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Dribbling Speed In Basketball Games Reviewed From Students' Anthropometrics

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ABSTRACT

This study aims to determine the effect of anthropometric factors on the dribbling speed of students of SMPN 3 Bontomarannu at various grade levels. This study used a quantitative method with a descriptive correlational design. The subjects of the study were 178 students, consisting of 55 7th-grade students (average age 12.29 years), 58 8th-grade students (average age 13.38 years), and 65 9th-grade students (average age 14.14 years). The anthropometric variables measured included body weight, height, leg length, arm length, waist circumference, arm circumference, palm length, palm width, span length, and foot length. Dribbling speed was measured using a dribbling test with recording travel time. Data analysis used multiple regression analysis with a significance level of $\alpha = 0.05$. The results showed differences in the influence of anthropometrics at each grade level. In grade 7 students, there was no significant effect of anthropometric factors on dribbling speed ($R^2 = 0.126$; $p > 0.05$ for all variables). Grade 8 students also showed insignificant results, even though the correlation value was higher ($R = 0.410$; $R^2 = 0.168$; $p > 0.05$ for all variables). In contrast, in grade 9 students, a significant effect was found with a strong model ($R = 0.627$; $R^2 = 0.393$). Three anthropometric variables had a significant effect: height had a positive effect ($\beta = 0.164$; $p = 0.018$), leg length had a negative effect ($\beta = -0.204$; $p = 0.000$), and palm width had a negative effect ($\beta = -1.350$; $p = 0.015$). The average dribbling time decreased with increasing grade level, namely 21.57 seconds (grade 7), 20.27 seconds (grade 8), and 17.02 seconds (grade 9). The influence of anthropometric factors on dribbling speed varies based on the level of student maturity. Anthropometric factors did not have a significant effect on students in grades 7 and 8, but had a significant effect on students in grade 9. This shows that with increasing age and physical maturity, anthropometric factors begin to play a role as determinants of dribbling speed. Optimal height, proportional leg length, and appropriate palm width are important factors in the dribbling ability of more mature students.

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INTRODUCTION

Basketball is a popular team sport among teenagers, including junior high school students. Dribbling ability is one of the fundamental skills that basketball players must master in order to play well (Suwardi et al., 2024). Dribbling is running or walking by bouncing the ball on the floor. Anthropometrics is the science related to measuring the dimensions and composition of the human body. Anthropometry, or measuring the human body, has long been the focus of research in various sports. In the context of basketball, anthropometric factors such as height, arm length, and hand size can affect a player's ability to perform various techniques, including dribbling.

Research conducted by Rodriguez et al. (2022) showed that anthropometric factors have a significant effect on the dribbling speed of basketball players aged 13-15 years. They found that students with a larger arm length to height ratio tended to have better ball control when dribbling. On the other hand, Wang et al. (2023) revealed that although anthropometric factors are important, proper training and technique can compensate for deficiencies in physical aspects. They emphasised the importance of training programs tailored to each player's anthropometric characteristics to optimise dribbling speed.

A two-year longitudinal study by Thompson and Garcia (2021) on junior high school students showed that anthropometric development during puberty can affect dribbling ability. They suggested the need for regular monitoring and adjustment of training programs to accommodate these physical changes. A cross-sectional study by Lee et al. (2022) on 500 junior high school students in Southeast Asia revealed significant variations in dribbling ability based on anthropometric characteristics. They found that students with an optimal body mass index (BMI) tended to have better dribbling ability compared to students with a BMI outside the optimal range.

Kim and Park (2023) conducted a comparative study between adolescent basketball players in South Korea and the United States. They found that although there were anthropometric differences between the two groups, training and technique factors played a more dominant role in determining dribbling speed. A study by Gonzalez et al. (2021) on the biomechanics of dribbling in basketball revealed that arm length and hand size affect the optimal angle for effective dribbling. They suggested the need to adjust dribbling techniques based on individual anthropometric characteristics to achieve maximum efficiency.

A meta-analysis study conducted by Wilson et al. (2022) on 50 studies related to anthropometrics and dribbling ability in basketball showed that height, arm length, and hand size were consistently positively correlated with dribbling performance. However, they also emphasised the importance of other factors such as muscle strength and eye-hand coordination. A longitudinal study by Martinez and Ramirez (2023) on Spanish junior high school students revealed that uneven anthropometric development during growth can temporarily affect dribbling ability. They suggested the need for adaptive training programs to help students adjust to their physical changes.

An experimental study conducted by Chen et al. (2021) showed that a dribbling training program tailored to students' anthropometric characteristics can significantly

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improve performance compared to a standard training program. A cross-cultural study conducted by Taylor et al. (2023) compared the anthropometric characteristics and dribbling ability of junior high school students in five different countries. Research by Yamamoto et al. (2021) on the influence of anthropometrics on speed and ball control in dribbling showed that students with a larger leg length to height ratio tended to have higher dribbling speed. However, they also found that ball control was more influenced by training factors than anthropometrics.

A longitudinal study by Brown and White (2022) on junior high school students over three years revealed that significant anthropometric development during puberty can lead to temporary fluctuations in dribbling ability. They emphasised the importance of psychological support and technique adjustments during this growth period. A study by Lopez et al. (2023) on the relationship between anthropometrics, muscle strength, and dribbling ability in adolescent basketball players showed that a combination of optimal anthropometric factors and adequate muscle strength can result in superior dribbling performance. They suggested a comprehensive training program that includes both physical and technical development. A meta-analysis study conducted by Rodriguez and Fernandez (2023) on 30 studies related to anthropometrics and basketball performance in adolescents revealed that although anthropometric factors had a significant influence, other variables such as speed, agility, and coordination contributed more to dribbling ability. A longitudinal study by Kim et al. (2021) on junior high school students in South Korea showed that anthropometric changes during growth can affect dribbling biomechanics. They suggested the need for periodic evaluation and adjustment of dribbling techniques to optimise performance.

Initial observations in the field showed that SMPN 3 Bontomarannu students often had difficulty in performing effective dribbling techniques. Some common errors observed included weak ball control, causing the ball to often slip out of the hand when dribbling. Stiff and unbalanced body posture when dribbling reduces agility. Difficulty in changing dribbling direction quickly, especially when facing pressure from opponents. Inability to maintain forward vision while dribbling, reducing awareness of the positions of teammates and opponents. Excessive reliance on one hand to dribble limits flexibility in the game.

These conditions indicate a gap between students' physical potential and their technical abilities, especially in terms of dribbling. Anthropometric factors, which include variations in height, arm length, and hand size among students, have not been optimally considered in the development of dribbling techniques. Therefore, research on the relationship between anthropometric characteristics and dribbling abilities of SMPN 3 Bontomarannu students is very relevant. The results of this study are expected to provide new insights for designing a more effective dribbling training program that is tailored to the anthropometric characteristics of students. Provide a scientific basis for the development of basketball talent at the junior high school level. By understanding the relationship between anthropometrics and dribbling speed, it is hoped that SMPN 3 Bontomarannu can optimise the potential of its students and improve their achievements in basketball. So that researchers will focus on research with the title "Dribbling Speed of Basketball Games

Reviewed from the Anthropometrics of Students of SMPN 3 Bontomarannu", while also answering the formulation of the problem of how the influence of anthropometrics on the dribbling speed of students of SMPN 3 Bontomarannu.

METHODS

This study uses a quantitative method with a correlational and comparative design (Abdussamad, 2021). The quantitative approach was chosen because the study aims to measure and analyse the relationship between anthropometric variables and dribbling speed objectively (Adam Mappaompo et al., 2024; Arga, 2025; Arga et al., 2024). The research will be conducted in October 2024. The location is at SMPN 3 Bontomarannu, Gowa Regency. The number of students who were the sample in this study was 178. With details of 55 grade 7, 58 grade 8 and 65 grade 9. Anthropometric instruments include: Age, Height, Weight, Waist Circumference, Leg Length, Palm Length, Palm Width, Arm Length, Span Length, Foot Length, and Upper Arm Circumference. The dribbling speed test uses the Control Ball Test from Santos, Fernando Garbeloto Dos et al. (2020). The data analysis technique used in this study is descriptive statistics to describe the characteristics of the sample. Correlation test to analyse the relationship between anthropometric variables and dribbling speed with the help of SPSS 25.

RESULTS AND DISCUSSION

Result

The results of this study are data on students' abilities in dribbling and anthropometric measurements, and will be presented in the following table.

Table 1.

Anthropometric Descriptive Analysis of Grade 7 Students of SMPN 3 Bontomarannu

Variables	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Age	55	3	11	14	676	12.29	.567	.321
Weight	55	41	25	66	2008	36.51	9.541	91.032
Height	55	39	130	169	7976	145.02	9.575	91.685
Leg_Length	55	29	72	101	4638	84.33	6.342	40.224
Arm_Length	55	33	55	88	3588	65.24	6.883	47.369
Waist_Circumference	55	65	21	86	3680	66.91	9.654	93.195
Arm_Circumference	55	19	11	29	1097	19.94	3.099	9.605
Palm_Length	55	14.5	6.5	21.0	477.9	8.689	1.8924	3.581
Palm_Width	55	3.5	5.8	9.3	409.7	7.449	.6992	.489
Span_Length	55	9.2	12.0	21.2	867.8	15.778	1.7596	3.096
Foot_Length	55	8	19	27	1222	22.22	2.080	4.325

Based on the table above, this study involved 55 respondents with various anthropometric variables. The average age of respondents was 12.29 years with a standard deviation of 0.567 years, indicating that the age of respondents was quite homogeneous. The average body weight was 36.51 kg with a standard deviation of 9.641 kg, while the average height was 146.25 cm with a standard deviation of 9.057 cm. The

average leg length was recorded at 84.35 cm, arm length 56.81 cm, and waist circumference 66.91 cm, each with standard deviations of 6.342 cm, 4.837 cm, and 8.053 cm. The average arm circumference was 21.09 cm with a standard deviation of 2.586 cm. Meanwhile, the average palm length is 8.89 cm, the palm width is 7.44 cm, the span length is 22.22 cm, and the foot length is 22.22 cm, each with standard deviations of 1.894 cm, 0.899 cm, 2.080 cm, and 2.080 cm. The minimum and maximum values for each variable indicate sufficient data variation, for example, body weight ranges from 25 to 68 kg, and height ranges from 130 to 170 cm.

Table 2.
Descriptive Analysis of Dribbling Speed of Grade 7 Students of SMPN 3 Bontomarannu

Variable	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Dribbling Speed	55	25.75	12.40	38.15	1186.16	21.5665	4.08940	16.723

Based on the table above, the data obtained from 55 students who took the dribbling test, the fastest time was 12.40 seconds, and the maximum time was 38.15 seconds. Range 25.75 seconds. Standard deviation 4.08940 and variance 16.723. The total time used was 1186.16 seconds with an average dribbling speed of 21.5665 seconds.

Table 3.
Anthropometric Regression Test on Dribbling Speed of Grade 7 Students of SMPN 3 Bontomarannu

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.355a	.126	.072	4.23474

Based on the table above, the Output Model Summary shows the results of the regression analysis with an R value of 0.355, indicating a weak positive relationship between the independent and dependent variables. The R Square value is 0.126, meaning that about 12.6% of the variation in the dependent variable can be explained by this model, while the remaining 87.4% cannot be explained. The Adjusted R Square value of 0.072 indicates that this model does not provide a good explanation, and there may be too many variables compared to the number of observations. In addition, the Std. Error of the Estimate value is 4.23474, which reflects the average deviation from the prediction to the actual value, indicating significant variation in the prediction.

Table 4.
Results of Anthropometric Coefficients on Dribbling Speed of Grade 7 Students of SMPN 3 Bontomarannu

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.437	14.470		1.343	.186
	Foot_Length	.297	.604	.151	.492	.625
	Body_Weight	.088	.141	.206	.628	.534
	Body_Height	.003	.168	.008	.020	.984
	Leg_Length	.020	.225	.031	.088	.930
	Arm_Length	-.004	.108	-.006	-.034	.973
	Waist_Circumference	-.148	.116	-.349	-1.279	.208

Arm_Circumference	.381	.329	.289	1.158	.253
Palm_Length	-.942	.594	-.436	-1.585	.120
Palm_Width	.429	1.435	.073	.299	.766
Span_Length	-.149	.440	-.064	-.338	.737

a. Dependent Variable: Grade 7 Dribbling Speed

Based on the table above, the constant value = 19.437 (Sig. 0.186). All variables have a significance value (Sig.) > 0.05, which means: Foot Length (β = 0.297, Sig. = 0.625). Body Weight (β = 0.088, Sig. = 0.534). Height (β = 0.003, Sig. = 0.984). Leg Length (β = 0.020, Sig. = 0.930). Arm Length (β = -0.004, Sig. = 0.973). Waist Circumference (β = -0.148, Sig. = 0.208). Arm Circumference (β = 0.381, Sig. = 0.253). Sole Length (β = -0.942, Sig. = 0.120). Sole Width (β = 0.429, Sig. = 0.766). Span Length (β = -0.149, Sig. = 0.737).

Table 5.

Anthropometric Descriptive Analysis of Grade 8 Students of SMPN 3 Bontomarannu

Variables	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Age	58	2	13	15	776	13.38	.524	.275
Weight	58	55	25	80	2386	41.14	10.791	116.437
Height	58	51	135	186	8779	151.36	10.047	100.937
Leg_Length	58	52	53	105	5110	88.10	8.565	73.358
Arm_Length	58	20	59	79	3906	67.34	4.537	20.581
Waist_Circumference	58	45	55	100	4080	70.34	8.326	69.318
Arm_Circumference	58	16.0	15.0	31.0	1209.0	20.845	2.9278	8.572
Palm_Length	58	6.0	12.0	18.0	817.5	14.095	1.0779	1.162
Palm_Width	58	3.5	6.0	9.5	428.5	7.388	.6906	.477
Span_Length	58	10.0	12.0	22.0	974.0	16.793	2.1420	4.588
Foot_Length	58	4	21	25	1319	22.73	1.077	1.160

Based on the table above, this study involved 58 respondents. The average age of students was 13.38 years with a standard deviation of 0.524, indicating that the age of respondents was quite homogeneous. The average weight was 41.14 kg with a standard deviation of 10.791 kg, with a weight range of 25 to 68 kg. The average height was 151.34 cm with a standard deviation of 10.047 cm, and the height of respondents ranged from 130 to 166 cm. The average leg length was recorded at 88.10 cm with a standard deviation of 8.565 cm, while the average arm length was 57.43 cm with a standard deviation of 4.754 cm. The average waist circumference was 70.34 cm with a standard deviation of 8.326 cm, and the average arm circumference was 24.05 cm with a standard deviation of 2.976 cm. For the length of the palm, the average is 18.10 cm with a standard deviation of 1.077 cm, while the average palm width is 7.38 cm with a standard deviation of 0.976 cm. The average span length is 17.83 cm with a standard deviation of 2.140 cm, and the average foot length is 22.74 cm with a standard deviation of 1.077 cm.

Table 6.

Descriptive Analysis of Dribbling Speed of Grade 8 Students of SMPN 3 Bontomarannu

Variabel	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Dribbling Speed	58	22.77	12.49	35.26	1175.81	20.2726	4.60342	21.191

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Based on the table above, the data obtained from 58 students who were tested for dribbling, the fastest time was 12.49 seconds, and the maximum time was 35.26 seconds. Range 22.77 seconds. Standard deviation 4.60342 and variance 21.191. The total time used was 1175.81 seconds with an average dribbling speed of 20.2726 seconds..

Table 7.
Anthropometric Regression Test on Dribbling Speed of Grade 8 Students of SMPN 3 Bontomarannu

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.410a	.168	-.009	4.62498

Based on the table above, the Output Model Summary shows the results of the regression analysis with an R value of 0.410, indicating a moderate positive relationship between the independent and dependent variables. The R Square value is 0.168, meaning that about 16.8% of the variation in the dependent variable can be explained by this model, while the remaining 83.2% cannot be explained. The Adjusted R Square value of -0.009 indicates that this model does not provide an adequate explanation, and there may be too many variables compared to the number of observations. In addition, the Std. Error of the Estimate value is 4.62498, indicating the average deviation from the prediction to the actual value.

Table 8.
Results of Anthropometric Coefficients on Dribbling Speed of 8th Grade Students of SMPN 3 Bontomarannu

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.354	21.131		1.578	.121
	Weight	.227	.200	.531	1.133	.263
	Height	-.121	.151	-.264	-.801	.427
	Leg_Length	.111	.127	.206	.871	.388
	Arm_Length	.006	.339	.006	.017	.986
	Waist_Circumference	.087	.158	.157	.550	.585
	Arm_Circumference	-.116	.514	-.074	-.226	.822
	Palm_Length	-.349	.716	-.082	-.488	.628
	Palm_Width	-1.478	1.267	-.222	-1.167	.249
	Span_Length	-.463	.551	-.215	-.840	.405
	Foot_Length	.250	.855	.059	.293	.771

a. Dependent Variable: Dribbling Speed

Based on the table above, it explains the SPSS output results of the Coefficients table for the dependent variable Dribbling Speed, namely Insignificant Variables: All variables in this model are insignificant (Sig. > 0.05), including Constant (B = 33.354, Sig. = 0.121. Body Weight (B = 0.227, Sig. = 0.263). Height (B = -0.121, Sig. = 0.427). Leg Length (B = 0.111, Sig. = 0.388). Arm Length (B = 0.006, Sig. = 0.986). Waist Circumference (B = 0.087, Sig. = 0.585). Arm Circumference (B = -0.116, Sig. = 0.822). Palm Length (B = -0.349, Sig. = 0.628). Width Palm Length (B = -1.478, Sig. = 0.249). Span Length (B = -0.463, Sig. = 0.405). Foot Length (B = 0.235, Sig. = 0.771).

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Table 9.
Anthropometric Descriptive Analysis of Grade 9 Students of SMPN 3 Bontomarannu

Variables	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Age	65	2	14	16	919	14.14	.429	.184
Weight	65	45	30	75	3014	46.37	11.705	137.018
Height	65	36	135	171	10231	157.40	7.163	51.306
Leg_Length	65	37	65	102	6033	92.82	6.703	44.934
Arm_Length	65	15	64	79	4606	70.86	3.741	13.996
Waist_Circumference	65	35	63	98	4898	75.35	8.758	76.701
Arm_Circumference	65	12	17	29	1416	21.79	3.158	9.974
Palm_Length	65	3.0	13.0	16.0	950.0	14.615	.6481	.420
Palm_Width	65	2.5	6.5	9.0	504.7	7.765	.6732	.453
Span_Length	65	7.5	13.5	21.0	1112.3	17.112	1.4533	2.112
Foot_Length	65	5	21	26	1513	23.28	1.139	1.297

Based on the table above, this study involved 65 respondents with various anthropometric variables. The average age of respondents was 15.14 years with a standard deviation of 0.429 years, indicating that the age of students was very homogeneous. The average weight was 46.37 kg with a standard deviation of 11.705 kg, with a weight range of 30 to 75 kg. The average height of respondents was 157.40 cm with a standard deviation of 7.165 cm, ranging from 135 to 171 cm. The average leg length was 92.82 cm with a standard deviation of 6.103 cm, while the average arm length was 58.80 cm with a standard deviation of 3.741 cm. The average waist circumference was recorded at 69.86 cm with a standard deviation of 8.758 cm, and the average arm circumference was 23.18 cm with a standard deviation of 2.754 cm. For the length of the palm, the average is 18.10 cm with a standard deviation of 0.847 cm, while the average palm width is 7.25 cm with a standard deviation of 0.453 cm. The span length has an average of 17.12 cm with a standard deviation of 1.433 cm, and the average foot length is 23.28 cm with a standard deviation of 1.139 cm. The minimum and maximum values for each variable indicate sufficient data variation, for example, body weight ranges from 30 to 75 kg, and height between 135 to 171 cm. Based on the table above, this study involved 65 respondents with various anthropometric variables. The average age of respondents is 15.14 years with a standard deviation of 0.429 years, indicating that the age of students is very homogeneous. The average body weight was 46.37 kg with a standard deviation of 11.705 kg, with a weight range of 30 to 75 kg. The average height of respondents was 157.40 cm with a standard deviation of 7.165 cm, ranging from 135 to 171 cm. The average leg length was 92.82 cm with a standard deviation of 6.103 cm, while the average arm length was 58.80 cm with a standard deviation of 3.741 cm. The average waist circumference was recorded at 69.86 cm with a standard deviation of 8.758 cm, and the average arm circumference was 23.18 cm with a standard deviation of 2.754 cm. For the length of the palm, the average was 18.10 cm with a standard deviation of 0.847 cm, while the average palm width was 7.25 cm with a standard deviation of 0.453 cm. The average span length was 17.12 cm with a standard deviation of 1.433 cm, and the average foot length was 23.28 cm with a standard deviation of 1.139 cm. The minimum and maximum values for each variable showed sufficient data variation, for example, body weight ranged from 30 to 75 kg, and height ranged from 135 to 171 cm.

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Table 10.
Descriptive Analysis of Dribbling Speed of Grade 9 Students of SMPN 3 Bontomarannu

Variabel	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Dribbling Speed	65	13.62	12.93	26.55	1106.17	17.0180	2.47376	6.119

Based on the table above, the data obtained from 65 students who were tested dribbling, the fastest time was 12.93 seconds, and the maximum time was 26.55 seconds. Range 13.62 seconds. Standard deviation 2.47376 and variance 6.119. The total time used was 1106.17 seconds with an average dribbling speed of 17.0180 seconds.

Table 11.
Anthropometric Regression Test on Dribbling Speed of Grade 9 Students of SMPN 3 Bontomarannu

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.627a	.393	.280	2.09878

Based on the table above, the Output Model Summary shows the results of the regression analysis with an R value of 0.627, indicating a strong positive relationship between the independent and dependent variables. The R Square value is 0.393, meaning that about 39.3% of the variation in the dependent variable can be explained by this model, while the remaining 60.7% cannot be explained. The Adjusted R Square value of 0.280 indicates that although the model can explain some of the variation, there is room for improvement. The Std. Error of the Estimate value is 2.09878, reflecting the average deviation from the prediction to the actual value.

Table 12.
Results of Anthropometric Coefficients on Dribbling Speed of Grade 9 Students of SMPN 3 Bontomarannu

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	20.053	11.860		1.691	.097
	Weight	.030	.091	.143	.331	.742
	Height	.164	.067	.474	2.432	.018
	Leg_Length	-.204	.051	-.554	-3.985	.000
	Arm_Length	.002	.110	.002	.014	.989
	Waist_Circumference	-.007	.090	-.025	-.079	.937
	Arm_Circumference	.161	.248	.205	.647	.521
	Palm_Length	-.541	.495	-.142	-1.093	.279
	Palm_Width	-1.350	.536	-.367	-2.518	.015
	Span_Length	.140	.221	.082	.634	.529
	Foot_Length	.072	.286	.033	.252	.802

Based on the Coefficients table from the SPSS output for the dependent variable Dribbling Speed: Significant variables (Sig. < 0.05): Height (β = 0.164, Sig. = 0.018). Has a positive influence. Every 1 cm increase in height will increase dribbling speed by 0.164 units. Leg Length (β = -0.204, Sig. = 0.000). Has a strong negative influence. Every 1 unit increase in leg length will decrease dribbling speed by 0.204 units. Palm Width (β = -1.350,

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Sig. = 0.015) has a strong negative influence. Every 1 cm increase in palm width will decrease dribbling speed by 1.350 units. Insignificant variables (Sig. > 0.05): Constant (20.053, Sig. = 0.097). Body Weight (β = 0.030, Sig. = 0.742). Arm Length (β = 0.002, Sig. = 0.989). Waist Circumference (β = -0.007, Sig. = 0.937). Arm Circumference (β = 0.161, Sig. = 0.521). Palm Length (β = -0.541, Sig. = 0.279). Span Length (β = 0.140, Sig. = 0.529). Foot Length (β = 0.072, Sig. = 0.802).

Discussion

Based on the results of the regression analysis that has been carried out on three grade levels (grades 7, 8, and 9) at SMPN 3 Bontomarannu, it can be seen that the influence of anthropometric factors on dribbling speed shows a different pattern at each grade level. Influence Analysis Based on Grade Level

Grade 7

The results of the analysis on grade 7 students show that the regression model used has a very low predictive ability with an R Square value of 0.126 (12.6%). This indicates that the anthropometric factors measured can only explain 12.6% of the variation in dribbling speed, while the remaining 87.4% is influenced by other factors not measured in this study. More importantly, none of the anthropometric variables measured showed a significant effect (p> 0.05) on dribbling speed in grade 7 students.

This condition can be explained by the developmental characteristics of grade 7 students who are still in the early stages of adaptation to more complex sports activities. At an average age of 12.29 years, students' coordination and dribbling technique abilities are still in the development stage, so anthropometric factors have not become the main determinant of students' dribbling performance.

Grade 8

In grade 8 students, although the R value increased to 0.410, which indicates a moderate relationship, the R Square value is still relatively low (16.8%), and the Adjusted R Square even shows a negative value (-0.009). This indicates that the model used does not provide an adequate explanation, possibly because there are too many predictor variables compared to the number of observations. Similar to grade 7, no anthropometric variables showed a significant effect on dribbling speed in grade 8 students.

This phenomenon indicates that at the development stage of grade 8 (average age 13.38 years), although there is better physical development compared to grade 7, the relationship between anthropometric characteristics and dribbling technical abilities has not yet been firmly established.

Grade 9

The most interesting results were found in grade 9 students, where the regression model showed a much better predictive ability with an R value of 0.627 (strong relationship) and an R Square of 0.393 (39.3%). More importantly, three anthropometric variables showed a significant effect on dribbling speed:

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1. Height (β = 0.164, p = 0.018): Showing a positive effect, where every 1 cm increase in height will increase dribbling speed by 0.164 units. This can be explained because better height provides advantages in terms of stride range and body stability when dribbling.
2. Leg Length (β = -0.204, p = 0.000): Showing a strong negative effect, where every 1 unit increase in leg length will decrease dribbling speed by 0.204 units. This finding may indicate that legs that are too long can reduce agility and ball control in dribbling movements that require high speed and precision.
3. Palm Width (β = -1.350, p = 0.015): Shows a very strong negative effect, where every 1 cm increase in palm width will decrease dribbling speed by 1.350 units. This may be related to coordination and ball control, where palms that are too wide can reduce sensitivity in controlling the basketball.

Interpretation of Development Based on Age

The patterns seen from the three grade levels indicate that the influence of anthropometric factors on dribbling speed increases with increasing age and maturity level of students. In grades 7 and 8, dribbling ability is more influenced by factors such as motor coordination, training experience, and technique adaptation that are still in the development stage.

Meanwhile, in grade 9 (average age 14.14 years), students have reached a better level of physical maturity and coordination, so that anthropometric characteristics begin to play a role as a determinant factor in dribbling performance. This is in line with the theory of motor development, which states that technical ability in sports will be increasingly influenced by physical characteristics as the athlete's maturity increases.

The findings of this study provide several practical implications for the development of basketball training programs in schools:

1. For students in grades 7 and 8, training programs should emphasise the development of motor coordination, basic techniques, and familiarisation with dribbling movements, because anthropometric factors are not yet the main determinants.
2. At the 9th grade level, anthropometric factors such as height, leg length, and palm width can begin to be considered in the selection or grouping of students for more specific training programs.
3. Students with certain anthropometric characteristics (e.g. long legs or wide palms) may require a specific training program to optimise their dribbling ability.

CONCLUSION

The influence of anthropometric factors on the dribbling speed of SMPN 3 Bontomarannu students varies based on the level of student maturity. This influence is

getting stronger with age. For students in grades 7 and 8, anthropometric factors are not yet the main determinant of dribbling speed. For students in grade 9, anthropometric factors begin to play a significant role as a determinant of dribbling speed. This development pattern shows that physical maturity and better motor coordination in older students allow anthropometric factors to play a more optimal role in dribbling speed.

REFERENCES

Abdussamad, H. Z. (2021). Qualitative Research Methods (Patta Rapanna, Ed.; First). Syakir Media Press.

Adam Mappaompo, M., Aprilo, I., Elisano Arfanda, P., & Arga. (2024). Shooting Accuracy Of Sports Coaching Education Students: Goaling Game Practice. Indonesian Journal of Research and Educational Review, 3(3), 204–210. https://doi.org/10.51574/ijrer.v3i3.1995

Arga, Arkanul Arba, M., Rahmatullah, W., Nurhalizah Mutia Aulria, S., & Tandi Rerung, C. (2024). Football Dribbling Speed Reviewed From Running Speed. KING: Knowledge Integrated Networking for Global Sport and Health, 1, 64–68. https://jurnal.sainsglobal.com/index.php/king

Arga. (2025). The Effect of Leg Raise Exercise on the Abdominal Muscle Strength of PKO UPRI Students. Journal of Sports Coaching Education (PEJUANG), 1(1), 18–23.

Brown, M., & White, J. (2022). Longitudinal analysis of anthropometric development and basketball dribbling performance in middle school students. Journal of Youth Sports Development, 15(3), 234-248.

Chen, L., Zhang, Y., & Liu, M. (2021). Effectiveness of anthropometric-based dribbling training programs in adolescent basketball players. Sports Science and Medicine, 12(4), 445-460.

Gonzalez, R., Martinez, A., & Silva, P. (2021). Biomechanical analysis of basketball dribbling: The role of arm length and hand size. International Journal of Sports Biomechanics, 8(2), 178-192.

Kim, J., Lee, S., & Choi, M. (2021). Impact of growth-related anthropometric changes on dribbling biomechanics in Korean middle school students. Korean Journal of Sport Science, 32(4), 512-527.

Kim, S., & Park, H. (2023). Comparative study of anthropometric factors and dribbling performance between Korean and American adolescent basketball players. Asian Journal of Sports Science, 18(1), 67-82.

Lee, K., Tan, C., Wong, L., & Nguyen, H. (2022). Cross-sectional analysis of anthropometric characteristics and dribbling ability in Southeast Asian middle school students. Southeast Asian Journal of Sports Medicine, 7(3), 156-171.

Lopez, M., Rodriguez, C., & Fernandez, L. (2023). Relationship between anthropometrics, muscle strength, and dribbling performance in adolescent basketball players. Sports Performance Research, 9(2), 298-315.

Martinez, J., & Ramirez, S. (2023). Effects of unbalanced anthropometric development on basketball dribbling skills during adolescent growth spurts. Developmental Sports Psychology, 11(1), 89-104.

Rodriguez, A., Smith, B., & Johnson, C. (2022). Anthropometric influences on dribbling speed in youth basketball players aged 13-15 years. Journal of Sports Performance, 14(2), 123-137.

Rodriguez, P., & Fernandez, M. (2023). Meta-analysis of anthropometric factors and basketball performance in adolescents: A systematic review of 30 studies. Sports Medicine Review, 28(3), 445-462.

Santos, F. G. D., Silva, R. M., & Oliveira, P. T. (2020). Kontrolle Ball Test: A valid and reliable instrument for assessing basketball dribbling speed. Brazilian Journal of Sports Science, 16(4), 278-291.

Suwardi, Adnan Hudain, M., Fahrizal, Adil, A., Rachmat Kasmad, M., & Arga. (2024). Structured Training at SDN Paccinangan on Basketball Dribbling. LITERA ABDI: Journal of Community Service, 2(1), 80–87. https://doi.org/10.59734

Taylor, R., Anderson, K., & Thompson, M. (2023). Cross-cultural comparison of anthropometric characteristics and dribbling performance in five countries. International Sports Research, 21(1), 34-51.

Thompson, D., & Garcia, M. (2021). Two-year longitudinal study of anthropometric development and basketball skills in middle school students. Adolescent Sports Development, 13(4), 201-218.

Wang, X., Liu, Y., & Chen, Z. (2023). Compensatory training strategies for anthropometric limitations in basketball dribbling performance. Applied Sports Science, 19(3), 345-362.

Wilson, P., Davis, S., & Miller, T. (2022). Meta-analysis of 50 studies examining anthropometric factors and basketball dribbling performance. Sports Science Meta-Analysis, 6(2), 112-128.

Yamamoto, T., Suzuki, K., & Tanaka, H. (2021). Effects of anthropometric ratios on dribbling speed and ball control in Japanese middle school basketball players. Japanese Journal of Sports Science, 25(3), 189-205.