Evaluation of Health Sciences Faculty Students' Knowledge Levels on Microbiota and Health

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Research Article

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Abstract

The importance of microbiota on health is an important topic that has been partially clarified and is still being illuminated. Individuals with health-related expertise are expected to be more familiar with the concepts of the microbiome and microbiota. However, some students who have not graduated and are studying in health-related fields do not understand concepts such as microbiota, microbiome, probiotics, and prebiotics, or they understand them incorrectly or insufficiently. The purpose of this study was to evaluate the knowledge levels of 4th grade students studying in the Nutrition and Dietetics, Midwifery, and Nursing departments about microbiota and health. A cross-sectional descriptive study was carried out on 133 students. The Microbiota Awareness Scale and Information Form were conducted online via a questionnaire survey created in Google Forms. It was determined that microbiota awareness, general information, product knowledge, chronic disease, and probiotic and prebiotic knowledge sub-dimension scores of the students whose departments were nutrition and dietetics were higher than the nursing and midwifery students. Furthermore, 78.9% of the students did not attend a "Microbiota and Health" conference, congress, seminar, or training. As a result, it is suggested that education programs focusing on the relationship between microbiota and health be organized, or that they be added to the curriculum, and that students be educated about microbiota and health.

INTRODUCTION

Many microorganisms, including bacteria, yeast, and viruses, have been found to coexist in various parts of the human body (gut, skin, lung, oral cavity). The term "microbiota" refers to the microorganisms that live on/in the body and include a wide range of bacteria, archaea, viruses, fungi, and protozoans. The term "microbiome" refers to the entire habitat, including microorganisms, genomes, and environmental conditions[1,2]. The human microbiome is known as our "last organ"[3]. Because of its enormous metabolic capacity, the microbiota has been referred to as a vital "organ" for life, with an impact on health and disease. Several recent studies have clearly demonstrated that the microbiota functions as an organ, performing important metabolic functions such as increasing mucosal barrier resistance, protecting tissues against pathogens, protecting mucosal integrity, and activating the immune system. Since a possible dysbiosis can be shaped by a change, decrease, or deterioration in the diversity of the microbiota, it can also be the main cause of a variety of chronic diseases. The relationship of microbiota with many diseases, including obesity, diabetes, asthma, allergic diseases, atherosclerosis, urogenital infections, and gastrointestinal system, has been revealed in recent research[4]. It is thought that health professionals' understanding o microbiota and related disorders influences individuals' healthy lifestyle choices. At this point, it is very important for healthcare professionals to learn the microbiota, its importance and its relationship with diseases while they are still university students. The purpose of this descriptive cross-sectional study was to assess the knowledge of university students from diverse disciplines of study on the issue of microbiota.

MATERIAL AND METHOD

Type of Research

This was a descriptive cross-sectional research.

Place and Time, Population and Sample of the Research

This study was conducted at Kirklareli University between April 2022- May 2022.

Data collection

The data collection tool is divided into two parts. In the first section, there are questions about the participants' sociodemographic characteristics (gender, age, university department and status of attending a conference, congress, seminar or training on “Microbiota and Health”). Microbiota awareness scale form is included in the second section. The microbiota awareness scale has 28 items. As a result of the researchers' analyses, it has been reported that it is a highly reliable and valid scale that can be used to measure individuals' microbiota awareness levels[5]. Before the study, the necessary permissions for the use of the microbiota awareness scale were obtained.

Ethical Approval

This study was approved by the Ethics Committee at the University of Kirklareli University (Protocol No: PR0387R0, Decision No: 4, Decision Date: March 21, 2022). An informed consent and an explanation of voluntary participation in the study were presented at the start of the questionnaire. Collected data were treated with confidentiality.

Statistical Analysis and Evaluation of Data

The SPSS (Statistical Package for Social Sciences) 25.0 program was used to analyze the study data. The data was evaluated using descriptive statistical methods (number, percentage, min-max values, mean, and standard deviation). The data used was tested for normal distribution conformity. When comparing quantitative data in normally distributed data, the independent t-test was used to determine the difference between two independent groups, one-way analysis of variance was used when comparing more than two independent groups, and Bonferroni was used to determine which group made a difference when there was a difference.

RESULTS

The total number of students participating in the research is 133. 88.7% of the participants are female and 36.1% are 22 years old. When the university departments of the participants are examined, it is seen that 24.1% of them are nutrition and dietetics, 23.3% of them are midwifery and 52.6% of them are nursing. It was determined that 78.9% of the participants did not attend a conference, congress, seminar or training on "Microbiota and Health" (Table 1).

Table 1. Distribution of the participants in the study according to their socio-demographic characteristics

Variables		n	%
Gender	Female	118	88.7
	Male	15	11.3
Age	21	20	15.0
Min-Max: 21-32	22	48	36.1
Mean±SD: 22.83±1.97	23	45	33.8
	24 years and older	20	15.0
University Department	Nutrition and Dietetics	32	24.1
	Midwifery	31	23.3
	Nursing	70	52.6
Status of attending a conference, congress, seminar or training on "Microbiota and Health"	Yes	28	21.1
	No	105	78.9
Total		**133**	**100.0**

According to the gender of the participants, there is a statistically significant difference in the microbiota awareness scale scores, general knowledge sub-dimension scores, product knowledge sub-dimension scores, probiotic and prebiotic sub dimension scores, and female participants have higher scores than male participants ($p<0,05$). It is seen that there is a statistically significant difference between the probiotic and prebiotic sub-dimension scores according to the age of the participants and the scores of the 24-year-old participants are higher than the other participants ($p<0.05$). There is a statistically significant difference between the microbiota awareness scale scores, general knowledge sub-dimension scores, product knowledge sub-dimension scores, chronic disease sub-dimension scores, probiotic and prebiotic sub-dimension scores according to the university departments of the participants ($p<0,05$).

Participants whose university department is nutrition and dietetics have higher microbiota awareness scale scores, general knowledge sub-dimension scores, product knowledge sub-dimension scores, chronic disease sub-dimension scores, probiotic and prebiotic sub-dimension scores than participants whose university department is midwifery and nursing. It is seen that the microbiota awareness scale scores and general knowledge sub-dimension scores of the participants whose university department is nursing are higher than the participants whose university department is midwifery.

There was a statistically significant difference between microbiota awareness scale scores, general knowledge sub-dimension scores, product knowledge sub-dimension scores, chronic disease sub-dimension scores, probiotic and prebiotic sub-dimension scores according to the participants' involvement in a conference, congress, seminar or training on microbiota and health ($p<0.05$). It is seen that there is a

difference and the scores of the participants who attended the conference, congress, seminar or training were higher than the participants who did not attend ($p<0,05$) (Table 2).

Table 2. Comparison of microbiota awareness scale and sub-dimension scores according to the socio-demographic characteristics of the participants

Variables		Microbiota Awareness Scale				
		Microbiota awareness (total)	**General information**	**Product knowledge**	**Chronic disease**	**Probiotic and prebiotic knowledge**
		±SD	±SD	±SD	±SD	±SD
Gender	Female	78.07±9.52	25.94±2.65	13.36±3.46	18.37±3.19	20.39±2.91
	Male	70.4±11.24	24.07±3.26	10.73±3.33	16.93±3.73	18.67±3.89
	t test	**2.878**	**2.510**	**2.788**	1.615	**2.072**
	p	**0.005***	**0.013***	**0.006***	0.109	**0.040***
Age	21	78.55±10.65	26.25±2.73	12.60±3.86	18.70±3.08	21.00±2.38
Min-Max: 21-32	22	78.88±10.57	26.02±3.02	13.31±3.29	18.69±3.50	20.85±3.08
Mean±SD: 22.83±1.97	23	76.67±8.33	25.73±2.19	13.16±3.44	17.62±3.39	20.16±2.92
	24 years and older	73.05±10.68	24.50±3.22	12.75±4.13	17.90±2.51	17.90±3.06
	F test	1.798	1.746	0.253	1.036	**5.415**
	p	0.151	0.161	0.859	0.379	**0.002***
	Bonferroni	-	-	-	-	21,22,23>24
University Department	Nutrition and Dietetics [1]	87.81±6.83	28.16±2.02	15.25±3.25	21.34±2.73	23.06±1.90
	Midwifery [2]	70.29±6.20	23.74±2.25	11.90±2.97	16.29±2.16	18.35±2.32
	Nursing [3]	75.41±8.73	25.50±2.48	12.59±3.49	17.63±2.92	19.70±2.92
	F test	**43.922**	**29.061**	**9.552**	**30.616**	**29.129**
	p	**0.000***	**0.000***	**0.000***	**0.000***	**0.000***
	Bonferroni	**1>2,3** **3>2**	**1>2,3** **3>2**	**1>2,3**	**1>2,3**	**1>2,3**
Status of attending a conference, congress, seminar or training on "Microbiota and Health"	Yes	84.5±8.07	27.5±2.24	14.93±3.44	19.86±3.32	22.21±2.13
	No	75.26±9.57	25.26±2.72	12.57±3.4	17.77±3.13	19.66±3.07
	t test	**4.685**	**4.007**	**3.252**	**3.094**	**4.148**
	p	**0.000***	**0.000***	**0.001***	**0.002***	**0.000***
n	**%**					

Total:	**133**	**100.0**

*p<0,05 t test: independent sample t test F test: one-way analysis of variance (ANOVA)

The statement “The human body contains a large number of microorganisms” was answered “Absolutely I agree” by 93.8% and 71.4% of nutrition and dietetics and nursing students, respectively. It was answered “I agree” by 51.6% of midwifery students. The statement “The gut microbiota begins to form when the baby is in the womb” was answered “Absolutely I agree” by 56.3% of nutrition and dietetics students. It was also answered “I agree” by 61.3% and 61.4% of midwifery and nursing students, respectively. The statement “I know what prebiotic products are” was answered “Absolutely I agree” by 65.6% of nutrition and dietetics students. It was also answered “I agree” by 64.5% and 54.3% of midwifery and nursing students, respectively. The statement “The use of antibiotics adversely affects the intestinal microbiota” was answered “Absolutely I agree” by 87.5% of nutrition and dietetics students. It was answered “I agree” by 45.2% and 52.9% of midwifery and nursing students, respectively. The statement “Obesity is caused by disruptions in the intestinal microbiota” was answered “Absolutely I agree” by 59.4% of nutrition and dietetics students. It was also answered “I agree” by 51.6% and 50% of midwifery and nursing students, respectively. The statement “Diet is one of the important factors affecting the intestinal microbiota” was answered “Absolutely I agree” by 84.4% and 50% of nutrition and dietetics and nursing students, respectively. It was also answered “I agree” by 71% of midwifery students. The statement “I know what probiotic products are” was answered “Absolutely I agree” by 71.9% of nutrition and dietetics students. It was also answered “I agree” by 74.2% and 64.3% of midwifery and nursing students, respectively. The statement “Changes in the microbiota are associated with bowel cancer” was answered “Absolutely I agree” by 50% of nutrition and dietetics students. 46.9% of them also answered “I agree”. While the statement was answered “I agree” by 32.3% of midwifery students, it was answered “I'm undecided” by 51.6% of them. 47.1% of nursing students answered “I agree” while 28.6% of them answered “I'm undecided”. The statement “Probiotics should be consumed regularly” was answered “I agree” by 45.2% and 44.3% of midwifery and nursing students, respectively. 59.4% of nutrition and dietetics students answered “Absolutely I agree”. %29 of midwifery students answered “I'm undecided”. 25.7% of nursing students answered “Absolutely I agree” and “I'm undecided”. The statement “Disruptions in the intestinal microbiota cause diabetes” was answered “I'm undecided” by 21.9% of nutrition and dietetics students, while 40.6% of them answered “I agree”. It was answered “I'm undecided” by 51.6% of midwifery students while 38.7% of them answered “I agree”. 9.7% of them answered “I do not agree”. The statement was answered “I'm undecided” by 40% of nursing students while 37.1% them answered “I agree”. 10% of them answered “I do not agree”. The statement “I believe that using probiotics can help with diarrhea” was answered “I agree” by 54.8% and 55.7% of midwifery and nursing students, respectively. 53.1% of nutrition and dietetics students answered “Absolutely I agree”. 29% and 22.9 of midwifery and nursing students answered “I'm undecided”, respectively. The statement “An increase in the number of harmful bacteria in the intestines can cause non-alcoholic fatty liver disease” was answered “I'm undecided” by 34.4%, 58.1% and 44.3% of nutrition and dietetics, midwifery and nursing students, respectively. In addition to this, 40.6%, 35.5% and 40% of them answered “I agree” by nutrition and dietetics, midwifery and nursing students, respectively. The statement “Breastfeeding positively affects the intestinal microbiota of the

baby” was answered “Absolutely I agree” and “I agree” by 90.6% and 9.4% of nutrition and dietetics students, respectively. There were no answer as “I'm undecided”, “I do not agree” and “I strongly disagree” among them. 48.4% of midwifery students answered “Absolutely I agree” and “I agree”. 61.4% and 32.9% of nursing students answered “Absolutely I agree” and “I agree”, respectively. The statement “Changes in the gut microbiota are associated with celiac disease” was answered “Absolutely I agree” and “I agree” by 56.3% and 31.3% of nutrition and dietetics students, respectively. 48.4% and 27.1% of midwifery and nursing students answered “I'm undecided, respectively. 35.5% and 40% of midwifery and nursing students answered as “I agree”. The statement “I believe that using probiotics can help with constipation” was answered “Absolutely I agree” by 65.6% of nutrition and dietetics students. 51.6% and 44.3% of midwifery and nursing students answered “I agree”. The statement “There is a link between gut microbiota and depression and Alzheimer's” was answered “I'm undecided” by 54.8% and 37.1% of midwifery and nursing students, respectively. 25.8% and 35.7% of midwifery and nursing students answered “I agree”. It was answered “Absolutely I agree” by 71.9% of nutrition and dietetics students (Table 3).

Table 3. Microbiota Awareness Scale

		Nutrition and Dietetics		Midwifery		Nursing	
		n	%	n	%	n	%
The human body contains a large number of microorganisms.	I strongly disagree	1	3.1	0	0.0	0	0.0
	I do not agree	0	0.0	0	0.0	2	2.9
	I'm undecided	0	0.0	0	0.0	0	0.0
	I agree	1	3.1	16	51.6	18	25.7
	Absolutely I agree	30	93.8	15	48.4	50	71.4
The gut microbiota begins to form when the baby is in the womb.	I strongly disagree	2	6.3	2	6.5	0	0.0
	I do not agree	3	9.4	5	16.1	6	8.6
	I'm undecided	2	6.3	4	12.9	7	10.0
	I agree	7	21.9	19	61.3	43	61.4
	Absolutely I agree	18	56.3	1	3.2	14	20.0
I know what prebiotic products are.	I strongly disagree	0	0.0	0	0.0	0	0.0
	I do not agree	0	0.0	1	3.2	3	4.3
	I'm undecided	0	0.0	8	25.8	8	11.4
	I agree	11	34.4	20	64.5	38	54.3
	Absolutely I agree	21	65.6	2	6.5	21	30.0
The use of antibiotics adversely affects the intestinal microbiota.	I strongly disagree	0	0.0	1	3.2	0	0.0
	I do not agree	0	0.0	1	3.2	2	2.9
	I'm undecided	0	0.0	9	29.0	10	14.3
	I agree	4	12.5	14	45.2	37	52.9

	Absolutely I agree	28	87.5	6	19.4	21	30.0
Obesity is caused by disruptions in the intestinal microbiota.	**I strongly disagree**	0	0.0	0	0.0	3	4.3
	I do not agree	0	0.0	4	12.9	2	2.9
	I'm undecided	1	3.1	9	29.0	15	21.4
	I agree	12	37.5	16	51.6	35	50.0
	Absolutely I agree	19	59.4	2	6.5	15	21.4
Diet is one of the important factors affecting the intestinal microbiota.	**I strongly disagree**	0	0.0	0	0.0	1	1.4
	I do not agree	0	0.0	0	0.0	0	0.0
	I'm undecided	0	0.0	1	3.2	2	2.9
	I agree	5	15.6	22	71.0	32	45.7
	Absolutely I agree	27	84.4	8	25.8	35	50.0
I know what probiotic products are.	**I strongly disagree**	0	0.0	0	0.0	1	1.4
	I do not agree	0	0.0	0	0.0	2	2.9
	I'm undecided	0	0.0	7	22.6	9	12.9
	I agree	9	28.1	23	74.2	45	64.3
	Absolutely I agree	23	71.9	1	3.2	13	18.6
Changes in the microbiota are associated with bowel cancer.	**I strongly disagree**	0	0.0	0	0.0	3	4.3
	I do not agree	0	0.0	4	12.9	3	4.3
	I'm undecided	1	3.1	16	51.6	20	28.6
	I agree	15	46.9	10	32.3	33	47.1
	Absolutely I agree	16	50.0	1	3.2	11	15.7
Probiotics should be consumed regularly.	**I strongly**	0	0.0	0	0.0	2	2.9

	disagree						
	I do not agree	0	0.0	4	12.9	1	1.4
	I'm undecided	1	3.1	9	29.0	18	25.7
	I agree	12	37.5	14	45.2	31	44.3
	Absolutely I agree	19	59.4	4	12.9	18	25.7
Disruptions in the intestinal microbiota cause diabetes.	**I strongly disagree**	1	3.1	0	0.0	3	4.3
	I do not agree	1	3.1	3	9.7	7	10.0
	I'm undecided	7	21.9	16	51.6	28	40.0
	I agree	13	40.6	12	38.7	26	37.1
	Absolutely I agree	10	31.3	0	0.0	6	8.6
I believe that using probiotics can help with diarrhea.	**I strongly disagree**	0	0.0	0	0.0	1	1.4
	I do not agree	0	0.0	4	12.9	3	4.3
	I'm undecided	1	3.1	9	29.0	16	22.9
	I agree	14	43.8	17	54.8	39	55.7
	Absolutely I agree	17	53.1	1	3.2	11	15.7
An increase in the number of harmful bacteria in the intestines can cause non-alcoholic fatty liver disease.	**I strongly disagree**	0	0.0	0	0.0	2	2.9
	I do not agree	0	0.0	2	6.5	1	1.4
	I'm undecided	11	34.4	18	58.1	31	44.3
	I agree	13	40.6	11	35.5	28	40.0
	Absolutely I agree	8	25.0	0	0.0	8	11.4
Breastfeeding positively affects the intestinal microbiota of the baby.	**I strongly disagree**	0	0.0	1	3.2	0	0.0
	I do not agree	0	0.0	0	0.0	0	0.0

	I'm undecided	0	0.0	0	0.0	4	5.7
	I agree	3	9.4	15	48.4	23	32.9
	Absolutely I agree	29	90.6	15	48.4	43	61.4
Changes in the gut microbiota are associated with celiac disease.	**I strongly disagree**	0	0.0	0	0.0	2	2.9
	I do not agree	0	0.0	3	9.7	7	10.0
	I'm undecided	4	12.5	15	48.4	19	27.1
	I agree	10	31.3	11	35.5	28	40.0
	Absolutely I agree	18	56.3	2	6.5	14	20.0
I believe that using probiotics can help with constipation.	**I strongly disagree**	0	0.0	1	3.2	2	2.9
	I do not agree	0	0.0	1	3.2	2	2.9
	I'm undecided	1	3.1	8	25.8	14	20.0
	I agree	10	31.3	16	51.6	31	44.3
	Absolutely I agree	21	65.6	5	16.1	21	30.0
There is a link between gut microbiota and depression and Alzheimer's.	**I strongly disagree**	1	3.1	0	0.0	4	5.7
	I do not agree	0	0.0	6	19.4	6	8.6
	I'm undecided	1	3.1	17	54.8	26	37.1
	I agree	7	21.9	8	25.8	25	35.7
	Absolutely I agree	23	71.9	0	0.0	9	12.9

n: Number of the participants

DISCUSSION

Microbiota are all microorganisms present in humans. As a result, it is hard to overlook the enormous impact of such a vast cosmos on health. Increased infertility and numerous cancer images in recent years

must have led us back to our essence, because we heard about the microbiota everywhere. Even when we try to explain this trending microbiome simply, we see a lot of uncertainty. Previous research on microbiota knowledge focused mostly on the therapeutic aspects of microbiota, such as probiotics[6-8] with the populations evaluated primarily consisting of healthcare professionals and students. In our review of the literature, the limited availability of studies determining microbiota awareness levels of university students whose fields are related to health.

Almost all of the students in this study had probiotic knowledge. University students' knowledge of probiotic could have come from formal education in school or university, social media, probiotic advertisements, or popular science, which is an interpretation of science aimed at a general audience. Although the students are aware of probiotics and their regular consumption, it is clear that they are perplexed by the concepts of microbiota and, in particular, their relationship with diseases. It was determined that students were undecided from time to time to the statement such as “Changes in the microbiota are associated with bowel cancer”, “Probiotics should be consumed regularly”, “Disruptions in the intestinal microbiota cause diabetes”, “I believe that using probiotics can help with diarrhea”, “An increase in the number of harmful bacteria in the intestines can cause non-alcoholic fatty liver disease”, “Changes in the gut microbiota are associated with celiac disease”, “There is a link between gut microbiota and depression and Alzheimer's”.

In this study, students' engagement in programs such as microbiome training and seminars is low, which is consistent with previous research. Furthermore, it has been shown that students are perplexed by concepts connected to microbiota and provide ambiguous replies, particularly regarding the association of microbiota with diseases. In this study, 54.8% and 37.1% of midwifery and nursing students, respectively, responded "I am undecided" to the statement "There is a link between the gut microbiota and depression and Alzheimer's."

Understanding how antibiotics modify microbiota is important, especially in view of the various illnesses associated with chronic antibiotic use and the global development of antibiotic resistance in bacterial pathogens, which is partly attributable to antibiotic abuse. The majority of participants in this study believed that the use of antibiotics adversely affects the intestinal microbiota. In a study determining the knowledge levels of midwifery students on intestinal microbiota, known as the second metabolic organ, it was discovered that 84.3% of the students (n=261) knew the concepts of "probiotic" and 74.8% of them knew the concepts of "prebiotic." The microbiota knowledge mean score of the students was found to be 34.63±31.38, and the difference in knowledge mean scores between 4th grade students and other grades was statistically significant. Researchers reported that midwifery students should increase their knowledge of intestinal microbiota [9].

When participants were asked about their knowledge levels on microbiota in a study examining the knowledge and awareness of midwives (78.2%) and nurses (21%) working in obstetrics clinics, 47.8% said it was bad, 45% said it was moderate, and 7.2% said it was good. Researchers stated that midwives' and nurses' knowledge and awareness of microbiota should be increased[10]. It was determined that microbiota

awareness, general information, product knowledge, chronic disease, and probiotic and prebiotic knowledge sub-dimension scores of the students whose departments were the nursing and midwifery were lower than the nutrition and dietetics students. However, it is seen that the students in the midwifery and nursing departments have highly accurate information, such as the knowledge that the intestinal microbiota begins to form when the baby is in the womb, the use of probiotics is good for constipation and the proposition that breastfeeding affects the intestinal microbiota of the baby positively, as well as the nutrition and dietetics students of the department. The fact that the answers to these statements are explained in the course contents in all departments can be explained by the fact that the students are familiar with the subject.

In a study conducted with the department of nutrition and dietetics; It was found that 27.4% of the 248 students received training on microbiota, probiotics and prebiotics, and the microbiota awareness level of the education areas was found to be statistically significantly higher when compared to the students who did not receive any education. Researchers have stated that by including the subject of microbiota in the curriculum as an elective course, the knowledge level of the students should be increased and it should be supported by scientific meetings and academic studies[11]. Similarly, in this study, students from nutrition and dietetics departments had higher microbial awareness scores than students from other disciplines. This could be due to course content on the impact of fermented foods on functional nutrition.

In a study conducted in Jordan, the microbiota knowledge levels of 402 university students enrolled in various departments were examined. The students were divided into two groups based on whether they took a microbiology course (45 hours), and the students who took a microbiology course had significantly higher microbiota knowledge scores. Participants who took a microbiology course scored much higher on microbiota knowledge and were more aware of the impact of antibiotics on microbiota. The study demonstrates that spreading information about the microbiota and microbiology in general can enhance antibiotic use behavior[12].

According to some studies conducted with university students in various countries, the questions asked by the students to explain the concepts related to microbiota were preferably left blank, some of them were answered incorrectly, or the students recorded insufficient general knowledge on the subject in the data form[13,14].

CONCLUSION

There is growing data that shows a link between midwifery, nursing care, and nutritional guidance and microbiome. It was determined in the present research indicated the knowledge level of nutrition and dietetics, nursing, and midwifery students, who will work in various health professions, should be upgraded. It is possible to ensure that microbiota and health are covered in relevant curriculum courses, and students can keep up with current research through extracurricular activities such as projects, panels, and lectures.

Declarations

Author contributions

OY wrote the initial draft of the editorial.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Institutional Review Board Statement

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee at the University of Kirklareli University (Protocol No: PR0387R0, Decision No: 4, Decision Date: March 21, 2022).

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