

Do Physical Activity Intervention Preferences Differ When People with Multiple Sclerosis Have Vascular Comorbidities? A Preliminary Analysis

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Background

Physical activity (PA), such as exercise, has been associated with numerous benefits for people with multiple sclerosis (PwMS), including but not limited to improved fitness levels, walking, muscle strength, balance, cognition, fatigue, depressive symptoms, lipid profiles, bone formation, glucose tolerance, insulin sensitivity, as well as lower rates of comorbidities. Despite the benefits of PA in PwMS, only 20% of PwMS reach the recommended level of ≥ 150 minutes of exercise and/or lifestyle PA per week,¹ and even in newly diagnosed PwMS, 36% were insufficiently physically active, prompting the need for efficacious PA interventions.²

Objectives

The aim of this study is to 1) determine PwMS' preferences for PA and exercise (EXS) intervention locations, types of activity, settings, delivery, frequency, intensity, and duration, and 2) determine if there are differences based on people with vascular comorbidities compared to those without.

Methods

Participants

- A convenience sample of 75 individuals with a diagnosis of MS

Study Design

- Preliminary analysis of survey study
- Data was collected through a Microsoft Forms survey that took approximately 20-30 minutes to complete.

Main Outcome Measures:

- Vascular comorbidity status: hypertension, hypercholesterolemia, diabetes, heart disease, or peripheral vascular disease.³
- Desired PA and EXS interventions:
 - Location, setting, activity type, intensity, delivery, check-in, duration, and frequency.

Statistical Analysis

- Frequencies of desired PA and EXS for participants overall and based on VC status were reported
- Pearson's chi-square tests were performed to determine if there were differences based on VC status using SPSS Version 26.0.

Table 1. Demographics presented as percentages unless otherwise noted for all participants and by vascular comorbidity status

		Overall n = 75	Has VC n = 36	No VC n = 39	p-value
Age	median (IQR)	54 (16)	58 (13)	49 (18)	0.010
Gender	Women	77.3%	72.2%	82.1%	0.576
	Men	20.0%	25.0%	15.4%	
	Non-binary	2.7%	2.8%	2.5%	
Race	White	90.7%	88.9%	92.3%	0.548
	Black	5.3%	8.3%	2.6%	
	Mixed	2.7%	2.8%	2.6%	
	Unknown	1.3%	0.0%	2.6%	
Ethnicity	Hispanic	6.7%	5.6%	7.7%	0.711
	Not Hispanic	93.3%	94.4%	92.3%	

Abbreviations: VC: vascular comorbidities
Bolded signifies $p < 0.05$

Results

Significant differences were noted between vascular comorbidity status for age ($p = 0.010$)

Table 2. Preferences for physical activity and exercise programs overall and by vascular comorbidity status					
		Overall n=75	Has VC n=36	No VC n=39	p-value
Location	in-clinic	33.3%	41.7%	25.6%	0.141
	remote (at home)	72.0%	72.2%	71.8%	0.967
	gym or fitness center	68.0%	66.7%	69.2%	0.812
	community	1.3%	2.8%	0.0%	0.295
	pool	4.0%	2.8%	5.1%	0.604
	outside	10.7%	8.3%	12.8%	0.529
Setting	group exercise	60.0%	63.9%	56.4%	0.509
	one on one with a trainer	58.7%	69.4%	48.7%	0.069
	alone (following a program)	66.7%	55.6%	76.9%	0.050
	with someone (e.g. friend or family)	2.7%	2.8%	2.6%	0.954
Activity type	walking	76.0%	77.8%	74.4%	0.729
	strength	92.0%	88.9%	94.9%	0.340
	aerobic	74.7%	72.2%	76.9%	0.640
	balance	76.0%	80.6%	71.8%	0.375
	stretching	80.0%	80.6%	79.5%	0.908
	other (tai chi, pilates, yoga)	10.7%	13.9%	7.7%	0.385
Intensity	high intensity	25.3%	19.4%	30.8%	0.260
	moderate intensity	85.3%	80.6%	89.7%	0.261
	low intensity	34.7%	50.0%	20.5%	0.007
Delivery	physical pamphlet	22.7%	27.8%	17.9%	0.310
	physical program	72.0%	77.8%	66.7%	0.284
	physical education materials	30.7%	30.6%	30.8%	0.984
	digital webpage	42.7%	52.8%	33.3%	0.089
	digital app	58.7%	58.3%	59.0%	0.955
	digital emails	25.3%	30.6%	20.5%	0.318
	digital video	60.0%	63.9%	46.2%	0.509
Check-in	in person	52.0%	58.3%	46.2%	0.292
	phone call	37.3%	41.7%	33.3%	0.456
	email	38.7%	38.9%	69.2%	0.970
	texting	66.7%	63.9%	25.6%	0.624
	app-based with another person	36.0%	47.2%	25.6%	0.052
	app-based self check-in	37.3%	36.1%	38.5%	0.833
	paper tracking	5.3%	8.3%	2.6%	0.267
	activity tracker	57.3%	61.1%	53.8%	0.525
	10-15 minutes	14.7%	19.4%	10.3%	0.261
	15-30 minutes	32.0%	33.3%	30.8%	0.812
Session Length	30-45 minutes	54.7%	55.6%	53.8%	0.882
	45-60 minutes	45.3%	36.1%	53.8%	0.123
	>60 minutes	12.0%	19.4%	5.1%	0.057
Frequency	1 day	12.0%	11.1%	12.8%	0.820
	2 days	22.7%	19.4%	25.6%	0.522
	3 days	41.3%	47.2%	35.9%	0.320
	4 days	34.7%	36.1%	33.3%	0.801
	5 days	30.7%	30.6%	30.8%	0.984
	6 days	10.7%	13.9%	7.7%	0.385
	7 days	10.7%	11.1%	10.3%	0.905
	more than once per day	2.7%	2.8%	2.6%	0.954

Abbreviations: VC: vascular comorbidities

Bolded signifies $p < 0.05$

PwMS with vascular comorbidities wanted low intensity exercise more than those without vascular comorbidities.

Discussion

- Overall, the majority (>50%) of PwMS were interested in:
 - Performing remotely (at home) or at a gym or fitness center
 - Group exercise, one on one with a trainer, and alone (following a program)
 - A mix of walking, strength, aerobic, balance, and stretching exercises
 - Moderate intensity
 - Receiving a physical program, digital app, and digital videos
 - Checking-in in-person, texting, and through an activity tracker
 - Session of 30-45 minutes long
 - The number of days per week were variables
- PwMS with vascular comorbidities preferred low intensity effort more than those without vascular comorbidities and were older.

Conclusion

- The preliminary results demonstrate that both PwMS with and without vascular comorbidities are interested in physical activity and exercise interventions, with preferences regarding how the program is designed.
- While those with vascular comorbidities were older and had a higher preference for low intensity exercise, they still were as interested in moderate intensity exercise as those without vascular comorbidities.
- This survey study will help incorporate patient input into the design of interventional studies and physical activity programs to benefit the PwMS in the future.

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