

Article

# Climate Change Knowledge and Awareness of Nutrition Professionals: A Case Study from Turkey

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**Abstract:** Nutrition professionals (nutritionists and dietitians) assess nutritional and food-related health problems. They also identify appropriate interventions and support people in making dietary and lifestyle changes. The current climate change emergency constitutes a global threat to health, and the nutrition professionals can promote some diet-related alterations that encourage practical mitigation actions against it. This study assessed the knowledge and awareness levels of Turkish nutrition professionals about climate change by using a multiple-choice online quantitative survey conducted in 2021. It uses a sample of 1200 nutrition professionals who graduated from Turkish Universities. The findings showed that the participants' climate change knowledge and awareness levels were correlated and significantly affected each other when it comes to understanding, responding, effects and awareness ( $p < 0.05$ ). However, the links with knowledge about sustainable diet and scientific collaboration were statistically insignificant ( $p > 0.05$ ). Educational and practice-based opportunities for linking climate change and diet-related advice are suggested for Turkish nutrition professionals.

**Keywords:** climate change; dietitian; nutritionist; community health; global warming; sustainability; education



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## 1. Introduction

Our present food systems and diets are susceptible to climate change and at the same time are responsible for about 25% to 42% of all global anthropogenic greenhouse gas (GHG) emissions [1]. Climate change has become a global priority, with 2033 jurisdictions worldwide covering one billion people, declaring it an emergency [2]. The link between climate change and diets, however, remains largely unacknowledged, particularly when it comes to providing professional dietary advice [3]. Nutrition professionals assess nutritional and food-related medical problems, identify appropriate interventions and support the people they advise in making dietary and lifestyle changes. They also follow any emerging food-related innovations and trends. By engaging with people's eating habits, these professionals encourage an increased sense of self-awareness and responsibility in individuals [4]. In the current climate emergency which is "one of the greatest global health threats of our time" [5] (p. E316), they can also promote diet-related changes that encourage practical mitigation actions while supporting good nutrition and a healthy lifestyle. Together with other public health professionals, they have significant powers to influence the community's eating and drinking habits towards more sustainable food choices [6,7], including novel food options and alternative proteins to animal-based foods with lighter environmental and climate change impacts. They can also trigger increased

awareness about the effects of one's diets and duty of care in relation to other people and future generations.

Despite recent research on the link between the views of nutrition professionals and climate change in English-speaking countries and other African, Asian and Latin American nations [5,8], there has not been a study explicitly analyzing the issue in the context of Turkey. With a population of 84 million spread across two continents, Turkey's 4.86 t per capita CO<sub>2</sub> emissions are higher than the 4.72 t per capita world average [9]. It is unclear what the knowledge and understanding about the greenhouse gas emissions priorities are among Turkish nutrition professionals and their willingness to advocate measures for abating climate change. In this study, we aim to reveal and assess the existing levels and challenges in nutrition professionals' knowledge and awareness as they relate to climate change.

## 2. Materials and Methods

Below, we explain the study design and methodology together with the characteristics of the survey sample. We used a quantitative online survey and the data was collected during 2021.

### 2.1. Study Design and Sample

In this study, we tested the climate change knowledge and awareness levels of Turkish nutrition professionals using a multiple-choice quantitative survey. The study sample was recruited from the nutrition professionals, namely nutritionists and dietitians, who have graduated from Turkish Universities. We reached out to 1200 graduates, both female and male, and invited them to participate in the study using public social networks, namely Instagram accounts and the professional network "@diyetisyendunyasi". In total, 415 people fully completed the survey representing a response rate of 35% and resulting in a statistically representative study with a 5% margin of error (or confidence interval) at the 95% confidence level [10].

### 2.2. Survey Design and Data Collection

The data were collected using LimeSurvey 3.0, an open-access electronic survey platform operated from Hamburg, Germany. Conducted in Turkish, the survey initially was based on questions used in other similar studies [11–15]. It was piloted with 100 Turkish participants, and the responses were tested for reliability and validity. The final survey contained 65 questions in total with 6 collecting demographic information, 28 related to the respondent's knowledge level of climate change and related issues, and the remaining 31 covering awareness level of climate change-related occupational challenges. Multiple-choice and 5-point Likert scale questions were used (see Supplementary Materials). Any incomplete survey responses were eliminated resulting in a sample of 415 fully completed questionnaires.

A research ethics approval was obtained from the Ethics Committee of the Istanbul Sabahattin Zaim University (29 February 2020; no.: 20292139-050.01.04) in Istanbul, Turkey. All participants were given online information describing the study and had to provide informed consent before participating by ticking a box at the beginning of the electronic survey. The participants had the option to withdraw from the study at any stage before submitting their responses to the survey.

### 2.3. Statistical Analysis

At the outset of the study, the proposed hypothesis was an interrelated and significant connection between the nutrition professionals' knowledge and awareness levels about climate change. The statistical analysis, including reliability and validity, descriptive statistics, normality, correlation, and multi regression, was conducted with the SPSS statistic software version 20.0 (IBM Corporation, New York, NY, USA). Results with a  $p$  value of less than 0.05 ( $p < 0.05$ ) were considered statistically significant and are commonly used

in statistics to indicate that there is less than 5% probability of the obtained results to be random.

### 3. Results

The results from the survey of the Turkish nutrition professionals are presented starting with the demographic and statistical description of the sample. This is followed by the hypothesis testing of its knowledge and awareness levels.

#### 3.1. Demographic Information

Approximately 93% ( $n = 387$ ) of the respondents were female, with the remaining 7% ( $n = 28$ ) being male. The age breakdown of the sample is as follows: 59.5% are recent university graduates aged between 21 to 25, 29.9% are 26 to 30 years old, 7%—31 to 35, 1.9%—36 to 40, and 1.7% are older than 41. A large share of the participants (79.8%) comprised single people, according to marital status. As required originally for the study, all participants had a university degree, and 34.2% had completed postgraduate studies. The number of years in nutrition and dietetics practice ranged from 1 to 21+ years, with 76.4% being involved in the profession for 1 to 3 years, 14.2% for 4 to 6 years, 5.1%—7 to 10 years, 2.9%—11 to 15 years, 0.3%—16 to 20 years, and 1.2%—longer than 21 years. Reflecting the current situation in Turkey, the participants were employed in a range of private and public institutions across the country. Of them, 55.2% were working in privately-owned clinics, 6.5% were employed by the Ministry of Health of Turkey, 4.3% in university hospitals, 3.9% in academia, and 1.2% in family health centers.

#### 3.2. Statistical Analysis

The survey responses were tested for reliability and validity, descriptive statistics, assessment of normality, correlation, and multi regression analyses, respectively ( $p < 0.05$ ). Firstly, the Kaiser–Meyer–Olkin (KMO) values for knowledge and awareness scales were found as 0.880 and 0.919, respectively ( $>0.80$ ). This test showed that our research might represent the Turkish nutrition professionals' workforce population [16]. Secondly, the Cronbach's alpha coefficients for both scales (0.866 and 0.914) exceeded the level of acceptance ( $>0.60$ ) and indicated internal consistency reliability [16].

Furthermore, the confirmatory factor analysis demonstrated that the respective factor loadings for the knowledge and awareness scales ranged from 0.510 to 0.859 and 0.503 to 0.862 ( $>0.50$ ) [16]. The normality of the data was checked for skewness and kurtosis. A value for asymmetry and kurtosis between  $-2$  and  $+2$  is considered acceptable [17]. The data in the knowledge scale did not show a normal univariate distribution ( $-1.088$  to  $3.233$ ). Normal univariate distribution, however, was observed in the awareness scale ( $-0.278$  to  $-0.332$ ). Finally, the factor correlation matrix was examined for discriminant validity, and the value was 0.444 ( $<0.6$ ). These findings confirmed good measurement scales for the survey.

The multiple regression analysis for the hypothesis showed that the participants' knowledge and awareness levels were correlated and significantly affected each other with understanding, responding, effects, and awareness related to climate change ( $p < 0.05$ ). However, sustainable diet and scientific collaboration were statistically insignificant ( $p > 0.05$ ) (see Table 1). Overall, the statistical results confirmed our hypothesis, eliciting an inter-related and significant connection between the nutrition professionals' knowledge and awareness levels about climate change.

#### 3.3. Knowledge Levels

Only 10.8% of the respondents agreed that climate change is an irreversible process. However, 76.9% expressed that it has a significant influence on development and has contributed to the collapse of civilizations throughout history. The majority of participants (89.9%) were worried about climate change and its effects. Regarding impacts of climate change on food safety/security and human health, the frequencies for those who see them

as significant were 80.2% and 83.6%, respectively. In addition, 81.9% of the participants expressed that humans were causing the climate to change. Smaller shares of the participants were aware of the policy environment related to climate change, namely: 22.9% were aware of Turkey's National Climate Change Action Plan, 29.4% of the Kyoto Protocol, 24.8% of the UN Framework Convention on Climate Change, and 19.8% of the Paris Climate Agreement. On the other hand, only 14.7% had a membership in an organization actively working on climate change-related issues. Regarding getting information on climate change, 59.3% followed social media, whereas 38.3% were tracking the scientific authorities, and 32.3% were monitoring official sources and the business world (Table 2). Such knowledge is important as it can put the Turkish nutrition professionals in a better position to give sustainability-related dietary recommendations aimed at achieving a real effect on the general population. Changing habits in recent years due to unhealthy dietary choices are leading to serious obesity prevalence (of 32.1% and the highest in Europe) and other diet- and physical activity-related non-communicable diseases [18,19].

**Table 1.** KMOs, Cronbach's alpha coefficients, and multi regression analysis results.

Scale/Sub-Scale	KMO Value	Cronbach's Alpha Coefficient
<b>Knowledge level overall</b>		0.866
Understanding climate change	0.880	0.887
Responding to climate change		0.892
<b>Awareness level overall</b>		0.914
Effects of climate change		0.932
Professional field and climate change	0.919	0.876
Sustainable diet		0.617
Scientific collaboration		0.900
<b>Multi Regression Results (<math>p &lt; 0.05</math>)</b>		
Scale/Sub-Scale	Awareness	Knowledge
<b>Knowledge</b>	0.000	
Understanding climate change	0.000	
Responding to climate change	0.036	
<b>Awareness</b>		0.000
Effects of climate change		0.000
Professional field and climate change		0.000
Sustainable diet		0.230
Scientific collaboration		0.086

**Table 2.** Knowledge and awareness levels of nutrition professionals on climate change.

<b>Climate Change Knowledge Levels</b>					
Question/Percentage of Response	1	2	3	4	5
How sure are you that global warming is happening now?	1.93%	2.17%	9.16%	42.65%	44.10%
How worried are you about climate change and its effects?	0.96%	2.41%	6.75%	42.65%	47.23%
To what degree do you believe that climate change is an irreversible process?	39.52%	34.70%	14.94%	8.43%	2.41%
To what degree do you believe that humans are causing the climate to change?	1.93%	2.17%	13.98%	43.37%	38.55%
Do you believe that governments and legal authorities inform the public about climate change?	1.45%	1.69%	3.61%	27.47%	65.78%
Do you think that you are aware of Turkey's National Climate Change Action Plan?	30.60%	26.99%	19.52%	15.90%	6.99%
Do you follow social media to obtain information about climate change-related issues?	5.78%	11.33%	23.61%	39.76%	19.52%

Table 2. Cont.

Question/Percentage of Response	Climate Change Awareness Levels				
	1	2	3	4	5
Do you agree that climate change adversely affects the mineral composition of foods?	0.48%	0.96%	11.57%	39.76%	47.23%
Do you agree that climate change causes gastrointestinal disorders?	0.48%	1.69%	17.11%	40.00%	40.72%
To what degree do you believe that dietitians can play an active role in climate change mitigation strategies?	1.45%	4.10%	17.59%	40.24%	36.63%
Regarding climate change mitigation strategies, do you recommend a vegan diet?	10.36%	15.18%	28.19%	26.99%	19.28%
Regarding cross-disciplinary collaboration with other fields in making progress with climate change, are you ready to act with medical sciences?	0.00%	0.48%	5.54%	24.82%	69.16%
Regarding cross-disciplinary collaboration with other fields in making progress with climate change, are you ready to act with engineering sciences?	2.17%	6.27%	23.13%	29.40%	39.04%
Do you agree that the promotion of diets can be considered as a climate change mitigation strategy?	0.96%	2.65%	14.46%	40.48%	41.45%

Note: The scale range is from 1—strongly disagree to 5—strongly agree.

### 3.4. Awareness Levels

More than 80% of the respondents agreed that climate change negatively affects the nutritional quality of foods, in particular mineral composition (87%) and vitamin content (84.1%). Regarding climate change-related health issues, many expressed concerns about gastrointestinal conditions (80.7%), infectious and immunological diseases (88.4%), cognitive impairment (81.7%), malnutrition, obesity (80.5%), and antimicrobial resistance (62.2%). As climate change and weather calamities jeopardize food security, nutrition professionals could also recommend a switch to alternative proteins to be the solution for a more sustainable diet. The survey respondents indicated that nutrition professionals could play an active role in climate change mitigation strategies, and in raising the awareness of patients and colleagues—76.9% and 80%, respectively. A large section of the sample, namely 81.9%, agreed about promoting particular diets as a climate change mitigation strategy. In this vein, 46.3% recommended a vegan diet, 54.7% defended a vegetarian diet, 61.7% advised reduction of meat consumption, and 83.4% suggested local/traditional diets. Furthermore, 43.4% believed that a sustainable diet is determined by international/national policies, food prices, accessibility to food, and eating habits. Regarding cross-disciplinary collaboration with other fields in making progress with climate change, many respondents were ready to act with medical sciences (93.3%), agriculture and environmental sciences (86%), education (84.3%), social (82.7%), natural (81.7%), veterinary (79.8%) sciences, and engineering (68.4%) (Table 2).

## 4. Discussion

As far as we are aware, this is the first study to assess Turkish nutrition professionals' knowledge and awareness levels about climate change. The large gender difference with more female than male respondents is notable but also understandable. A much higher response rate from female nutrition professionals was expected, as globally, women dominate this profession. According to the International Affiliate of the Academy of Nutrition and Dietetics, most nutrition professionals in Turkey are female [20]. Similarly, the reported shares of females in this profession are 85.2% in the United States and 94.6% in Australia [21]. Hence, we consider that our sample represents the Turkish nutrition professionals well.

Although the respondents did not express a precise engagement with climate change issues, several insights from this study can be drawn. The knowledge levels about the anthropogenic nature of climate change are in line with previous Spain-based research findings among health professionals in relation to the Mediterranean diet [5]. While the nutrition professionals influence the shaping of dietary practices, they are yet to see a role for themselves in advocating increased action to address climate change through people's

food choices. Half of the nutrition professionals do not see vegan or vegetarian diets as a response to climate change; however, most agree about reducing the consumption of animal-originated foods, which are significant contributors to GHG [22]. In fact, estimates show global GHG emissions from animal-based foods to be twice those of plant-based options [23]. Some current, trendy meat reduction practices involve substitution for less environmentally-burdening options, such as replacing meat with plant-based products mimicking meat. For instance, the promotion of non-meat food options supported by social media campaigns, such as the Anglo-American Meatless Mondays, the Finnish Meatless October, and the vegetarian school days in Belgium and Finland, provide a solution in this direction [24]. Our results revealed that the nutrition professionals would be more likely to promote a plant-based diet if they are informed about its positive health and environmental benefits.

Around a fifth of the Turkish participants are aware of the policies to respond to climate change, including Turkey's National Climate Change Action Plan (22.9%), the Kyoto Protocol (29.4%), UN Framework Convention on Climate Change (24.8%), and Paris Agreement (19.8%). However, this is yet to translate into practice-based actions in their work. This is in sharp contrast with a US study which shows that 38% of the dietitians actively engage in activities to promote diet as a climate change mitigation strategy [3].

Even with the existing awareness of the health burden of climate change, the respondents still do not see it as a complicated and multidimensional scientific problem [25]. To substantiate this claim, we need to examine the presence of the critical terms "climate change" and "global warming" in this field. According to the Academy of Nutrition and Dietetics (AND), these terms were not among the global trends affecting the profession in the 2002 report on Workforce Demand [26]. By 2006, global warming has become one of the eleven themes shaping the nutrition world [27]. Furthermore, the 2007 report considered the nutrition professionals as essential players in the food systems, and in 2010, global warming was seen as one of the critical future research directions, and considered as one of the future changes driving the dietetics workforce supply and demand between 2012 and 2022 [28,29]. The Association of UK Dietitians clearly acknowledges that these nutrition professionals are at the forefront of shaping healthy eating practices and policies [30]. They have the counselling skills needed to engage, communicate about climate change, and influence people's behavior [30]. Similarly, Dietitians of Canada see sustainable diets that reduce food's impact on climate change as a joint responsibility across diverse sectors and professions [31].

Although the Turkish nutrition organizations are linked to a number of international organizations, such as the International Confederation of Dietetic Associations (ICDA), there are no activities, reports or dietary guideline panels on nutrition and climate change. By comparison, nutrition professionals have produced such related work in Australia, Brazil, Denmark, Finland, Germany, The Netherlands, the United States, Qatar, Sweden, and the UK [32]. From 2018 to 2019, ICDA completed a survey of members of 50 national dietetic associations from 43 different countries and reported that the number of nutrition professionals working in public health and food services increased by 60.8% and 39.1%, respectively. In addition, the focus on malnutrition screening increased by 69.6% [33]. Another survey covering 35 countries showed that 51% did not have an adequate national plan to protect public health from climate change, and 77.1% did not identify health risks from projected climate change [34]. Turkey was not covered in any of these studies, but the country has a national plan to combat climate change. Our study suggests that Turkey needs effective strategies to increase research evidence and mobilize its educated nutrition professionals to respond to this challenging issue.

There seems to be a broad awareness about the link between diet and climate change in other parts of the world. For instance, in 2010, there was a 78% support for nutrition professionals to have a valid role concerning climate change in Australia; however, the respondents expressed the need for more knowledge to assist them in engaging in related activities [33]. Another study from Australia showed that healthcare services produce 7%

of total GHG; therefore, nutrition professionals can play a substantial role in responding to climate change by promoting better diets [33]. Although 75% of the nutrition professionals in the United States were concerned about climate change, half of them were unsure about their role in responding to it. They connected to diet and climate change through authoritative and personal experiential pieces of knowledge [35]. Our study shows that the situation in Turkey is similar to those in Australia and the United States. Almost 90% of the participants in the study were worried about climate change. Still, their engagement with the issue is patchy. For example, only 14.7% had a membership in an organization actively working on climate change-related matters; 59.3% connected to diet and climate change mainly by following social media, and only 38.3% tracked scientific authorities. Overall, our results suggest that the Turkish respondents exhibit a discrepancy between concern and practice-based actions due to a lack of knowledge.

Regarding awareness about national and international mitigation strategies on climate change, only 19.8% of the survey participants knew about the 2015 Paris Climate Agreement, which is the most significant global commitment to combating GHG emissions. Awareness about other policy initiatives, such as Turkey's National Climate Change Action Plan (22.9%), the UN Framework Convention on Climate Change (24.8%), and Kyoto Protocol (29.4%), was similarly inadequate. This was despite Turkey's active engagement with the Kyoto Protocol since 2009 and public health being one of the five priorities in the country's 2012 National Climate Change Action Plan [36,37]. Turkey also committed to the UN Sustainable Development Goals adopted in 2015 [38]. At the 2015 Paris Climate Conference of the Parties, Turkey was described as being one of the climate change hotspots indicating the need for broad social engagement [39]. Turkey has been putting a lot of effort at a national level into understanding and reducing the adverse effects of climate change on public health. In 2010, a commission was set up to study diseases linked to climate change, and the Turkish Ministry of Health hired 3000 staff to increase awareness among health personnel and the public [40–42]. However, it seems that these efforts have not reached the entire nutrition community. Our study revealed that the participants' understanding of climate change mitigation strategies is incomplete, leaving out dietary responses.

A sustainable diet encourages healthy eating, reduces food waste, and is among the top five solutions to combat climate change [43]. Dietary guidelines and the work of reputable scientific panels advise eating food in quantities enough to maintain the body's energy balance from sustainable sources with recommendations to consume fewer animal-based foods [27,44]. The main reason is the climatic implications of the types of food consumed. For instance, meat and dairy products are responsible for 14.5% of all GHG emissions in the world [45]. Similarly, agricultural activities are responsible for 70–80% of all water withdrawals and occupy 38% of the earth's ice-free land [37]. Thus, even a moderate reduction in meat consumption can result in cutting the dietary GHG emissions [46]. Plant-rich, vegan, and vegetarian diets are widely regarded as better for our planet and have many health advantages. For instance, in the United States, 12% of all nutrition professionals describe themselves as vegetarian or vegan compared to 4% among the general population [3,47]. Almost half of our participants do not consider vegan or vegetarian diets to respond to climate change-related issues; however, the majority agrees about lowering the consumption of animal-based foods. More than 80% of the surveyed respondents prefer local/traditional diets to plant-based diets. Nearly 50% expressed international/national policies, food prices, accessibility to food, and eating habits as the key actors in formulating sustainable diets. Research evidence, however, shows that a shift in diet away from meat and dairy decreases GHG emissions significantly more than buying local and traditional foods [48,49]. Therefore, GHG emissions of diets in line with nutritional recommendations need further exploration [50]. Furthermore, diets being lower in GHG emissions do not always imply being "healthy" [51–53]. Studies show that climate change can adversely affect the nutrient density and quality of some staple crops due to increased temperature and elevated CO<sub>2</sub> levels, which is of particular concern in low-income countries. A public health strategy focused on dietary changes towards

predominantly plant-based diets that are in line with evidence on healthy eating can be a suitable approach for sustainable diets [54,55].

Our study also corroborates that nutrition is a complex science. There should be a pathway between different dietary choices. From this perspective, vegetarian/vegan vs. non-vegetarian/non-vegan dietary interventions for fighting climate change should be part of the Turkish nutrition participants' actions.

The coexistence of hunger and malnutrition characterizes the world in the twenty-first century. Almost 800 million people suffer from a lack of adequate foodborne energy, and more than 2 billion experience micronutrient malnutrition. Nutrition professionals should raise the challenging question of: "how do we satisfy nutritional needs while also addressing climate change-associated issues?" [33]. Climate change might influence crop yields and alter the nutritional content of certain foods [56,57]. In our study, 80% of the participants agree that climate change affects the nutritional quality of foods (87% on mineral composition and 84.1% on vitamin content). Studies in Sweden also show that the nutritional value of food is related to environmental conditions [58]. It is not clear to what degree Turkish nutrition professionals are aware of these facts.

According to the World Health Organization (WHO), climate change will cause 250 thousand additional deaths per year by the 2030s [59]. In our study, 83.6% of the participants agreed about the need to be better equipped with knowledge and skills to address the food safety risks of climate change and global warming [38]. The management of climate change-linked health effects requires an integrated and multidisciplinary approach in which nutrition professionals can play a role [60]. Many confounding factors link extreme weather events with disease dissemination, and they are not understood well [61]. An increase of 1.5 °C in global average temperature corresponds to change in the distribution of some disease vectors, while an increment of 3.5 °C will trigger increasing burden from malnutrition, diarrhea, cardiorespiratory, and infectious diseases [62]. In the European Union (EU), there is already a growing increase in foodborne illnesses and allergic reactions (for example, rhinitis) [62–64]. The West Nile virus risk is projected to reach the EU by 2025–2050, and Greece, Croatia, and Turkey are seen as high-risk areas [65,66]. In our study, the respondents expressed a greater sense of urgency around diseases, such as gastrointestinal (almost 80%), infectious and immunological (88.4%), cognitive (81.7%), malnutrition and obesity (80.5%), and antimicrobial resistance (62.2%). Thus, our work shows that climate change presents grand challenges for Turkey.

The lack of focus on the interrelation between diets and climate change during their professional degree may be a reason for the current level of awareness among the surveyed Turkish participants. These degrees do not contain modules on climate change [66]. In the meantime, the diet of the Turkish population is significantly changing with higher intake of animal-based foods which have a bigger contribution to greenhouse gas emissions. Between 2000 and 2019, meat consumption in Turkey has increased by 78%—one of the highest increases globally, from 18.4 to 32.8 kg per person per year [67]. It is clear that the Turkish population is embracing less sustainable food options, and this study reveals that one of the contributing factors is the lack of climate change-related advice from nutrition practitioners.

To complement their skills, nutrition professionals need to learn about sustainability and climate change through professional development. In Australia, only 6.9% of the degrees include modules related to sustainable food systems. However, Australia has a "Food systems and environmental sustainability role statement" in its National Competency Standards (2019), capturing the problem and the need for consistent dietary change recommendations [68]. To this moment, there is no current mandate for nutrition and dietetics students to develop knowledge and capabilities to incorporate sustainability into their practices, including to combat climate change [35]. There is also a lack of research regarding the nutritional benefits of plant-based meat alternatives despite the surge of industry interest. Climate change was ranked low against other public health nutrition priorities in Australia as well as in the case of Turkey [34,69–72]. Our study found that

influencing further collaboration with other disciplines can be beneficial due to the multi-disciplinary/dimensional climate change–health–diet nexus. In fact, the Council of Higher Education (YÖK) in Turkey has been encouraging higher education institutions to include environmental, biodiversity, and climate-related topics in the curricula since 2015. Therefore, our results can be considered a reminder about the need for an educational strategy that specifically addresses the nutrition and dietary effects of climate change to be presented to YÖK and policy-makers.

## 5. Conclusions and Implications

This study represents the first national snapshot of the knowledge and awareness levels of the Turkish nutrition professionals regarding climate change and on their preparedness to deal with its impacts. Its findings are also comparable with other studies across the globe in this field. The results from the research sample reveal that climate change, mitigation, and adaptation are moderately correlated with understanding, responding, effects, and awareness. On the other hand, there is a discrepancy between concern and practice-based actions for the Turkish nutrition professionals in relation to climate change, despite the latter being described by the World Health Organization as the “greatest threat to global health in the 21st century” [73]. This fact echoes the insufficient awareness level about sustainable diet and scientific collaboration with other parties to tackle the current and future impacts of climate change-related health and nutritional issues.

Such results on this challenging issue are timely for Turkey, given the existing evidence from Australia, the United States, and other countries. Educational and experiential opportunities are needed to connect climate change mitigation to the knowledge and practice of dietitians and nutritionists with university degrees. Strengthening the climate change knowledge and awareness levels of Turkish nutrition professionals can contribute to mitigation actions by reaching larger masses of people. Overall, educational and experiential opportunities connecting climate change to nutrition and diet-related advice are highly needed, and there is a clear role for nutrition professionals. Such opportunities can include the following:

- i. Improving the educational components that link climate change, diet, and health during the university degrees of the nutrition professionals; for example, the co-benefits from plant-based options for improving human health and reducing impacts on climate can be incorporated in the curriculum;
- ii. Strengthening research, collaboration, communication, leading by doing and networking to lobby the government regarding the health risks of climate change, and the potential for mitigation through dietary choices;
- iii. Mobilizing the skills of nutrition professionals to educate the public about climate change, health risks, long-term outcomes, and dietary choices;
- iv. Adopting best practice examples from other parts of the world and international bodies which showcase the role of diets in mitigating climate change.

All of the above recommendations can also represent directions for further research. For example, a curriculum and syllabus analysis can identify gaps in the existing graduate attributes and skills that nutrition professionals need in relation to climate change. The role of national dietary guidelines and how they reflect environmental concerns can be an area of investigation, as well as collaboration between government bodies, academia, nutrition professionals, and the broader society. Identifying best practice examples from other parts of the world similarly requires further research as does identifying possible interventions through which the public can be better educated about the links between climate change, health, and diets.

An array of global actions are needed to combat climate change, driven in part by inappropriate diets, and to prevent temperature overshoots above 1.5 °C [74]. Although long overdue, engaging the nutrition professionals in this challenge can deliver important dietary advice that will help in transitioning to more sustainable diets.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su14073774/s1>, Table S1. Examples of survey questions.

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## References

- Crippa, M.; Solazzo, E.; Guizzardi, D.; Monforti-Ferrario, F.; Tubiello, F.; Leip, A. Food systems are responsible for a third of global anthropogenic GHG emissions. *Nat. Food* **2021**, *2*, 198–209. [CrossRef]
- Climate Emergency Declarations in 2044 Jurisdictions and Local Governments Cover 1 Billion Citizens—Climate Emergency Declaration. Climate Emergency Declaration. Available online: <https://climateemergencydeclaration.org/climate-emergency-declarations-cover-15-million-citizens/#nationalgovernments> (accessed on 25 November 2021).
- Hawkins, I.; Balsam, A.; Goldman, R. A Survey of registered dietitians' concern and actions regarding climate change in the United States. *Front. Nutr.* **2015**, *2*, 21. [CrossRef] [PubMed]
- Heatherton, T.F.; Baumeister, R.F. Binge eating as escape from self-awareness. *Psychol. Bull.* **1991**, *110*, 86–108. [CrossRef] [PubMed]
- Castañé, S.; Antón, A. Assessment of the nutritional quality and environmental impact of two food diets: A Mediterranean and a vegan diet. *J. Clean. Prod.* **2017**, *167*, 929–937. [CrossRef]
- Robinson, G.; Cryst, S. Academy of Nutrition and Dietetics: Revised 2018 Standards of Practice and Standards of Professional Performance for Registered Dietitian Nutritionists (Competent, Proficient, and Expert) in Post-Acute and Long-Term Care Nutrition. *J. Acad. Nutr. Diet.* **2018**, *118*, 1747–1760.e53. [CrossRef]
- Hathaway, J.; Maibach, E. Health implications of climate change: A review of the literature about the perception of the public and health professionals. *Curr. Environ. Health Rep.* **2018**, *5*, 197–204. [CrossRef]
- Kotcher, J.; Maibach, E.; Miller, J.; Campbell, E.; Alqodmani, L.; Maiero, M.; Wins, A. Views of health professionals on climate change and health: A multinational survey study. *Lancet Planet. Health* **2021**, *5*, e316–e323. [CrossRef]
- Ritchie, H.; Roser, M. CO<sub>2</sub> and Greenhouse Gas Emissions. Our World in Data. 2021. Available online: <https://ourworldindata.org/co2/country/turkey#citation> (accessed on 25 November 2021).
- Yazıcıoğlu, Y.; Erdoğan, S. *SPSS Uygulamalı Bilimsel Araştırma Yöntemleri*; Detay Yayıncılık: Ankara, Turkey, 2014.
- Europeanbarometer. Europeans' Attitudes towards Climate Change. 2008. Available online: [https://www.europarl.europa.eu/pdf/eurobarometre/EB69.2\\_Climate\\_change/EB69.2\\_rapport\\_en.pdf](https://www.europarl.europa.eu/pdf/eurobarometre/EB69.2_Climate_change/EB69.2_rapport_en.pdf) (accessed on 3 December 2021).
- Sarfaty, M.; Abouzaid, S. The physicians' response to climate change. In *Handbook of Public Health in Natural Disasters*; Watson, R.R., Tabor, J.A., Ehiri, J.E., Preedy, V.R., Eds.; Wageningen Academic Publishers: Wageningen, The Netherlands, 2015; pp. 97–112.
- Leiserowitz, A.; Smith, N.; Marlon, J.R. Americans' knowledge of climate change. In *Yale Project on Climate Change Communication*; Yale University: New Haven, CT, USA, 2010; Available online: <https://climatecommunication.yale.edu/publications/americans-knowledge-of-climate-change/> (accessed on 3 January 2022).
- Borda, A.; Patrick, R.; Armstrong, F.; Taylor, T. Survey of Health Professionals' Opinions around a National Strategy on Climate, Health and Wellbeing for Australia. Available online: [https://d3n8a8pro7vhm.cloudfront.net/caha/pages/34/attachments/original/1481515689/CAHA\\_Survey\\_quotes\\_FINAL\\_lowres.pdf?1481515689](https://d3n8a8pro7vhm.cloudfront.net/caha/pages/34/attachments/original/1481515689/CAHA_Survey_quotes_FINAL_lowres.pdf?1481515689) (accessed on 3 December 2021).
- The Association of UK Dietitians. Eating Patterns for Health and Environmental Sustainability. 2018. Available online: <https://www.bda.uk.com/uploads/assets/539e2268-7991-4d24-b9ee867c1b2808fc/421de049-2c41-4d85-934f0a2f6362cc4a/one%20blue%20dot%20reference%20guide.pdf> (accessed on 3 January 2022).
- Muzaffar, M.B. The development and validation of a scale to measure training culture: The TC Scale. *J. Cult. Soc. Dev.* **2016**, *23*, 49–58.
- George, D.; Mallery, P. *SPSS for Windows Step by Step: A Simple Guide and Reference 11.0*. Available online: <https://wps.ablongman.com/wps/media/objects/385/394732/george4answers.pdf> (accessed on 9 November 2021).
- World Health Organisation (WHO). Turkish Healthy Nutrition and Active Life Programme 2010–2014 and Related Initiatives: An Evaluation of Progress Since the WHO Ministerial Conference on Counteracting Obesity. Available online: [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0014/333212/HNAP-Turkey.pdf](https://www.euro.who.int/__data/assets/pdf_file/0014/333212/HNAP-Turkey.pdf) (accessed on 18 February 2022).

19. Kaya, E.; Yilmaz, Y. Non-alcoholic fatty liver disease: A growing public health problem in Turkey. *Turk. J. Gastroenterol.* **2019**, *30*, 865–871. [[CrossRef](#)]
20. International Affiliate of the Academy of Nutrition and Dietetics. Turkey Information Sheet. 2018. Available online: <https://eatrightinternational.org/wp-content/uploads/2019/05/turkey-cis-2018-edited-2019.pdf> (accessed on 3 January 2022).
21. Zippia. Registered Dietitian Statistics and Facts in the US. Available online: <https://www.zippia.com/registered-dietitian-jobs/demographics/> (accessed on 3 January 2022).
22. Marinova, D.; Bogueva, D. Reconciling not eating meat and masculinity in the marketing discourse for new meat alternatives. In *Environmental, Health and Business Opportunities in the New Meat Alternatives Market*; Bogueva, D., Marinova, D., Raphaely, T., Schmidinger, K., Eds.; IGI Global: Hershey, PA, USA, 2019; pp. 260–282.
23. Xu, X.; Sharma, P.; Shu, S.; Lin, T.-S.; Ciais, P.; Tubiello, F.N.; Smith, P.; Campbell, N.; Jain, A.K. Global greenhouse gas emissions from animal-based foods are twice those of plant-based foods. *Nat. Food* **2021**, *2*, 724–732. [[CrossRef](#)]
24. Pohjolainen, P.; Jokinen, P. Meat Reduction Practices in the Context of a Social Media Grassroots Experiment Campaign. *Sustainability* **2020**, *12*, 3822. [[CrossRef](#)]
25. Chand, A.M.; Orris, P.; Armstrong, F.; Purcell, R.; Tait, P.; ClimChng, M.; McGirr, J.; Marinucci, G.; Wang, J.; Seker, A.; et al. Climate Change and Health Policy Assessment Project Report: A Global Survey 2015. Environmental Health Working Group of the World. Available online: [https://noharm-global.org/sites/default/files/documents-files/3598/WFPHA-Global-Climate-Healthy-Policy-Survey.FINAL\\_.pdf](https://noharm-global.org/sites/default/files/documents-files/3598/WFPHA-Global-Climate-Healthy-Policy-Survey.FINAL_.pdf) (accessed on 4 January 2022).
26. McCright, A.M.; O’Shea, B.V.; Sweeder, R.D.; Urquhart, G.R.; Zeleke, A. Promoting interdisciplinarity through climate change education. *Nat. Clim. Chang.* **2013**, *3*, 713–716. [[CrossRef](#)]
27. Ochs, A.; McKnight, P. Preliminary report of the State Issues Task Force: Trends affecting the dietetics profession. *J. Am. Diet. Assoc.* **2013**, *103*, 1595–1596. [[CrossRef](#)] [[PubMed](#)]
28. Jarratt, J.; Mahaffie, J. The profession of dietetics at a critical juncture: A report on the 2006 environmental scan for the American Dietetic Association. *J. Am. Diet. Assoc.* **2007**, *107*, 39–57. [[CrossRef](#)]
29. Harmon, A.H.; Gerald, B.L. Position of the American Dietetic Association: Food and nutrition professionals can implement practices to conserve natural resources and support ecological sustainability. *J. Am. Diet. Assoc.* **2007**, *107*, 1033–1043. [[CrossRef](#)]
30. The Association of UK Dietitians. Why Environmental Sustainability Should Matter to Dietitians and How It Impacts on Dietetic Practice. Available online: <https://www.bda.uk.com/resource/why-environmental-sustainability-should-matter-to-dietitians-and-how-it-impacts-on-dietetic-practice.html> (accessed on 5 March 2022).
31. Dietitians of Canada. Sustainable Food Systems: Dietitians’ Role. Available online: [https://www.dietitians.ca/DietitiansOfCanada/media/Documents/Resources/Sustainable-Food-Systems-Dietitians-Roles-\(Role-Paper\).pdf?ext=.pdf](https://www.dietitians.ca/DietitiansOfCanada/media/Documents/Resources/Sustainable-Food-Systems-Dietitians-Roles-(Role-Paper).pdf?ext=.pdf) (accessed on 5 March 2022).
32. Rhea, M.; Bettles, C. Future changes driving dietetics workforce supply and demand: Future Scan 2012–2022. *J. Am. Diet. Assoc.* **2012**, *112*, 10–24. [[CrossRef](#)]
33. Rose, D.; Heller, M.C.; Roberto, C.A. Position of the Society for Nutrition Education and Behavior: The importance of including environmental sustainability in dietary guidance. *J. Nutr. Educ. Behav.* **2019**, *51*, 3–15.e1. [[CrossRef](#)]
34. International Confederation of Dietetic Associations (ICDA). 2018–2019 Study Report Dietitians-Nutritionists around the World. Available online: <https://www.internationaldietetics.org/Downloads/2018-2019-ICDA-Education-Work-report.aspx> (accessed on 10 November 2021).
35. Sulda, H.; Coveney, J.; Bentley, M. An investigation of the ways in which public health nutrition policy and practices can address climate change. *Public Health Nutr.* **2010**, *13*, 304–313. [[CrossRef](#)]
36. McCormack, J.; Noble, C.; Ross, L.; Cruickshank, D.; Bialocerkowski, A. How do foodservice dietitians and dietetic students learn about environmental sustainability? A scoping review protocol. *BMJ Open* **2019**, *9*, e032355. [[CrossRef](#)]
37. Hawkins, I.W.; Balsam, A.L.; Graves, D. A qualitative study of how registered dietitians made the connection between diet, climate change, and environmental degradation. *J. Hunger Environ. Nutr.* **2015**, *10*, 47–59. [[CrossRef](#)]
38. Turhan, E.; Cerit Mazlum, S.; Şahin, Ü.; Şorman, A.H.; Cem Gündoğan, A. Beyond special circumstances: Climate change policy in Turkey 1992–2015. *Wiley Interdiscip. Rev. Clim. Chang.* **2016**, *7*, 448–460. [[CrossRef](#)]
39. Savaşan, Z. Climate governance in Turkey: A forward-looking perspective. *Turk. Stud.* **2020**, *20*, 541–571. [[CrossRef](#)]
40. Carino, S.; Porter, J.; Malekpour, S.; Collins, J. Environmental sustainability of hospital foodservices across the food supply chain: A systematic review. *J. Acad. Nutr. Diet.* **2020**, *120*, 825–873. [[CrossRef](#)] [[PubMed](#)]
41. Şahin, Ü. Warming a frozen policy: Challenges to Turkey’s climate politics after Paris. *Turk. Policy Q.* **2016**, *15*, 117–129.
42. Ministry of Environment and Urbanization. Republic of Turkey. Climate Change Strategy 2010–2023. Available online: [https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim\\_degisikligi\\_stratejisi\\_EN\(2\).pdf](https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim_degisikligi_stratejisi_EN(2).pdf) (accessed on 19 November 2021).
43. Ministry of Health. National Programme and Action Plan on Reducing the Adverse Impacts of Climate Change on Public Health (2015–2019). Available online: [https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim\\_degisikligi\\_eylem\\_plani\\_EN\\_2014.pdf](https://webdosya.csb.gov.tr/db/iklim/editordosya/iklim_degisikligi_eylem_plani_EN_2014.pdf) (accessed on 19 November 2021).
44. Organisation of Economic Co-Operation and Development (OECD). OECD Environmental Performance Reviews: Turkey 2019. Available online: <https://www.oecd.org/turkey/oecd-environmental-performance-reviews-turkey-2019-9789264309753-en.htm> (accessed on 4 January 2022).

45. Wegener, J. Equipping future generations of registered dietitian nutritionists and public health nutritionists: A commentary on education and training needs to promote sustainable food systems and practices in the 21st century. *J. Acad. Nutr. Diet.* **2018**, *118*, 393–398. [[CrossRef](#)]
46. Melina, V.; Craig, W.; Levin, S. Position of the Academy of Nutrition and Dietetics: Vegetarian diets. *J. Acad. Nutr. Diet.* **2016**, *116*, 1970–1980. [[CrossRef](#)]
47. Food and Agriculture Organisation of the United Nations (FAO); International Fund for Agricultural Development (IFAD); United Nations Children’s Fund (UNICEF); World Food Programme (WFP); World Health Organisation (WHO). The State of Food Security and Nutrition in the World 2019. Safeguarding against Economic Slowdowns and Downturns. Available online: <http://www.fao.org/3/ca5162en/ca5162en.pdf> (accessed on 4 January 2022).
48. Scarborough, P.; Appleby, P.N.; Mizdrak, A.; Briggs, A.D.M.; Travis, R.C.; Bradbury, K.E.; Key, T.J. Dietary greenhouse gas emissions of meat-eaters, fish-eaters, vegetarians and vegans in the UK. *Clim. Chang.* **2014**, *125*, 179–192. [[CrossRef](#)]
49. Horrall, J. People Should Consume Less Meat for the Environment. The Breeze. Available online: [https://www.breezejmu.org/opinion/opinion-people-should-consume-less-meat-for-the-environment/article\\_74cb26b4-34cd-11eb-bc7e-4fd50c3b1367.html](https://www.breezejmu.org/opinion/opinion-people-should-consume-less-meat-for-the-environment/article_74cb26b4-34cd-11eb-bc7e-4fd50c3b1367.html) (accessed on 22 March 2022).
50. Weber, C.L.; Matthews, H.S. Food-miles and the relative climate impacts of food choices in the United States. *Environ. Sci. Technol.* **2008**, *42*, 3508–3513. [[CrossRef](#)]
51. Vieux, F.; Soler, L.G.; Touazi, D.; Darmon, N. High nutritional quality is not associated with low greenhouse gas emissions in self-selected diets of French adults. *Am. J. Clin. Nutr.* **2013**, *97*, 569–583. [[CrossRef](#)]
52. Huseinovic, E.; Ohlin, M.; Winkvist, A.; Bertz, F.; Sonesson, U.; Brekke, H.K. Does diet intervention in line with nutrition recommendations affect dietary carbon footprint? Results from a weight loss trial among lactating women. *Eur. J. Clin. Nutr.* **2017**, *71*, 1241–1245. [[CrossRef](#)]
53. Soret, S.; Mejia, A.; Batech, M.; Jaceldo-Siegl, K.; Harwatt, H.; Sabaté, J. Climate change mitigation and health effects of varied dietary patterns in real-life settings throughout North America. *Am. J. Clin. Nutr.* **2014**, *100* (Suppl. S1), 490S–495S. [[CrossRef](#)] [[PubMed](#)]
54. Fox, M.; Zuidema, C.; Bauman, B.; Burke, T.; Sheehan, M. Integrating public health into climate change policy and planning: State of practice update. *Int. J. Environ. Res.* **2019**, *16*, 3232. [[CrossRef](#)] [[PubMed](#)]
55. Gallegos, D. Global challenges and opportunities for dietitians. *Nutr. Diet.* **2020**, *77*, 179–181. [[CrossRef](#)] [[PubMed](#)]
56. Macdiarmid, J.I.; Whybrow, S. Nutrition from a climate change perspective. *Proc. Nutr. Soc.* **2019**, *78*, 380–387. [[CrossRef](#)] [[PubMed](#)]
57. Springmann, M.; Wiebe, K.; Mason-D’Croz, D.; Sulser, T.B.; Rayner, M.; Scarborough, P. Health and nutritional aspects of sustainable diet strategies and their association with environmental impacts: A global modelling analysis with country-level detail. *Lancet Planet. Health* **2018**, *2*, e451–e461. [[CrossRef](#)]
58. Bezirtzoglou, C.; Dekas, K.; Charvalos, E. Climate changes, environment and infection: Facts, scenarios and growing awareness from the public health community within Europe. *Anaerobe* **2011**, *17*, 337–340. [[CrossRef](#)]
59. Trombley, J.; Chalupka, S.; Anderko, L. Climate change and mental health. *Am. J. Nurs.* **2017**, *117*, 44–52. [[CrossRef](#)]
60. Sonesson, U.; Davis, J.; Hallström, E.; Woodhouse, A. Dietary-dependent nutrient quality indexes as a complementary functional unit in LCA: A feasible option? *J. Clean. Prod.* **2019**, *211*, 620–627. [[CrossRef](#)]
61. Pan American Health Organization; World Health Organisation (WHO). Climate Change and Health. Available online: <https://www.paho.org/salud-en-las-americanas-2017/?p=53> (accessed on 20 October 2021).
62. Costello, A.; Abbas, M.; Allen, A. Managing the health effects of climate change. *Lancet* **2009**, *373*, 1693–1733. [[CrossRef](#)]
63. Fouque, F.; Reeder, J.C. Impact of past and on-going changes on climate and weather on vector-borne diseases transmission: A look at the evidence. *Infect. Dis. Poverty* **2019**, *8*, 51. [[CrossRef](#)]
64. Paavola, J. Health impacts of climate change and health and social inequalities in the UK. *Environ. Health Glob. Access Sci. Source* **2017**, *16*, 113. [[CrossRef](#)] [[PubMed](#)]
65. Skypala, I. Adverse food reactions—An emerging issue for adults. *J. Am. Diet. Assoc.* **2011**, *111*, 1877–1891. [[CrossRef](#)] [[PubMed](#)]
66. World Health Organisation (WHO) Europe. Public Health and Climate Change Adaptation Policies in the European Union. Available online: [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0010/386965/Pagoda-REPORT-final-published-2.pdf](https://www.euro.who.int/__data/assets/pdf_file/0010/386965/Pagoda-REPORT-final-published-2.pdf) (accessed on 4 January 2022).
67. Whitton, C.; Bogueva, D.; Marinova, D.; Phillips, C.J.C. Are we approaching peak meat consumption? Analysis of meat consumption from 2000–2019 in 35 countries and its relationship to Gross Domestic Product. *Animals* **2021**, *11*, 3466. [[CrossRef](#)] [[PubMed](#)]
68. Semenza, J.C.; Suk, J.E. Vector-borne diseases and climate change: A European perspective. *FEMS Microbiol. Lett.* **2018**, *365*, fnx244. [[CrossRef](#)] [[PubMed](#)]
69. Global Academia, Study Nutrition and Dietetics in Turkey. 2017. Available online: <https://www.globalacademia.com/en/study-nutrition-and-dietetics-in-turkey/> (accessed on 4 January 2022).
70. Willett, W.; Rockström, J.; Loken, B.; Springmann, M.; Lang, T.; Vermeulen, S.; Garnett, T.; Tilman, D.; DeClerck, F.; Wood, A.; et al. Food in the Anthropocene: The EAT-Lancet Commission on healthy diets from sustainable food systems. *Lancet* **2019**, *393*, 447–492. [[CrossRef](#)]

71. Krasna, H.; Czabanowska, K.; Jiang, S.; Khadka, S.; Morita, H.; Kornfeld, J.; Shaman, J. The future of careers at the intersection of climate change and public health: What can job postings and an employer survey tell us? *Int. J. Environ. Res.* **2020**, *17*, 1310. [[CrossRef](#)]
72. Holdsworth, M. Sustainability should be integral to nutrition and dietetics. *J. Hum. Nutr. Diet.* **2010**, *23*, 467–468. [[CrossRef](#)]
73. World Health Organisation (WHO). WHO Calls for Urgent Action to Protect Health from Climate Change—Sign the Call. Available online: <https://www.who.int/news/item/06-10-2015-who-calls-for-urgent-action-to-protect-health-from-climate-change-sign-the-call> (accessed on 5 March 2022).
74. Intergovernmental Panel on Climate Change (IPCC). Climate Change 2022: Impacts, Adaptation and Vulnerability. Available online: <https://www.ipcc.ch/report/ar6/wg2/> (accessed on 5 March 2022).