symptoms, neuroticism, life events, exercise, and demographic scales, in that order. As an incentive, participants had the option to enter a drawing to win a $100 Amazon gift card at the end of the survey, and then they were thanked for their time.

Results

Descriptive Statistics

First, data were screened for data entry errors by examining descriptive statistics (see Tables 1 and 2). Out-of-bounds responses were found in five surveys (e.g., the number of hours reported doing exercise exceeded the number of hours in a day); these surveys were eliminated from analyses.

The average age of respondents was 50.74, with the youngest respondent being 30 years old and the oldest being 61 years old. The mean age of respondents in this study approximates the typical age in which women begin experiencing menopausal symptoms (i.e., 50 years; Ginsberg, 1991). As seen in Table 1, Caucasian (non-Hispanic) women were over-represented, comprising 86% of the sample. In addition, the majority of women also had a college education or more and middle-class income levels.

The means and standard deviations for each of the study variables are shown in Table 2. Respondents' mean number of objective stressors was toward the top of possible scores, confirming the evidence that women tend to face added stressors during this phase of their lives (Woods & Mitchell, 1997). However standard deviations were large indicating a considerable range in the number of stressors reported.

Table 1

Participant Characteristics

Characteristic	*M*	*SD*	*n*	%
Age	50.88	5.11	168	
Number of people in household	2.79	1.29	169	
Race/Ethnicity				
Caucasian			144	87
Latino/Hispanic			6	4
African-American			4	2
Native American/Aleut			1	1
Other			11	7
Education Level				
Grammar School			1	<1
High School or Equivalent			19	11
Vocational/technical School (2 year)			15	9
Some College			50	30
Bachelor's Degree			56	34
Master's Degree			14	8
Doctoral Degree			3	1
Professional Degree (MD, JD, etc.)			2	1
Other			6	4
Annual Income($)			58	34
0 to 29,999			15	9
30,000 to 59,999			44	26
60,000 to 119,999			58	34
120,000 to 179,999			19	11
180,000+			13	8
Prefer not to answer	–		20	12

Note. Totals of percentages are not 100 for every characteristic because of rounding.

The exercise mean also fell in the high range with a large standard deviation. The large standard deviation is indicative of the large range of amounts of exercise reported, with women tending to report either large amounts of exercise or very little exercise.

Physical activity scores on the IPAQ can vary greatly depending on the sample tested. For example, one could not expect physical activity scores for young, athletic women to be similar to scores for elderly women. Furthermore, there are no IPAQ scores with a

similar population in which to compare this study's sample. Therefore, it was not possible to determine whether physical activity scores were typical for this sample.

Table 2

Exercise, Stressors, and Menopause Scale Characteristics

Measure	*M*	*SD*
SRRS	691.44	924.23
IPAQ–Total	6408.10	7791.29
IPAQ–Walking	1825.47	3355.91
IPAQ–Moderate	3331.51	4610.49
IPAQ–Vigorous	1251.12	2737.16
IPAQ–Work	2673.82	5386.42
IPAQ–Transport	591.40	1542.83
IPAQ–Domestic	2242.20	4044.29
IPAQ–Leisure	900.67	1636.79
EPQ-BV	27.82	9.86
MRS–Total	17.34	7.98
MRS–Psychological	6.67	3.85
MRS–Somato-Vegetative	6.66	2.90
MRS–Urogenital	4.01	2.55

Note. SRRS = Social Readjustment Rating Scale; IPAQ = International Physical Activity Questionnaire; EPQ-BV = Eysenck Personality Questionnaire Brief Version; MRS = Menopause Rating Scale.

All neuroticism and menopausal symptom scales reflected mean scores close to midrange of possible scores. However, standard deviations were large for both scales, signifying a considerable range in the number of symptoms reported.

Although stressors scores and physical activity means and standard deviations were somewhat high relative to possible scores, there was no evidence for basement or

ceiling effects on any of the measures. The study variables seemed to yield adequate variability with no compromise to correlational analysis.

Correlations were calculated to identify any relationship between demographics (e.g., education, income level) and both the independent and dependent variables. This was done in order identify any demographics as potential confounds in the neuroticism-symptoms relationships. It was found that the respondents' income level indeed correlated with both menopausal symptoms and neuroticism, in which lower income levels correlated with more symptoms and higher neuroticism (see Table 3).

Table 3

Zero-Order Correlations for Primary Study Variables

Measure	1	2	3	4	5	*M*	*SD*
1. Income	—						
2. Stressors	.03	—				636.09	874.62
3. Exercise	.06	.10	—			6000.30	7195.37
4. Neuroticism	–.27**	.19**	.04	—		29.24	10.17
5. Menopausal Symptoms	–.20*	.31**	.24**	.74**	—	18.35	7.92

* $p < .05$. ** $p < .01$.

Hypothesis Test

As indicated earlier, zero-order correlations calculated among all primary study variables showed a negative relationship between neuroticism and income level, in which higher neuroticism scores corresponded to lower income levels (see Table 3).

Menopausal symptoms were found to have a negative relationship with income level, with more severe menopausal symptoms associated with lower income levels. Also found was a positive relationship between neuroticism and reported stressors, in which higher neuroticism scores corresponded to more stressors. More menopausal symptoms correlated to more exercise, more stressors and high neuroticism. Because income was the only demographic variable to correlate

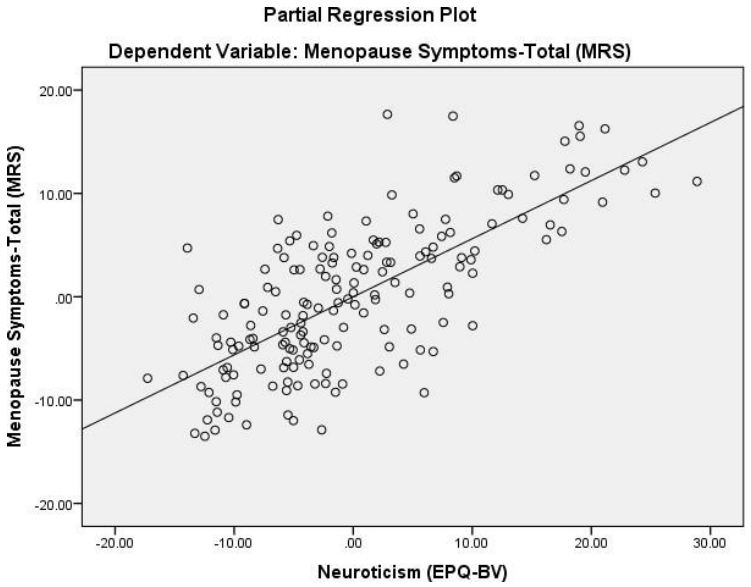
with both neuroticism and menopausal symptoms, it was considered a possible confound in the relationship between neuroticism and menopausal symptoms. Stressors and exercise would also be treated as possible confounds, as planned.

To test the hypothesis that high levels of neuroticism are associated with increased menopausal symptoms, hierarchical regression was used. To control for the possibly confounding effects of income level, stressors, and exercise, these variables were entered first into the equation (Step 1). In order to determine whether higher neuroticism could still predict menopausal symptoms after removing the influence of the potential confounds, it was entered next (Step 2). Results showed the overall regression equation, with all four predictors, to be statistically significant, $F(4, 164) = 65.61$, $p < .001$, adjusted $R^2 = .61$. Thus, approximately 61% of the variance in menopausal symptoms was explained by the four predictors in this model.

To assess the contributions of individual variables, the *t*-statistic for each variable was examined according the step entered. In Step 1, income level was statistically significant, $t(165) = -3.12$, $p < .01$, as was the stressors score, $t(165) = 4.10$, $p < .001$, and the exercise score, $t(165) = 3.15$, $p < .01$. Together, these variables explained 19% of the variance in menopausal symptoms. In Step 2, the neuroticism score was also found to be statistically significant, $t(164) = 13.54$, $p < .001$. The hypothesis was clearly confirmed as evidenced by the fact that neuroticism was responsible for 43% of the remaining variance in menopausal symptoms. In short, women with higher levels of the neuroticism personality trait reported more severe menopausal symptoms above and beyond the effects of income level, stressors, and exercise (see Figure 1).

Figure 1

Partial Regression Scatterplot for Hypothesis Test



Note. Regression plot depicting a significant positive relationship between menopausal symptoms and the neuroticism personality trait above and beyond income, stressors, and exercise. More severe levels of menopausal symptoms were related to higher levels of the neuroticism personality trait.

Secondary Analyses

A secondary area of interest was whether any particular stressors were related to menopausal symptoms. To determine whether there were any such relationships, zero-order correlations were calculated between individual stressors and menopausal symptoms (see Table 4). Although many of the relationships found between these stressors and symptoms were small, such relationships would be important starting points

for future research, and could help inform the assessment and treatment of women with severe menopausal symptoms.

Table 4

Zero-Order Correlations for Menopause-Subscales and Stressors

Measure	MRS Psychological	MRS-Somato-Vegetative	MRS-Urogenital
Divorce	.12*	.01	.08
Marital Separation	.12*	–.00	.06
Marriage	.06	.03	.15*
Sex Difficulties	.16*	.19**	.32**
Death of Close Friend	.12*	.07	.07
Death of Family Member	.11	.08	.15*
Change Financial State	.14*	.09	.22**
Mortgage over $100,000	.17*	.20*	.14
Personal Injury/Illness	.21**	.16*	.16*
Change in Sleeping Habits	.11	.18**	.25**
Change in Eating Habits	.14*	.18*	.20**
Retirement	.18*	.11	.11
Single Living Alone	.20**	.17*	–.04

Note. * $p < .05$. **$p < .01$.

More difficulties with sex, more changes in eating habits, and more instances of personal injury/illness were found to correlate with higher levels of three symptom subscales (i.e., psychological, somato-vegetative, and urogenital). Higher home mortgages and the living alone stressors were related to higher levels of the psychological and somato-vegetative menopausal symptom subscales. Changes in sleeping habits was also related to higher levels of the somato-vegetative and urogenital menopausal symptom subscales. Changes in financial status were related to higher levels of the psychological and urogenital menopausal symptom subscales,. Divorce, marital separation, death of a close friend, and retirement were correlated with higher levels of the psychological menopausal symptom subscale. Death of a close family member and

marriage were correlated to higher levels of the urogenital menopausal symptom subscale. Relationships between stressors and symptoms may have reverse affects. For example, some women in pain may experience more arguments in their relationships and, therefore, face divorce or marital separation.

Table 5

Zero-Order Correlations for Menopause-Subscales and Exercise

Measure	MRS Psychological	MRS-Somato-Vegetative	MRS-Urogenital
Total Exercise	.18*	.19*	.26**
Walking	.16*	.18*	.22**
Moderate	.12	.12	.13
Vigorous	.08	.11	.20**
Work Total	.20**	.21**	.29**
Walking	.19*	.17*	.28**
Moderate	.13	.20*	.21**
Vigorous	.17*	.16*	.22**
Transportation Total	.10	.14	.17*
Walking	.12	.17*	.20**
Cycling (Moderate)	–.08	–.10	–.09
Domestic Total	.07	.05	.06
Vigorous Outside Work	–.04	.02	.17*
Moderate Outside Work	.03	.08	.09
Moderate Inside Work	–.04	.04	.01
Leisure Total	–.15*	–.04	–.03
Walking	–.09	–.04	–.04
Moderate	.02	.02	.02
Vigorous	–.15*	–.05	–.03
Sitting Total per Week	.01	–.07	.02
Sitting Average per Day	.01	–.07	.02

* $p < .05$. ** $p < .01$.

Another area of secondary interest involved the relationship between the type of exercise, both in terms of exercise domains (work, transportation, domestic, or leisure) and intensity (easy, moderate, vigorous) and the types of menopausal symptoms (e.g., psychological, somato-vegetative, and urogenital). Although, the IPAQ does not ask

respondents to indicate specific types of exercise with regards to cardiovascular exercise or strength training exercise, it does reflect how much exercise a women gets on average per week, even when they are getting this exercise in their everyday activities.

The benefit of knowing whether different types of exercise help or exacerbate menopausal symptoms may help resolve the debate regarding how much exercise, if any, helps alleviate menopausal symptoms. To determine whether there are any such relationships, zero-order correlations were calculated between the domains / intensity of exercise and menopausal symptoms (see Table 5). Some correlations, although small, were found.

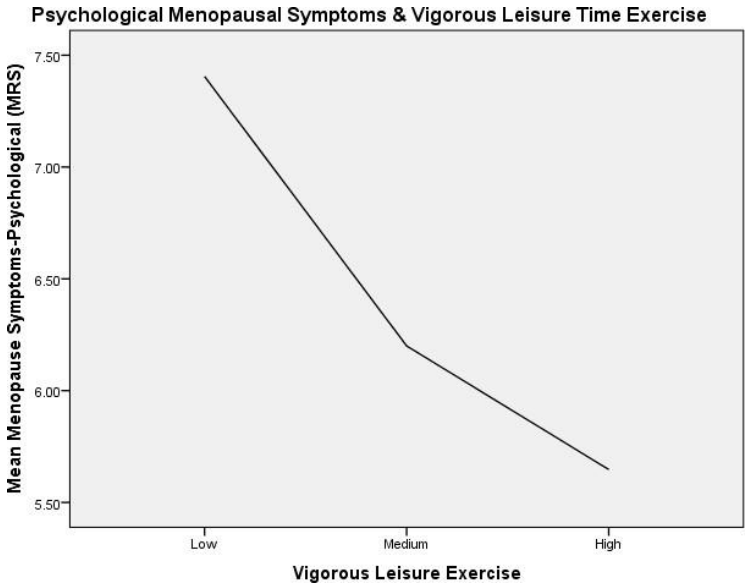
There was only one significant correlation in which exercise had a beneficial effect on menopausal symptoms. Respondents who reported participating in more vigorous leisure time exercise also had lower psychological menopausal symptoms (see Figure 2). However, the more exercise respondents had at work, the more psychological symptoms they reported.

As evidenced in Table 6, it seems that exercise during work has the most impact on menopausal symptoms. Regrettably, the effects from exercise seem to affect symptoms in an undesirable manner. The more exercise participants had during work, the more psychological, somato-vegetative, and urogenital symptoms they reported experiencing. However, because directionality cannot be determined from correlational analysis, it is possible that, rather than exercise having a negative impact on symptoms, severe symptoms prevented women from doing as much exercise. For example, women experiencing the joint and muscular discomfort described in the Somato-vegetative

symptom subscale, may find it difficult to participate in much exercise. There were no significant relationships found between the sedentary activity of sitting and menopausal symptoms.

Figure 2.

Linear Line Graph of Menopausal Symptoms and Vigorous Leisure Time Exercise



Note. Line graph of relationship between the vigorous level exercise domain for leisure and the menopausal symptoms subscale for psychological symptoms. When participating in vigorous activity during leisure activities, respondents reported less severe psychological menopausal symptoms.

Discussion

The aim of this study was to explore a possible connection between the neuroticism personality trait and menopausal symptoms. Furthermore, in order to sift out other possible contributing factors to menopausal symptoms, stressors and exercise were controlled in the analysis. Results supported the study's hypothesis: High levels of the neuroticism personality,