

Exploring Anxiety and Depressive Symptoms in Parkinson's Disease Through (()) Content (()) Conte





## **Dance Interventions: An Observational Analysis Using PANAS-X**

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# INTRODUCTION

**Parkinson's Disease (PD)** is a neurodegenerative disorder characterized by **motor** symptoms (tremors, falls, rigidity, etc.) and **nonmotor** symptoms such as depression and anxiety.<sup>3</sup>



Parkinson's disease and the non-motor symptoms: hyposmia, weight loss, osteosarcopenia - Scientific Figure on ResearchGate. Available

# RESULTS

The study design that has been performed is a repeated-measures (RM) ANOVA in order to investigate the research objectives.

### **D-Neg Scale RM-A analysis**

	Sum of Squares	df	Mean	F	р	η²
			Square			
RM Factor 1	304.2	1	304.2	17.410	< .001	0.247
RM Factor 1 * GROUP	14.2	1	14.2	0.814	0.380	0.012
Residual	279.6	16	17.5			

### **D- Pos Scale RM-A analysis**

D-Pos Scale Analysis:										
Vithin Subjects Effects										
	Sum of Squares	df	Mean Square	F	р	η²				
RM Factor 1	125.3472	1	125.3472	8.20	0.011	0.045				
RM Factor 1 🕸 GROUP	0.0139	1	0.0139	9.09e-4	0.976	0.000				
Residual	244.4583	16	15.2786							

Depression and Anxiety are prevalent nonmotor symptoms of PD, due to neurobiological mechanisms associated with the neurodegenerative disorder. Depression is known as the most commonly reported neuropsychiatric disturbances in PD as over 50% of participants in a sample study of 1000 PD patients reported having mild to severe depressive symptoms. Anxiety is also known as a globally recognized NMS of PD in 31% of PwPD.<sup>3</sup>

Bearss & Desouza (2021) found that weekly **dance** interventions are able to mitigate some MS and NMS of PD through measures (i.e. **PANAS-X)**<sup>4</sup>

To **operationally define** symptoms of depression and anxiety, the PANAS-X scale moodlets were used to categorize the mood disorders into 4 separate scales in reference to the **DSM-V.**<sup>1</sup> **Current Aims:** 

 To observe how NMS of depression and anxiety will be mitigated through dance interventions using PANAS-X Derived Scales
To observe the after effects of the mood disorders to the dance class (if any).



Suzuki, K. (Director), & Choueiri, S. (Producer). (2016). SYNAPSE DANCE

Squares     Square       GROUP     34.7     1     34.7     0.930     0.349     0.028		Sum of	ui	mean	· ·	р	ц.
GROUP 34.7 1 34.7 0.930 0.349 0.028		Squares		Square			
	GROUP	34.7	1	34.7	0.930	0.349	0.028
Residual 597.1 16 37.3	Residual	597.1	16	37.3			

	Sum of Squares	df	Mean	F	р	n²
			Square			
ROUP	82.3	1	82.3	0.558	0.466	0.029
esidual	2360.1	16	147.5			

The within subjects **(WS)** effects for the D-Neg includes df = 1,  $\eta^2$ = 0.247, p = 0.001, and F= 17.410. The between subjects **(BS)** effects for the D-Neg Scale includes df=1,  $\eta^2$ = 0.028, p= 0.349, F= 0.930.).

The **WS** effects for the D-Pos includes df = 1,  $\eta^2$ = 0.045, p = 0.011, and F= 8.20. The

**BS** effects for the D-Pos Scale includes df= 1,  $\eta^2$ = 0.029, p= 0.466, F= 0.558.

A-Neg Scale RM-A analysis

	ffects							
	Sur	n of Square	s df	Mear Squar	n F	р	n²	
RM Factor 1		64,2	1	64.2	2 5.55	0.032	0.062	
RM Factor 1 캬 GROUP		18.0	1	18.0	1.56	0.230	0.017	
Residual		185.0	16	11.6				
etween Subject:	s Effects							
letween Subject:	Sum of Squares	df	Mean Square	F	р	η²		
letween Subject: GROUP	Sum of Squares 37,6	df 1	Mean Square 37.6	F 0.821	р 0.378	<b>n²</b> 0.036		

A-Pos Scale RM-A analysis

Vithin Subjects Effects										
	s	ium of Squares	s df	Mean Square	F	q	η²			
RM Factor 1		86.7	1	86.68	10.31	0.005	0.050			
RM Factor 1 🕸 GROUP		19.0	1	19.01	2.26	0.152	0.011			
Residual		134.5	16	8,41						
Note. Type 3 Su	ms of Squar	es								
Jetween Subject	a chiecta									
	Sum of Squares	df	Mean Square	F	р	η²				
GROUP	8.68	1	8.68	0.0946	0.762	0.005				

The **WS** effects for A-Neg includes df = 1,  $\eta^2$ = 0.062, p = 0.032, and F= 5.55. The **BS** effects includes df= 1,  $\eta^2$ = 0.036, p= 0.378, F= 0.821.

The **WS** effects of A-Pos includes df= 1,  $\eta^2$ = 0.050, p = 0.005, and F= 10.31. The **BS** effects



### PANAS-X DERIVED SCALES (PRETEST-POSTTEST)

This scale consists of a numbe mark the appropriate answer in	r of words and phrases in the space next to that	that describe differen word. Indicate to w	t feelings and emotion hat extent you have for	ns. Read each item and t elt this way during the pa
few weeks. Use the following	g scale to record your as	nswers:		
1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely
cheerful	sad	act	ive	angry at self
disgusted	calm	guilty		enthusiastic
attentive	afraid	joyful		downhearted
bashful	tired	nervous		sheepish
sluggish	amazed	lonely		distressed
daring	shaky	sleepy		blameworthy
surprised	happy	exc	ited	determined
strong	timid	hos	stile	frightened
scomful	alone	pro	ud _	astonished
relaxed	alert	jitti	ery _	interested
irritable	upset	live	ely	loathing
delighted	angry	ash	amed _	confident
inspired	bold	at c	ase	energetic
fearless	blue	scat	red _	concentrating
disgusted	shy	dro	wsy _	dissatisfied
with self				with self

Depression -	D.C (B)	D.C. (A)	Anxiety -	D.C. (B)	D.C. (4
Sluggish	2	3	Afraid	2	
Guilty	1	3	Shaky	4	
Disgusted w/ se	1 1	2	Timid	2	
Sad	3	3	Irritability	3	
Tired	3	2	Nervous	3	
Upset	4	3	Jittery	3	
Alone	3	1	Distressed	2	
Loathing	1	3	Alert	3	
Dissatisfied w/s	3	3	Frightened	3	
Downhearted	1	2	Blameworthy	2	
TOTAL	22	25	TOTAL	27	
Depression +	D.C. (B)	D.C. (A)	Anxiety +	D.C. (B)	D.C. (4
Happy	4	3	Fearless	3	
Enthusiastic	3	3	Calm	3	
Delighted	3	3	At ease	4	
Proud	4	3	Concentrating	3	
Active	4	3	Determined	3	
Excited	3	2	Relaxed	4	
Lively	3	4	Confident	3	
Energetic	4	2	Daring	3	
Joyful	4	3	Strong	3	
Inspired	3	3	Bold	3	
			TOTAL	32	

**Measures.** The JOElab (2017) research was conducted as a pretest-posttest design where participants in the people with Parkinson's Disease (PwPD) experimental (N = 12) and healthy, age-matched control groups (N= 6) completed the PANAS-X scale before and after the 60 minute dance session.<sup>2</sup>

### **1-hr Dance Class**



### FOUR SEPARATE PANAS-X SCALES:

Anxiety-Negative (A-Neg)  $\rightarrow$  afraid, shaky, jittery, nervous, distressed, timid, alert, frightened, blameworthy Depression-Negative (D-Neg)  $\rightarrow$  guilty, sluggish, sad, upset, loathing, dissatisfied and disgusted with self, downhearted, alone, and tired

### include df= 1, $\eta^2$ = 0.005, p= 0.762, F= 0.0946. A-Pos/ D-Pos Scale RM-A analysis

/ithin Subjects Effects										
	Sum of Squares	df	Mean Square	F	р	'n²				
RM Factor 1	37.556	1	37.556	4.244	0.056	0.017				
RM Factor 1 米 GROUP	0.889	1	0.889	0.100	0.755	0.000				
Residual	141.583	16	8.849							
Note. Type 3 Sums of Sc Between Subjects Effects	i									
Sum Squar	of df res	Mean Square	F	ą	η²					

# D-Neg/A-Neg After Effects Analysis: Within Subjects Effects Sum of Squares df Mean Square F P RM Factor 1 36.1 1 36.13 9.65 0.007 P RM Factor 1 36.1 1 36.13 9.65 0.007 P RM Factor 1 36.1 1 15.12 4.04 0.062 P Residual 59.9 16 3.74 D D P Note. Type 3 Sums of Squares Square F P P Q

The **WS** effects for A-Neg/ D-Neg (after effects) includes df = 1,  $\eta^2$ = 0.055, p = 0.007, and F= 9.65. The **BS** effects includes df= 1,  $\eta^2$ = 0.051, p= 0.323, F= 1.04.

The **WS** effects of A-Pos/ D-Pos (after effects) includes df= 1,  $\eta^2$ = 0.017, p = 0.056, and F= 4.244. The **BS** effects include df= 1,  $\eta^2$ = 0.031, p= 0.465, F= 0.561.

# DISCUSSION

This study provided an insightful method of determining the effects of PwPD and how dance interventions may mitigate symptoms through the novel use of the PANAS-X. PwPD reported NMS highly associating with negative symptoms of D-Neg scale, and the A-Pos scale had the largest decreasing effect after the dance intervention. Future direction for the NMS research is promising as the limitations of this research included usage of pharmacotherapy and the lack of a multiple session dance program to further explore the results of dance interventions on NMS of PD relating to depressive and anxiety disorders.

### A-Neg/D-Neg Scale RM-A analysis

Manaf, H., Justine, M., & Omar, M. (2014)

Each moodlet for the scales referenced by common negative and positive/counteracting characteristics of major depressive disorder, generalized anxiety disorder, and social anxiety according to **DSM-V.**<sup>1</sup>

Anxiety-Positive (A-Pos)  $\rightarrow$  fearless, calm, at ease, concentrating, determined, relaxed,confident, daring, strong, bold **Depression-Positive (D-Pos)**  $\rightarrow$  happy, enthusiastic, delighted, proud, active, excited, lively, energetic, joyful, inspired,



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- 2. Bearss, K. A., McDonald, K. C., Bar, R. J., & DeSouza, J. F. (2017). Improvements in balance and gait speed after a 12 week dance intervention for Parkinson's disease. Advances in integrative medicine, 4(1), 10-13.,
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4. Bearss, K. A., & DeSouza, J. F. (2021). Parkinson's disease motor symptom progression slowed with multisensory dance learning over 3-years: A preliminary longitudinal investigation. *Brain Sciences*, *11*(7), 895. https://doi.org/10.3390/brainsci11070895