The state of knowledge of nurses and factors influencing it regarding vegetarian/vegan diet

Hemşirelerin vejetaryen/vegan beslenme hakkındaki bilgileri ve etkileyen faktörler

Abstract

Aim: This descriptive and cross-sectional study aims to investigate the knowledge of nurses and the factors influencing it regarding the vegetarian/vegan diet.

Methods: This study was conducted at a university hospital with the participation of 213 nurses. Data were collected using the "Sociodemographic Data Form," "Vegetarian/Vegan Diet Knowledge Test," and "Vegetarian/Vegan Diet Opinion Form". Data were analyzed by number, percentage, Pearson Correlation, One-Way Analysis of Variance, and Independent Sample T-Test.

Results: The mean age of the nurses was 31.21±7.56 years, 86.4% of which were women, 53.5% were single, and 70.4% had bachelor's degrees. The nurses' knowledge test score was 8.68±3.81 on average (min=0, max=16). Only 27.2% of the nurses correctly answered the following item: "People on a vegetarian/vegan diet could get all the essential amino acids with their diets". The nurses who are married or have completed postgraduate education achieved higher knowledge test scores ($p<0.05$).

Conclusions: Nurses have limited knowledge about vegetarian/vegan diets. Nurses should keep up with up-to-date information about diet types for evidence-based practices.

Keywords: Knowledge; nursing; vegan; vegetarian

Öz

Amaç: Bu çalışma, hemşirelerin vejetaryen/vegan beslenmeye ilişkin bilgilerini ve etkileyen faktörleri ortaya koymak amacıyla tanımlayıcı ve kesitsel tipte yapılmıştır.

Yöntemler: Bu çalışma bir üniversite hastanesinde 213 hemşirenin katılımı ile gerçekleştirilmiştir. Veriler "Sosyodemografik Veri Formu", "Vejetaryen/Vegan Beslenme Bilgi Testi" ve "Vejetaryen/Vegan Beslenme Görüş Formu" kullanılarak toplanmıştır. Veriler sayı, yüzde, Pearson Korelasyon, One-Way Tek Yönlü Varyans Analizi ve Bağımsız Örneklem T-Testi ile analiz edilmiştir.

Bulgular: Hemşirelerin yaş ortalaması 31.21±7.56 yıl olup, %86.4'ü kadın, %53.5'i bekar ve %70.4'ü lisans mezunudur. Hemşirelerin bilgi testi puanı ortalama 8.68±3.81'dir (min=0, max=16). Hemşirelerin sadece %27,2'si "Vejetaryen/vegan beslenen bireylerin diyetleri ile gerekli amino asitlerin tamamını alabilirler" maddesini doğru cevapladı. Evli ve lisansüstü eğitimini tamamlamış hemşirelerin bilgi testi puanları daha yüksek bulundu ($p<0.05$).

Sonuçlar: Hemşireler, beslenme türleri hakkında bireyleri, aileleri ve toplumu doğru bilgilendirmek, bakım vermek, bireyin günlük yaşamına rehberlik etmek ve kanıta dayalı uygulamalara temel oluşturmak için güncel bilgileri takip etmelidir.

Anahtar Sözcükler: Bilgi; hemşirelik; vegan; vejetaryen

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INTRODUCTION

There has been an emphasis in recent years on the need to obtain detailed information about eating habits to better understand the nutritional status and problems of healthy/sick individuals (1-3). Geographical, climatic, and agricultural characteristics of the place where the individual lives and the beliefs, traditions, and socioeconomic status are the main factors that shape people's eating habits (2-3). When assessing the nutritional status of individuals, it is generally considered whether the total food consumed daily meets the energy and nutrient needs (4,5). Research, however, puts into question the understanding that "proper nutrition" is related to longer life and good health as well as what proper nutrition actually is and how we should eat (4). There is an increasing number of people going on diets styled with different purposes and based on different principles, adopting these diets as part of their lifestyles in recent years (6,7). Vegetarian diet, pescatarian diet, paleo diet, ketogenic diet, planetary health diet, diabetic diet, and gluten-free diet are some of these dietary styles (8).

Vegetarianism, the most popular of alternative diets, includes mainly consumption of plant-based foods. The types of vegetarian diets differ according to food limitations (6,9) (Table 1). Although veganism is a subtype of a vegetarian diet, it should be considered separately. It is described as a radical end of vegetarianism (10% of vegetarians are vegans) (10,11). The vegan diet has several benefits for health, both physical and environmental, as foods of animal origin are restricted. Adopting a vegan diet can provide numerous health benefits, including improved heart health, lower diabetes risk, better weight management, and a decreased likelihood of certain cancers (12-15). Additionally, it can contribute to environmental sustainability by reducing greenhouse gas emissions, conserving water, and minimizing land use (16,17). According to the Academy of Nutrition and Dietetics, properly organized vegetarian diets, including vegan diets, are adequate in terms of health and nutrition and may be beneficial for preventing and treating some diseases (12-15). As an example, cross-sectional studies with vegetarians and vegans have shown that these individuals have lower body mass indices and plasma cholesterol concentrations compared to non-vegetarians (omnivores) (18).

Looking at examples from the world, 600.000 people (1.6% of the population) in England are vegan (19), and 3-5% of the USA population are vegetarian and vegan, respectively (20). In Turkey, it is estimated that 5% of the population is vegetarian and 10% of them (80,000) are vegans (11,21). Although more and more people choose alternative diets, health professionals lack knowledge about vegetarian/vegan nutrition. (22,23). This lack of knowledge may impact healthcare and patients' access to evidence-based practices (7).

The number of vegans grows faster than the number of vegetarians (11). Among the major drivers of this are the concerns about the negative effects on the environment, health, and economy arising from diets rich in animal products. The main idea behind a vegan diet is to refuse the use of all kinds of products of animal origin (7,13,14). Vegans describe this as a lifestyle, not a diet, because of their compassion for animals and because they think it has a positive effect on their health. (11).

Nurses as professionals who spend the most time with patients should consider patients' daily living activities holistically (6,22,23). Given the nurses' role as primary care providers, they are in the best position to ensure a patient is well-fed (22). They are responsible for observing the food intake of patients, assessing their nutritional status, and providing dietary education (22,24). The most common cause of wrong diet or diet attempts is the lack of nutritional knowledge (24). One study found that doctors provide dietary advice 2.8 times a day and nurses 2.7 times a day (21). There are some situations when all healthcare professionals, not just dietitians, need to inform patients about their diet. Nurses need knowledge and skills regarding nutrition to prevent patients from deteriorating and to guide them on possible new alternative diets that are becoming increasingly common. Although a vegan diet may seem easy to follow, many nurses may not have the right knowledge about vegan nutrition (6,22-24). It is important to know the reason for the individual's diet choice and possible deficits and to guide them correctly. For example, a vegan individual should be aware of the risk of B12 deficiency and how to supplement it (8). Nurses should possess basic information about the alternatives to the diets preferred by the people they care for.

Vegans in Turkey may have difficulties living according to their beliefs. Most individuals in Turkey are Muslims (25). Islam does not allow for the torture of animals. On the other hand, Muslims offer animal sacrifices (26). According to a study investigating beliefs and vegetarianism/veganism, vegan Muslims want to maintain their religious identity while continuing to live as vegans. Some of them have mentioned that the notion of sacrifice in Islam has changed over time and it is no longer correct to religiously sacrifice animals (27). Vegan individuals in Turkey are also suscept to doubt in terms of their piety (27). Nurses should advocate for the rights of patients, including the choice of diet. They can also guide patients through a healthy and safe way to continue an alternative diet using evidence-based information. From the perspective of this study, which is of special importance for Turkish dietary habits, gains a special importance for our country.

In a study investigating nursing students' knowledge about the vegan diet, 73% of the students consumed animal products daily and 27% weekly, they possessed the basic knowledge of the vegan diet but limited knowledge of the ethical and environmental considerations (22). In a study conducted to determine the knowledge, attitudes, and behaviour of physicians regarding vegetarian/vegan diets, only 1% of the participants were vegetarian/vegan, and 94.8% had not received training on the health effects of the vegetarian/vegan diet before (28). There is limited research on health professionals' knowledge of vegetarian/vegan nutrition. The fact that nurses hold negative and factually wrong opinions about vegetarian/vegan nutrition may cause the patients to underestimate their nutritional expertise and experience stress during care. Thus, it may be a barrier for the individual to receive holistic nursing care. This study aims to determine nurses' knowledge and influencing factors about the vegetarian/vegan diet and thus, to raise awareness.

METHODS

Aim and design

This descriptive and cross-sectional study aimed to investigate nurses' knowledge about vegetarian/vegan diets and the factors affecting it.

Research questions

1. What is the knowledge level of nurses about vegetarian/vegan diets?
2. What are the factors affecting the knowledge level of nurses about vegetarian/vegan diets?

Participants and sample size

We collected the study data in a training and research hospital in the University of Health Sciences, between October 1, 2021, and April 1, 2022. The sample size of the study was calculated using the G*Power 3.1.9.7 program and more precisely, the one-way analysis of variance. The required sample size was calculated at 213 by taking 0.25 effect size (d = 0.25), 5% margin of error ($\alpha = 0.05$) and 80% power ($1-\beta = 0.80$) into account (29,30).

Measurements

The data of the study were collected from nurses working in the hospital during the day shift. The researcher interviewed the nurses in the clinic (intensive care, surgical, internal medicine, outpatient clinic, management, eye/ear-nose-throat, pediatrics, emergency, etc.) where they worked, explained the purpose of the study, and obtained their written informed consent. Then the "*Sociodemographic Data Form*", "*Vegetarian/Vegan Diet Knowledge Test*" and "*Vegetarian/Vegan Diet Opinion Form*" were filled. It took a total of 20 minutes.

Sociodemographic Data Form: The form includes questions prepared by the researchers. It contains 13 questions about participants' sociodemographic characteristics (age, gender, marital status, educational status etc.), their eating habits (diet etc.), and their experiences regarding the vegetarian/vegan diet (trying a vegetarian/vegan diet, any acquaintance on a vegetarian/vegan diet, training on the health effects of vegetarian/vegan diet, etc.) ((2,8-12).

Vegetarian/Vegan Diet Knowledge Test: It includes knowledge-based questions. These questions are answered by the participants as "Right", "Wrong" or "Undecided". Each question given a correct answer scored 1 point whereas incorrect answers or undecided answers scored 0. The lowest score to be obtained from the knowledge test is 0 and the highest is 17. Participants'

answers were evaluated as either correct or incorrect based on the literature published by scientific organizations (2,6,8,11,22,28,31,32). The knowledge test was evaluated by 5 experts (3 academicians from the Department of Nutrition and Dietetics and 2 academicians from the Department of Nursing). Items were rated by experts as "appropriate", "must be changed" or "not appropriate". The items achieved their final form following the feedback of the experts (Item Content Validity Index-I CVI=0.91). The Kuder Richardson (KR-20) score for the Vegetarian/Vegan Diet Knowledge Test was found to be 0.772, indicating acceptable internal consistency for the knowledge test (33).

Vegetarian/Vegan Diet Opinion Form: It includes an open-ended question in which nurses are asked to write any thoughts about the vegetarian/vegan diet.

Ethical approval

This study was approved by Hamidiye Scientific Research Ethics Committee (date: 01.10.2021, decision no: 30/11). We obtained written permission from the hospital and each participant for data collection.

Statistical analysis

We used IBM SPSS Statistics version 21 (IBM Inc., Armonk, NY, USA) for data analysis. The nominal variables were evaluated using frequency and percentage, while the ordinal variables were evaluated using mean and standard deviation. The Kolmogorov-Smirnov Test showed normal data distribution. For this reason, Pearson Correlation, One-Way ANOVA, and Independent Sample T-Test were used to compare the mean test scores.

RESULTS

The mean age of the individuals in the study was 31.21±7.56 years, 86.4% of whom were women, 53.5% were single and 66.2% had no children. As for education and experience, 70.4% had a bachelor's degree, 32.9% had professional experience for 1-5 years and over 10 years, most of them worked in intensive care, internal medicine and surgical clinics, and outpatient clinics. Moreover, 97.2% of them were omnivorous, 88.7% had never tried a vegetarian/vegan diet at any time in their lives, 68.1% did not have any acquaintance following a vegetarian/vegan diet, 73.7% did not have a pet at home, 89.7% had not received any training on vegetarian/vegan diet, and 93.0% had not cared for a patient on a vegetarian/vegan diet (Table 2). The nurses' average Vegetarian/Vegan Diet Knowledge Test score was 8.68±3.81 (Min=0, Max=16) (Table 2).

When the sociodemographic characteristics of the nurses and their vegetarian/vegan diet knowledge levels were compared, married nurses scored higher than singles (p<0,001). The nurses with postgraduate degrees scored higher on the knowledge test than the nurses with bachelor's degrees (p<0.05). The knowledge test scores of the nurses who had acquaintances or relatives on a vegetarian/vegan diet were also higher (p<0.05). There was no difference between nurses' concerning other sociodemographic characteristics and knowledge test scores. (Table 2.).

When we look at each item in the Vegetarian/Vegan Diet Knowledge Test, 15 of them were answered correctly by most nurses, respectively. Item 9 (61.5%), Item 10 (64.8), Item 12 (62.0%), and Item 16. (76.5%) received correct answers from most of the nurses. Very few of the nurses got Item 4 (26.8%) and Item 6 (27.2%) right. One of the most incorrectly answered items (Item 6.) stated that people on a vegetarian/vegan diet could get all the essential amino acids with their diets. For Item 17, half of the nurses gave the correct answer (46.5%), while half were undecided (44.1%). Other answers can be found in Table 3.

In the Vegetarian/Vegan Diet Opinion Form used in this study, some of the nurses provided the following statements about the vegetarian/vegan diets:

– "The vegetarian/vegan diet is healthy but difficult to maintain in social life."

– "I do not approve of the vegetarian/vegan diet."

– "I find it right as a philosophy, but it is difficult to maintain. There should be more vegetarian/vegan options in cafes and restaurants".

– "Animal-based foods should also be consumed for proper nutrition."

– "I would like to try it, but I can't give up the taste of meat."

– "Doing a vegetarian/vegan diet makes you feel restricted, can't we even eat eggs!"

A vegan nurse participating in the study also added:

Table 1. Varieties of vegetarian diet type

Diet	Features
Lacto-vegetarian diet	Aside from plant foods, only milk and dairy products as foods of animal origin can be consumed.
Ovo-vegetarian diet	Aside from plant foods, only eggs as foods of animal origin can be consumed.
Lacto-ovo vegetarian diet	Aside from plant foods, products the animals yield when they are alive such as milk and eggs can be consumed.
Semi-vegetarian diet	Aside from plant foods, poultry and fish can be consumed less than once a week and more than once a month. Eggs, milk and derivatives can be consumed in the semi-vegetarian diet.
Vegan diet	No animal products can be consumed in a vegan diet. Vegans do not eat animal foods and they do not wear clothes made of wool, silk, leather because they are obtained from animals, nor do they use products containing animal fat.

– "People's habits and commitment to comfort prevent them from researching and finding the truth. The rigid prejudices against vegan diets in people working in healthcare are sad and startling. There should be more scientific studies."

DISCUSSION AND CONCLUSION

A plant-based diet is based on foods that come from plants and includes no ingredients from animals. Such diets include vegetables, whole grains, legumes, nuts, seeds, and fruits (34). Individuals may choose a plant-based diet for many different reasons, such as a positive impact on their health, animal protection, environmental concerns, or individual preferences. These diets can support the health of an individual at any age. As with any diet, plant-based eating should be planned to meet the person's nutritional needs (31). Nurses spend more time with patients than all other healthcare professionals and play an important role in planning their daily life activities. They should have basic information about alternatives to the diets preferred by the individuals they care for (7). Nurses who do not have sufficient information about the nutritional preference of the individual may experience stress while giving care. It may even cause them not to respect the preferences of the individual (23). There is no study showing the nurses' perspective on vegetarian/vegan diets in Turkey, and studies around the world are limited (7,22). In the study, 15 items were answered correctly by the majority of the nurses' but the mean score from the knowledge test on vegetarian/vegan diet was only 8.68±3.81 out of 17 points, indicating that nurses possess insufficient knowledge about the vegetarian/vegan diet (Table 2.).

Married individuals are familiar not only with their preferences but also with the needs or preferences of other people and age groups. Likewise, if the nurses live with or have close relationships with people choosing a vegan diet, they are better informed because it has become a part of their lives (22). In this study, the nurses who are married or have vegetarian/vegan-fed relatives scored higher on the knowledge test ($p=0.000$, $p<0,001$ and $p=0.043$, $p<0.05$) (Table 2.).

The nurses who finished postgraduate education, too, scored higher on the knowledge test ($p<0,05$). (Table 2.). This suggests that nursing education should continue after graduation for holistic nursing care.

In the study, only 41.3% of the nurses knew that a vegetarian-vegan diet would not cause folic acid deficiency (Item 1.) (Table 3.). Folate is the natural form of vitamin B9 that is water-soluble and naturally found in many foods. A wide variety of foods (turnip greens, spinach, romaine lettuce, asparagus, Brussels sprouts, broccoli, beans, and peanuts) naturally contain folate (35). A study comparing participant groups on different diets reported that vegans consumed more fiber, folate, vitamin C and E (36).

According to the study, 52.1% of the nurses knew that a vegetarian/vegan diet could cause vitamin B12 deficiency (Item 2.) (Table 3.). The majority of the nurses recognised that individuals on vegan diets were at risk for vitamin B12 deficiency. Vitamin B12 (cobalamin) is an essential nutrient. It is required for nervous system functions, DNA synthesis, and homocysteine metabolism (37). Vitamin B12 requires supplementation for people with a plant-based diet because it is found only in animal products. Vitamin B12 is found in yeast, fortified cereals, and plant milk (soy, almond, oat), but it cannot meet the need because of its low contents. (8).

Table 2. Sociodemographic information's, mean scores and statistically significant differences between groups (n:213)

Characteristic	Mean±SD	Range	Knowledge Score Mean±SD	Test value	p
Age (years)	31.21±7.56	20-52	8.68±3.81	r=0.109	[a]0.113
	n	**%**			
Gender					
Female	184	86.4	8.6±3.9	t=-0.623	[b]0.536
Male	29	13.6	9.0±2.7		
Marital status					
Single	114	53.5	7.8±3.9	t=-3.594	[b]0.000*
Married	99	46.5	9.6±3.5		
With children					
Yes	72	33.8	9.2±3.6	t=1.509	[b]0.133
No	141	66.2	8.4±3.8		
Educational status					
Bachelor's degree	150	70.4	8.2±3.8	t=-2.584	[b]0.010**
Postgraduate	63	29.6	9.7±3.5		
Professional experience					
0-1 years	32	15.0	7.1±4.4	F=1.325	[c]0.185
1-5 years	70	32.9	8.6±3.8		
5-10 years	41	19.2	9.4±3.3		
> 10 years	70	32.9	9.0±3.5		
Working unit					
Intensive care	49	23.0	8.1±3.9	F=1.240	[c]0.240
Surgical	45	21.1	8.8±3.5		
Internal medicine	43	20.2	8.3±4.0		
Outpatient clinic	31	14.6	9.8±2.0		
Management	9	4.2	9.3±5.0		
Eye/Ear-Nose-Throat	9	4.2	7.4±2.9		
Paediatrics	9	4.2	9.5±2.0		
Emergency	11	5.2	7.4±2.2		
Other	7	3.3	9.7±3.6		
Diet					
Omnivore	207	97.2	8.6±3.7		
Vegetarian	1	0.5	15		
Lacto-vegetarian	2	0.9	7.0±1.4		
Pescatarian	2	0.9	10.5±4.9		
Vegan	1	0.5	15		
Triying a vegetarian/vegan diet					
Yes	24	11.3	10.9±3.0		
No	189	88.7	8.3±3.8		
Any acquaintance on a vegetarian/vegan diet					
Yes	68	31.9	9.4±3.5	t=-2.032	[b]0.043**
No	145	68.1	8.3±3.9		
Has pet at home					
Yes	56	26.3	8.6±4.6	t=0.016	[b]0.989
No	157	73.7	8.6±3.4		
Training on the health effects of vegetarian/vegan diet?					
Yes	22	10.3	10.2±3.6		
No	191	89.7	8.5±3.8		
Cared for a patient on a vegetarian/ vegan diet					
Yes	15	7.0	9.1±4.5		
No	198	93.0	8.6±3.7		

SD: Standard Deviation, Knowledge Score: Vegetarian/Vegan Diet Knowledge Test Score, a Pearson Correlation, b Independent sample T-Test, c One Way Anova, * p<0,001, **p<0,05

Table 3. Nurses' knowledge about vegetarian/vegan diet

Items	Questions	Correct Answer	Nurses' Response (n:213)		
		Right/Wrong	Right *n* (%)	Wrong *n* (%)	Undecided *n* (%)
	Vegetarian/vegan diet causes folic acid deficiency.	Wrong	73 (34.3)	**88 (41.3)***	52 (24.4)
	Vegetarian/vegan diet causes vitamin B12 deficiency.	Right	**111 (52.1)***	60 (28.2)	42 (19.7)
	Vegetarian/vegan diet causes vitamin D deficiency.	Wrong	61 (28.6)	**103 (48.4)***	49 (23.0)
	Zinc bioavailability is higher in people not on vegetarian/vegan diets.	Right	57 (26.8)*	49 (23.0)	**107 (50.2)**
	People on a vegetarian/vegan diet get more dietary fibre.	Right	**125 (58.7)***	24 (11.3)	64 (30.0)
	People on a vegetarian/vegan diet cannot get all the essential amino acids from the diet.	Wrong	**98 (46.0)**	58 (27.2)*	57 (26.8)
	People on vegetarian/vegan diet have lower body mass index values.	Right	**78 (36.6)***	75 (35.2)	60 (28.2)
	Vegetarian/vegan diet reduces physical performance.	Wrong	59 (27.7)	**116 (54.5)***	38 (17.8)
	Vegetarian/vegan diet is effective in reducing LDL cholesterol.	Right	**131 (61.5)***	19 (8.9)	63 (29.6)
	Vegetarian/vegan diet reduces the risk of cardiovascular disease.	Right	**138 (64.8)***	29 (13.6)	46 (21.6)
	Vegetarian/vegan diet reduces risk of diabetes.	Right	**120 (56.3)***	46 (21.6)	47 (22.4)
	Vegetarian/vegan diet reduces risk of hypertension.	Right	**132 (62.0)***	32 (15.0)	49 (23.0)
	Vegetarian/vegan diet causes menstrual irregularities in women.	Wrong	27 (12.7)	**110 (51.6)***	76 (35.7)
	A vegetarian/vegan diet reduces sperm count in men.	Wrong	24 (11.2)	**106 (49.8)***	83 (39.0)
	Well-planned vegetarian/vegan diets (with supplements such as vitamin B12 as needed) are suitable for individuals and athletes at all stages of the life cycle.	Right	**118 (55.4)***	37 (17.4)	58 (27.2)
	The reason why individuals prefer a vegetarian/vegan diet may be to be healthier, for ethical reasons, taste preferences, ecological, cultural or religious considerations.	Right	**163 (76.5)***	4 (1.9)	46 (21.6)
	A vegetarian/vegan diet has fewer carbon emissions than diets based on animal sources.	Right	**99 (46.5)***	20 (9.4)	94 (44.1)

* Correct answer option according to the knowledge test. Highest score for each item is in boldface. Abbreviations: n: Sample, LDL: Low-density lipoprotein, %: Percentage

Another finding of the study, 48.4% of the nurses correctly stated that a vegetarian/vegan diet would not cause vitamin D deficiency (Item 3.) (Table 3.). Vitamin D is obtained through the catalysis of ultraviolet (UV) light. Provitamin D accumulates in the skin and transforms into vitamin D form under the influence of sunlight. It is an important vitamin with an active role in bone health and development, cell growth, and nervous system balance. Very few foods in nature contain vitamin D. Although there is vitamin D in animal products (beef livers, cheese, egg yolks), the most important source of vitamin D is sunlight (38,39). Individuals are at risk of low vitamin D if they live in areas with little sunlight, are overly protected from the sun, or have dark skin. These individuals may need to take vitamin D supplements or foods containing vitamin D (40). While there has been some concern that vegetarians/vegans might have inadequate vitamin D levels, studies have shown that this is not the case (39,41).

In the study, only 26.8% of the nurses knew that the bioavailability of zinc was lower in vegetarian/vegan diets (Item 4.) (Table 3.). Zinc is the most abundant

element after iron and is very important for the body's metabolic function. Individuals following plant-based diets have lower plasma zinc levels than omnivores due to phytate intake which reduces absorption. Food preparation techniques, such as soaking and germinating legumes such as beans, chickpeas, nuts, or fermenting bread, can increase the bioavailability of zinc. Phytates reduce the amount of zinc the body absorbs. Vegetarians and vegans might benefit from taking zinc supplements (13,15,42). When all findings are evaluated, it is seen that individuals following a vegan/vegetarian diet should be careful about vitamin B12 and zinc bioavailability, and there is no difference in vitamin D deficiency compared to individuals following other diets.

According to the study, 58.7% of the nurses knew that people on vegetarian/vegan diets consume more fiber (Item 5.), while 27.2% knew that they could get all the necessary amino acids through such diet (Item 6.) (Table 3.). The Academy of Nutrition and Dietetics reported that individuals who use different protein sources and use the energy they receive while on plant-based nutrition can get all the amino acids they need (13,17). In addition, although short-term studies suggest that high protein intake is beneficial (5), its long-term effects on health are a matter of debate (17,43). If nurses think that vegan/vegetarian individuals cannot get the necessary amino acids, it may cause concern that they will be harmed. This may cause conflicts in the nursing care of the individual.

Only 36.6% of the nurses participating in our study knew that the body mass index values were lower in vegetarian/vegan diets (item 7.) (Table 3.). Studies show that people on plant-based diets have lower average body mass (18,36,44).

In the study, 54.5% of the nurses correctly knew that a vegetarian/vegan diet would not decrease physical performance (item 8.) (Table 3.). Like any diet, a vegetarian/vegan diet can be based on processed foods of poor nutritional quality or foods that are high in nutrients and rich in variety. Thus, a well-planned plant-based diet not containing processed foods and including fruits and vegetables would be beneficial whereas a poorly planned plant-based diet may cause insufficient intake of some vitamins and minerals (8,45). With a well-planned herbal diet, athletes gain benefits such as increased carbohydrate and energy intake, fruit and vegetable consumption and regulation of acid-base balance, reduction of oxidative stress, and recovery acceleration thanks to antioxidant fruits (8).

In the study, 61.5% of the nurses correctly answered that the vegetarian/vegan diet reduces LDL cholesterol (item 9.), 64.8% knew that it reduces cardiovascular disease risk (item 10.), 56.3% knew that it reduces diabetes risk (item 11.) and 62.0% knew that it reduces hypertension risk (item 12.) (Table 3.). The plant-based diet has recently increased in popularity due to its positive effects on general health and because it reduces cardiovascular diseases. Plant-based diets, especially vegan diets, are associated with improvement in cardiovascular health and reduce the occurrence of risk factors such as diabetes and hypertension (3). It also reduces the risk of type 2 diabetes and lowers HgA1c levels (46,47). A prospective study in which nurses were followed for 32 years and health workers for 26 years compared animal and vegetable protein intakes and morbidity and mortality and concluded that those who received their energy predominantly from animal proteins experienced more cases of cardiovascular diseases than those who received their energy from plant proteins (46). The same study also found that protein intake from red meat was associated with higher mortality (45). Studies show that a plant-based diet such as a vegetarian/vegan diet has positive effects on cardiovascular health and reduces the level of cholesterol in the blood (16). A healthy diet poses an 11-24% lower risk of death than an unhealthy diet (17,48). Many chronic conditions such as cancer occur due to obesity, insufficient physical activity, and malnutrition (1,2). Studies indicate that a diet that is mostly plant-based, restricts red and processed meats, avoids refined carbohydrates, avoids simple sugars, and restricts alcohol can be healthy and prevent chronic diseases (1,2). It has been reported that consuming non-starchy vegetables such as broccoli, lettuce, and green beans was associated with a lower incidence of stomach, mouth and larynx cancers (49) and consuming foods rich in yellow, green and orange carotene from cruciferous vegetables was associated with less aggressive breast cancers (50). Processed red meats such as salami and sausages are classified as carcinogenic, while red meats such as veal and lamb are classified as potentially carcinogenic (2).

According to the data from our study, 51.6% of the nurses correctly knew that a vegetarian/vegan diet would not cause menstrual irregularities (item 13.), and 49.8% correctly knew that it would not decrease the sperm count in men (item 14.) (Table 3.). Women lose 10-42 mg of iron daily during menstruation compared to 1 mg of iron in non-menstruating women (51). Women are therefore advised to pay more attention to their iron intake during these periods. Plant-based nutrition does not adversely affect the menstrual cycle and is recommended partially for increasing fertility. Studies indicate that the intake of vegetable protein instead of animal protein, and the high consumption of fiber and low consumption of glycaemic carbohydrates increase fertility (51,52). One study highlights the relationship between animal protein intake and increased risk of infertility (53). Women (over 32 years old) who consume protein from plant sources rather than carbohydrates or animal protein have been reported to have a lower risk of infertility (51-53). Mediterranean diet is also recommended as a "pre-pregnancy diet" for individuals receiving infertility treatment (54). According to a prospective study comparing sperm quality between vegan diets and non-vegan diets, people on vegan diets had higher total sperm count and motile sperm percentage than non-vegans (55). According to the literature, not only does plant-based nutrition not reduce sperm count, but it also increases their quality (54,55).

In the study, 55.4% of the nurses stated that well-planned vegetarian/vegan diets (with supplements such as vitamin B12 when necessary) are suitable for individuals and athletes at all stages of their life cycle (item 15.) (Table 3.). Vegetarian/vegan diets can be followed at any age and under any circumstance (31). In studies conducted on athletes of different age groups, it is stated that plant-based nutrition is sustainable (8,32). A study conducted with omnivorous, vegetarian, and vegan pregnant women demonstrated that the babies of vegan mothers had lower birth weights than the babies of omnivorous mothers, but the birth weight decreases were not out of the normal ranges. The same study also concluded that the vegan diet carries less risk than other diet types for excessive maternal weight gain (56). There are also studies suggesting that pregnant women on a vegan diet must take supplements such as vitamin B12 and, if necessary, folic acid and ferritin (56,57).

According to the study, 76.5% of the nurses stated that the reasons why individuals may prefer a vegetarian/vegan diet include the wish to be healthier, ethical reasons, taste preferences, and ecological, cultural, or religious considerations (item 16.) (Table 3.). Studies have reported that individuals choose a vegan diet for different reasons, including religious practices, health effects, animal rights, and environmental awareness (8,58). Only 46.5% of the nurses participating in the study think that the vegetarian/vegan diet leads to less carbon emissions than the diets based on animal sources (item 17.). It is sustainable because less harm is done to the environment (14,18). Nurses need to know that individuals who prefer a vegan/vegetarian diet are not only due to taste, but may have chosen it for different reasons. To provide individualized nursing care, it is necessary to evaluate the individual holistically and respect their wishes and preferences. If the attitudes and behaviors of the individual are not understood by the nurse, it may lead to missed nursing care. In addition, the nurse who does not know the nutritional differences may cause stress while providing care.

The study has some limitations. A valid and reliable scale for the measurement of vegetarian/vegan dietary knowledge has not been found. The study is limited by the cross-sectional survey design.

In conclusion, dietary preferences, adopted by increasingly more people for different reasons, fall under the responsibility of the nurses, who are the closest healthcare professionals to patients. Nurses should keep up with up-to-date information and conduct research to accurately inform people, families, and the public about diet needs, provide care, guide the daily living of the patient, and form a basis for evidence-based practices.

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