ± 19.2	58.3 ± 23.9	0.0008
EQ-5D	0.5 ± 0.2	0.7 ± 0.2	p<0.001

Table 3. Univariate analyses between ODI and SCL-90 subscales

Variable	Coefficient	95% C.I.	p-value
GSI	0.20	0.10 – 0.31	<0.0001
Somatization	0.14	0.08 – 0.19	<0.0001
Obsessive-compulsive	0.10	0.04 – 0.16	0.002
Interpersonal sensitivity	0.09	-0.03 – 0.22	0.142
Depression	0.15	0.08 – 0.22	<0.0001
Anxiety	0.17	0.09 – 0.24	<0.0001
Hostility	0.10	-0.01 – 0.21	0.063
Phobic anxiety	0.12	-0.04 – 0.28	0.131
Paranoid ideation	0.09	-0.03 – 0.21	0.124
Psychoticism	0.24	0.11 – 0.38	0.001

Table 4. Univariate analyses between VAS and SCL-90 subscales

Variable	Coefficient	95% C.I.	p-value
GSI	2.18	0.52 – 3.84	0.011
Somatization	1.66	0.74 – 2.58	0.001
Obsessive-compulsive	0.99	0.01 – 1.97	0.047
Interpersonal sensitivity	0.37	-1.52 – 2.26	0.696
Depression	1.71	0.55 – 2.86	0.005
Anxiety	2.07	0.87 – 3.27	0.001
Hostility	1.31	-0.3 – 2.91	0.108
Phobic anxiety	1.41	-1.22 – 4.03	0.287
Paranoid ideation	0.99	-0.82 – 2.79	0.278
Psychoticism	2.18	-0.03 – 4.39	0.053

Fig. 3**Table 5. Univariate analyses between NDI and SCL-90 subscales**

Variable	Coefficient	95% C.I.	p-value
GSI	0.27	0.15 - 0.39	<0.0001
Somatization	0.19	0.12 - 0.25	<0.0001
Obsessive-compulsive	0.14	0.07 - 0.21	<0.0001
Interpersonal sensitivity	0.1	-0.05 - 0.25	0.19
Depression	0.19	0.11 - 0.28	<0.0001
Anxiety	0.22	0.13 - 0.31	<0.0001
Hostility	0.15	0.02 - 0.27	0.022
Phobic anxiety	0.2	0 - 0.39	0.045
Paranoid ideation	0.17	0.03 - 0.31	0.019
Psychoticism	0.26	0.09 - 0.43	0.004

Table 6. Univariate analyses between SF-36 physical score and SCL-90 subscales

Variable	Coefficient	95% C.I.	p-value
GSI	-24.72	-37.55 - -11.89	<0.0001
Somatization	-18.26	-24.93 - -11.59	<0.0001
Obsessive-compulsive	-12.72	-20.33 - -5.11	0.001
Interpersonal sensitivity	-11.23	-26.38 - 3.93	0.144
Depression	-18.07	-27.09 - -9.04	<0.0001
Anxiety	-18.47	-28.08 - -8.86	<0.0001
Hostility	-14.59	-27.52 - -1.66	0.028
Phobic anxiety	-17.53	-37.12 - 2.05	0.078
Paranoid ideation	-11.68	-26.42 - 3.07	0.118
Psychoticism	-22.81	-40.56 - -5.07	0.013

Table 7. Univariate analyses between EQ-5D and SCL-90 subscales

Variable	Coefficient	95% C.I.	p-value
GSI	-0.22	-0.35 - -0.08	0.003
Somatization	-0.14	-0.22 - -0.07	<0.0001
Obsessive-compulsive	-0.13	-0.21 - -0.04	0.003
Interpersonal sensitivity	-0.09	-0.24 - 0.07	0.274
Depression	-0.15	-0.25 - -0.05	0.005
Anxiety	-0.18	-0.29 - -0.08	0.001
Hostility	-0.11	-0.25 - 0.03	0.110
Phobic anxiety	-0.12	-0.34 - 0.11	0.298
Paranoid ideation	-0.12	-0.27 - 0.02	0.101
Psychoticism	-0.22	-0.41 - -0.03	0.023

Fig. 4

Table 8. Multiple Linear Regression Analysis

Dep.Var.	Coef.	95% CI	p-value
FU-ODI			
Preop-ODI		-0.08 -	
GSI	0.16	0.39	0.186
Dep.Var.	0.19	0.09 - 0.3	0.001
FU-VAS			
Preop-VAS		-0.07 -	
GSI	0.33	0.72 -	0.101
	1.89	0.23 -	
		3.56	0.027
Dep.Var.	Coef.	95% CI	p-value
FU-NDI			
Preop-NDI		0.05 -	
GSI	0.4	0.76	0.028
		0.07 -	
	0.2	0.34	0.004
Dep.Var.	Coef.	95% CI	p-value
FU-SF-36			
Preop-SF-36		-0.05 -	
GSI	0.26	0.56	0.097
		-34.73 - -	
	-21.55	8.37	0.002
Dep.Var.	Coef.	95% CI	p-value
FU-EQ-5D			
Preop-EQ-5D		0.06 -	
GSI	0.33	0.61	0.019
		-0.32 - -	
	-0.19	0.05	0.007

Fig. 5

Supplementary Table. Correlation analyses between psychosomatic profiles and preoperative and postoperative pain, disability and quality-of-life parameters.

		Somatization	Obsessive-compulsive	Interpersonal sensitivity	Depression	Anxiety	Hostility	Phobic anxiety	Paranoid ideation	Psychoticism
PreOp-ODI	Rho	0.241	0.255	0.17	0.289	0.237	0.203	0.201	0.123	0.111
	P-value	0.05	0.037	0.169	0.018	0.053	0.1	0.102	0.321	0.37
FinalFU-ODI	Rho	0.546	0.403	0.197	0.482	0.518	0.247	0.202	0.206	0.432
	P-value	< .001	0.002	0.142	< .001	< .001	0.063	0.131	0.124	< .001
Preop-VAS	Rho	0.326	0.31	0.135	0.306	0.296	0.279	0.255	0.169	0.088
	P-value	0.007	0.011	0.277	0.012	0.015	0.022	0.018	0.173	0.479
FinalFU-VAS	Rho	0.446	0.269	0.054	0.376	0.429	0.219	0.146	0.149	0.263
	P-value	< .001	0.007	0.696	0.005	0.001	0.108	0.287	0.278	0.053
PreOp-NDI	Rho	0.478	0.467	0.341	0.519	0.453	0.383	0.355	0.341	0.247
	P-value	< .001	< .001	0.005	< .001	< .001	0.001	0.003	0.005	0.044
FinalFU-NDI	Rho	0.62	0.461	0.179	0.522	0.557	0.308	0.271	0.315	0.383
	P-value	< .001	< .001	0.19	< .001	< .001	0.022	0.045	0.019	0.004
Preop-SF-36	Rho	-0.44	-0.383	-0.228	-0.407	-0.363	-0.276	-0.235	-0.183	-0.237
	P-value	< .001	0.001	0.063	< .001	0.003	0.024	0.055	0.138	0.053
FinalFU-SF-36	Rho	-0.595	-0.412	-0.196	-0.476	-0.461	-0.292	-0.235	-0.209	-0.328
	P-value	< .001	0.001	0.144	< .001	< .001	0.028	0.078	0.118	0.013
Preop-EQ-5D	Rho	-0.33	-0.332	-0.326	-0.401	-0.357	-0.321	-0.379	-0.308	-0.272
	P-value	0.006	0.006	0.007	< .001	0.003	0.008	0.002	0.011	0.026
FinalFU-EQ-5D	Rho	-0.47	-0.391	-0.149	-0.37	-0.43	-0.216	-0.141	-0.222	-0.304
	P-value	< .001	0.003	0.274	0.005	< .001	0.11	0.298	0.101	0.023