

AN EXAMINATION OF NUTRITION, EXERCISE, AND ATTITUDES TOWARDS SPORT IN FEMALE UNIVERSITY STUDENTS

UN EXAMEN DE NUTRICIÓN, EJERCICIO Y ACTITUDES HACIA EL DEPORTE EN ESTUDIANTES UNIVERSITARIOS FEMENINOS

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Información del artículo:

Artículo original

DOI: <https://doi.org/10.33975/riug.vol35n1.831>

Recibido: 1 septiembre 2022; Aceptado: 21 marzo 2023

ABSTRACT

This study has four interrelated main objectives. First, to examine the distribution of the variables of nutrient content, water consumption, exercise goal, and exercise outcome expectation period. Second, to compare water consumption levels for each of the nutrient content and exercise goal variables. Third, to determine students' attitudes towards sports. Fourth, to evaluate the potential impact of the variables of nutrient content, exercise goal, expectation time after exercise, and level of water consumption on attitudes towards sports. 225 female university students participated voluntarily. Personal information form and attitudes scale towards sport were used as data collection tools. As a result, nutrient content, water consumption, exercise goal, and exercise outcome expectation period were examined separately within themselves, there was a statistically significant difference ($p < .001$). The relationship between nutrient content ($p < .05$) and exercise goal ($p < .001$) variables with the amount of water consumption was statistically significant. Students have high scores in attitudes towards sport scale. Excessive carbohydrate consumption should be avoided, and information should be given that < 1 L/day water consumption is unhealthy.

Keywords: nutrient content; water consumption; exercise goal.

Cómo citar: İmamoğlu, Mehmet. (2023). An examination of nutrition, exercise, and attitudes towards sport in female university students. *Revista de Investigaciones Universidad del Quindío*, 35(1), 72-83. <https://doi.org/10.33975/riug.vol35n1.831>

ISSN: 1794-631X e-ISSN: 2500-5782

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RESUMEN

Este estudio tiene cuatro objetivos principales interrelacionados. Primero, para examinar la distribución de las variables de contenido de nutrientes, consumo de agua, objetivo de ejercicio y período de expectativa de resultado del ejercicio. En segundo lugar, para comparar los niveles de consumo de agua para cada una de las variables del objetivo de ejercicio y contenido de nutrientes. En tercer lugar, para determinar las actitudes de los estudiantes hacia el deporte. Cuarto, evaluar el impacto potencial de las variables contenido de nutrientes, objetivo de ejercicio, expectativa de tiempo después del ejercicio y nivel de consumo de agua sobre las actitudes hacia el deporte. Participaron voluntariamente 225 mujeres universitarias. El formulario de información personal y la escala de actitudes hacia el deporte se utilizaron como herramientas de recolección de datos. Como resultado, el contenido de nutrientes, el consumo de agua, la meta del ejercicio y el período esperado del resultado del ejercicio se examinaron por separado dentro de sí mismos y hubo una diferencia estadísticamente significativa ($p < 0,001$). La relación entre las variables contenido de nutrientes ($p < 0,05$) y meta de ejercicio ($p < 0,001$) con la cantidad de agua consumida fue estadísticamente significativa. Los estudiantes tienen puntajes altos en la escala de actitudes hacia el deporte. Se debe evitar el consumo excesivo de hidratos de carbono y se debe informar que un consumo de agua inferior a 1 L/día no es saludable.

Palabras clave: contenido de nutrientes; consumo de agua; objetivo de ejercicio.

INTRODUCTION

The acceptable macronutrient distribution ranges for carbohydrate is 45–65%, for fat is 20–35%, and for protein is 10–35% of the energy intake for adults (Institute of Medicine, 2005). Irregularity in fat and carbohydrate levels, for example, one high and the other very low, negatively affects the immune system and creates cardiovascular risk (Pendergast et al., 2010).

Water is a primary component in cells, tissues, organs, and the body, and water intake is related to the environment and food preferences (Jéquier & Constant, 2010). Malnutrition, physical inactivity, frequent fast-food consumption, and obesity among young people are associated with low water intake (Park et al., 2012).

Psychologically, attitude refers to a tendency to favor or disfavor assets to some extent and is in line with the way of thinking about inner tendency suggested by theorists (Eagly & Chaiken, 2007).

Physical activity levels increase due to improved attitudes towards physical activity among university students (Hyde et al., 2012). Developing a favorable attitude towards physical activities at a young age will help individuals participate in physical activity and, as a result, develop an active lifestyle in their adulthood (Hagger et al., 2003; Telama et al., 2005; Subramaniam & Silverman, 2007; Phillips & Silverman, 2015; Solmon, 2015). When systematic review and meta-analysis studies are examined, it is seen that there are many studies to increase physical activity (Owen et al., 2017; Messing et al., 2019; Kompf, 2020), but global inactivity is still high. Evidence suggests that high levels of sustained sedentary behavior (such as sitting for prolonged periods) are associated with abnormal glucose metabolism and cardiometabolic morbidity, as well as overall mortality (Owen et al., 2010). The combination of biological and psychosocial factors puts adolescent girls at risk of adopting a sedentary lifestyle (Young et al., 2014).

This study has four interrelated main objectives. First, to examine the distribution of the variables of nutrient content, water consumption, exercise goal, and exercise outcome expectation period. Second, to compare water consumption levels for each of the nutrient content and exercise goal variables. Third, to determine students' attitudes towards sports. Fourth, to evaluate the potential impact of the variables of nutrient content, exercise goal, expectation time after exercise, and level of water consumption on attitudes towards sports. In this context, the following null hypotheses were formed:

H_{01} : There is no difference between the energy source types of the foods that the students mainly include in their meals.

H_{02} : There is no difference between the average daily water consumption of the students.

H_{03} : There is no difference between the students' exercise goals.

H_{04} : There is no difference between the period students expect to reach their goals as a result of the exercises.

H_{05} : Nutrient content and exercise goal variables have no effect on the amount of water consumption.

H_{06} : Nutrient content, water consumption, exercise goal, and exercise outcome expectation period variables have no effect on attitude towards sports.

METHODS

Type of study

In this study, a survey research method was used. Survey research aims to describe the views of the participants. The questionnaire was used as a data collection technique.

Participants

In this study, 225 women participated voluntarily from Sinop University students in the 2019-2020 academic year selected by random sampling method. Faculty, School of Higher Education, and Higher Vocational School students participated in the study, the types of institutions are defined in the Turkish Higher Education Law (Council of Higher Education, 2000). Faculty: an institution of higher education conducting high-level education, scholarly research, and publication; sub-divisions may be attached to it. School of Higher Education: An institution of higher education mainly concerned with providing instruction for a specific vocation. Higher Vocational School: An institution of higher education carrying out four-semester education aimed at training manpower in specific areas.

Personal information form

The personal information of the students was obtained through the form. The questions in the personal information form are as follows; date of birth, type of higher education institution, grade levels, what kind of energy sources do you predominantly include in your meals? Responses are presented as a categorical variable with three levels (Protein, Fat, and Carbohydrate) and only one of them can be selected. How many liters of water do you consume on average daily? Responses are presented as a two-level (<1 L/d and ≥ 1 L/d) categorical variable and only one of them can be selected. What is your goal to exercise? Responses are presented as a categorical variable with four levels (Lose weight, Gain weight, Become fit, and Stay healthy) and only one of them can be selected. What is the period

you set to reach your goal as a result of the exercise? Responses are presented as a three-level (0-6, 7-12, and Over 12) categorical variable and only one of them can be selected.

Attitudes scale towards sport

In order to measure the attitudes of university students towards sport; the “attitudes scale towards sport” developed by Koçak, (2014) was used. To test the reliability level of the scale, Cronbach’s Alpha reliability coefficient, and Spearman-Brown internal consistency coefficient were examined, and these values were calculated as .891 and .839, respectively. The scale is a 5-point Likert type, consists of 22 items, and three sub-dimensions (psychosocial development-12 item, physical development-6 item, and mental development-4 item). Attitudes are evaluated categorically as high attitude (3.34-5.00), medium attitude (1.67-3.33), and low attitude (0.00-1.66) by taking the arithmetic average of the items in the calculation of scores for sub-dimensions and total. There is no reverse item on the scale.

Procedures

Questionnaires were administered face to face. The study was conducted according to the principles of the Declaration of Helsinki. Informed consent was obtained.

Data analysis

IBM SPSS 21.0 software was used, an alpha level was utilized as .05 and .001, the Kolmogorov-Smirnov test determined that the data was not distributed normally. Chi-Square Goodness of Fit test and Chi-Square Test of Independence were used for categorical variables, and Cramer’s V was used for effect value. The value obtained as a result of calculating the amount of effect of the independent variable on the dependent variable is expressed as the effect size (Murphy et al., 2014). Cramér’s V effect sizes are generally evaluated as negligible association (.00 and under .10), weak association (.10 and under .20), moderate association (.20 and under .40), relatively strong association (.40 and under .60), strong association (.60 and under .80), and very strong association (.80 and under 1.00) (Rea & Parker, 2014). The Mann-Whitney U test was used for the comparisons of mean ranks between two groups, and the Kruskal-Wallis test was used for more than two groups.

RESULTS

The aim of this study was to examine the types of nutrient energy sources, daily average water consumption, exercise goals, exercise outcome expectation period, and the relationship of these variables with attitudes towards sport in female university students.

In Table 1, the ages of the students participating in the study were divided into four groups (Categorical classification is ≤ 19 , 20, 21, and ≥ 22 years), and the proportion of students among the groups showed a balanced distribution of approximately N=55, 25%. According to institution type, the number of students studying at the faculty is higher N=166, 77.2%. A balanced distribution was observed among the grade levels.

Table1. Frequency and percentage distribution of age, institution type, and grade levels

AGE*	N (%)	INSTITUTION TYPE	N (%)	GRADE	N (%)
≤19	59 (27.4)	Faculty	166 (77.2)	First grade	46 (21.4)
20	54 (25.1)	School of Higher Education	37 (17.2)	Second grade	66 (30.7)
21	55 (25.6)	Higher Vocational School	12 (5.6)	Third grade	47 (21.9)
≥22	47 (21.9)	Total	215 (100)	Fourth grade	56 (26.0)
Total	215 (100)			Total	215 (100)

* year = M±SD=20.55±1.956

In Table 2, nutrient content (protein, fat, and carbohydrate), water consumption (<1 L/day and ≥1 L/day), exercise goal (lose weight, gain weight, become fit, and stay healthy), and exercise outcome expectation period (0-6, 7-12, and over 12 month) were examined separately within themselves, there was a statistically significant difference (p<.001). Protein, ≥1 L/day, weight loss, and 0-6 month rates are the highest, respectively.

Table 2. Distribution by nutrient content, water consumption, exercise goal, and exercise outcome expectation period

	N (215)	100 %	χ^2 **
Nutrient content			
Protein	71	33.0	69.77
Fat	22	10.2	
Carbohydrate	122	56.7	
Water consumption			
<1 L/day	72	33.5	23.44
≥1 L/day	143	66.5	
Exercise Goal			
Lose weight	97	45.1	56.01
Gain weight	21	9.8	
Become fit	51	23.7	
Stay healthy	46	21.4	
Exercise outcome expectation period (month)			
0-6	145	67.4	118.83
7-12	50	23.3	
Over 12	20	9.3	

** p<.001

In Table 3, there is a statistically significant difference between nutrient content and water consumption at the moderate effect level (p<.05). Water consumption differs significantly in favor of ≥1 L/day for both conditions whose nutrient content is protein or carbohydrate, but there is no difference in fat. There is a statistically significant difference between exercise goal and water consumption at the moderate effect level (p<.001). Water consumption differs significantly in favor of <1 L/day for whose

exercise goal is gain weight, but there is no difference in lose weight, become fit, or stay healthy.

Table 3. Relationship between nutrient content and exercise goal variables with water consumption

		WATER CONSUMPTION	
		<1 L/DAY	≥1 L/DAY
Nutrient Content ($\chi^2 = 9.02, p = .011^*$, Cramer's V = .205)			
	N	14 ^a	57 ^b
Protein	% within nutrient content	19.7%	80.3%
	% within water consumption	19.4%	39.9%
	N	9 ^a	13 ^a
Fat	% within nutrient content	40.9%	59.1%
	% within water consumption	12.5%	9.1%
	N	49 ^a	73 ^b
Carbohydrate	% within nutrient content	40.2%	59.8%
	% within water consumption	68.1%	51.0%
Exercise Goal ($\chi^2 = 20.55, p = .000^{**}$, Cramer's V = .309)			
	N	27 ^a	70 ^a
Lose weight	% within exercise goal	27.8%	72.2%
	% within water consumption	37.5%	49.0%
	N	16 ^a	5 ^b
Gain weight	% within exercise goal	76.2%	23.8%
	% within water consumption	22.2%	3.5%
	N	18 ^a	33 ^a
Become fit	% within exercise goal	35.3%	64.7%
	% within water consumption	25.0%	23.1%
	N	11 ^a	35 ^a
Stay healthy	% within exercise goal	23.9%	76.1%
	% within water consumption	15.3%	24.5%

*p<.05, **p<.001, a-bMeans in a row without a common superscript letter differ (p<.05), as analyzed by z-test

In Table 4, students show predominantly high attitudes at all scale scores of psychosocial development (N = 176, 81.9%), physical development (N = 202, 94.0%), mental development (130, 60.5%), and attitudes towards sport (N = 185, 86.0%).

Table 4. Student’s Attitudes Towards Sport and their subscale scores

		N	N %	M	SD	MIN.	MAX.
Psychosocial Development	Low	1	0.5%	1.33		1.33	1.33
	Moderate	38	17.7%	2.93	±.33	2.08	3.33
	High	176	81.9%	4.17	±.51	3.42	5.00
	Total	215	100.0%	3.94	±.70	1.33	5.00
Physical Development	Low	0	0.0%				
	Moderate	13	6.0%	3.09	±.32	2.17	3.33
	High	202	94.0%	4.36	±.48	3.50	5.00
	Total	215	100.0%	4.28	±.56	2.17	5.00
Mental Development	Low	6	2.8%	1.33	±.20	1.00	1.50
	Moderate	79	36.7%	2.82	±.41	1.75	3.25
	High	130	60.5%	4.32	±.55	3.50	5.00
	Total	215	100.0%	3.69	±.96	1.00	5.00
Attitudes Towards Sport	Low	0	0.0%				
	Moderate	30	14.0%	2.98	±.37	1.72	3.33
	High	185	86.0%	4.13	±.52	3.36	5.00
	Total	215	100.0%	3.97	±.64	1.72	5.00

In Table 5, the difference between the mean rank scores of psychosocial development, physical development, and attitudes towards sport is statistically significant according to nutrient content ($p < .05$). The difference between the mean rank scores of mental development is not statistically significant according to the nutrient content ($p > .05$). In psychosocial development sub-dimension, protein mean rank value is higher than fat ($U = 512.00, z = -2.438, p = 0.015$) and carbohydrate ($U = 3471.00, z = -2.303, p = 0.021$), and it is statistically significantly different. In the physical development sub-dimension, protein mean rank value is higher than fat ($U = 518.00, z = -2.397, p = 0.017$) and carbohydrate ($U = 3399.00, z = -2.509, p = 0.012$), and is statistically significantly different. Attitudes towards sport protein mean rank value is higher than fat ($U = 538.00, z = -2.198, p = 0.028$) and carbohydrate ($U = 3312.50, z = -2.724, p = 0.006$), and is statistically significantly different.

Table 5. The potential influence of nutrient content, exercise goal, exercise outcome expectation period, and water consumption on attitudes towards sport

	PSYCHOSOCIAL DEVELOPMENT		PHYSICAL DEVELOPMENT		MENTAL DEVELOPMENT		ATTITUDES TOWARDS SPORT	
	Mean Rank	χ^2	Mean Rank	χ^2	Mean Rank	χ^2	Mean Rank	χ^2
		p		p		p		p
		Diff.		Diff.		Diff.		Diff.
Nutrient Content (N=215)								
Protein (71)	123.90	8.12	124.82	8.53	120.45	4.41	125.77	9.01
Fat (22)	86.95	.017*	89.77	.014*	97.93	.110	91.91	.011*
Carbohydrate (122)	102.54	P.>F.,C.	101.50	P.>F.,C.	102.57	-	100.56	P.>F.,C.
Exercise Goal (N=215)								
Lose weight (97)	105.15	5.72	106.75	9.03	105.55	.666	103.61	2.42
Gain weight (21)	92.29	.125	129.36	.029*	117.07	.881	111.86	.488
Become fit (51)	124.95		119.45		107.10		119.01	
Stay healthy (46)	102.38	-	88.20	G., B.>S.	110.02	-	103.29	-
Exercise Outcome Expectation Period (Month, N=215)								
0-6(145)	110.97	1.25	111.67	7.73	108.87	5.62	111.02	5.39
7-12(50)	104.15	.533	111.98	.021*	117.17	.060	111.55	.067
Over 12(20)	96.10	-	71.43	0-6,7-12> over12	78.75	-	77.25	-
		U		U		U		U
	Mean Rank	Z	Mean Rank	Z	Mean Rank	Z	Mean Rank	Z
		p		p		p		p
Water Consumption (N=215)								
<1 L/day (72)	95.98	4282.5	104.32	4883.0	100.49	4607.0	96.78	4340.0
≥1 L/day (143)	114.05	-2.014	109.85	-.620	111.78	-1.266	113.65	-1.878
		.044*		.535		.205		.060

* p<.05 Diff.= Difference, P.=Protein, F.=Fat, C.=Carbohydrate G.=Gain Weight, B.=Become Fit, S.=Stay Healthy

The difference between the physical development mean scores is statistically significant according to the exercise goal (p<.05). The difference between the mean scores of psychosocial development, mental development, and attitudes towards sport is not statistically significant according to the exercise goal (all p>.05). In the physical development sub-dimension, gain weight is higher than stay healthy (U = 298.000, z = -2.517, p = .012) and become fit than stay healthy (U = 831.000, z = -2.486, p = 0.013), and it is statistically significantly different (p<.05).

The difference between the mean scores of physical development is statistically significant according to the exercise outcome expectation period (p<.05). The difference between the mean scores of psychosocial development, mental development, and attitudes towards sport is not statistically significant according to the exercise outcome expectation period (all p>.05). In the physical

development sub-dimension, the 0-6 month mean rank is higher than over 12 month ($U = 898.000$, $z = -2.774$, $p = .006$), 7-12 month higher than over 12 month ($U = 320.500$, $z = -2.354$, $p = .019$), and it is statistically significantly different ($p < .05$).

In the psychosocial development sub-dimension, the mean rank of ≥ 1 L/day is higher than < 1 L/day and it is statistically significantly different ($p < .05$). The difference between the mean scores of physical development, mental development, and attitudes towards sport is not statistically significant according to the daily average amount of water consumed (all $p > .05$).

DISCUSSION

In this study, the food content preference of students according to the type of energy source are carbohydrate, protein, and fat, respectively. Dapi et al. note that more than 50% of adolescents aged 12-16 consume protein, 26% consume fat less than recommended, and 26% consume fat more than recommended (Dapi et al., 2011). Individuals' food choices are influenced by many interrelated variables such as physiological and nutrient needs social and cultural factors (Shepherd, 1999).

It is seen that the students in our sample mainly consume ≥ 1 L/day of water. Adequate intakes for women 19–30 years is 2.7 L/day of total water, and this includes approximately 2.2 L as total beverages, including drinking water (Institute of Medicine, 2005). Although number of students consuming < 1 L/day of water is lower than the number of students consuming ≥ 1 L/day of water, it can still be said to be at a significant rate. Drinking water intake is commonly low and is associated with age, residence, low levels of physical activity, and unhealthy behaviors and attitudes, such as eating while watching television (Goodman et al., 2013). The variables of residence, levels of physical activity, and unhealthy behaviors were not investigated in this study.

A significant portion of the students participating in the study stated the goal of exercising as losing weight. Alfawaz et al. (2018), in the study of 448 healthy adult male individuals over the age of 20, determined that main motives of the participants for visiting the fitness center were: weight loss, muscle building, and keeping fit. Chang et al. (2011), found that 17.1% of 1605 female high school students had bad eating attitudes and behaviors, and emphasized that these attitudes and behaviors endanger the nutrient status of adolescents. Unconscious nutrition and wrong diets lay the groundwork for various eating behavior disorders, as young people give importance to body development and aesthetic appearance, and especially among young girls, being thin is perceived as synonymous with beauty (Pritts & Susman, 2003).

A significant portion of the students participating in the study determined a period of 0-6 month to reach the goal as a result of the exercise. Students in the study want to reach their goals as soon as possible. If they want to ensure permanence in their goals, they need to make long-term plans instead of short-term.

The number of students consuming an average ≥ 1 L/day of water is higher among those whose energy source is protein. Among those whose average water consumption is < 1 L/day, the number of students whose food energy source is a carbohydrate is higher. Fat is the least consumed as a type of food energy source among those with average water consumption of ≥ 1 L/day.

According to the goal of the exercise, it is seen that among those who want to lose weight, become fit, and stay healthy, ≥ 1 L/day water consumption is predominantly, and among those who want to gain weight, < 1 L/day water consumption is seen. According to the goal of exercise in those with average water consumption of ≥ 1 L/day; the number of people who want to lose weight is the highest, and the number of people who want to gain weight is at the lowest level. The absolute increase in water intake affects metabolism and leads to weight loss (Almiron-roig & Drewnowski, 2003; Stookey et al., 2008). Studies have shown that increasing fluid consumption leads to an increase in resting energy consumption and thus weight loss (Dubnov-Raz et al., 2011).

Drinking enough water is associated with weight loss because drinking-induced thermogenesis is effective in daily energy expenditure, so increasing daily water intake may be a useful and inexpensive intervention to achieve an increase in energy expenditure in overweight and obese individuals (Boschmann et al., 2003). For every 100-kcal increase in energy intake, there were increases in water intake from beverages and foods (Lee et al., 2016). The water intake source was not evaluated in this study.

The students in this study have a high level of psychosocial development $3.94 \pm .70$, physical development $4.28 \pm .56$, mental development $3.69 \pm .96$, and sport attitudes $3.97 \pm .64$. In his study, Yanık (2018) applied the same scale to 292 female university students and found that the students had a high level of attitude both in the sub-dimensions of the scale and in the total score of the scale. SalehNia et al. (2012) reported that out of the four groups they tested at the Iranian university, two groups with athletic team members had higher attitudes towards sports and were more interested in physical activities compared to the groups without athletic team members. When the literature on university students' is examined, it is seen that males attitude scores towards sports are higher than females (Çoknaz, 2015; Yanık, 2018). Li et al. (2014) reported that boys at a Chinese university had more positive attitudes towards physical activities than girls, this was attributed to different perceptions of pleasure, competence, and success.

CONCLUSIONS

Even though about two thirds of the current sample reported drinking ≥ 1 L/day, low water consumption is known to cause various health problems, so this situation should be intervened, and student's average daily water consumption should be increased. More efforts are needed to encourage students to consume more water as a precaution to maintain general health and wellness. Although physical activity was not evaluated in this study, developing attitudes and behaviors that will increase physical activity such as short walks in daily life and prevent inactivity will be beneficial for health. It is suggested that various activities should be organized in order to investigate the attitudes towards sport more widely, to learn the reasons of low and moderate level attitudes, and to increase the attitudes to high levels.

Acknowledgments: Thanks to E. Ozan, H. Cantürk and İ. Uluyaz, for their contributions to the data collection process.

Conflict of interest: The author declares the non-existence of conflicts of interest.

Contribution by author: The author is responsible for all components of this work.

Funding or funds: No financial support was provided.

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