

The relationship between body perception and nutrition of B2 - B3 impaired athletes

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Summary. *Study Objectives:* It is aimed to investigate the relationship between body perception and nutrition of b2-b3 visually impaired athletes. In addition, another aim of this study is to determine the knowledge of b2-b3 visually impaired athletes about body perception and nutrition. *Methods:* The study was conducted with the participation of a total of 108 volunteers, 40 women and 68 men, from b2-b3 visually impaired athletes, who played professionally in different clubs, and the relationship between body perception and nutritional variables and demographic characteristics were analyzed. Volunteering was taken into account in participation. As the data collection tool, the “Personal Information Form” and the body perception scale developed by Secord and Jourard, whose validity and reliability study was conducted and adapted into Turkish by Hovardaoğlu, and the three-factor nutrition scale developed by Karlsson et al. were used. *Results:* Body perception scale total score means of the individuals differ significantly according to gender and educational status ($p < 0.05$). No significant differences were obtained for other demographic variables ($p > 0.05$). While there was a significant difference in the four-factor nutrition questionnaire of the individuals and the sub-scales according to gender ($p < 0.05$), there was no significant difference in terms of age and disability status, sports branch, education status, income status, vision level ($p > 0.05$). There was a statistically significant strong positive directional relationship between Body Perception Scale and Four Factor Nutrition Survey ($p < 0.05$). *Conclusion:* It was determined that the training programs, competitions, and resting intervals of the sports life of B2-B3 visually impaired athletes have an effective role on body perception as they have a controllable nutritional habit. In short, we can say that the thoughts or ideas of visually disabled athletes about body perception are extremely effective on nutrition.

Key words: B2 - B3 Visually Disabled, Athlete, Body Perception, Nutrition

Introduction

The human body has emerged as the existing space of the individual throughout history. There are comments, definitions, and explanations about the body in all scriptures. In its historical development, science has taken its place among the research subjects (1). In the 16th century, Surgeon Ambroise Pare introduced the concept of “body perception disorder” based on his observations about his patients. Even though

the pause period had been started in this subject in the following periods, the studies that examine and explain body perception were started to be re-conducted in the first half of the 20th century (2). According to Schilder, body perception is defined as the way the individual perceives himself aesthetically (3). In a different definition, it is the evaluation of the individual about his/her body parts and their functions as positive or negative (4). Another issue that affects body perception is nutrition. Nutrition is the basic activity of

human life. Nutrition has become a phenomenon that has started to gain symbolic values rather than being a biological action for humans. Psychological, social, economic, and even political dimensions have started to exist in food like sexuality. Food contributes to the most valuable areas of individuals, their bodies. That is why its psychological factor in the formation of the human self is big (5). Adequate and balanced nutrition is one of the basic conditions for society and individuals to live healthily and strongly, to develop economically and socially, and to increase the level of welfare (6). Nutrition is the body's benefiting from the foods we eat in order to grow, perform body functions and sustain life healthily and happily (7). A Balanced diet consists of taking the desired food from different food components to meet the energy and nutritional needs of a person (8). Malnutrition is an important risk factor in non-communicable diseases such as cardiovascular diseases, diabetes, and some types of cancer (9). Therefore, body perception and regular nutrition have a very important effect on individuals.

Engaging in social, cultural, or sportive activities at every stage of life is the basic right of the individual. However, having any physical disorder and restriction of this disorder on the normal behavior and movements causes the individual to be disabled by making them different from other people. This difference constitutes the real cause of discrimination experienced by disabled people (10). Disability, on the other hand, can be defined as "the lack of anatomical, physiological or psychological structure, and functions, or the situation where a normal person can result in success as a result of loss or abnormal condition (11). Disabled types are; visual, hearing, speech, and orthopedic disabled people and those with chronic illness. Visually impaired, on the other hand, is the person who has full or partial vision loss or impairment in one or both eyes.

Sports are extremely important for disabled individuals. Sport is the easiest way for disabled individuals to communicate and socialize psychologically and socially (12). Although the visual impairment of the individual is not a restrictive condition for sports, a high amount of muscle and endurance movements can be done to these people. Individuals with visual impairments can develop many skills such as good body posture, proper walking, running,

and swimming through training aids. In addition, they could strengthen their muscles with physical training programs (10). The International Blind Sports Federation (IBSA) has determined three classes in an international competition for athletes who are partially blind or blind (13). Each class applies sports branches that visually impaired people can do. These are; B1. They don't see completely, can perceive light, but they can't recognize the hand form from any distance; B2. Although they can perceive the shape of the hand, their visual acuity is 20/600, and their visual angles are below 50 in the visual environment; B3. Their visual angles are 5-200. They have a vision of 20/600, 60/600 (13). Each visually impaired athlete is divided into the sports branches according to the degree of vision. It can be said that visually impaired individuals, whose physical development is different and less developed than healthy individuals, need more sports. Because the movement functions of the visually impaired who are doing sports are developing and rehabilitating. In addition, their mental functions improve, their self-confidence increases and it is provided that they keep up with social life (10).

As a result, it has been determined that nutrition has an effective role on body perception as the training programs, competitions and resting intervals provided by the sports life provide B2-B3 visually impaired athletes with controllable nutritional habits. In short, we can say that the thoughts or ideas of visually impaired athletes about body perception are extremely effective on nutrition.

MaterialS and MethodS

In this research, as the data collection tool, the "Personal Information Form" and the body perception scale developed by Secord and Jourard (14) in 1953, whose validity and reliability study was conducted and adapted into Turkish by Hovardaoğlu in 1986. The body perception scale consists of 40 items and is answered according to the 5-point answering system (1: I like it very much, 2: I like it much, 3: Neutral, 4: I don't like it much, 5: I don't like it at all). The most negative statement gets 5 points and the most positive one gets 1 point. In this sense, the highest score that can

be obtained from the scale is 200, and the lowest score is 40. The increase in the total score obtained from the scale illustrates the decrease of the individual's satisfaction from the body parts or function, and the decrease in the score shows the increase the satisfaction (15).

A three-factor nutrition scale was developed by Karlsson et al. (2000) (16). With this questionnaire, it was reported that it is possible to measure the individuals' degree of eating restriction consciously, eating uncontrollably, and eating at emotional times, and the scale was created as 51 questions and the questionnaire took the final form with 18 questions after validity and reliability tests were done in various populations. Turkish adaptation of the scale, its validity, and reliability study were done by Kıracı et al. (2015) (17). In addition, in the pilot study, they reported that in addition to the three factors mentioned above, this questionnaire measured the fourth factor as the level of people's hunger sensitivity. The scale includes "Absolutely true- Mostly true- Mostly false- Absolutely false" answer statements for each statement consisting of 18 items. It was stated that the scale consists of 5 items in the sub-dimension 'Eating uncontrolled', 3 items in the sub-dimension 'Eating emotionally', 6 items in the sub-dimension 'Eating consciously', and 4 items in the sub-dimension 'Hunger sensitivity level' (17).

Statistical Analyses

IBM SPSS 22.0 package program was used to analyze the obtained data. Independent t-test and ANOVA, which are parametric tests, were used in the analysis of the change of body perception scale total scores according to demographic findings. Body Perception Scale Cronbach's Alpha Value was found to be 0.888. Therefore, it can be said that 40 items in the scale are reliable. One-way ANOVA, two sample independent t-tests and parametric ANOVA tests were used to investigate the change of total scores of the nutrition questionnaire according to demographic findings. The Cronbach's Alpha value of the four-factor nutrition questionnaire applied to the study group was 0.873, eating restriction level of subscale was 0.878, the uncontrolled eating level of the subscale was 0.816, eating level at emotional times of the subscale was 0.826 and the sensitivity level to hunger subscale

was 0.825. Therefore, it can be said that 18 items are reliable in the scale.

Results

Age group, Gender distributions, Disability situations, Educational status, Sports branches, Income states, Vision degree distributions of the individuals participating in the research are given in the Table 1.

According to the table (2), the total score mean of the individuals' body perception scale, the total score mean of the body perception scale of the male individuals' is higher than the total score mean of the women ($p < 0.05$). As the educational status of the individual's increases, the total perception scale of the body perception scale decreases gradually. As the education level increases, the satisfaction of individuals with their body parts and functions increases ($p < 0.05$). No significant differences were obtained for other demographic variables ($p > 0.05$).

In the tables below, summary statistics of nutrition survey total scores and subscales according to demographic findings were given.

Looking at the table (3), the total score mean of the four-factor nutrition questionnaire varies according to the age groups of individuals ($p < 0.05$). According to the ANOVA Post Hoc test, the total score mean of the four-factor nutrition questionnaire is lower than the other age groups. No significant difference was found for the subscales ($p > 0.05$).

The total score means of four-factor nutrition survey and subscale do not vary according to their gender (Table 4; $p > 0.05$).

The total score means of four-factor nutrition survey and subscale do not vary according to disability status (Table 5; $p > 0.05$).

Eating level at emotional times subscale total score means of primary education graduates was higher than high school and university graduates ($p < 0.05$). There is no significant difference in other scales (Table 6; $p > 0.05$).

The total score means of four-factor nutrition questionnaire and subscale do not vary according to the sports branches (Table 7; $p > 0.05$).

The total score means of four-factor nutrition questionnaire and subscale do not vary according to their income status (Table 8; $p > 0.05$).

Table 1. Distribution of the Working Group by Demographic Findings

Variable	Frequency	Percentage (%)	Cumulative Percentage (%)
Age			
20 and below	37	34.3	34.3
21-30	43	39.8	74.1
31 and above	28	25.8	100.0
Gender			
Male	68	63.0	63.0
Female	40	37.0	100.0
Disability Situation			
Congenital Disabilities	93	86.1	86.1
Disabled later	15	13.9	100.0
Educational Status			
Primary Education	10	9.3	9.3
High School	48	44.4	53.7
University	50	46.3	100.0
Sports Branch			
Individual sport	82	75.9	75.9
Team sport	26	24.1	100.0
Income status			
0 – 1000 TL	16	14.8	14.8
1001 - 2000 TL	89	82.4	97.2
2001 TL and above	3	2.8	100.0
Vision Degree			
B2	47	43.5	43.5
B3	61	56.5	100.0
Total	108	100.0	

The total score means of four-factor nutrition questionnaire and subscale do not vary according to the degree of vision (Table 9; $p>0.05$).

When looking at the general scales, there is a statistically 99% significant strong positive correlation between the total scores of the “Body Perception Scale”

Table 2. Change of Body Perception Scale Total Scores According to Demographic Findings

	Mean	Std. Deviation	p
Age			
0 – 20	81.83	10.15	0.138
21 - 30	77.60	8.98	
31 and above	80.17	9.39	
Gender			
Male	81.17	9.09	0.039
Female	77.25	10.02	
Disability Situation			
Congenital	79.84	9.51	0.733
Disabled Later	78.93	10.36	
Level of Education			
Primary Education	83.60	7.51	0.017
High School	81.79	10.56	
University	76.96	8.27	
Sports Branch			
Individual sport	79.92	9.93	0.696
Team sport	79.07	8.56	
Income status			
0 - 1.000 TL	78.87	8.27	0.524
1001 - 2000 TL	80.06	9.91	
2001 TL and above	74.00	4.58	
Vision Degree			
B2	79.63	8.32	0.937
B3	79.78	10.53	

and the “Four Factor Nutrition Survey” total scores. The correlation value was 0.359 ($p<0.001$). While the total scores of the body perception scale decreases, that is, the satisfaction of the body increases, the total scores of the four-factor nutrition survey also decrease, that is, the nutritional habits improve (Table 10) ($p<0,05$).

Discussion and Conclusion

Within the scope of the research, it was aimed to examine the relationship between body perception and nutrition of b2-b3 visually impaired athletes.

The total score mean of the body perception scale of male individuals by gender are higher than the total score mean of women. The satisfaction of women

Table 3. Findings Regarding the Nutrition and Subscale Scores of the Participants by Age

	Age Group						p
	0 - 20		21 - 30		31 and above		
	Mean	SD	Mean	SD	Mean	SD	
Level of Eating Restriction	11.59	3.11	9.90	3.09	10.92	2.78	0.051
Uncontrolled Eating Level	4.94	1.91	4.41	1.91	5.53	2.50	0.080
Eating Level at Emotional Times	13.29	3.61	12.90	3.41	13.35	3.71	0.805
Sensitivity Level to Hunger	8.29	3.16	7.55	2.38	7.85	2.87	0.647
Nutrition Survey	38.13	6.80	34.79	6.49	37.67	6.35	0.044

Table 4. Findings Regarding the Nutrition and Subscale Scores of the Participants by Gender

	Gender				p
	Male		Female		
	Mean	SD	Mean	SD	
Level of Eating Restriction	11.00	2.99	10.32	3.22	0.334
Uncontrolled Eating Level	5.07	2.26	4.57	1.79	0.354
Eating Level at Emotional Times	12.95	3.63	13.50	3.38	0.237
Sensitivity Level to Hunger	8.11	2.90	7.50	2.58	0.331
Nutrition Survey	37.14	6.53	35.90	6.96	0.352

Table 5. Findings Regarding Nutrition and Subscale Scores of Participants According to Disability Status

	Disability Situation				p-value (Sig.)
	Congenital		Disabled later		
	mean	SD	mean	SD	
Level of Eating Restriction	10.73	2.96	10.86	3.87	0.785
Uncontrolled Eating Level	4.72	1.94	5.93	2.81	0.118
Eating Level at Emotional Times	13.16	3.58	13.13	3.31	0.883
Sensitivity Level to Hunger	7.78	2.70	8.53	3.31	0.424
Nutrition Survey	36.39	6.21	38.46	9.20	0.269

Table 6. Findings Regarding Nutrition and Subscale Scores of Participants According to Educational Status

	Educational Status						p
	Primary Education		High School		University		
	mean	SD	mean	SD	mean	SD	
Level of Eating Restriction	11.30	3.80	11.04	3.13	10.36	2.89	0.629
Uncontrolled Eating Level	5.30	3.09	4.64	1.85	5.04	2.13	0.636
Eating Level at Emotional Times	15.00	3.80	12.22	3.12	13.68	3.67	0.038
Sensitivity Level to Hunger	8.50	2.87	7.85	2.96	7.80	2.64	0.743
Nutrition Survey	40.10	6.10	35.77	7.04	36.88	6.33	0.171

Table 7. Findings Regarding Nutrition and Sub-Scales Scores of Participants According to Sports Branch

	Occupation Branch				p
	Individual		Team sport		
	Mean	SD	Mean	SD	
Level of Eating Restriction	10.50	2.97	11.53	3.33	0.163
Uncontrolled Eating Level	4.73	2.06	5.38	2.22	0.116
Eating Level at Emotional Times	13.23	3.59	12.92	3.41	0.681
Sensitivity Level to Hunger	7.81	2.74	8.11	2.98	0.680
Nutrition Survey	36.28	6.61	37.96	6.89	0.266

Table 8. Findings Regarding Nutrition and Subscale Scores of Participants According to Income Status

	Income status						P
	0 - 1.000 TL		1001 - 2000 TL		2001 TL and above		
	Mean	SD	Mean	SD	Mean	SD	
Level of Eating Restriction	10.00	2.52	10.93	3.19	9.33	1.52	0.337
Uncontrolled Eating Level	5.12	2.02	4.87	2.14	4.00	1.73	0.611
Eating Level at Emotional Times	13.18	3.65	13.15	3.59	13.00	1.00	0.938
Sensitivity Level to Hunger	6.93	2.71	8.06	2.79	7.66	3.21	0.316
Nutrition Survey	35.25	6.52	37.03	6.79	34.00	3.60	0.486

Table 9. Findings Regarding Nutrition and Subscale Scores of Participants According to Vision Degree

	Vision Degree				P
	b2		b3		
	Mean	SD	Mean	SD	
Level of Eating Restriction	10.70	3.20	10.78	3.01	0.704
Uncontrolled Eating Level	4.95	2.07	4.83	2.15	0.611
Eating Level at Emotional Times	13.46	3.64	12.91	3.46	0.472
Sensitivity Level to Hunger	7.65	2.94	8.06	2.68	0.364
Nutrition Survey	36.78	6.69	36.60	6.74	0.890

with their body parts and functions is higher than men ($p < 0.05$). This finding obtained from the study is similar to the findings of İncekara (2018), Slater and Tiggemann (2010), in which the body perception of women is higher than the body perception of men (18-19). In short, we can say that whether women are disabled or not, their feelings and thoughts are in the same direction and differ from those of men.

Table 10. Relationship between Body Perception Scale Total Scores and Four Factor Nutrition Survey Total Scores

	Body Perception Scale	Four Factor Nutrition Survey
Body Perception Scale	1.00	0.35** (0.001)
Four Factor Nutrition Survey	0.35 (0.001)	1.00

** Correlation is significant at the 0.01 level.

As the educational status of the individual's increases, the total perception scale of the body perception scale decreases gradually. As the educational status increases, the satisfaction of individuals with their body parts and functions increases ($p < 0.05$). The findings of the research conducted by Yurdakul (2018) show similarity with the findings obtained from the research (20). As a result of the study, it is shown that education has a very effective role in body perception. We can say that thanks to education, individuals know their bodies better and they take necessary precautions.

Significant differences in body perception according to the age of people could not be obtained ($p > 0.05$). With this finding obtained from the study, the study findings of Kara (2019) and Aydın (2015) show similarities about that there is no significant difference between body perception and age (5-21). It was concluded that body perception is not effective for different ages. We can say that there is no difference since body perception has an important role for individuals of all ages.

There is no significant difference in the body perception of individuals according to disability status ($p > 0.05$). Studies that support this finding obtained from the research could not be reached. Whether individuals are congenital visually impaired or later, the purpose of both is to have an ideal body structure. We can say that both feelings and thoughts are in the same direction.

There is no significant difference in the body perception of individuals according to the sports branch ($p > 0.05$). Studies that support this finding obtained from the research could not be reached. As a result of the study with high school students, Mülazımoğlu (2001) determined that the perceptions of students who are athletes are more positive compared to students who are not athletes (22). In our study, individuals with

visual impairments actively exercise regularly. These athletes are professional athletes. These athletes are engaged in individual and team sports. We can say that visually impaired individuals, whether engaged in team sports or individual sports, are both more satisfied with what they find their bodies more attractive and what other non-sports disabled, or non-disabled individuals see. For this reason, it is thought that athletes with visual impairments tend to do more sports to reach these ideal bodies. We can say that as they are visually impaired, the athletes do sports to have a proper body, eating regularly, delaying aging, being happy, losing weight regularly, reducing stress, being healthy, and not depending on someone to keep their lives alone.

There is no significant difference in the body perception of individuals according to income status ($p>0.05$). This finding obtained from the study is similar to the study findings of Kara (2019), Incekara (2018), and Guzel (2016), in which there is no significant difference between body perception levels and income levels (5-18-23). We can say that body perception has no relation with income status. Although visually impaired individuals have different incomes, we state that body perception is important for all of them.

There is no significant difference in the body perception of individuals according to b2-b3 vision level ($p>0.05$). Studies that support this finding obtained from the research could not be reached. Whether individuals are b2 or b3 visually impaired, the purpose of both is to have an ideal body structure. We can say that the expectations of both are in the same direction.

The total score means of the four-factor nutrition survey of individuals varies according to the age groups of individuals ($p<0.05$). The total score means of the four-factor nutrition survey of people in the 21-30 age group is lower than the other age groups. The reason why the level of nutrition is low compared to other groups between the ages of 21 and 30 may be due to reasons such as the age range in different emotions and thoughts, that is, school life, marriage, and entering the business life. No significant difference was found for the subscales ($p>0.05$). We can say that although the visually impaired athletes are in different ages, as they know how to take nutrition regularly to perform in sports, they know the nutritional conditions. Also, they know that nutrition is very important for all ages.

Since disabled people have disabilities, nutrition is vital for them.

Individuals' total score means of four-factor nutrition survey and subscale do not vary according to their gender ($p>0.05$). The finding obtained from the research is similar to Tuğay's (2019) findings in which there is no significant difference in nutritional habits according to gender (24) and Koltaş et al.'s (2018) findings in which there is no difference in the assessment of the nutritional knowledge levels according to gender (25). We can say that due to the blindness of the visually impaired individuals, they pay attention to their nutritional levels so that both genders can live, be healthy, have adequate and balanced nutrition, have a beautiful appearance, that is, their body perception is smooth, have fun or socialize and act independently.

Individuals' total score means of four-factor nutrition survey and subscale do not vary according to their disability ($p>0.05$). Studies that support this finding obtained from the research could not be reached. Regular and balanced nutrition is very important for disabled individuals to continue their lives healthily. Since nutrition is vital for every living thing, we can mention that being visually disabled, whether born with it or being disabled later, does not affect nutrition.

The total score means of the "Eating at emotional times" subscale of the primary school graduates was higher than the high school and university graduates ($p<0.05$). Visually disabled individuals who are elementary school graduates tend to eat more because they cannot get out of the emotional state. We can say that the rate of eating increases when individuals cannot find a way to get out of their emotional state. There is no significant difference in the items of other nutrition surveys and subscales ($p>0.05$). Here we can state that education is not effective on nutrition. Regardless of the level of education in visually disabled individuals, we can say that they know the diet very well due to sports. They eat healthily as they are aware of the fact that malnutrition causes their body structures to deform and health problems.

Individuals' total score means of four-factor nutrition survey and subscale do not vary according to the sports branches ($p>0.05$). Studies that support this finding obtained from the research could not be reached. Although the sports branches of visually

disabled athletes are different, they pay attention to regular and balanced nutrition because they do regular sports. There is a programmed diet according to the sports branches. They cannot get out of the nutrition program. If they do not pay attention to nutrition, their performance decreases, they cannot do sports, and have health problems. Therefore, visually disabled athletes have a healthy lifestyle and diet even if they are in different branches. We can say that the diets are the same.

Individuals' total score means of four-factor nutrition survey and subscale do not vary according to their income status ($p>0.05$). The finding obtained from the research is similar to Erçim's (2014) findings in which there is no difference between healthy nutrition values according to income status (26). We can say that being visually disabled doesn't affect the level of nutrition even if they have different income levels. Visually disabled athletes pay great attention to nutrition as they are aware that healthily nutrition is very important. Otherwise, their performance will decrease in sports and they will not be able to get efficiency. We can say that this will be an end for them.

Individuals' total score means of four-factor nutrition survey and subscale do not vary according to the degree of vision ($p>0.05$). Studies that support this finding obtained from the research could not be reached. Nutrition is very important for disabled individuals to keep the immune system strong and to continue their lives peacefully and happily for a long time. Since nutrition is vital for every living thing, we can mention that having different vision levels does not affect their nutritional levels.

There is a statistically significant strong positive directional relationship between Body Perception Scale and Four Factor Nutrition Survey ($p<0.05$). The findings of Büyük and Özdemir (2018) and the findings of Uskun and Şabaplı (2013) are similar in terms of the fact that there is a positive correlation between eating attitude score and body perception score (27-28). While the total scores of the body perception scale of the visually disabled athletes decrease, that is, body satisfaction increases, the total scores of the four-factor nutrition survey also decrease. In another word, nutritional habits are improving. It has been concluded that body perception is extremely effective in nutrition. Our body needs to maintain a healthy life by

regulating nutritional habits. Since visually disabled individuals are disabled, they should pay attention to the diet. Because unbalanced nutrition will cause the body to restrict its movement area as a result of its disruption. This causes weight gain and will cause it to go out and disrupt health.

As a result, it was determined that the training programs, competitions, and resting intervals of the sports life of B2-B3 visually impaired athletes have an effective role on body perception that is body perception, because they have a controllable eating habit. In short, we can say that the thoughts or ideas of visually impaired athletes about body perception are extremely effective on nutrition. Since the sport is effective on disabled people, it can be ensured that disabled people who do not do sports can be made to do sport to have a proper body structure, to keep their diet under control, and continue their lives without being dependent on one.

Conflicts of interest: The authors declare that there is no conflict of interest in this manuscript.

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