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WEIGHT-HEIGHT PARAMETERS OF THE 2002 WORLD FOOTBALL CHAMPIONSHIP PARTICIPANTS

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Abstract. *Contemporary football tends more and more to demand appropriate body structure, strong, enduring bodies, extensive football intelligence, controlled aggressiveness, highly developed functional and motor abilities, and a sense for improvisation and a collective game, of football players. The aim of this research is to define the average values of all the 712 participants in the 2002 World Football Championship by analyzing height and body mass, as well as certain weight-height relations. The research results point to the fact that the average height of all the participants in the 2002 World Football Championship is 180.90 ± 6.13 cm and the average body mass is 75.91 ± 6.38 kg. The biggest average height was noted in the case goalkeepers, then defense and offense players, and the smallest height (178.36 ± 5.55 cm) and body mass (73.87 ± 5.55 kg) was noted in the case of connecting players. The first team of Brazilian football players, the champions of this tournament (2002), is distinguished from second ranked Germany and third ranked Turkey and all the other participants. Brazilian football players are on average younger, they have played longer for their national team, they are of smaller body mass and weight-height index.*

Key words: *height, mass, index, selection, football*

1. INTRODUCTION

A successful sport engagement demands continuous training from an early age. Apart from the training sessions, in order to succeed in contemporary sport it is essential for an athlete to possess certain genetically conditioned abilities and features. To meet the demands of state-of-the-art football it is necessary to continually perform guided selections from early on all the way to the national team selection.

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Contemporary football presupposes the existence of a certain body structure, of strong enduring football players marked by great football intelligence, controlled aggressiveness, and highly developed functional and motor abilities, with a sense for improvisation and a collective game (Borić, 1999; Elsner, 1997; Đurašković and Milojević, 2002; Mikelić, 2003).

The analyses up to date that have researched anthropometric dimensions point to the fact that contemporary football is dominated by football players of above-average height compared to the selected population, and their build tends to be athletic. The relation between height and body mass is equally important due to the fact that modern football implies duel play, jump head play, fast activities (alternating offense and defense), all of which are bound to efficient realization and the obligatory playing time during the entire match (Borić, 1999; Faina et al. 1988; Grajevska, 1972; Joksimović & Đorđević, 1985; Matković et al. 1999; Zelenika, 1983; White et al. 1988).

In contemporary football, there are fewer football players of lower body height. If there are such football players they have to have other qualities that make it possible for them to achieve the same results as the football players of greater body height.

The weight-height relationship of first-class football players observed through the index value of ideal body mass, the body mass index and Kettle's index represents the subject matter of this research.

The relationship among the participants of the 2002 World Football Championship represents the topic of this research.

The **aim** of the research is to analyze the height and body mass, along with certain weight-height relations of the 2002 World Football Championship participants and finally to define the average values for all the participants. The analysis will comprise the aforementioned features according to the playing positions of the team members (goalkeepers, defense, connection, offense) and the characteristics of the teams holding the first three positions in this Championship.

On the basis of the stated problem and the aim it is possible to formulate the hypothesis for this research: height and body mass, the body mass index, Kettle's weight-height index and the ideal body mass index are considerably greater in the case of goalkeepers, defense players and offence players, and are considerably smaller in the case of connection players compared to the average values of these indexes for all the 2002 World Football Championship participants.

The results of this research can be used in team selection and the national team selection as well, but can also be utilized for the selection of young football players striving towards top sports achievements.

2. METHODS

The participants' height and body mass were taken from the internet site of the 2002 World Football Championship in Japan and Korea. Some of the data was missing and therefore the exact number of the subjects analyzed will be mentioned.

The analysis numbered 712 football players, all participants of the 2002 World Football Championship. The age of the football players ranged from 18 to 39 with an average age of 27.49±3.87.

During the course of the research the following values have been analyzed: the age (GSTAR) of the 712 players, the number of times 689 players played for their national teams (BNURE), the body height of 700 players given in cm (AVIST), the body mass of 700 players given in kg (AMAST), the ideal body mass of 700 players given in kg (AITEM), the body mass index for 700 players given in kg/m^2 (BOMAI), and Kettle's weight-height index for 700 players given in gr/cm (AKETLIN). All the aforementioned characteristics have been analyzed for all the subjects and according to their playing positions on their teams.

The ideal body mass was measured according to the Lorenc index:

$$\text{ITM in kg} = (\text{VT} - 100) - [(\text{VT} - 150) \times 0.25] \text{ (Medved, 1987)}$$

The body mass index was measured according to the formula:

$$\text{BMI} = \text{body mass in kg / body height (in m)}^2 \text{ (Must et al., 1991)}$$

Kettle's index (weight-height index) was calculated according to the formula:

$$\text{TVI} = \text{Body mass in gr / body height in cm (Đurašković, 2002)}$$

The statistics were computer analyzed by means of the SPSS (Statistics Programme-Version 6). The computations refer to the basic statistic parameters: AV-average value, SD-standard deviation, MIN-and MAX values, and the *t*-test was used for statistic significance determination.

3. THE DISCUSSION OF THE RESULTS

The average height of all the participants is 180.90 ± 6.13 cm, and the body mass is on average 75.91 ± 6.38 kg, which is 2.73 kg more in relation to the average ideal body mass calculated by means of the Lorenc formula. The body mass index is 23.17 ± 1.29 kg/body height (in m)^2. These parameters show that the football players, participants of the 2002 World Football Championship belong to the average-nourished group of people. The maximum value of 29.07 shows that there are football players whose body mass is bordering on the level of the group of people with a tendency towards obesity. This can be explained by the fact that the superfluous weight of top football players is probably achieved through muscle mass and not fat tissue. Most of the football players have a height which exceeds 180.0 cm, 417 or 60.36% of the total number. A total of 549 subjects or 79.45% of the total number, have a body height of 176.0 cm. These findings show that contemporary football is demanding very tall football players (the results are shown in the Tables 1 and 7)

Table 1. Participants of the 2002 World Football Championship (N = 712)

Variables		SV	SD	MIN	MAX
GSTAR	(N = 712)	27.49	3.87	17.00	39.00
BNURE	(N = 689)	30.51	26.38	0.00	168.00
AVIST	(N = 700)	180.90	6.13	163.00	198.00
AMAST	(N = 700)	75.91	6.38	57.00	100.00
AITEM	(N = 700)	73.18	4.59	59.75	86.00
BOMAI	(N = 700)	23.17	1.29	18.61	29.07
AKETLIN	(N = 700)	419.18	26.26	335.29	512.82

The results shown in Table 2 deal with the weight-height values of the goalkeepers of the 2002 World Football Championship. The research included 87 goalkeepers of an age average of 29.50 ± 4.34. The difference in age between the oldest and the youngest of the goalkeepers, participants in this Championship, is 21 years. The average height of the goalkeepers is 186.42 ± 5.27 cm which exceeds the height average of the participants in the Championship. The average body mass of the goalkeepers is 81.62 ± 6.30 kg which is on average 4.31 kg more compared to the average ideal body mass calculated by means of the Lorenc formula. The average values of the body mass index are within the limits set for people of normal body weight.

The most of the goalkeepers have a height that exceeds 180.0 cm or a total of 93.10%, and 24.14% of the goalkeepers have a height that exceeds 190.0 cm.

The results are shown in Table 11.

A height of 171.0 cm was noted in the case of just one goalkeeper (Table 2). Higher values for the height of goalkeepers compared to the average height of football players has been noted and cited by more than one author (Joksimović & Djordjević, 1985; Grajevska, 1972).

Elzner (1997) in "The Model Player" gives the Austrian model in which the football player's height is at least 175.0 cm and the goalkeeper's height is at least 180.0 cm.

Stojanovic et al. (1969) state that the average height on the national football team is 176.0 cm and that the average weight is 73.27 kg.

Verdenik (1999) speaks about the Slovenian national football team model in which the average height is 173.3 cm and the body mass is 68.85 kg in the case of seniors, and 172.3 cm and 64.20 kg in the case of cadets, and 170.0 cm and 60.65 kg in the case of older pioneers.

Contemporary football demands experienced goalkeepers. The average age is 29.50 ± 4.34 which is above the average age of all the Championship participants.

Previous research has shown that the height of the football players has changed from an average height of 170.3 cm in 1928 to an average height of 180.9 cm in 2002. This is the result of all the guided selections and partly of the acceleration in growth and development (Joksimović & Djurašković, 1984).

Table 2. Goalkeepers of the 2002 World Championship (N = 88)

Variables	SV	SD	MIN	MAX
GSTAR	29.50	4.34	18.00	39.00
BNURE	27.21	29.78	1.00	168.00
AVIST	186.42	5.27	171.00	198.00
AMAST	81.62	6.30	63.00	94.00
AITEM	77.31	3.95	65.75	86.00
BOMAI	23.48	1.35	18.61	27.17
AKETLIN	437.57	27.25	342.39	502.70

The results of Table 3 show the statistical significance of the fact that goalkeepers have a greater average age, height and body mass, ideal body mass, body mass index and Kettle's index. The number of times they played for their national teams has not been determined.

Table 3. Statistically significant differences between football players and goalkeepers in the 2002 World Football Championship regarding the age means, the number of games played for their national teams, height and body mass, body mass index and Kettle' s index.

Variables	All the participants		Goalkeepers		T	P
	SV	SD	SV	SD		
GSTAR	27.49	3.87	29.50	4.34	–4.18	< 0.001
BNURE	30.51	26.38	27.21	29.78	0.99	> 0.05
AVIST	180.90	6.13	186.42	5.27	–9.20	< 0.001
AMAST	75.91	6.38	81.62	6.30	–8.04	< 0.001
AITEM	73.18	4.59	77.31	3.95	–4.39	< 0.001
BOMAI	23.17	1.29	23.48	1.35	–2.06	< 0.05
AKETLIN	419.18	26.26	437.57	27.25	–6.01	< 0.001

T > 1.96 is 0.05 significant, > 2.57 is 0.01 significant, > 3.291 is 0.001 significant

Defense football players are of an average height of 181.87 ± 5.57 cm which is also above the average height of all the participants of this Championship. The height of 68 players, or 69%, is within the range of the 180.0 cm height level, and the taller players, over 190.0 cm, make up 7.01% or 15 out of the 214 football players. The height of 176-179.9 cm was noted in the case of 38 football players or 17.76%. The number of football players of a height of 169.0 cm or shorter is the smallest, and makes up 1.87% of the total number of players. Defense football players are characterized by an average height which is above the average for all the participants of the World Championship (Tables 4, 10 and 11). The average body mass of the defense players is 3 kg greater than the average ideal body mass. In the case of the goalkeepers the difference is 1 kg less, indicating that defense players weigh less. The average participation on the national team is greater in the case of defense players compared to the goalkeepers.

This points to the fact that when selecting defense football players we have to choose those of a greater height, strong players with body mass index values which are in the range of a normally-nourished person and those who have more extensive international experience. The goalkeeper of the national team has to have great experience in playing for the national team and experience regarding international matches.

Table 4. Defense football players participants of the 2002 World Championship (N = 219)

Variables	SV	SD	MIN	MAX
GSTAR	27.60	3.65	21.00	39.00
BNURE	30.91	27.12	1.00	130.00
AVIST	181.87	5.57	168.00	196.00
AMAST	76.94	5.51	63.00	91.00
AITEM	73.90	4.18	63.50	84.50
BOMAI	23.25	1.19	19.87	29.07
AKETLIN	422.79	22.98	367.56	497.07

Table 5. The statistically significant difference between all the football players and the defense players in the 2002 World Football Championship regarding the means of age, playing for their national teams, height and body mass, the body mass index and Kettle's index

Variables	All the World Championship participants		Defense (back) football players, participants of the World Championship		T	P
	SV	SD	SV	SD		
GSTAR	27.49	3.87	27.60	3.65	–0.39	> 0.05
BNURE	30.51	26.38	30.91	27.12	–0.19	> 0.05
AVIST	180.90	6.13	181.87	5.57	–2.25	< 0.05
AMAST	75.91	6.38	76.94	5.51	–2.34	< 0.05
AITEM	73.18	4.59	73.90	4.18	–2.18	< 0.05
BOMAI	23.17	1.29	23.25	1.19	–0.88	> 0.05
AKETLIN	419.18	26.26	422.79	22.98	–2.09	< 0.05

T > 1.96 is 0.05 significant; > 2.57 is 0.01significant; > 3.291 is 0.001 significant

Defense players are on average of greater height and body mass, ideal body mass and Kettle's weight-height index, compared to the average values of all the participants of the World Football Championship. There is no difference in average age, playing time for the national team and body mass index. This points to the fact that selected defense players must be above average in their height, body mass and weight-height index (Table 5).

Football players playing in the mid-field position (connecting players) are characterized by an average height of 178.36 ± 5.55 cm which is lower than the average height of all the participants of the World Championship. The largest number of football players, 157 or 67.67%, is in the height range of 176 to 189.9 cm (Tables 6, 10 and 11). The average body mass of the connecting players is 1.8 kg greater than the ideal body mass of the mentioned line position players, which is the smallest difference. Both the body mass index as well as Kettle's weight-height index for the connection line players are on average the smallest values compared to the players of other line positions on the team. All the mentioned values of body mass, ideal body mass, the body mass index and Kettle's weight-height index point to the fact that relatively small body mass is necessary for the football players who are characterized by impressive endurance and a large movement radius.

Table 6. Football players of the connecting line (mid-field line) participants of the 2002 World Championship (N = 234)

Variables	SV	SD	MIN	MAX
GSTAR	27.28	3.56	19.00	37.00
BNURE	32.57	25.17	1.00	155.00
AVIST	178.36	5.55	163.00	193.00
AMAST	73.07	5.55	57.00	88.00
AITEM	71.27	4.16	59.75	82.25
BOMAI	22.96	1.33	19.72	29.06
AKETLIN	409.39	24.48	335.29	491.12

Table 7. The statistically significant difference between all the football players and the connection line players in the 2002 World Football Championship regarding the means of age, playing for their national teams, height and body mass, the body mass index and Kettle's index

Variables	All the participants of the World Football Championship		Football players of the connecting line in the World Football Championship		T	P
	SV	SD	SV	SD		
GSTAR	27.49	3.87	27.28	3.56	0.77	> 0.05
BNURE	30.51	26.38	32.57	25.17	–1.07	> 0.05
AVIST	180.90	6.13	178.36	5.55	6.04	< 0.001
AMAST	75.91	6.38	73.07	5.55	5.13	< 0.001
AITEM	73.18	4.59	71.27	4.16	5.96	< 0.001
BOMAI	23.17	1.29	22.96	1.33	2.33	< 0.05
AKETLIN	419.18	26.26	409.39	24.48	5.20	< 0.001

T > 1.96 is 0.05 significant; > 2.57 is 0.01 significant; > 3.291 is 0.001 significant

Table 7 shows that the average values of height and body mass, ideal body mass, the body mass index and Kettle's index are statistically significant and lower than the values for all the participants in the World Football Championship. This points to the fact that the selected mid-field line players should have a smaller body mass in both absolute and relative values compared to the body mass of all the other football players.

The height of the offense players is 180.27 ± 5.76 cm and is within the range of the average height of all the participants of the 2002 World Championship. The majority of the players (108) or 68.35%, are in the height range of 176-189.9 cm. Only 11 offense players or 6.96% have a height that exceeds 190.0 cm. The difference between the average values of the ideal body mass and the average body mass of the offense players is 2.68 kg. The body mass index is within the limit which points to normal body mass (Tables 8 and 10). The average playing time for the national team is greater than for the other player position lines analyzed, which shows that one should engage more experienced players to play offense and, in the national team selection, should choose players with extensive international experience. It is interesting that the average age of the offense players has lesser values compared to that of the players of the other lines or positions (Table 10).

Table 8. Offense football players in the 2002 World Championship (N = 169)

Variables	SV	SD	MIN	MAX
GSTAR	26.71	3.82	18.00	37.00
BNURE	32.55	24.83	1.00	148.00
AVIST	180.27	5.76	166.00	197.00
AMAST	75.38	6.19	59.00	100.00
AITEM	72.70	4.32	62.00	85.25
BOMAI	23.18	1.33	18.72	26.79
AKETLIN	417.78	26.26	338.98	512.82

Table 9. The statistically significant difference between all the football players and offence players in the 2002 World Football Championship regarding the means of age, participation in their national teams, height and the body mass, the body mass index and Kettle's index

Variables	All the participants		Offence players		T	P
	SV	SD	SV	SD		
GSTAR	27.49	3.87	26.71	3.82	2.16	< 0.05
BNURE	30.51	26.38	32.55	24.83	–0.94	> 0.05
AVIST	180.90	6.13	180.27	5.76	1.28	> 0.05
AMAST	75.91	6.38	75.38	6.19	1.00	> 0.05
AITEM	73.18	4.59	72.70	4.32	1.29	> 0.05
BOMAI	23.17	1.29	23.18	1.33	–0.09	> 0.05
AKETLIN	419.18	26.26	417.78	26.26	0.62	> 0.05

T = 1.96 is 0.05 significant; > 2.57 is 0.01significant; > 3.291 is 0.001significant

Offence players in the 2002 World Football Championship have statistically significant and lower values in regards to age. All the other parameters that have been analyzed are almost identical. The results show that offense players should be younger compared to the other players. Their length of their sports careers, body mass and height should be identical to those of all the other players.

Table 10. All the participants, goalkeepers, defense, connecting line and offense players of the 2002 World Football Championship

Category	All the participants		Goalkeepers		Defense players		Connecting line players		Offense	
Variables	SV	SD	SV	SD	SV	SD	SV	SD	SV	SD
GSTAR	27.49	3.87	29.50	4.34	27.60	3.65	27.28	3.56	26.71	3.82
BNURE	30.51	26.38	27.21	29.78	30.91	27.12	32.57	25.17	32.55	24.83
AVIST	180.90	6.13	186.42	5.27	181.87	5.57	178.36	5.55	180.27	5.76
AMAST	75.91	6.38	81.62	6.30	76.94	5.51	73.07	5.55	75.38	6.19
AITEM	73.18	4.59	77.31	3.95	73.90	4.18	71.27	4.16	72.70	4.32
BOMAI	23.17	1.29	23.48	1.35	23.25	1.19	22.96	1.33	23.18	1.33
AKETLIN	419.18	26.26	437.57	27.25	422.79	22.98	409.39	24.48	417.78	26.26

By analyzing Kettle's weight-height index we can conclude that its highest value was noted in the case of goalkeepers and is, on average, 437.57 ± 27.25 gr/cm, and that its lowest value was noted in the case of connecting line players 409.39 ± 24.48 gr/cm. This can be explained by the fact that for the mentioned lines and for the purpose of successfully accomplishing the set tasks of the football game, a certain weight-height relation is obligatory.

Table 11. The number and the percentage of the 2002 World Championship football players aligned according to height and their position on their teams

Category	All the participants		Goalkeepers		Defense players		Connecting line players		Offence players	
Height cm	Number	%	Number	%	Number	%	Number	%	Number	%
190.0 >	52	7.53	21	24.14	15	7.00	5	2.16	11	6.96
180-189.9	365	52.82	60	68.96	132	61.68	97	41.81	76	48.10
176-179.9	132	19.11	2	2.30	38	17.76	60	25.86	32	20.25
170-175.9	122	17.65	4	4.60	25	11.68	55	23.71	38	24.05
169.9 cm <	20	2.89	0	0.00	4	1.88	15	6.46	1	0.64
Total	691	100.00	87	100.00	214	100.00	232	100.00	158	100.00

Tables 10 and 11 show a survey of the weigh-height relation of all the players and the players according to the position lines which they take on their national team selection in the form of numbers and percentages representing the height of the participants in the 2002 World Football Championship. This is done purposefully because the cited relations can be used in the practical work of the coaches when creating the model of the team.

Table 12. The first Brazilian team, the winner of the 2002 World Championship (N = 11)

Variables	SV	SD	MIN	MAX
GSTAR	27.09	2.84	22.00	32.00
BNURE	42.09	30.46	12.00	103.00
AVIST	182.36	6.65	168.00	193.00
AMAST	76.27	4.38	70.00	86.00
AITEM	74.27	4.99	63.50	82.25
BOMAI	22.95	1.07	21.10	24.80
AKETLIN	418.14	15.19	392.47	445.59

Table 13.The first German team, ranked second in the 2002 World Football Championship (N = 11)

Variables	SV	SD	MIN	MAX
GSTAR	29.45	2.29	26.00	34.00
BNURE	33.45	15.09	9.00	66.00
AVIST	184.45	6.76	171.00	193.00
AMAST	80.54	8.04	64.00	93.00
AITEM	75.84	5.07	65.75	82.25
BOMAI	23.62	1.27	21.28	24.97
AKETLIN	435.94	31.54	374.27	481.86

Table 14. The first Turkish team, ranked third in the 2002 World Football Championship (N = 11)

Variables	SV	SD	MIN	MAX
GSTAR	28.64	2.20	25.00	32.00
BNURE	39.45	21.59	12.00	72.00
AVIST	180.36	7.47	168.00	191.00
AMAST	75.82	6.55	65.00	89.00
AITEM	72.77	5.60	63.50	80.75
BOMAI	23.30	1.46	21.39	26.57
AKETLIN	420.03	26.93	386.90	486.34

Table 15. Weight-height relations of the first national teams of Brazil, Germany and Turkey

Variables	Brasil		Germany		Turkey	
	SV	SD	SV	SD	SV	SD
GSTAR	27.09	2.84	29.45	2.29	28.64	2.20
BNURE	42.09	30.46	33.45	15.09	39.45	21.59
AVIST	182.36	6.65	184.45	6.76	180.36	7.47
AMAST	76.27	4.38	80.54	8.04	75.82	6.55
AITEM	74.27	4.99	75.84	5.07	72.77	5.60
BOMAI	22.95	1.07	23.62	1.27	23.30	1.46
AKETLIN	418.14	15.19	435.94	31.54	420.03	26.93

Football players of the first team of Brazil, the winners of the 2002 World Football Championship are characterized by an average body height 182.36 ± 6.65 cm which is above the average height of all the participants of this championship. The difference between the ideal body mass of players is the smallest and is 2 kg on average. The body mass index and Kettle's weight-height index is on average the smallest value compared to the first national team of Germany and the national team of Turkey. Football players of the winning team of the Championship are on average younger, and have played longer for their national team. This shows grater international experience of the first team of Brazil in relation to the German national team, which is ranked second, and in relation to Turkey, which is ranked third in the 2002 World Championship.

4. CONCLUSION

On the basis of the analyses of the body mass, height, the number times they had played for the national team, ideal body mass, the body mass index and the weight-height index of 715 participants of the 2002 World Football Championship it can be concluded that:

1. The average height of the participants of the Football Championship is 180.90 ± 6.38 cm, and the average body mass is 75.91 ± 6.38 kg which is above the average values for height of the national team players, starting from 1928 and up to 1980 and is below the average height of the Yugoslav national team players in 2001 (Barić, 2000; Bošković 2001; Elsner, 1997; Faina et al., 1998). The results of this research show that contemporary football demands players whose body height is above the average height of the population out of which they were selected. Certain lines in the team demand an above-average height (goalkeepers, offense and defense players). The smallest average height is to be found in the case of field players (players on the connecting line).
2. The smallest body mass, on average, is to be found in the case of connecting line players, while goalkeepers have the greatest body mass. The biggest aberration of the Lorenz formula is to be found in the case of the goalkeepers, the defense players, offense players and the least aberration is to be found in the case of football players of the connecting line.
3. Values of the body mass index as well as the weight-height index are the largest in the case if the goalkeepers, then the defense and offense players and they are the

smallest in the case of connecting line players. It can also be said that the connecting line players have the lowest body mass values.

4. The first team or the winners of the World Football Championship (Brazilian football players) are characterized by a grater average height in relation to all the participants, the smallest difference in the average body mass in relation to the body mass of all the participants, the smallest average values of the body mass index and Kettle's weight-height in relation to the average values of all the participants of the Championship, and of the football players of the first national teams of Germany and the third ranked national team of Turkey.

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TEŽINSKO VISINSKI POKAZATELJI FUDBALERA UČESNIKA SVETSKOG PRVENSTVA 2002 GODINE

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Savremeni fudbal sve više zahteva fudbalere određe telesne građe, snažne, izdržljive, velike fudbalske inteligencije, kontrolisane agresivnosti, visokih funkcionalnih i motoričkih sposobnosti, koji imaju smisao za improvizaciju i kolektivnu igru. Cilj ovog istraživanja je da se analizom visine i mase tela i određenih težinsko visinskih odnosa učesnika Svetskog prvenstva u fudbalu 2002. godine utvrde prosečne vrednosti visine i mase tela kao i određenih težinsko visinskih odnosa posmatranih odgovarajućim indeksima.Uzorak ispitanika sačinjavalo je 712 fudbalera učesnika Svetskog prvenstva u fudbalu. Rezultati istraživanja ukazuju da prosečna visina, svih fudbalera učesnika Svetskog prvenstva u fudbalu 2002. godine, iznosi 180,90 ± 6,13 cm, a prosečna telesna masa 75,91 ± 6,38 kg. Najveće prosečne visine su golmani, zatim su to fudbaleri odbrane, napada i najmanje prosečne visine (178,38 ± 5,55 cm) i mase tela (73,87 ± 5,55 kg) su fudbaleri sredine terena (veznog reda). Prvih 11 fudbalera Brazila koji su osvojili prvo mesto na Svetskom prvenstvu u fudbalu 2002. godine, razlikuju se u ispitivanim pokazateljima od drugoplasirane Nemačke i Turske ekipe, a i svih drugih učesnika. Fudbaleri Brazila su u proseku numerički mlađi, imaju duži reprezentativni staž, manje su prosečne telesne mase i visinsko težinskih indeksa.

Ključne reči: *visina, masa, indexi, selekcija, fudbal*