ORIGINAL ARTICLE

KNOWLEDGE OF YOUNG ADULTS ABOUT NEURODEGENERATIVE DISEASES AND NEUROPROTECTIVE FOOD

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ABSTRACT

The aim: To assess the knowledge of young adults about neurodegenerative diseases and neuroprotective food.

Material and methods: The study was conducted using an anonymous self-constructed questionnaire. 150 people aged 18 – 30 participated in the study, including 69% (n = 104) women and 31% (n = 46) men.

Results: Most of the respondents had sufficient or good knowledge of neurodegenerative diseases and neuroprotective nutrition. The obtained results did not depend on gender, place of residence, and age. However, knowledge was influenced by education ($p < 0.05$; better-educated respondents indicated more correct answers), and the occupation performed ($p < 0.05$; respondents performing medical professions gave correct answers more often).

Conclusions: It seems essential to introduce additional school classes in the field of neurodegenerative diseases and neuroprotective nutrition. Only modern nutritional education from an early age can help implement appropriate eating habits in the field of prevention of neurodegenerative diseases and their application in adulthood.

KEY WORDS: neurodegenerative disease, neuroprotective nutrition, questionnaire, knowledge

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INTRODUCTION

The risk of developing neurodegenerative diseases increases with age [1-3]. We do not yet have effective methods of treating these diseases, but we can delay the aging process of nerve cells and alleviate symptoms, for example, by using a well-balanced diet from an early age, rich in products with neuroprotective properties. Nerve cells are particularly exposed to oxidative stress due to the more significant number of mitochondria and more intense oxygen metabolism. The introduction of products rich in antioxidants into the daily diet allows one to avoid or even reverse oxidative stress. Chemical compounds with antioxidant properties include vitamins A, C, and E, curcumin (present in curry spice and turmeric), polyphenols, e.g., resveratrol (present in red wine and grapes), flavonoids (present in vegetables and fruits, green tea, coffee, cocoa), lycopene (most easily absorbed from processed tomatoes), as well as omega-3 and omega-6 fatty acids. Some of the alkaloids, such as piperine present in black pepper, and capsaicin present in chili peppers, also belong to neuroprotective agents. It is also essential to use products rich in B vitamins (especially B1, B6, B12, folic acid), which condition the nervous system's proper functioning. Increased blood levels of homocysteine have been observed in patients with Parkinson's disease (PD) and Alzheimer's disease (AD). It may be associated with cognitive decline and accelerated deposition of β-amyloid in senile plaques. The sources of the above-mentioned B vitamins are, among others: liver, pistachios, bananas, mandarins, rye bread, soybeans, baker's yeast, broad beans, strawberries, eggs, buckwheat, walnuts, and fish [4-15].

The Mediterranean diet is the most commonly used diet for the prevention and treatment of neurodegenerative diseases. Products of plant origin are the basis of this diet, with simultaneous giving up the consumption of animal products. It is also recommended to use olive oil as the main source of fats, consume red wine moderately, and rely on local, unprocessed products.

THE AIM

Currently, the nutritional prevention of neurodegenerative diseases is becoming increasingly important. Therefore, this study aimed to assess the knowledge of young people about neurodegenerative diseases and neuroprotective food.

MATERIALS AND METHODS

The research was carried out using an anonymous proprietary questionnaire. The form was made available on social forums. The questionnaire consisted of 12 single-choice questions concerning knowledge about neurodegenerative diseases and neuroprotective foods, and seven questions concerning gender, age, professional activity, education, place of residence, and family history of neurodegenerative diseases. The study was conducted among young people aged 18 – 30.

The obtained results were statistically analyzed using Excel 2016 and STATISTICA 12.0, Stat Soft Polska software. The result was considered statistically significant if the p was ≤ 0.05. Measurable data were characterized using the mean X and standard deviation SD. Nominal data were presented as percentages.

Table 1. Knowledge about neurodegenerative diseases.

Questions	Possible answers	n (%)
Characteristic symptoms of Alzheimer's disease	Memory disturbance, failure to recognize loved ones, mood changes, apathy*	124 (83%)
	Mood changes, mobility problems, high blood pressure, constipation	5 (3%)
	Dizziness, pain in the lower abdomen, drooling, constipation	14 (9%)
	I don't know	7 (5%)
Characteristic symptoms of Parkinson's disease	Hand tremor, postural disturbance, changes in handwriting, mask-like face*	110 (73%)
	Problems with concentration, mood disorders, bone, and joint pain, dizziness	8 (6%)
	Difficulty remembering, spatial orientation disorders, muscle tremors, constipation	26 (17%)
	I don't know	6 (4%)
Risk factors for Alzheimer's disease	Older age, male gender, depression	30 (20%)
	Older age, male gender, atherosclerosis	58 (39%)
	Older age, female gender, diabetes*	38 (25%)
	I don't know	24 (16%)
Neurodegenerative diseases include:	Alzheimer's disease, spinal muscular atrophy, Tourette's syndrome	15 (10%)
	Depression, Parkinson's disease, multiple sclerosis	22 (15%)
	Huntington's disease, Alzheimer's disease, Parkinson's disease*	85 (56%)
	I don't know	28 (19%)

* The correct answer

RESULTS

150 people participated in the study, including 69% of 104 women and 31% of 46 men. People aged 18 – 22 (n = 73; 49%) dominated in the study population. More than half of the respondents lived in a city of over 100,000 people (n = 80; 53%). The respondents who had secondary education constituted 48% (n = 72), while those with higher education – 43% (n = 64). In the studied group, more than half had the status of a student (n = 78; 53%), while economically active people accounted for 43% (n = 64). The vast majority of the respondents worked in non-medical professions (n = 101; 67%).

In the families of 71 respondents (47%), no one suffered from any neurodegenerative diseases. Twenty-six respondents (17%) had a family history of Alzheimer's disease, and 15 (10%) had Parkinson's disease. Others were unable to answer this question (26%; n = 38).

One hundred and three respondents (69%) knew the correct definition of neurodegenerative diseases. Twenty-four respondents (16%) answered "I don't know", while 10% (n = 15) believed that this is a group of autoimmune diseases, and 5% (n = 8) – that neurodegenerative diseases belong to the group of civilization diseases.

Answers to questions concerning general knowledge about neurodegenerative diseases are presented in Table 1, and about neuroprotective food – in Table 2.

The respondents received 1 point for each correct answer. The knowledge of the respondents was assessed based on the number of points scored (Table 3).

The results are presented in Table 4. There was no statistically significant difference in knowledge about neurodegenerative diseases and neuroprotective food between men and women. Most of the respondents assessed their knowledge at a sufficient or good level. The knowledge of the respondents also did not depend on the place of residence and age.

On the other hand, the obtained results depended on education ($p < 0.05$; respondents with higher education indicated more correct answers) and profession ($p < 0.05$; respondents from medical professions gave correct answers more often).

DISCUSSION

Many factors determine the physical and mental well-being of a person. Among them, one can distinguish a well-balanced diet, physical activity, and hygienic lifestyle. To talk about the prevention of neurodegenerative diseases and other neurological diseases, one needs to have a basic knowledge of their symptoms, prevention, and treatment options. Many questionnaire studies assessed Polish society's knowledge of such neurological diseases like stroke or epilepsy [16-20]. Simultaneously, few studies have been done on the knowledge of neurodegenerative diseases and their nutritional prevention [21].

Nutritional knowledge is essential because knowledge of neuroprotective substances and their sources virtually affects the daily diet and determines the use of nutritional prevention of neurodegenerative diseases. Previous work from this center showed that the knowledge of users of online forums about neurodegenerative diseases appeared to be good, while about neuroprotective nutrition, insufficient. Three hundred and seventy people of all ages took part in this study, which was carried out with an online survey. It was proved that the elderly had a higher level of knowledge about the nutritional prevention of neurodegenerative diseases, and the results of their responses

Table 2. Knowledge about neuroprotective food.

Questions	Possible answers	n (%)
Neuroprotective food include:	Black tea, coffee, saffron	14 (9%)
	Green tea, ginseng, rosemary	50 (33%)
	Ginseng, chocolate, cinnamon*	36 (24%)
	I don't know	50 (34%)
The ingredients that have a positive effect on nerve conduction are:	Stearic acid, taurine	15 (10%)
	Dopamine, serotonin*	61 (41%)
	Acetylcholine, ethanol	17 (11%)
	I don't know	57 (35%)
Products that increase the level of uric acid in the blood	Meat, fish, fructose-rich foods*	45 (30,0%)
	Dairy products, legumes, leafy vegetables	54 (36%)
	Starchy foods, meat, dairy products	51 (34%)
The neuroprotective diet is:	Dukan's diet	20 (13%)
	Cabbage diet	11 (7%)
	High-protein diet	30 (20%)
	Mediterranean diet*	89 (60%)
Products containing curcumin	Curry seasoning*	90 (60%)
	Corn	7 (5%)
	Cardamom	15 (10%)
	I don't know	15 (10%)
	In any of the above	23 (15%)
Factors affecting the formation of free radicals	Smoking, drinking alcohol*	81 (54%)
	Eating plenty of antioxidants	25 (17%)
	Genetic susceptibility to the formation of free radicals	17 (11%)
	I don't know	27 (18%)
The effect of antioxidants on the body	Lowering the risk of developing Alzheimer's disease	13 (9%)
	Slowing down the aging process	31 (21%)
	Prevention of oxidative damage in nerve cells	23 (15%)
	All answers are correct*	83 (55%)

* The correct answer

Table 3. Rules for assessing the knowledge of the respondents.

Points	Mark
1-3	unsatisfactory
4-6	satisfactory
7-9	good
10-12	very good

Table 4. Assessment of the nutritional knowledge of the respondents

	Mark n (%)			
Sex	Unsatisfactory	Satisfactory	Good	Very good
Males N = 46	6 (13.0%)	15 (32.6%)	18 (39.1%)	7 (15.22%)
Females N = 104	4 (3.9%)	28 (27%)	44 (42.3%)	28 (27%)

were satisfactory. There was also a statistically significant correlation between the level of knowledge and education. On the other hand, no statistically significant correlation was found between the studied knowledge and gender, place of residence, professional activity, or a positive family history of neurodegenerative diseases [17].

Only people under 30 years took part in this study, conducted three years after the previous assessment. This study aimed to test the knowledge about nutritional prevention of neurodegenerative diseases in young people, bearing in

mind that healthy eating principles should be applied from an early age for the best effect. Most of the respondents assessed the knowledge of neurodegenerative diseases and their nutritional prevention as sufficient or good. As in the previous work, a relationship between knowledge and education was found, while factors such as gender, age, or residence place did not affect the result.

It seems that it would be essential to modify the existing curricula so that information on neurodegenerative diseases, as well as nutrition and prevention of these diseases, would be included in school textbooks, e.g., on biology. This type of knowledge should be disseminated already in the older grades of primary schools and continued in secondary and higher education, both in medical and non-medical students. Only proper nutritional education from an early age can help implement appropriate eating habits to prevent neurodegenerative diseases and their application in adulthood.

CONCLUSIONS

It seems essential to introduce additional school classes in the field of neurodegenerative diseases and neuroprotective nutrition. Only modern nutritional education from an early age can help implement appropriate eating habits in the field of prevention of neurodegenerative diseases and their application in adulthood.

REFERENCES

1. Barcikowska M, Biernat W, Bilikiewicz A et al. Choroby układu nerwowego. Warszawa: Wydawnictwo Lekarskie PZWL.
2. Dobryszycka W, Leszek J, Rymaszewska J. Choroba Alzheimera: Patogeneza, diagnostyka, leczenie. Wrocław: Continuo, 2002.
3. Gaweł M, Potulska-Chromik A. Choroby neurodegeneracyjne: choroba Alzheimera i Parkinsona. Post N Med 2015;28(7):468-476
4. Wyka J. Czynniki żywieniowe w zapobieganiu chorobie Alzheimera. Zakład Żywienia Człowieka, Katedra Technologii Rolnej i Przechowalnictwa. Uniwersytet Przyrodniczy we Wrocławiu. Rocz Panstw Zakl Hig 2012;63(2):135-140.
5. Sakowska A, Łopacka J, Rafalska UK, Żontała K, Lipińska A, Konarska M. Znaczenie mięsa w diecie osób z chorobą Parkinsona. Geriatria 2015;9:161-169.
6. Bawa S, Gajewska D, Kozłowska L, Lange E, Myszkowska-Ryciak J, Włodarek D. Dietoterapia. Warszawa: SGGW, 2009.
7. Dochniak M, Ekiert K. Żywienie w prewencji i leczeniu choroby Alzheimera i choroby Parkinsona. Pieleg Zdr Publ 2015;5(2):199-208.
8. Laurent C. 60 zaleceń dietetycznych w wybranych stanach chorobowych. Wrocław: Elsevier Urban & Partner, 2015.
9. Lewadowicz M. Choroba Parkinsona – etiologia, leczenie, żywienie. Post Diet Geriatr Gerontol 2016;2:13-18.
10. Włodarek D, Lange E, Kozłowska L, Głąbska D. Dietoterapia. Warszawa: Wydawnictwo Lekarskie PZWL, 2014.
11. Ziemlański S, Gawęcki J. Tłuszcze. In: Berger S, Brzozowska A, Charzewska J et al. (eds). Żywienie człowieka. Podstawy nauki o żywieniu. Warszawa: Wydawnictwo Naukowe PWN. 2012, pp. 181-189.
12. Jaworski M, Trojańczyk M. Rozwój choroby Alzheimera – rola czynników związanych z dietą. Post Zyw Klin. 2012;8(4):17-23.
13. Wyka J. Czynniki żywieniowe w zapobieganiu chorobie Alzheimera. Rocz Panstw Zakl Hig 2012; 63(2): 135-140.
14. Ciepłowska A, Kulczyński B. Strategie żywieniowe w prewencji choroby Alzheimera. Post Diet Geriatr Gerontol 2016;3:10-17.
15. Gorzkowska A. Żywienie w chorobie Parkinsona. Aktualn Neurol 2017;14(4):199-207.
16. Talarska D, Pomian-Śniedziewska A, Zielińska A. Wiedza i postawy studentów wobec chorych na padaczkę. Epileptologia 2008;16:197-206.
17. Tokarski Z, Wojciechowska M. Poziom wiedzy nauczycieli na temat padaczki w szkołach integracyjnych. Nursing Topics 2008;16(1, 2):151-156.
18. Tomaszewska A. Wiedza mieszkańców Płocka i jego okolic na temat udaru mózgu. Pieleg Neurol Neurochir. 2013;2(3):109-116
19. Łabuz-Roszak B, Pierzchała K, et al. Knowledge and attitiudes towards epilepsy among inhabitants of Silesia. A questionnaire study. Neurol Neurochir Pol 2011;45(2):107-113.
20. Pop T, Zajkiewicz K. Wiedza studentów o czynnikach ryzyka i pierwszych objawach udaru mózgu. Postępy Rehabilitacji 2008;4:5 -10.
21. Nowak H, Dobrakowski P, Tomczyk K, Łabuz-Roszak B. Ocena wiedzy osób dorosłych na temat żywieniowej prewencji chorób neurodegeneracyjnych – potrzeba edukacji dotyczącej żywienia neuroprotekcyjnego w społeczeństwie polskim. In: Kamińska A, Oleśniewicz P (eds). Edukacja jutra. Wiedza i edukacja w egzystencji współczesnego człowieka. Sosnowiec: Oficyna Wydawnicza Humanitas. 2018. pp. 401-412

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Conflict of interest

Authors declare no conflict of interest

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