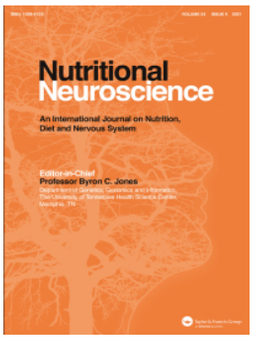

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Anthropometric indices, nutrient intakes and health-related characteristics of patients with multiple sclerosis: a cross-sectional study

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Table 5. Linear correlation between health-related characteristics and body composition of patients with multiple sclerosis.

	%BF		VFA		FFM		SMM	
Variable	*r*	*P*-value	*r*	*P*-value	*r*	*P*-value	*r*	*P*-value
MFIS	0.08	0.21	0.04	0.47	−0.03	0.66	−0.005	0.94
Physical subscale	−0.02	0.68	0.03	0.67	−0.01	0.86	0.04	0.49
Cognitive subscale	0.05	0.41	0.08	0.17	−0.03	0.58	0.01	0.83
Psychosocial subscale	0.12	0.049*	0.14	0.02*	0.04	0.45	−0.01	0.85
EDSS	−0.09	0.14	−0.05	0.46	0.10	0.09	0.09	0.15
PHC	−0.005	0.94	−0.11	0.06	−0.13	0.03*	−0.19	0.001*
MHC	0.06	0.34	−0.049	0.41	−0.16	0.006*	−0.27	<0.001*

**P*-value <0.05; %BF: %body fat; EDSS: expanded disability status scale; FFM: fat free mass; MFIS: modified fatigue impact scale; MHC: mental health composite; PHC: physical health composite; r: correlation coefficient; SMM: skeletal muscle mass; VFA: visceral fat area.

weakness and loss of mobility may be barriers for performing physical activity which will result in weight gain. In turn, the increase in weight may deteriorate MS symptoms, leading to a vicious cycle [39].

The other findings of this study were the positive but very weak linear correlations between psychosocial subscale of MFIS and both of %BF and VFA. A recent study that was also carried out on MS individuals, the participants were divided into fatigued and non-fatigued groups. Similar to our study, significant positive correlations were found between %BF and fatigue score in the overall sample as well as in the non-fatigued group [40]. The unexpected results of our study were the significant negative correlations between quality of life the patients and both of FFM and SMM. Nevertheless, it should be noted that all of these associations were very weak or weak and could be attributed to the cross-sectional design of the study. It is possible that those patients with lower quality of life had engaged in physical activities to improve their health status which has led to increased muscle mass. Contrary to our findings, results of an investigation on individuals with relapsing-remitting MS indicated that deterioration of psychological quality of life was associated with higher %BF. But no significant correlations were observed between symptoms of physical quality of life or fatigue, and any of the fat mass, %BF and FFM [41].

Body composition can influence the overall health and risk of chronic diseases [41]. It has been reported that increased fat mass and decreased LBM are associated with increased risk of musculoskeletal problems and cardiometabolic disorders that can contribute to higher rates of falls and lower quality of life [42]. As a result, improving body composition in MS patients can decrease the risk of certain comorbidities and complications [41].

The relatively high sample size of this study can be considered as a strength of this investigation. Moreover, measuring the body composition indices in addition to BMI provided more detailed information concerning the anthropometric parameters. However, one of the limitations of the present work was determining the nutritional status of the patients solely by FFQ, and no biochemical assessment was performed. Besides, the cross-sectional design of this research prevented us from obtaining definite causal relationship between the study variables.

Conclusion

The results of this study revealed that being overweight, having a high %BF, poor nutrient intake and fatigue are common among MS patients. Moreover, sodium intake exceeds the UL especially in females. Therefore, improving the patients' lifestyle and nutritional intake is recommended to decrease their level of fatigue and increase their quality of life. Performing further studies particularly with prospective design is required for obtaining a more decisive conclusion.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon a reasonable request.