

ROLE OF RESILIENCE IN HEALTH BEHAVIORS IN MULTIPLE SCLEROSIS

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Background

- There is evidence of an association between positive health behaviors (e.g., regular physical activity and healthy diet) and high resilience in older adults with multiple sclerosis (MS)¹, however this relationship has yet to be evaluated with younger adults.
- Additionally, exploration between resilience and objective health status metrics (e.g., body mass index [BMI] and mean arterial pressure [MAP]) has yet to be looked at.
- Furthermore, there is no current evidence on whether having higher levels of resilience can moderate the relationship between health behaviors and MS symptoms.

Objectives

- 1) To examine whether self-reported health behaviors and objective metrics differ between adults with MS (ages 22-47) with high and low resilience.
- 2) Exploratory moderation analyses evaluated whether resilience affects the strength of the relationship between lifestyle and MS symptoms.

Methods

Participants: 59 persons with MS

- Resilience level was determined using the MS Resiliency Scale (MSRS)²
 - High resilience: ≥ 81 (n = 28)
 - Low resilience: ≤ 75 (n = 31)
 - Persons with medium resilience were excluded

Subjective Measures:

- The Simple Lifestyle Indicator Questionnaire: a self-reported measure used here to assess physical activity (3 items), diet (3 items), stress (1-item), and tobacco use (2 items)³.
- AUDIT-C⁴: a 3-item measure used to assess self-reported alcohol consumption.
- The SymptoMScreen⁵: was used to assess 12 common MS symptoms (mobility, dexterity, body pain, sensation, bladder function, fatigue, vision, dizziness, cognition, depression, and anxiety), with a composite score calculated in order to measure symptom severity.

Objective Measures:

- BMI and blood pressure were extracted from the medical record.
- Mean arterial pressure was calculated.

Statistical Analyses

- Bivariate analyses were conducted using Fisher's exact tests, t-tests, median tests, and Mann-Whitney U tests .
- If a significant difference was found in the bivariate analyses, regressions were conducted to examine the relationship between resilience and health behaviors, controlling for age, gender, disability, disease duration, and MS subtype as covariates¹.
 - Linear regressions for physical activity, diet, and BMI
 - Ordinal regression for life stress
- Exploratory moderation analyses (using the Hayes's PROCESS⁶) were conducted for health behaviors that were significant in the regression analyses (**Figure 1**).
 - X = Individual health behaviors
 - Y = Composite SymptoMScreen
 - M = Dichotomized MSRS
- Analyses were performed using SPSS version 26 (SPSS, Chicago, IL).

Results

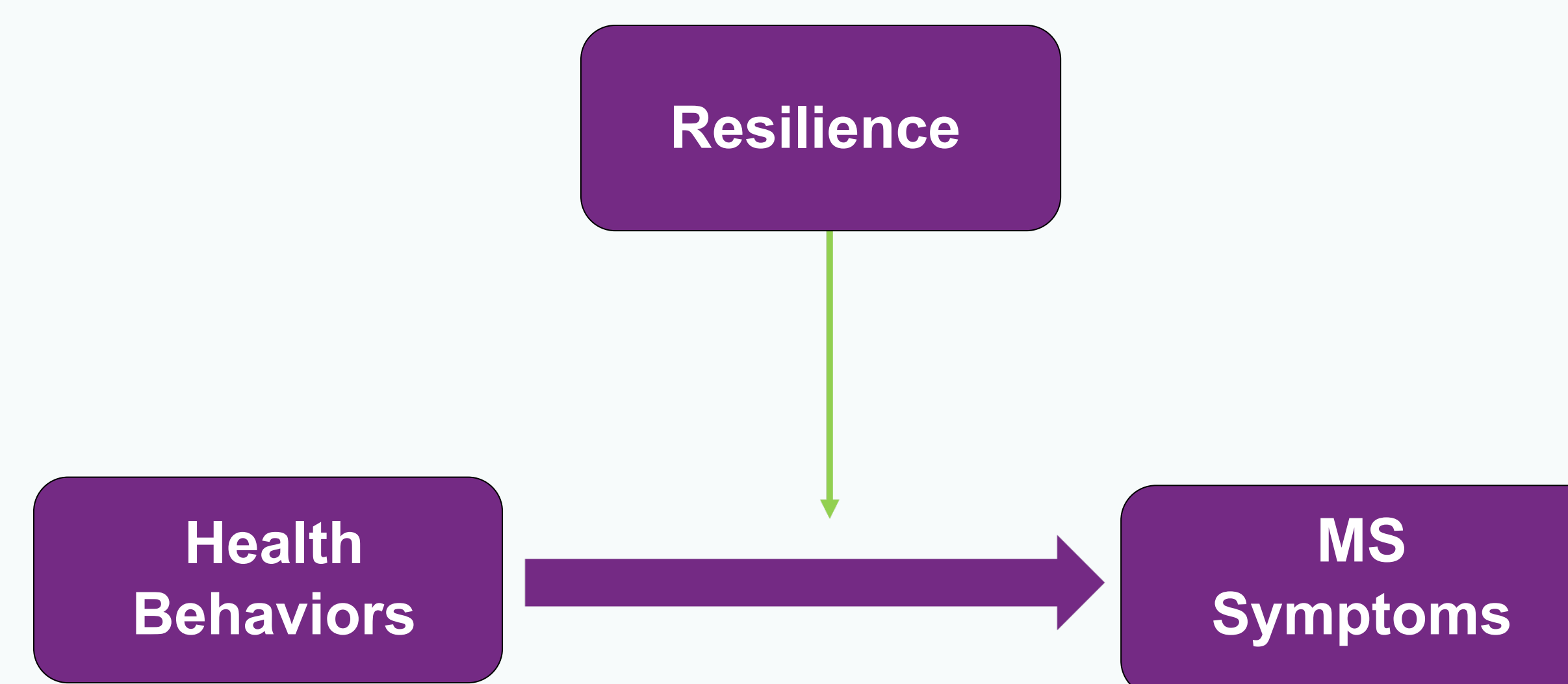


Figure 1: Theoretical mediation model in which resilience (dichotomized variable from the MS Resiliency Scale) would mediate the relationship between individual health behaviors (measured objectively or subjectively) and MS symptoms (measured using the composite score of the SymptoMScreen).

Table 1: Bivariate analyses demonstrating the differences in health behaviors between persons with high and low resilience.

Health Behaviors	High Resilience (n=28)	Low Resilience (n=31)	P-value
Smoker Status (%)			0.415
Current	3.6%	6.5%	
Previous	50%	32.3%	
Never	46.4%	61.3%	
Diet (score) (mean ± SD)	7.86 ± 2.76	6.38 ± 2.69	0.043*
Mean Arterial Pressure (MAP) (mmHg) (mean ± SD)	93.11 ± 9.54	95.13 ± 11.96	0.479
Life Stress (score)	2.00	4.00	<0.001*
Physical Activity (score)	8.00	4.00	0.001*
Alcohol Consumption (score)	1.00	1.00	0.784
BMI (m2/kg)	25.22	30.75	0.050*

*p<0.05
Reported as median unless otherwise noted

Regression Results:

- Resilience was a significant predictor of life stress after controlling for age, gender, disability, disease duration, and MS subtype (Wald $\chi^2(1) = 10.93$, $p = .001$).
- Resilience was also a significant predictor of physical activity after considering the covariates ($b = 3.30$, $p = .033$).
- However, none of the other significant associations remained in the regression models after the addition of the covariates:
 - Diet model: $b = 0.38$, $p = .676$
 - BMI model: $b = -3.21$, $p = .309$

Results (Cont.)

Moderation Results

- There was evidence of resilience moderating the relationship between life stress and MS symptoms ($b = -7.43$, 95% CI [-13.38, -1.49], $p = .015$).
 - When resilience was low, there was a significant positive relationship between stress levels and MS symptoms ($b = 4.68$, 95% CI [1.29, 8.08], $t = 2.76$, $p = .008$)
 - When resilience was high, there was a non-significant negative relationship between stress levels and MS symptoms ($b = -2.75$, 95% CI [-7.64, 2.13], $t = -1.13$, $p = .263$)
- There was no evidence of resilience moderating the relationship between physical activity and MS symptoms ($b = -0.62$, $p = .377$).

Conclusions

- Consistent with previous findings, resilience was positively associated with physical activity and negatively associated with life stress. Unlike in older adults from other studies, diet was not found to be different by resilience level.
- Persons with high resilience had better dietary choices, lower life stress, more physical activity, and lower BMI than persons with low resilience.
- However, once the covariates (age, gender, disability, disease duration, and MS subtype) were introduced in the regression models, resilience was only a predictor of life stress and physical activity, but not diet or BMI.
- Resilience did not affect the strength of the relationship between physical activity and MS symptoms.
- The negative association of stress on MS symptoms is found to be greater when people have low levels of resilience.

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