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Personality in multiple sclerosis (MS): Impact on health, psychological well-being, coping, and overall quality of life

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Abstract

Personality has long been considered a factor that can account for differences in health, well-being, and overall quality of life (QOL). A “Distressed or Type D Personality” has been studied in medical populations as a predictor of several outcomes. The purpose of the present investigation was to determine the presence of Type D Personality in multiple sclerosis (MS) and its role on disease symptoms, disease management, health-related behaviors, coping, psychological well-being, and overall QOL and functioning. Two hundred and thirty (233) individuals with MS completed a survey assessing personality, disease symptoms, disease management, coping, self-efficacy, locus of control (LOC), psychological well-being, and QOL. Thirty-seven (16%) individuals were found to be “Type D+.” Such individuals reported greater fatigue, pain, depression, and anxiety and worse disease management and adherence. They also reported engaging in maladaptive means of coping. Compared to “Type D–” they reported lower self-efficacy, LOC, QOL and greater perceived stress. Finally, “Type D+” individuals were more likely to be considering leaving the workforce. Findings suggest that “Type D” Personality is associated with various negative outcomes in MS. Consideration of the routine assessment of personality in MS seems warranted and may better inform interventions and ward off poor outcomes.

Keywords

Multiple Sclerosis; Personality; Health; Coping

Introduction

Individuals diagnosed with multiple sclerosis (MS) are adjusting to a disease that is unpredictable and variable in nature. Proper identification of the factors that influence an individual’s perception of their illness and ability to cope and effectively manage one’s disease is vital to the maintenance of health, psychological well-being, and overall quality of life (QOL). One factor, personality, has long been used to explain individual differences in health, coping, and psychological well-being. For instance, the trait of neuroticism has been shown to be associated with greater mental and physical health problems (Kern, Friedman,

Martin, Reynolds, & Luong, 2009), increased somatization and reports of pain (Russo et al., 1997), and cause of earlier mortality (Lahey, 2009). In contrast, conscientiousness has been associated with greater self-rated health, decreased frequency of physical limitations among those with a physical illness, and lower mortality risk (Goodwin & Friedman, 2006; Kern et al., 2009).

Engagement in health-related behaviors has also been linked to certain personality traits (Friedman, 2000). In particular, neuroticism has been linked with smoking, alcohol use (Mroczek, Spiro, & Turiano, 2009), abuse of psychoactive substances, and unprotected sex (Lahey, 2009). Individuals low on conscientiousness have also been shown to be less active, to use alcohol, drugs, and tobacco, engage in unhealthy eating (Bogg & Roberts, 2004). High levels of conscientiousness, on the other hand, is associated with healthier lifestyles and adherence to disease treatment and self-management (Hampson & Friedman, 2008). Limited research in MS has shown that personality traits, namely low conscientiousness and high neuroticism, are associated with poor adherence (Bruce, Hancock, Arnett, & Lynch, 2010).

Personality also influences how one copes with stressors, such as a chronic illness. More specifically, conscientiousness and extraversion have been linked with problem-focused coping while openness has been shown to be potentially related to use of humor and positive reappraisals. In contrast, a high level of neuroticism has been associated with the use of emotion-focused and avoidance coping (O'Brien & DeLongis, 1996), increased distress in response to daily stressors (Mroczek & Almeida, 2004), and a likelihood of disengagement as a means of coping (Carver & Connor-Smith, 2010). In MS, neuroticism is significantly correlated with the use of emotion-focused coping and agreeableness related to avoidance-oriented coping (Rätsep, Kallasmaa, Pulver, & Gross-Paju, 2000). Finally, with regard to well-being, personality has long been shown to be a determining factor. In particular, neuroticism and extraversion have been found to have the most consistent relationships with subjective well being (Lucas & Diener, 2008).

In medical psychology, personality and their indicators for cardiovascular disease was well appreciated in the 1970s and 1980s. Individuals with a "Type A Personality" were described as being aggressive, competitive, and hostile and more importantly, more likely to suffer from heart disease (Kupper & Denollet, 2007). In 1995, Denollet observed other personality characteristics that seemed predictive of health status and outcomes and coined the so called "Distressed" or "Type D" Personality (Denollet, Sys, & Brutsaert, 1995). Individuals with Type D Personality are characterized as having a synergistic combination of higher levels of neuroticism and lower levels of extraversion or greater social discomfort (Denollet et al., 1996).

Type D Personality has been shown to be a predictor of mortality among individuals with coronary artery disease (Denollet et al., 1996), associated with higher levels of proinflammatory cytokines among individuals with chronic heart failure (Denollet et al., 2003), predictive of lower health related quality of life in renal disease (Son, You, & Song, 2012) and irritable bowel syndrome (Sararoudi et al., 2011), and related to higher levels of depression and anxiety and perceived lower social support among individuals with coronary

artery disease (Staniute et al., 2015). In a large study of 3080 cancer survivors, those with Type D Personality report lower QOL, general health, and emotional and social functioning, while also endorsing greater levels of fatigue, depression, and anxiety (Mols, Thong, van de Poll-Franse, Roukema, & Denollet, 2012). High levels of neuroticism and low levels of extraversion are also more predictive of reports of fatigue than physical impairment among individuals with MS (Merkelbach, König, & Sittinger, 2003). Among individuals who suffered a myocardial infarction, those with a Type D Personality reported a lower level of overall life satisfaction as well as specific domains of health, self, friends and relatives, marriage/partner relationship, and sexuality (Ogińska-Bulik, 2013). Finally, in a recent study, Type D Personality was associated with worse health-related QOL among individuals with MS and Parkinson's disease (Dubayova et al., 2013).

In sum, it has been presumed that one's personality may explain why individuals with similar health problems have differing levels of pain, disability, and somatization, and may also determine how one manages their illness, including the engagement in health-related behaviors. Personality factors may also be predictive of an individual's overall QOL and functioning, above the disease itself. The purpose of the present investigation was to determine the presence of Type D Personality among individuals with MS and examine its role on disease symptoms, disease management, including health-related behaviors, coping, psychological well-being, and overall QOL and functioning.

Methods

Participants

All participants were diagnosed with clinically definite MS as verified by their neurologist and had enrolled in a prospective, longitudinal investigation examining the disease and person-specific factors (e.g., personality) associated with employment status in MS. Eligibility criteria included age ranging from 20 to 64, absence of other neurological disorders, and being employed.

Methods

All participants completed an online survey consisting of questionnaires assessing personality, disease symptoms, disease management, coping, self-efficacy, locus of control (LOC), psychological well-being, and QOL. All study procedures were approved by the Institutional Review Board. Informed consent was obtained from all participants.

Measures

Personality was assessed with the NEO-Five Factor Inventory – 3 (NEO-FFI-3),(Costa & McCrae, 1992) which is based on the five factor model of personality and includes subscales of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Individuals rate on a five-point Likert scale the extent to which an attribute or behavioral tendency applies to them. Individuals also completed the International Personality Item Pool (IPIP) Social Discomfort Scale (Goldberg et al., 2006), which assesses ones discomfort in social situations and tendency to be reclusive or avoidant of social situations.

The Modified Fatigue Impact Scale (MFIS). The MFIS is modified form of the Fatigue Impact Scale (Fisk et al., 1994) that is based on 21 items derived from interviews with MS patients concerning how fatigue impacts their lives. It consists of three subscales: physical, cognitive, and psychosocial functioning.

The MOS Pain Effects Scale (MOS-PES), a brief measure assessing the experience and impact of pain that is part of the Multiple Sclerosis Quality of Life Inventory (Ritvo et al., 1997) was used to assess pain.

Sleep was assessed by the Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). The PSQI is a measure of sleep quality consisting of several domains of sleep. It consists on 19 items rated by the individual and five by a bed partner.

Disease management and perceived self-efficacy in managing one's MS was assessed by the Multiple Sclerosis Self-Management Scale (MSSM-R) (Bishop & Frain, 2007) and Disability Management Self-Efficacy Scale (DMSES), respectively. The MSSM-R is a recently developed measure aimed at assessing one's level of self-management, in general, as well as aspects of self-management specific to the experiences of persons with MS. It consists of four subscales: Provider Communication and Relationship, Treatment Adherence & Barriers, Family & Social Support, Knowledge & Information, and Health Maintenance Behavior. The DMSES was developed to assess how an individual with MS handles or feels they can manage their illness.

The Morisky Adherence Questionnaire (MAQ) (Morisky, Green, & Levine, 1986) is an 8-item measure assessing an individual's adherence to their current medical regimen. Participants were asked if they were presently prescribed a MS medication and asked to provide their responses pertaining to such.

The COPE inventory (Carver, Scheier, & Weintraub, 1989) assesses different ways individuals respond to stress. It consists of five scales to measure problem-focused coping (Active Coping, Planning, Suppression of Competing Activities, Restraint Coping, Seeking of Instrumental Social Support) and five scales to measure emotion-focused coping (Seeking of Emotional Social Support, Positive Reinterpretation, Acceptance, Denial, Turning to Religion) and three less adaptive coping styles (Focus on and Venting of Emotions, Behavioral Disengagement, Mental Disengagement). Three items also measure Alcohol and Drug Use and four items assess use of Humor.

Self efficacy was measured by the 10 item General Self-Efficacy Scale (GSE) (Schwarzer & Jerusalem, 1995).

Locus of Control was assessed by the International Personality Item Pool Locus of Control scale (IPIP-LOC) (Goldberg et al., 2006). The IPIP-LOC assesses the degree to which individuals perceive having an external versus internal locus of control.

Depression was assessed by the Chicago Multiscale Depression Inventory (CMDI) (Nyenhuis & Luchetta, 1998), a self-report measure specifically designed to assess

depression in MS and other medically-ill groups. It consists of three subscales: Evaluative, Mood, and Vegetative.

The State Trait Anxiety Inventory (STAI) (Spielberger & Gorsuch, 1983) was used to assess anxiety. Individuals are asked to rate how they feel at this moment (state anxiety) as well as how they generally feel (trait anxiety) on 20 items assessing symptoms of anxiety.

The Flourishing Scale (FS) (Diener et al., 2010) and Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983) were administered to assess one's overall satisfaction with life and level of everyday stress, respectively. Both are brief, eight and 10 item measures, respectively.

Statistical Analyses—All statistical analyses were conducted using SPSS version 21.0. Initial comparisons of group means (Independent Students' t-test or MANOVA, where applicable) were made between those found to be "Type D +" and those found to be "Type D -" with regard to demographic factors and disease variables. Comparisons were then made on disease symptoms, disease management, coping, LOC, self-efficacy, psychological well-being, and QOL. An effect size (Cohen's *d*) was computed for all variables. Finally, Chi-Square analyses were used to determine the role of Type D Personality on work status, namely the inclination to feel that one has to reduce their work hours or leave the workforce.

Results

To determine the presence of Type D Personality the NEO Neuroticism scale and IPIP Social Discomfort scale were used. A median split was utilized to separate individuals into two groups on the IPIP social discomfort scale. T-scores were calculated for the NEO Neuroticism scale per manual norms. Individuals who were found to be high on the IPIP social discomfort scale and had a T-score greater than 60 on the NEO Neuroticism were identified as having Type D Personality. This resulted in 37 (16%) of the sample being classified as "Type D +." There were no differences between "Type D +" and "Type D -" with regard to gender, age, education, disease course, or disease duration. See Table 1.

On measures assessing disease symptoms, "Type D +" individuals endorsed greater fatigue, $t(228) = -4.76, p < .001$ and pain, $t(228) = -1.71, p = .001$. There was no difference with regard to sleep. On a measure assessing overall disease management (MSSM-R), "Type D +" individuals reported lower levels of provider relationship and communication, $t(228) = 2.24, p = .026$ and social and family support, $t(228) = 2.73, p = .007$. They also reported lower perceived self-efficacy in managing their MS (DMSES), $t(228) = 4.43, p < .001$, and poorer adherence to their medication (MAQ), $t(228) = -2.18, p = .030$. See Table 2.

With regard to coping, "Type D +" individuals employed more negative or maladaptive coping styles such as mental disengagement, $F(228) = 7.32, p = .007$, behavioral disengagement, $F(228) = 22.65, p < .001$, denial, $F(228) = 10.14, p = .002$, venting of and focusing on emotions, $F(228) = 16.09, p < .001$, and substance use, $F(228) = 13.62, p < .001$. In contrast, they were less likely to use adaptive coping such as planning, $F(228) = 6.06, p = .015$, active coping, $F(228) = 5.69, p = .018$, and positive interpretation and growth, $F(228) = 9.74, p = .002$. On measures of self-efficacy and LOC, "Type D +"

individuals reported a lower sense of general self-efficacy, $t(228) = 5.32, p < .001$, as well as LOC, $t(228) = 7.55, p < .001$. See Table 3.

With regard to psychological well-being and QOL, “Type D +” individuals reported greater depression; Mood, $t(228) = -7.34, p < .001$, Evaluative, $t(228) = -6.04, p < .001$, Vegetative, $t(228) = -5.43, p < .001$. They also endorsed greater state, $t(228) = -8.21, p < .001$ and trait anxiety, $t(228) = -13.48, p < .001$. Given the inclusion of the FS and PSS later in the study, only a subset ($n=123$) of participants received these measures. Of this, 24 (20%) were “Type D+.” The Type D individuals reported a lower satisfaction with life, $t(121) = 4.50, p < .001$ and greater perceived stress, $t(121) = -7.07, p < .001$. See Table 4.

Finally, we aimed to determine if the existence of Type D characteristics would play a role on an individual’s decision to feel as if they need to reduce their work hours or leave the workforce. It was found that of the 51 considering leaving the workforce, 26% were “Type D +.” This was in contrast to only 14% of those remaining in the workforce, $\chi^2 = 4.22, p = .040$.

Discussion

Type D Personality has been investigated as a factor associated with various health and psychological outcomes. While the role of this personality type has been studied in numerous medical populations, it has not been studied in MS to date despite the fact that it has been suggested that there are personality traits commonly found in MS, which have not always been seen as positive. In particular, it has been suggested that individuals with MS exhibit lower levels of conscientiousness, extraversion, and agreeableness and higher levels of neuroticism compared to healthy controls (Benedict, Priore, Miller, Munschauer, & Jacobs, 2001). These particular personality characteristics are not optimal with regard to psychological well-being and health and seem akin to a Type D Personality. Given this, we sought to determine the presence of Type D Personality in MS and the role it may have on overall health, QOL, coping, and psychological well-being.

Results of the present study suggest that Type D Personality existed in 16% of the sample. This rate is consistent with the rate of the general population. Individuals who were identified as “Type D +” were found to report more severe symptoms of fatigue and pain and have a lower degree of self-efficacy in managing their illness. They also reported lower management of their illness with regard to family or social support or communication with their provider and worse adherence. They also described having lower self-efficacy and poor sense of locus of control and endorsed significantly greater psychological distress. Subsequently, they reported experiencing more perceived stress and lower life satisfaction. On a measure of coping, they endorsed many maladaptive means of coping and were less likely to adopt adaptive coping styles. Finally, a greater number of individuals considering leaving the workforce were “Type D+.” In sum, findings are consistent with a wealth of literature suggesting that personality plays a large role on how one perceives, manages, and copes with an illness and the effect that such traits can have on overall well-being and QOL.

The significant role of personality in MS has been noted previously. In particular, personality has been found to play a role on overall quality of life (Benedict et al., 2005), medical adherence (Bruce et al., 2010), coping (Rätsep et al., 2000), fatigue (Merkelbach et al., 2003), cognitive difficulties (Akbar, Honarmand, & Feinstein, 2011), depression, and anxiety (Bruce & Lynch, 2011). In the present study, it is clear that the influence of personality ranges from the level of how one feels they can manage their illness and relationship with their provider to more functional outcomes as to who may or may not stay employed. This suggests a fairly all encompassing and grave impact of personality. While we may not specifically modify one's personality, per se, efforts to understand one's personality traits and provide informed education as to how this may influence their disease, relationships, well-being, stress, and overall quality of life is possible. Moreover, identifying those who are at risk for such outcomes and providing early intervention could ward off future affective disorders, poor medical adherence, greater perceived stress and potential future exacerbations, and possibly even premature departure from the workforce. Given these potential benefits, it seems imperative that the role of personality be integrated into discussions and treatment planning. Finally, it is possible that practitioners may feel more confident in making decisions regarding when and how to intervene with individuals when they are more aware of the individual, person-specific factors that contribute to outcomes. Such knowledge allows for greater dialogue regarding the individual's experience and how their own personal characteristics play a role on how the disease may be perceived and its progression. Awareness and consideration of such factors may also result in less frustration and disappointment at times for the practitioner and patient and be a better adoption of a biopsychosocial (BPS) model. Developed by George Engel in 1977, the BPS model emphasizes the role of the psychological and social factors as well as the biological (Engel, 1977). Engel argued that practitioners need to consider these factors simultaneously in order to fully appreciate the patient's subjective experience of their illness. It is hoped that the present paper alerts practitioners as well as patients to the importance of such.

While the present paper is likely to make a substantial contribution to the MS literature and care, there are certain limitations that temper its conclusions. For one, the absence of an objective measure of disease severity. Another limitation is lack of variability in disease course. Further investigations with varying disease course as well as disease duration are warranted. Despite these limitations, this paper is one of the first to identify the existence of a Type D Personality in MS and demonstrate that, similar to other medical conditions, such characteristics hold a significant amount of merit in predicting outcomes in MS and are in need of further investigation.

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Table 1

Participant demographics

	Type D + (N=37) Mean (SD)	Type D – (N=193) Mean (SD)	t-test or χ^2
Age	41.81 (9.82)	44.06 (9.43)	t(228) = 1.32, p = .188
Education	15.30 (1.98)	15.69 (2.23)	t(228) = 1.01, p = .313
Gender (F/M)	33F/4M	166F/27M	$\chi^2 = .269$, p = .604
Disease Duration	7.18 (7.05)	8.14 (7.14)	t(228) = .75, p = .454
Disease Course	36RR/1P	178RR/15P	$\chi^2 = 1.23$, p = .267

Note. RR = Relapsing Remitting; P = Progressive course

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Table 2

Group comparisons on disease symptoms and disease management

	Type D + (N=37) Mean (SD)	Type D – (N=193) Mean (SD)	t-test	<i>d</i>
MFIS Physical	22.24 (6.95)	17.36 (7.93)	t(228) = -3.50, p = .001	.65
MFIS Cognitive	22.84 (8.32)	15.49 (8.65)	t(228) = -4.76, p < .001	.87
MFIS Psychosocial	4.43 (1.97)	3.41 (2.04)	t(228) = -2.80, p = .006	.51
PSQI	8.69 (3.73)	7.42 (4.09)	t(228) = -1.71, p = .089	.58
PES	16.20 (5.93)	12.92 (5.39)	t(219) = -3.25, p = .001	.58
MSSMS Provider	25.03 (5.06)	27.35 (5.90)	t(228) = 2.24, p = .026	.42
MSSMS Barriers	28.32 (3.99)	28.58 (5.43)	t(228) = .57, p = .572	.05
MSSMS Support	11.32 (3.01)	12.69 (2.75)	t(228) = 2.73, p = .007	.48
MSSMS Knowledge	17.92 (2.15)	18.32 (2.33)	t(228) = .96, p = .338	.18
MSSMS Health Beh	14.62 (2.93)	15.34 (2.85)	t(228) = 1.40, p = .162	.25
DMSSES	49.81 (15.04)	60.96 (13.84)	t(228) = 4.43, p < .001	.77
MAQ	3.59 (2.20)	2.72 (2.23)	t(213) = -2.18, p = .030	.39

Note. MFIS = Modified Fatigue Impact Scale; PSQI = Pittsburgh Sleep Quality Index; PES = Pain Effects Scale; MSSMS = Multiple Sclerosis Self-Management Scale; DMSSES = Disability Management Self-efficacy Scale; MAQ = Morisky Adherence Questionnaire

Table 3

Group comparisons on coping, self-efficacy, and locus of control measures

	Type D + (N=37) Mean (SD)	Type D - (N=193) Mean (SD)	F-test or t-test	<i>d</i>
<i>COPE Subscales:</i>				
Mental Disengagement	9.54 (2.29)	8.51 (2.09)	F(228) = 7.32, p = .007	.47
Behavioral Disengagement	7.62 (2.33)	5.96 (1.87)	F(228) = 22.65, p < .001	.79
Denial	6.54 (2.14)	5.46 (1.85)	F(228) = 10.14, p = .002	.54
Venting/Focus on Emotions	11.00 (2.52)	9.02 (2.80)	F(228) = 16.09, p < .001	.74
Substance Use	5.95 (3.14)	4.59 (1.77)	F(228) = 13.62, p < .001	.53
Suppressing Activities	9.70 (2.07)	10.01 (2.14)	F(228) = .65, p = .421	.15
Emotional Support	10.46 (3.23)	10.98 (3.18)	F(228) = .84, p = .360	.16
Instrumental Support	11.49 (2.90)	11.80 (2.82)	F(228) = .39, p = .534	.11
Religious Coping	9.65 (4.63)	9.83 (4.67)	F(228) = .05, p = .830	.04
Humor	9.70 (3.42)	10.02 (3.24)	F(228) = .28, p = .595	.10
Acceptance	10.76 (2.31)	11.24 (2.27)	F(228) = 1.39, p = .240	.21
Positive Reinterpretation	11.43 (2.54)	12.78 (2.38)	F(228) = 9.74, p = .002	.55
Active Coping	11.00 (2.51)	11.98 (2.25)	F(228) = 5.69, p = .018	.41
Planning	11.54 (2.53)	12.64 (2.49)	F(228) = 6.06, p = .015	.44
Restraint	10.03 (2.73)	10.29 (2.20)	F(228) = .41, p = .523	.11
GSE	27.97 (3.95)	31.97 (4.22)	t (228) = 5.32 <.001	.98
IPIP-LOC	63.86 (10.81)	78.42 (10.72)	t (228) = 7.55 <.001	1.35

Note. COPE = The COPE Inventory; GSE = General Self-efficacy Scale; IPIP-LOC = International Personality Item Pool-Locus of Control

Table 4

Group comparisons on depression, anxiety, quality of life, and perceived stress measures

	Type D + (N=37) Mean (SD)	Type D – (N=193) Mean (SD)	t-test	<i>d</i>
CMDI Mood	35.97 (11.39)	21.53 (8.36)	t(228) = -9.03, p < .001	1.44
CMDI Evaluative	29.86 (11.34)	18.29 (6.19)	t(228) = -8.90, p < .001	1.27
CMDI Vegetative	42.19 (8.84)	33.15 (9.35)	t(228) = -5.43, p < .001	.99
STAI State	53.05 (10.46)	37.18 (10.83)	t(228) = -8.21, p < .001	.49
STAI Trait	55.41 (7.15)	36.97 (9.69)	t(228) = -11.00, p < .001	2.17
FS	41.08 (7.95)	47.93 (6.35)	t(121) = 4.50, p < .001	.95
PSS	24.42 (5.02)	14.74 (6.22)	t(121) = -7.07, p < .001	1.71

Note. CMDI = Chicago Multiscale Depression Inventory; STAI = State Trait Anxiety Inventory; FS = Flourishing Scale; PSS = Perceived Stress Scale

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