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Original Article

Evaluation of oncology-related healthcare professionals' knowledge and practices on sustainable nutrition, Ankara, Turkey

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Abstract

Background: Increasing population, limited resources, and climate change require adopting more sustainable diets. This study aims to evaluate health professionals' knowledge levels and practices on sustainable nutrition.

Methods: A cross-sectional study was conducted between January 2022 and May 2022 at Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital in Ankara. The research was performed by using the "Stretched Sampling Method". A semi-structured and self-reported online survey was recruited to collect data from healthcare professionals. Data from 298 participants were subjected to descriptive and univariate analyses to evaluate differences in knowledge mean scores and SCOFI scores. The data analysis results with the SPSS 26.0 program were accepted as a 95% confidence interval, with significance p≤0.05.

Results: A total of 298 people participated in the study. The mean age of respondents was 36 years (13±10.8). More than two-thirds (79.2%) were females, more than half (52%) were nurses, 20.5% were doctors, 60.4% had a bachelor's degree, % and 12.8 had a master's degree. Sustainable nutrition knowledge and SCOFI mean scores were 10.71±5.3 (0-24) and 54.09±13.2, respectively. 37.9% of the participants stated that they had heard of the concept of sustainable nutrition before. The sustainable nutrition knowledge of females was lower, and the SCOFI score was higher (P>0.05). The SCOFI score of the 18-25 age group was lower than the other age groups (P<0.05). Sustainable nutrition knowledge means scores increased as the education level increased (P<0.05). Dieticians had the highest sustainable nutrition knowledge and SCOFI score (P<0.05). The SCOFI score of those working in the surgery room and intensive care unit was lower than the other units (P<0.05).

Conclusion: Training for healthcare professionals might increase sustainable nutrition knowledge and awareness.

Keywords: Environment, Hospital, Oncology, Healthcare professional, Sustainable nutrition, Turkey

Background

The concept of sustainability is a term it has been heard in many areas recently. It first appeared in the Brundtland Report titled "Our Common Future," prepared by United Nations (UN) World Commission on Environment and Development in 1987. The concept of sustainability was mentioned as sustainable development. It was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" [1]. This requires the effective use of our existing resources by current and future generations. The concept of sustainability was born with the concern that our natural resources could not meet our needs [2]. The increasing population, climate changes, and limited resources raise the question of whether we can reach healthy and safe food in the future. What kind of problems will arise 100 years from now if our current nutritional status continues? What can be the impact of food on the environment from production to our table? These questions reveal the concept of sustainable nutrition. The Food and Agriculture Organization (FAO) of The United Nations developed the concept of sustainable nutrition within the scope of the symposium held in 2010, and the following definition was accepted. Sustainable diets are "diets with a low environmental impact that contribute to food and nutrition security and wellness for current and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems; culturally acceptable, accessible, economically fair and affordable; diets that use natural and human resources appropriately" [3].

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The number of undernourished people around the world is substantial. One out of every three people has symptoms of malnutrition, such as hunger and stunting, and being overweight or obese. More than 830 million people go to bed hungry every day [4]. Four million people lose their life worldwide each year due to being overweight, obesity, and related diseases. At the same time, the global burden of foodborne diseases is that all forms of malnutrition cost US$3.5 trillion per year, and overweight and obesity alone cost US$500 billion per year [5]. Sustainable diets are not only concerned with people's health and nutritional status but also with the environmental effects of food [6].

From production to distribution, the global food system is responsible for approximately one-third of anthropogenic greenhouse gas emissions worldwide [7]. Agricultural lands use 70% of freshwater [8]. However, agriculture is an essential source of water pollution from pesticides and other pollutants [9]. One-third of the food produced worldwide is wasted, which puts an extra burden on the environment [10]. This study was carried out to evaluate the knowledge and practices of health professionals, who are expected to be an example to society about sustainable nutrition, and to examine its relationship with sociodemographic characteristics.

Methods

Study design

A cross-sectional study was conducted between January 2022 and May 2022 at Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital in Ankara. The data were prepared electronically due to the Covid-19 pandemic, and the access address of questionnaires was sent to participants via email or SMS.

Inclusion and Exclusion criteria

All healthcare professionals who graduated from any department of health working in Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital, both gender and willing to participate, were included in the research. However, health professionals working in other hospitals, non-health workers, missing data, and those unwilling to participate were included in the study.

Sample size

The population of the research is N:1305. The sample size calculator arrived at 297 participants, using a margin of error of ±5.0%, a confidence level of 95%, a 50% response distribution, and 1305 people [11]. A total of 298 people responded to the survey.

Study tool

First Section: In this section, questions were asked to determine demographic characteristics such as gender, age, marital status, educational status, occupation, and income level.

Second Sections: In this section, there are 13 main questions and 11 sub-questions to measure the level of knowledge about sustainable nutrition. Since there is no scale measuring the level of sustainable nutrition knowledge, the researcher prepared the questions in accordance with the literature [3, 4, 12, 13]. Scoring is calculated as 1 point for the "Yes" answer, 0 for "No" and "I have no idea answer". There are three negative statements, and these statements are scored as 1 point for the "No" answer and 0 points for the "Yes" and "I have no idea" answers. Cronbach's Alpha value was found to be 0.890.

Third Sections: In this section, the Sustainable Food Consumption Index (SCOFI) prepared as the 2nd Intellectual Output of the project titled "Assessment and Changing Adult Behaviors on Sustainable Consumption of Food Products" implemented within the scope of Erasmus + KA204 Strategic Partnerships Adult Education on sustainable nutrition practices was used. SCOFI aims to measure the practices of individuals on sustainable food consumption [14]. The reliability analysis of the scale found the Cronbach's Alpha value for Turkey to be 0.9. The construct validity of the Index was tested with exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). KMO value is .95, and Bartlett Sphericity Test ($\chi 2$ = 12500.96; p = .00) was found significant. When the findings obtained from the CFA were evaluated, the $\chi 2$ / SD ratio (2336,38 / 626) was found to be 3.73 [15]. In our reliability analysis, Cronbach's Alpha value was 0.931.

Dependent and independent variables

Dependent variables are the sustainable nutrition knowledge mean score and sustainable food consumption index (SCOFI) score, while independent variables are gender, marital status, age, education level, occupation, etc. demographic features.

Statistical analysis

The collected data were analyzed by using the SPSS version 26.0 program. In the descriptive results section, categorical variables were presented as numbers and percentages, and continuous variables were presented as mean ± standard deviation. We found that the knowledge level-dependent variables had a Kolmogorov-Smirnov normal distribution. However, the sustainable food consumption index (SCOFI) dependent variable did not have a Kolmogorov-Smirnov normal distribution. Mann-Whitney U test, Kruskal-Wallis test, Independent Sample T-Test, and One-way ANOVA (One-Way Analysis of Variance) test were used for statistical analysis. The statistical significance threshold was determined as $p \leq 0.05$.

Results

Sociodemographic characteristics

236 (79.2%) and 62 (20.8%) of the 298 people who participated in the study were female and male, respectively. The mean age was 36.13±10.8 years. 57.4% of the participants are married, 60.4% have a bachelor's degree, 52.0% are nurses, and 56% have a monthly income of 7001-10000TL. 45.3%of they work in the clinical unit. The characteristics of the participants are shown in Table 1. 62.1% declared that they had not heard of the concept of sustainable nutrition before.

Those who stated that they heard received information from internet sources. The opinions of the health professionals participating in the study about the elements of sustainable nutrition were analyzed statistically. Considering the responses, the statement "should promote a healthy life" was market at the most 245 (14.3%), and the statement "should have a low environmental impact" was marked the least by 73 (4.3%) (Table 2, Table 3).

Level of knowledge

The sustainable nutrition knowledge mean score was 10.71±5.3 (range: 0-24). The participants generally gave 44.62% (10.71/24*100) correct answers. Sustainable nutrition knowledge mean scores of men (11.31±5.5), 46-55 age group (12.30±5.3), widowed individuals (13±0), monthly income of 10001 TL and above (11.89 ± 5.7) are higher (p> 0.05). Sustainable nutrition knowledge mean scores increase as the education level increases (P=0.003). Dietitians are the occupational group with the highest sustainable nutrition knowledge scores (15.09 ± 6.5, P=0.001). The distribution of the participants' mean knowledge scores by sociodemographic structure is shown in Table 4.

Sustainable nutrition practices

Sustainable nutrition practices mean score was 54.09±13.2 (0-100). Participants generally gave correct answers by 54.09% (54.09/100*100). The sustainable food consumption index score of females, widowed persons, and doctorate degrees is higher (p>0.05). The SCOFI score of the 18-25 age group (49.64±14.6) was lower than the other age groups (p=0.01). Dietitians have the highest SCOFI score (66.25±6.7, p=0.047) among the health professionals. The SCOFI score of individuals in the operating room and intensive care unit (48.46±12.8) was lower than those in other units (p=0.033). The distribution of the participants' SCOFI scores by sociodemographic structure is shown in Table 5.

Table 1. The distribution of participants according to sociodemographic characteristics (N=298)

Variable	Categorized Variables	N	%
Gender	Female	236	79.2
	Male	62	20.8
Age Group	18-25	68	22.8
	26-35	85	28.5
	36-45	83	27.9
	46-55	46	15.4
	56-65	16	5.4
Marital Status	Married	171	57.4
	Single	110	36.9
	Divorced	15	5
	Widow	2	0.7
Education	Vocational School of Health	5	1.7
	Associate Degree	29	9.7
	Bachelor's Degree	180	60.4
	Master's Degree	38	12.8
	Doctorate Degree	46	15.4
Job	Specialist Doctor	42	14.1
	Doctor	19	6.4
	Nurse	155	52
	Health Officer	26	8.7
	Nutritionist	11	3.7
	Pharmacist	10	3.4
	Laboratory Technician	14	4.7
	Other*	21	7
Monthly Income	3001-5000 TL	6	2
	5001-7000 TL	63	21.1
	7001-10000 TL	167	56
	10001 TL or more	62	20.8
Unit of Work	Policlinic	67	22.5
	Clinic	135	45.3
	Emergency	12	4
	Lab	26	8.7
	Operating Room-IC***	27	9.1
	Other**	31	10.4
Total		298	100

Other*Physiotherapist, Psychologist, Medical Secretary, Audiometry Technician, Health Technician, Occupational Therapist, Biologist, Speech and Language Therapist

Other** Outpatient Chemotherapy Unit, Clinical Research Unit, Dining Hall, Patient Rights, Social Service Unit, Transfusion Center, Audiology, Administrative Unit

*** Intensive Care

Table 2. Distribution of health professionals' hearing about the concept of sustainable nutrition and distribution of the resources they heard

Hearing the Concept of Sustainable Nutrition	**N (%)**
Yes	113(37.9)
No	185(62.1)
Information Resources	
Internet	69(28.7)
TV news	26(10.8)
Social media	43(17.9)
friend/environment	20(8.3)
Newspaper/magazine	9(3.8)
Scientific publications	31(12.9)
from health professionals	39(16.3)
Other	3(1.3)

Table 3. Distribution of statements made by health professionals within the scope of the elements included in sustainable nutrition

Statements	**N (%)**
It should have a low environmental impact	73(4.3)
Include Seasonal Foods	205(12.0)
Promote healthy living	245(14.3)
It should be economical	179(10.4)
Provide food safety	194(11.3)
It should be suitable for traditional foods	89(5.2)
Prevent food waste	192(11.2)
It should be accessible to everyone	188(11.0)
Must meet nutritional needs	159(9.3)
Local production should be supported	77(4.5)
Prevent nutritional diseases	111(6.5)
Other	2(9.1)

Discussion

The literature on sustainable nutrition is quite scarce. This indicates that it is a developing field of study. The literature has not found a study on sustainable nutrition in healthcare workers. Our study can help fill this gap in the literature. In a study conducted by Gülsöz on individuals aged 20 and over in Turkey in 2017, 76.0% (n=312) of the participants stated that they had not heard of the concept of sustainable nutrition before, while 24.0% (n=100) stated that they had heard of it [12]. It is thought that the higher rate of hearing the concept of sustainable nutrition in our study is because our sample is health professionals. In the study conducted by Engin on bachelor's degree students in Turkey in 2022, it was seen that the concept of sustainable nutrition was heard on social media at a rate of 33.0%. It is estimated that it may be related to the fact that bachelor's degree students spend more time on social media due to their age. They stated that they heard this from health professionals (16.0%), publications such as newspapers and magazines (14.0%), scientific publications (14.0%), courses and training they took in bachelor's degree education (12%), and television (9.0%), respectively [16]. The rate of courses taken in bachelor's degree education was higher than that of health professionals. This may be because sustainable nutrition has been included in the course contents of some health departments recently. When the answers of the health professionals participating in the study about the elements of sustainable nutrition were examined, the statement "Promote healthy life" was marked the most, and the statement "Should have a low environmental impact" was marked the least. The data from Akay's study (Turkey) on university students studying health in 2020 resembles the current study. The students declared that sustainable nutrition should again most often promote healthy living and have the least environmental impact [13]. In another study, the Spanish population surveyed most associated a sustainable diet with "plenty of fresh produce", " respect for biodiversity," and "rich in vegetables"; least associated with "cultural aspects of diet", "simple (consist of few ingredients) and "environmental impact" [17]. This shows that the relationship between sustainable nutrition and the environment is not absolutely known. Studies are needed to inform health professionals about the environmental impact of sustainable nutrition. No significant relationship was found between healthcare professionals' sustainable nutrition knowledge levels and practices and gender and marital status. Considering similar studies; In a study with the participation of 388 people from 5 different countries (Slovakia, Turkey, Denmark, Sweden, and Austria), which was prepared within the scope of the SUSCOF Erasmus+ Project, to evaluate the attitudes and behaviors of adults towards sustainable food consumption, no significant difference was found between the gender variable. Considering marital status, it is stated that married individuals have more positive behaviors toward sustainable consumption [18]. A study conducted with 230 bachelor's degree students in California stated no significant difference between men and females, single and married students in food sustainability knowledge [19]. In Gülsöz's study in Turkey, a significant difference was observed between gender and the level of sustainable nutrition knowledge, and it was seen that 38.0% of females and 22.0% of men had adequate, sustainable nutrition levels [12]. The reason for the difference may be that most of the sample in our study was female, which may have prevented a statistical difference from occurring. While people's sustainable food consumption index score increases with age, surprisingly, the 56-65 age group scores decreased. In Atar's study in Turkey, no significant relationship was found between sustainable nutrition knowledge levels and age; as age increases, the proportion of participants with a higher-than-average level of knowledge decreases [20]. Dietitians are important health professionals to promote sustainable nutrition in health institutions [21]. In one-on-one consultancy services, they can create sustainable diets that have a low environmental impact and encourage healthy eating, minimize food waste in kitchen services in their institutions, plan menus suitable for sustainable diets, and increase the awareness of employees and patients by providing both in-house and external training. In our study, dietitians' sustainable nutrition knowledge and practice scores were higher than other occupational groups. This is an expected result, but whether dietitians reflect sustainable nutrition knowledge and practices in their work is unknown. In the study conducted by Wilson et al. in Canada, it is seen that dietitians' recommendations about sustainable diets are left to their own self-efficacy and personal preferences. In the same study, it was stated that the reason why dietitians recommend reducing meat consumption is related to health rather than environmental impact [22].

Table 4. Distribution of sustainable nutrition knowledge levels of health professionals according to sociodemographic characteristics

Variable	Categorized Variables	N	Mean Knowledge Score (± SD)
Gender	Female	236	10.56±5.3
	Male	62	11.31±5.5
	t / p		**0.196/0.658**
Age Group	18-25	68	10.44±5
	26-35	85	10.67±5.2
	36-45	83	10±5.4
	46-55	46	12.30±5.3
	56-65	16	11.19±6.1
	F / p		**1.496/0.203**
Marital Status	Married	171	10.231±5.2
	Single	110	11.59±5.3
	Divorced	15	9.47±5.8
	Widow	2	13±0
	F / p		**1.895/0.131**
Education	Vocational School of Health[1]	5	7.8±3.4
	Associate Degree[2]	29	7.83±4.3
	Bachelor's Degree[3]	180	10.67±5.1
	Master's Degree[4]	38	11.34±5.5
	Doctorate Degree[5]	46	12.48±5.8
	F / p*		**4.090/0.003**
	PostHoc		**5>2**
Job	Specialist Doctor[1]	42	11.93 ± 5.6
	Doctor[2]	19	13.11 ± 5.7
	Nurse[3]	155	9.97 ± 4.9
	Health Officer[4]	26	12.19 ± 5.7
	Nutritionist[5]	11	15.09 ± 6.5
	Pharmacist[6]	10	9.8 ± 5
	Laboratory Technician[7]	14	8.36 ± 4
	Other[8]	21	9.48 ± 4.8
	F / p**		**3.446/0.001**
	PostHoc		**5>3 5>7**
Monthly Income	3001-5000 TL	6	10.33 ± 7.5
	5001-7000 TL	63	10.56 ± 4.8
	7001-10000 TL	167	10.35 ± 5.3
	10001 TL or more	62	11.89 ± 5.7
	F / p		**1.308/0.272**
Unit of Work	Policlinic	67	11.72 ± 5.1
	Clinic	135	10.16 ± 5.2
	Emergency	12	11.92 ± 7.5
	Lab	26	10.31 ± 4.8
	Operating Room-IC	27	10.74 ± 5
	Other	31	10.81 ± 6.1
	F / p		**0.931/0.461**

In the study conducted by Wang et al. [23]in China by using sustainability assessment of food consumption of a group of more than 30,000 people, whose food consumption data and socioeconomic information were obtained from the China Health and Nutrition Survey for the period 1997–2011, although the low-income and low-education group is much more sustainable than the higher income and higher education group, is has been stated that the sustainability of food consumption has decreased significantly over the years in all groups [23]. The sustainable food consumption index score of participants in the operating room and intensive care unit were significantly lower than those in other units. In Alemdağ's study in Turkey [24], it was stated that the healthy lifestyle behaviors of the health personnel working in the operating room were moderate, they could not use their knowledge in daily life, and the reason for this could be related to the intense work schedule and the stress of the cases [24]. In Kalın's study in Turkey [24], it was observed that as the stress level of operating room nurses increased, healthy lifestyle behaviors decreased [25].

Table 5. Distribution of SCOFI scores of healthcare professionals by sociodemographic characteristics

Variable	Categorized Variables	N	Mean SCOFI Score (± SD)	p Value
Gender	Female	236	54.86±12.4	0.103
	Male	62	51.14±15.9	
Age Group	18-25	68	49.64±14.6	**0.01****
	26-35	85	53.69±13.7	
	36-45	83	55.45±12	
	46-55	46	58.57±11.1	
	56-65	16	54.09±13.2	
Marital Status	Married	171	54.79±12.9	0.129
	Single	110	52.51±14.6	
	Divorced	15	55.9±8.7	
	Widow	2	67.82±3.3	
Education	Vocational School of Health	5	54.24±13.8	0.18
	Associate Degree	29	48.95±13.4	
	Bachelor's Degree	180	54.12±13.6	
	Master's Degree	38	54.53±12.8	
	Doctorate Degree	46	56.81±11.6	
Job	Specialist Doctor	42	56.09±11.7	**0.047***
	Doctor	19	55.23±11.8	
	Nurse	155	52.46±13.8	
	Health Officer	26	54.46±13.2	
	Nutritionist	11	66.25±6.7	
	Pharmacist	10	50.62±19.9	
	Laboratory Technician	14	56.77±8.6	
	Other	21	54.43±11.6	
Monthly Income	3001-5000 TL	6	54.01±14.8	0.829
	5001-7000 TL	63	51.93±15.78	
	7001-10000 TL	167	54.27±12.7	
	10001 TL or more	62	55.81±11.5	
Unit of Work	Policlinic	67	56.16±11.4	**0.033***
	Clinic	135	52.77±14.3	
	Emergency	12	58.35±14	
	Lab	26	56.93±9.6	
	Operating Room-IC	27	48.46±12.8	
	Other	31	54.09±13.2	

In the study of Gençgün in Turkey [26], he mentioned that the healthy lifestyle behaviors of the operating room and intensive care nurses are still at a moderate level. This situation is lower than expected, possibly because the difficulty of working conditions prevents them from experiencing their knowledge in daily life [26]. Due to similar reasons, operating room and intensive care workers may have lower scores than other units because they cannot spare time for sustainable practices. More detailed studies can be done on this subject. Studies have shown that diet can prevent most cancer cases [27]. Vineis et al. [28] examined the relationship between cancer and climate change. They mentioned that reducing the compounds released into the atmosphere and contributing to climate change will reduce the risk of many non-communicable diseases, including cancer [28]. Considering the positive effects of sustainable diets on the environment and health, it is important for the health professionals working in the oncology hospital to have sufficient knowledge of sustainable nutrition for their patients. Simões et al.'s study [29] determined that Insulin-like growth factor 1 (IGF-1), glycemia, and total cholesterol decreased at

the end of the intervention in a breast cancer patient who switched from a western-style diet to a plant-based diet [29]. Sustainable diets that encourage the overconsumption of plant foods may benefit cancer patients. The lack of a standard scale to measure the level of sustainable nutrition knowledge in the literature and the inability to reach our entire universe due to COVID-19 conditions constitute the limitations of the research. A large number of females impacted our study. The height and weight status of the participants were taken according to their statements. In addition, the fact that our study has a cross-sectional design creates a limitation in revealing causality.

Conclusion

As a result, 62.1% of healthcare professionals have yet to hear of sustainable nutrition. It was observed that only 44.6% of the participants had sufficient sustainable nutrition knowledge, and 54.1% had sufficient sustainable nutrition practices. More than sustainable nutrition knowledge and practices of health professionals is required. Hospitals are important institutions for promoting sustainable nutrition. Training should be given to increase health professionals' sustainable nutrition knowledge level, who is expected to be an example to society. Sustainable nutrition should be added to the bachelor's degree education curriculum, especially in health departments. Strategies and policies for sustainable nutrition should be developed, and health professionals should be pioneers..

Abbreviation

TRH: Training and Research Hospital; SCOFI: Sustainable Food Consumption Index; SPSS: Statistical Package for the Social Sciences; UN: United Nations; WCED: World Commission on Environment and Development; FAO: Food and Agriculture Organization; ABD: United States of America; SD: Standard Deviation; SUSCOF: Sustainable Consumption of Food; IGF-1: Insulin-like growth factor; COVID-19: Coronavirus Disease-2019

Declaration

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Availability of data and materials

Data will be available by emailing dyteminebalyan@gmail.com

Authors' contributions

Emine Balyan Çelikkaya (EBC) is the responsible author for the concept, design, literature search, data analysis, data acquisition, manuscript writing, editing, and reviewing. EBC has read and approved the final manuscript.

Ethics approval and consent to participate

We conducted the research following the Declaration of Helsinki. The protocol was approved by Ankara Yıldırım Beyazıt University Ethics Committee (Ref: SR/33 at 29-November-2021); In addition, web-based informed consent was obtained from each participant after the study objectives and confidentiality guarantee was explained.

Consent for publication

Not applicable

Competing interest

The authors declare that they have no competing interest.

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