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Examination of Metabolic Syndrome Knowledge and Awareness Levels of Individuals Going to Fitness Centers

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ABSTRACT

Metabolic syndrome is defined as a condition that includes a number of health problems such as insulin resistance, hypertension, obesity and dyslipidemia and increases the risk of heart disease, stroke and type 2 diabetes, and poses a serious threat to public health. Therefore, it is widely accepted that physical activity and regular exercise are effective in preventing metabolic syndrome. This research aims to examine the metabolic syndrome knowledge and awareness levels of individuals attending fitness centers in terms of variables such as gender, age, height, weight, weekly exercise frequency and monthly income. 189 volunteers (138 women, 51 men) who regularly go to fitness and health centers participated in the study. "Personal Information Form" was used to collect demographic information of the participants and "Metabolic Syndrome Awareness Scale" was used to measure metabolic syndrome awareness levels. In the analysis of the data, the relationships between demographic characteristics and awareness level were evaluated by using the SPSS statistical package program. According to the research results, it was determined that gender, age, body weight, weekly exercise frequency and monthly income variables created a significant difference on the metabolic syndrome awareness level. It was found that female participants' metabolic syndrome awareness levels were higher than men. Additionally, it was determined that the metabolic syndrome awareness levels of individuals who exercise regularly at least three days a week were significantly higher than other individuals. As a result, it was observed that the metabolic syndrome knowledge and awareness levels of individuals attending fitness centers were generally at a medium level. These findings point to the need to disseminate health education programs and awareness campaigns in order to increase awareness about metabolic syndrome in society. It is thought that such programs will contribute to individuals understanding the risk factors associated with metabolic syndrome, adopting healthy living habits and thus living a better quality of life.

Keywords: *Fitness Center, Awareness, Metabolic Syndrome*

1. INTRODUCTION

Nowadays, it can be said that the rapid advancement of technology, the intensity of business life and the comfort brought by the modern lifestyle limit the physical activities of individuals and, combined with unhealthy eating habits, cause diseases (Akyol et al., 2008). With the influence of modern lifestyle, the balance between individuals' energy intake and energy expenditure is disrupted, which leads to fat storage in the body and the inability to use insulin effectively, increasing the risk of metabolic syndrome (Alwafi et al., 2020). Metabolic syndrome is a disease condition characterized by a combination of factors such as obesity, high blood pressure, high blood sugar levels, high cholesterol and an increase in waist circumference (Cheng et al, 2012).

According to NCEP Adult Treatment Panel III, to diagnose metabolic syndrome, the waist circumference must first be more than 88 cm in women and more than 102 cm in men. The second criterion is the triglyceride level, which must be 150 mg/dL or higher. Third, HDL cholesterol levels are examined; It must be less than 40 mg/dL in men and less than 50 mg/dL in

women. The fourth criterion involves blood pressure, which must be greater than 130/85 mmHg or use of antihypertensives. Finally, the fasting blood glucose level must be higher than 110 mg/dL or the individual must already be diagnosed with diabetes (NCEP, 2002). If at least three of these criteria are present together, metabolic syndrome is diagnosed (Özseven & Sönmez, 2012). Individuals can try various ways to get away from metabolic syndrome. It can be said that one of these ways is sectors that provide services to protect health, such as fitness.

It is known that the relationship between individuals who regularly attend fitness centers and metabolic syndrome is multifaceted (Ünal, 2018; Hsu, 2006). In this context, it can be said that exercises performed in fitness centers help improve many health parameters as well as weight control. Additionally, cardiovascular exercises in fitness centers can lower high blood pressure and improve cardiovascular health, reducing the risk of metabolic syndrome. The positive effects of exercise on metabolic syndrome occur through a number of mechanisms. Exercise can help reduce abdominal fat by regulating body weight. It can also control blood glucose levels and reduce insulin resistance by increasing insulin sensitivity. Exercise may also reduce the risk of hypertension by lowering blood pressure and may have positive effects on the lipid profile (Grundy et al., 2005). Regular exercise can increase insulin sensitivity and reduce the risk of type 2 diabetes by contributing to keeping blood sugar under control (Avuklu, 2017). Exercise, which also has positive effects on the lipid profile, can increase HDL cholesterol levels and reduce triglyceride levels (Gürsoy, 2008). Additionally, exercises in fitness centers can reduce fat tissue and reduce the risk of metabolic syndrome by keeping the accumulated fat, especially in the abdominal area, under control. However, each individual's risk of metabolic syndrome is different, and in addition to fitness centers, it is important to have a balanced diet, regular health check-ups and compliance with professional health advice, and adequate knowledge about metabolic syndrome. In this context, this research was conducted to determine the metabolic syndrome awareness levels of individuals attending fitness centers.

2. METHOD

Research Group

The research group consists of 189 (138 women, 51 men) volunteer individuals who participate in fitness and centers in Bitlis province.

Collection of Data

In the study, the "Personal Information Form" prepared by the researchers was used to obtain the data, and in the second part, the "Metabolic Syndrome Knowledge and Awareness Scale" was used to measure the metabolic syndrome awareness levels of individuals going to fitness centers.

Data Collection Tools

Personal Information Form

Participants' gender, age, height, body weight, income status, There are descriptive questions about how many days a week you exercise and whether you have any chronic diseases.

Metabolic Syndrome Knowledge and Awareness Scale (MSBFS)

The "Metabolic Syndrome Knowledge and Awareness Scale" developed by Karaman and Akbulut 2023 consists of 14 items with a total of 4 sub-dimensions: definition, general health, awareness and protection. In this scale, which was created as a 5-point Likert type; The statement "Strongly Disagree" will be scored as "1" point, the statement "I Disagree" will be scored as "2" points, the statement "No Opinion" will be scored as "3" points, the statement "Agree" will be scored as "4" points and the statement "Strongly Agree" will be scored as "5" points. As a result of the scoring, the total score that can be obtained from the scale is at least '14' and at most '70'.

Research Model

In this research, the survey model, which is one of the quantitative research models that aims to describe the current situation of a phenomenon or event that has continued from past to present, as it is, and to reflect the individual or object in the research subject as it exists, was used (Karasar, 2014). This study was approved by Bitlis Eren University Ethical Principles and Ethics Committee with the decision numbered 2024/03-25 and E.5281.

Analysis of Data

In the study, statistical power calculations were made using the G-Power 3.1 program, taking into account the number of samples, the significance level of the hypothesis and the effect size. The data were analyzed using the SPSS statistical program. The demographic information and warm-up knowledge levels of the research group were summarized using percentage, frequency, arithmetic mean and standard deviation techniques as descriptive statistics. Skewness and kurtosis values of the data were checked to determine whether the data showed normal distribution. If the skewness and kurtosis values are between +1 and -1, the data is considered to be normally distributed (George & Mallery, 2010). After it was determined that the data showed normal distribution, Independent Samples t and One-Way ANOVA tests were applied for

intra-group comparisons. “Tukey” test was applied to determine the source of the difference revealed in the One-Way ANOVA test. The confidence interval was accepted as $p<0.05$.

Table 1. Mean, Standard Deviation, Skewness and Kurtosis Values for the Metabolic Syndrome Awareness Scale and its Sub-Dimensions

Variables	$\bar{X}$	ss	Skewness	Kurtosis
Description Sub-Dimension	3,32	1,11	-,344	-,477
General Health Sub-Dimension	3,50	1,10	-,476	-,368
Awareness Sub-Dimension	3,63	1,15	-,543	-,445
Protection Sub-Dimension	4,11	1,11	-1,026	,327
MSKAS Total	3,58	,92	-,544	,128

When Table 1 was examined, it was determined that the skewness and kurtosis values of the metabolic syndrome awareness scale and its sub-dimensions were between -1 and +1.

3. FINDINGS

Table 2. Scale, Sub-Dimensions and Item Means

	$\bar{x}$	Ss
One of the causes of metabolic syndrome is increased blood sugar (glucose) level.	3,17	1,31
One of the causes of metabolic syndrome is increased blood pressure level.	3,06	1,35
One of the causes of metabolic syndrome is insufficient fluid consumption.	3,58	1,29
One of the causes of metabolic syndrome is increased triglyceride level.	3,16	1,33
One of the causes of metabolic syndrome is insulin resistance.	3,49	1,37
Metabolic syndrome impairs an individual's eye health	3,47	1,29
Metabolic syndrome causes cognitive impairment	3,45	1,24
Health problems occur in children of mothers with metabolic syndrome	3,44	1,26
Increased blood sugar level (glucose) causes daily tasks not to be carried out satisfactorily.	3,66	1,31
Increased waist circumference causes daily tasks not to be performed satisfactorily.	3,52	1,31
High triglyceride levels cause the inability to perform daily tasks satisfactorily.	3,53	1,29
Balanced and regular nutrition is essential to protect against metabolic syndrome.	3,98	1,23
Regular exercise is important to protect against metabolic syndrome.	3,96	1,24
Being physically active in daily life is important to protect from metabolic syndrome.	4,06	1,23
Description Sub-Dimension	16,48	5,58
General Health Sub-Dimension	10,37	3,30
Awareness Sub-Dimension	10,72	3,46
Protection Lower Dimension	12,01	3,35
Metabolic Syndrome Knowledge and Awareness Scale	49,58	12,98

When Table 2 is evaluated, the research group; It was observed that the statement "being physically active in daily life is important to protect from metabolic syndrome" had an item average of 4.06±1.23, and the statement "balanced and regular nutrition is indispensable for protecting from metabolic syndrome" had an item average of 3.98±1.23 and the students

generally agreed. The research group; It was observed that the statement "one of the causes of metabolic syndrome is increased blood pressure level" had an item mean of 3.06±1.35, while the statement "one of the causes of metabolic syndrome is an increased triglyceride level" had an item mean of 3.16±1.33, and the students generally agreed at a low level. In addition, it was determined that the research group had a mean score of 16.48±5.58 in the definition sub-dimension, a mean score of 10.37±3.30 in the general health sub-dimension, a mean score of 10.72±3.46 in the awareness sub-dimension, a mean score of 12.01±3.35 in the protection sub-dimension, and a total score of 49.58±12.98 in the nutrition and metabolic syndrome knowledge and awareness scale.

Table 3. Analyzes Regarding the Demographic Information of the Research Group

		Frequency	Percentage (%)
Gender	Male	51	27,0
	Woman	138	73,0
Age	20-25 years old	39	20,6
	26-31 years old	57	30,2
	32-37 years old	51	27,0
	38 years and above	42	22,2
Body weight	50-60 kg	28	14,8
	61-70 kg	64	33,9
	71-80 kg	61	32,3
	81-90 kg	26	13,8
	91 kg and above	10	5,3
Height	150-160 cm	50	26,5
	161-170 cm	93	49,2
	171-180 cm	32	16,9
	181-190 cm	12	6,3
	191 cm and above	2	1,1
How many days a week do you train?	1 day	24	12,7
	2 days	30	15,9
	3 days	94	49,7
	4 days	20	10,6
	5 days or more	21	11,1
Chronic Disorder	Yes	119	63,0
	No	70	37,0
Your income situation	Good	37	19,6
	Medium	121	64,0
	Bad	31	16,4

When Table 3 is examined, it is seen that 27.0% of the research group consists of male participants and 73.0% consists of female participants. When looking at the age distribution, it was determined that 20.6% of the participants were 20-25 years

old, 30.2% were 26-31 years old, 27.0% were 32-37 years old and 22.2% were 38 years old and above. According to body weight distribution, 14.8% of the participants are 50-60 kg, 33.9% are 61-70 kg, 32.3% are 71-80 kg, 13.8% are 81-90 kg and 5.3% are 91 kg and above. When the data regarding heights were examined, it was determined that 26.5% were 150-160 cm, 49.2% were 161-170 cm, 16.9% were 171-180 cm, 6.3% were 181-190 cm and 1.1% were 191 cm and above. Additionally, in terms of exercise frequency, it was determined that 12.7% of the participants exercised 1 day a week, 15.9% 2 days a week, 49.7% 3 days a week, 10.6% 4 days a week and 11.1% 5 days or more a week. It was determined that 63.0% of the participants had a chronic illness and 37.0% did not have any chronic illness. In terms of monthly income, it was determined that 19.6% of the participants had a good income, 64.0% had a medium income and 16.4% had a bad income.

Table 4. T-Test Analyzes Regarding Gender Variable

Subdimensions	**Gender**	**x̄**	**ss**	**t**	**p**
Description Sub-Dimension	Male	15,54	3,73	-1,732	0,08
	Woman	16,82	6,09		
General Health Sub-Dimension	Male	9,96	2,57	-1,194	0,23
	Woman	10,52	3,53		
Awareness Sub-Dimension	Male	9,94	2,52	-2,262	0,02*
	Woman	11,01	3,71		
Protection Sub-Dimension	Male	10,45	2,41	-4,762	0,00*
	Woman	12,58	3,46		
MSKAS Total	Male	45,90	6,41	-3,310	0,01*
	Woman	50,94	14,47		

p<0.05*

When Table 4 is examined, it is seen that there is a significant difference between the gender variable and the awareness, protection sub-dimension and MSFS scale total score averages ($p<0.05$), while there is no significant difference between the identification sub-dimension and general health sub-dimension average scores ($p>0.05$). In addition, it was determined that women's metabolic syndrome knowledge and awareness average scores were higher than men.

Table 5. T-Test Analyzes Regarding Your Chronic Disorder

Sub-Dimensions	**Chronic Disorder**	**x̄**	**ss**	**t**	**p**
Description Sub-Dimension	Yes	16,52	6,06	,127	0,89
	No	16,41	4,67		
General Health Sub-Dimension	Yes	10,55	3,45	,998	0,31
	No	10,05	3,04		
Awareness Sub-Dimension	Yes	11,08	3,62	1,872	0,06
	No	10,11	3,09		
Protection Sub-Dimension	Yes	12,64	3,18	3,506	0,00*
	No	10,92	3,37		
MSKAS Total	Yes	50,80	13,98	1,692	0,09
	No	47,51	10,86		

p<0.05*

When Table 5 is examined, it was determined that there was a significant difference between the chronic disease and prevention subscale mean scores ($p<0.05$), while there was no significant difference between the definition, general health, awareness subdimensions and MSKAS scale total score averages ($p<0.05$).

Table 6. Variance Analyzes Regarding the Age Variable

Sub-Dimensions	Age	x̄	ss	F	p	Tukey
Description Sub-Dimension	20-25 years old (a)	15,84	6,20	,215	0,88	--
	26-31 years (b)	16,70	4,98			
	32-37 years old (c)	16,56	5,64			
	38 years and above (d)	16,66	5,82			
General Health Sub-Dimension	20-25 years old	10,17	3,41	,548	0,65	--
	26-31 years old	10,00	2,98			
	32-37 years old	10,64	3,35			
	38 years and above	10,71	3,60			
Awareness Sub-Dimension	20-25 years old	10,05	3,71	,884	0,45	--
	26-31 years old	10,80	3,18			
	32-37 years old	11,23	3,43			
	38 years and above	10,61	3,62			
Protection Sub-Dimension	20-25 years old	11,17	4,01	1,223	0,30	--
	26-31 years old	11,96	2,76			
	32-37 years old	12,47	2,87			
	38 years and above	12,28	3,87			
MSKAS Total	20-25 years old	47,25	14,48	,637	0,59	--
	26-31 years old	49,47	10,91			
	32-37 years old	50,92	12,56			
	38 years and above	50,28	14,67			

p<0.05*

When Table 6 was examined, it was determined that there was no statistically significant difference between the age variable and the sub-dimensions of identification, general health, awareness and protection and the total score averages of the MSFS scale (p>0.05). However, it was determined that as the average age increased, there was an increase in the MSFS scale total score average.

Table 7. Variance Analyzes for Body Weight Variable

Sub-Dimensions	Body Weight	x̄	ss	F	p	Tukey
Description Sub-Dimension	50-60 kg (a)	16,85	5,84	,435	0,78	--
	61-70 kg (b)	16,73	5,19			
	71-80 kg (c)	16,37	5,68			
	81-90 kg (d)	15,30	6,10			
	91 kg and above (e)	17,50	5,81			
General Health Sub-Dimension	50-60 kg (a)	10,14	3,18	,159	0,95	--
	61-70 kg (b)	10,20	3,17			
	71-80 kg (c)	10,49	3,51			
	81-90 kg (d)	10,57	3,64			
	91 kg and above (e)	10,80	2,78			

Awareness Sub-Dimension	50-60 kg (a)	10,25	3,56	,665	0,61	--
	61-70 kg (b)	11,09	3,00			
	71-80 kg (c)	10,81	3,74			
	81-90 kg (d)	9,96	3,60			
	91 kg and above (e)	11,10	3,98			
Protection Sub-Dimension	50-60 kg (a)	12,64	2,99	,298	0,87	--
	61-70 kg (b)	11,84	3,35			
	71-80 kg (c)	11,91	3,51			
	81-90 kg (d)	11,96	3,16			
	91 kg and above (e)	12,00	4,10			
MSKAS Total	50-60 kg (a)	49,89	12,76	,179	0,94	--
	61-70 kg (b)	49,87	12,02			
	71-80 kg (c)	49,60	13,87			
	81-90 kg (d)	47,80	14,31			
	91 kg and above (e)	51,40	12,45			

p<0.05*

When Table 7 was examined, it was determined that there was no statistically significant difference between the body weight variable and the sub-dimensions of identification, general health, awareness and protection and the total score averages of the MSFS scale (p>0.05).

Table 8. Variance Analysis Regarding Height Variable

Sub-Dimensions	**Height**	**x̄**	**ss**	**F**	**p**	**Tukey**
Description Sub-Dimension	150-160 cm (a)	15,48	6,25	2,376	0,13	--
	161-170 cm (b)	17,56	5,50			
	171-180 cm (c)	15,37	4,64			
	181-190 cm (d)	15,35	4,44			
General Health Sub-Dimension	150-160 cm (a)	9,24	3,45	4,410	0,00*	b>a
	161-170 cm (b)	11,19	3,28			
	171-180 cm (c)	10,06	2,67			
	181-190 cm (d)	9,64	3,02			
Awareness Sub-Dimension	150-160 cm (a)	9,94	4,04	5,024	0,00*	b>a
	161-170 cm (b)	11,66	3,18			
	171-180 cm (c)	9,90	2,95			
	181-190 cm (d)	9,14	2,47			
Protection Sub-Dimension	150-160 cm (a)	11,88	3,95	9,023	0,00*	c>a,b
	161-170 cm (b)	13,01	2,76			
	171-180 cm (c)	9,78	3,13			
	181-190 cm (d)	10,92	2,20			
MSKAS Total	150-160 cm (a)	46,54	15,03	5,900	0,00*	c>a,b
	161-170 cm (b)	53,44	12,45			
	171-180 cm (c)	45,12	9,39			

	181-190 cm (d)	45,07	8,07			

p<0.05*

When Table 8 is examined, it was determined that there was a statistically significant difference between the height variable and the general health, awareness, protection sub-dimension and the total score averages of the MSFS scale (p<0.05), while there was no significant difference between the protection sub-dimension average score (p>0.05). According to the Tukey test results, it was determined that the significant differences in the general health and awareness sub-dimensions were due to the fact that group b was higher than group a. The significant difference in the protection sub-dimension was found to be due to the fact that group C was higher than groups A and B. It was determined that the significant difference seen in the total MSKAS scale was due to the fact that group c had higher averages than groups a and b.

Table 9. Variance Analysis Regarding Weekly Exercise Status

Sub-Dimensions	**weekly exercise**	**$\bar{x}$**	**ss**	**F**	**p**	**Tukey**
Description Sub-Dimension	1 day (a)	15,91	5,81	1,647	0,16	--
	2 days (b)	15,43	5,76			
	3 days (c)	17,50	5,84			
	4 days (d)	15,05	4,96			
	5 days or more (e)	15,42	3,66			
General Health Sub-Dimension	1 day (a)	10,45	3,50	,342	0,85	--
	2 days (b)	9,86	3,26			
	3 days (c)	10,60	3,50			
	4 days (d)	10,10	3,02			
	5 days or more (e)	10,19	2,61			
Awareness Sub-Dimension	1 day (a)	10,66	4,00	,936	0,44	--
	2 days (b)	10,56	3,23			
	3 days (c)	11,13	3,65			
	4 days (d)	10,15	2,85			
	5 days or more (e)	9,71	2,66			
Protection Sub-Dimension	1 day (a)	11,79	3,87	2,889	0,02*	c>e
	2 days (b)	12,10	2,94			
	3 days (c)	12,64	3,48			
	4 days (d)	10,95	2,60			
	5 days or more (e)	10,28	2,57			
MSKAS Total	1 day (a)	48,83	14,84	1,725	0,14	--
	2 days (b)	47,96	12,46			
	3 days (c)	51,89	14,17			
	4 days (d)	46,25	8,14			
	5 days or more (e)	45,61	7,19			

p<0.05*

When Table 9 is examined, it was determined that there was a significant difference between the weekly exercise status variable and the protection subscale mean score (p<0.05), while there was no significant difference between the definition, general health, awareness subdimensions and MSKAS scale total score mean (p>0.05). As a result of the Tukey test, it was determined that the significant difference in the protection sub-dimension was due to the higher mean score of group c compared to group e.

Table 10. Variance Analysis According to Monthly Income Status

Sub-Dimensions	Monthly Income Status	x̄	ss	F	p	Tukey
Description Sub-Dimension	good (a)	16,72	5,64	1,432	0,24	--
	Medium (b)	16,80	5,61			
	bad (c)	14,93	5,26			
General Health Sub-Dimension	good (a)	10,02	3,36	2,179	0,11	--
	Medium (b)	10,71	3,20			
	bad (c)	9,41	3,52			
Awareness Sub-Dimension	good (a)	10,54	3,48	3,246	0,04*	b>c
	Medium (b)	11,12	3,38			
	bad (c)	9,38	3,49			
Protection Sub-Dimension	good (a)	12,64	3,06	4,939	0,00*	a>b,c
	Medium (b)	12,23	3,13			
	bad (c)	10,35	4,02			
MSKAS Total	good (a)	49,94	13,16	3,478	0,03*	b>c
	Medium (b)	50,88	12,50			
	bad (c)	44,09	13,59			

p<0.05*

When Table 10 is examined, it is seen that there is a significant difference between the monthly income variable and the awareness, protection sub-dimensions and MSFS scale total score averages (p>0.05), while there is no statistically significant difference between the definition and general health sub-dimensions average score (p<0.05). Additionally, Tukey test results show that the significant difference in the awareness sub-dimension is due to the higher mean score of group b compared to group c. It was determined that the difference in the protection sub-dimension was related to the higher mean score of group a than groups b and c. In addition, it was determined that the significant difference observed in the MSFAS scale total score was due to the fact that the mean score of group b was higher than group c.

4. DİSCUSSİON AND CONCLUSİON

In this study, which aims to examine the metabolic syndrome awareness levels of individuals attending fitness and health centers, the MSKAS scale and a personal information form describing the demographic characteristics of the participants were used. 189 volunteers (138 women and 51 men) who went to fitness and health centers in Bitlis province participated in the research. While it was observed that there was a significant difference between the research group's gender variable and the awareness, protection sub-dimension and MSKAS scale total score averages, there was no significant difference between the identification sub-dimension and general health sub-dimension average scores. In addition, it was determined that the average metabolic syndrome awareness score of women was higher than that of men. When the findings of the research group were examined according to age variable, it was determined that there was no statistically significant difference between the definition, general health, awareness and protection sub-dimensions and the total score averages of the MSKAS scale. However, it was determined that as the average age increased, there was an increase in the MSFS scale total score average. While it was determined that there was a significant difference between the research group's chronic disease and prevention sub-dimension average scores, there was no significant difference between the definition, general health, awareness sub-dimensions and MSKAS scale total score averages. When the body weight variable findings of the research group were examined, it was determined that there was no statistically significant difference between the definition, general health, awareness and protection sub-dimensions and the total score averages of the MSKAS scale. When the height variable findings were examined, it was determined that there was a statistically significant difference between the general health, awareness, protection sub-dimension and the total score averages of the MSFS scale, while there was no significant difference between the protection sub-dimension average scores. While it was determined that there was a significant difference between the weekly exercise status variable of the research group and the protection subscale mean score, there was no significant difference between the definition, general health, awareness subdimensions and MSKAS scale total score mean. While it was observed that there was a significant difference between the monthly income status variable of the research group and the awareness, protection sub-dimensions and MSKAS scale total score averages, there was no statistically

significant difference between the identification and general health sub-dimensions average scores. When the literature research is examined; It shows that women have a more proactive attitude towards accessing health services and health information, and they tend to be more informed about health risks (Gönenç & Vural, 2013). The fact that metabolic syndrome components such as obesity and insulin resistance are more common in women stands out as an important factor that increases this level of awareness (Samur & Yıldız, 2008). However, there are also studies showing that although individuals with high body mass index (BMI) should be aware of the risks of metabolic syndrome, their level of awareness is not always directly proportional to these risks (Wieland et al., 2015). It has also been emphasized that with the aging process, individuals become more aware of health problems and this awareness increases the rate of participation in health checks (Deeks et al., 2009). These findings reveal that the level of awareness is related to the age factor and that utilization of health services increases with age. It is known that physical activity plays an important role in the management of metabolic syndrome risk factors. Akman et al. (2023) emphasized that physical activity is effective in reducing the risk of metabolic syndrome, and other studies supported that regular exercise is a critical factor in preventing metabolic syndrome (Dik, 2013; Tümer & Çolak, 2012). It is understood that the income level of individuals is also a determining factor on metabolic syndrome awareness. Individuals with high income levels can access health services more easily and are more successful in maintaining healthy lifestyles (Joshi et al., 2020). This shows that income level has a direct impact on health consciousness and awareness. Additionally, Pavlova et al. (2023) stated that metabolic syndrome in young athletes increases the risk of cardiovascular disease in adulthood and emphasized that early diagnosis and timely intervention are critical in managing these risks. Finally, Koç's (2010) study drew attention to the potential of regular exercise to reduce metabolic syndrome risk factors. As a result, it was determined that the metabolic syndrome awareness levels of individuals attending fitness centers were generally at a medium level. Comparedeen determined that this level of awareness varies according to demographic variables, especially women have a higher level of awareness compared to men. Additionally, it has been observed that awareness tends to increase as age increases and income level may be a determining factor on awareness. However, it was evaluated in line with the findings that physical activity could be associated with metabolic syndrome management.

Increasing the level of metabolic awareness and knowledge can provide information about the basic functioning of metabolism, individual metabolic differences and their effects on health through training programs and seminars. Additionally, through applied training, individuals can be helped to better understand their metabolic rates, energy consumption levels and the relationship between nutritional habits and physiological processes.

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