

Analysis Of The Physical Condition Of Football Referees C3, C2 And C1 Licenses Of Askab Blitar Year 2026

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Abstract

This research is motivated by the importance of physical conditions in supporting the performance of football referees. The study aims to determine the level of physical condition of ASKAB PSSI referees in Blitar Regency based on C1, C2, and C3 licenses and analyze the differences in physical conditions between licensing levels. The study uses a quantitative approach with a comparative descriptive method. The sample consists of 25 active referees, consisting of 3 C1 referees, 5 C2 referees, and 17 C3 referees. Physical condition was measured through aerobic endurance using *the Interval Run Test*, repeated sprint ability using *Repeated Sprint Ability* (RSA), and agility using the *Change of Direction Ability* (CODA) Test. Data analysis was carried out using descriptive statistics, Shapiro-Wilk test, Levene's Test, and One-Way ANOVA with a significance level of 0.05. The results showed that C1 referees had the best physical condition with an average $VO_2\text{max}$ of 66.8 ml/kg/min, an RSA of 5.977 seconds, and a CODA of 10.125 seconds. The C2 referee had an average of 55.6 ml/kg/min, an RSA of 6.101 seconds, and a CODA of 10.211 seconds, while C3 had an average of 48.188 ml/kg/min, an RSA of 6.188 seconds, and a CODA of 10.745 seconds. The results of the One-Way ANOVA showed significant differences in RSA ($p=0.003$), CODA ($p=0.028$), and endurance based on *the Interval Run Test* ($p=0.045$). The findings showed that the higher the level of licensing, the better the physical condition of the referee.

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Therefore, a structured and continuous physical training program is needed, especially for C2 and C3 license referees.

Keywords: physical condition, football referee, referee license.

INTRODUCTION

Sport is an activity that involves physical and mental abilities and is carried out in a planned manner to improve fitness, health, and performance. One of the fastest-growing sports in Indonesia is football. In addition to requiring technical skills and teamwork, football also demands the role of referees who are able to maintain order, enforce rules, and make appropriate decisions during matches. Football referees have high physical demands because they have to follow the movements of the game during the match. Referees are required to have fitness, speed, agility, endurance, and the ability to make decisions in conditions of physical and psychological stress. In one match, referees can cover a distance of about 9-12 kilometers with walking, running, and sprinting activities. Therefore, physical condition is one of the important factors that support Quality of referee performance. In Indonesia, the referee system is developed in stages through C3, C2, C1, and Elite licenses. Each level has higher demands for technical competence and physical condition. At the basic level, referees must meet fitness standards through endurance, sprint, and agility tests. As the level of licensing increases, the demands on physical ability, consistency, and quality of decision-making are also increasing.

Blitar Regency is one of the regions that has the development of football refereeing. However, scientific documentation regarding the physical condition of referees based on the level of licensing, especially at the district level, is still limited. Field conditions show that there are referees who experience fatigue in the second half of the match, are late in following the movement of the ball, and are not quick in changing direction. This condition shows the need for a more objective study of the fitness level of referees as the basis for the development of referee coaching. In addition, the physical training of referees in Blitar Regency still faces several obstacles, including physical training that has not been structured and sustainable, variations in match intensity, and fitness monitoring that has not been carried out regularly. Therefore, it is important to analyze physical conditions based on the level of referee licenses to determine the physical readiness of referees and become the basis for the preparation of a more targeted coaching program.



RESEARCH METHODS

This study uses a quantitative approach with a comparative descriptive survey method to analyze and compare the physical condition of football referees based on the C3, C2, and C1 license levels at ASKAB PSSI Blitar Regency. The components of physical condition measured include aerobic endurance, speed, and agility. The research population is all active referees with C3, C2, and C1 licenses registered at ASKAB PSSI Blitar Regency in 2026 as many as 30 people. The sample was selected using *purposive sampling techniques* based on the criteria of active referees, having an official PSSI license, participating in at least one official competition in the last 12 months, and willing to take part in the entire series of tests. Based on these criteria, 25 referees were obtained, consisting of 17 C3 licenses, 5 C2 licenses, and 3 C1 licenses.

Physical condition measurements were carried out using *the Interval Run Test* for aerobic endurance, *Repeated Sprint Ability* (RSA) for repeated sprint speed, and *Change of Direction Ability* (CODA) Test for agility. The test was carried out at the Gelora Penataran Stadium in Blitar in May 2026 with standardized procedures and data recording. The data was analyzed using SPSS version 26.0 through descriptive statistics in the form of mean, standard deviation, minimum and maximum values. The normality test was carried out with Shapiro-Wilk and the homogeneity test was carried out using Levene's Test. Furthermore, the difference in physical condition between the license groups was analyzed using One-Way ANOVA at a significance level of 0.05. If the parametric assumption is not met, the Kruskal-Wallis test is used, while the Post Hoc LSD analysis is used if a significant difference is found

RESULTS

This study uses a quantitative approach with a comparative descriptive survey method to compare the physical condition of football referees based on the C1, C2, and C3 license levels at ASKAB PSSI Blitar Regency. The components of physical condition measured include aerobic endurance, speed, and agility. The research population is all active referees with C1, C2, and C3 licenses registered at ASKAB PSSI Blitar Regency in 2026 as many as 30 people. The sample was determined using *purposive sampling* based on the criteria of active referees, have an official PSSI license, participated in at least one official competition in the last 12 months, and were willing to take part in the entire series of tests. Based on these criteria, 25 referees were obtained, consisting of 3 C1 referees, 5 C2 referees, and 17 C3 referees.



Table 1. 1 Distribution of Samples by Referee License

No	Licensing Groups	Number of Referees
1.	C1	3
2.	C2	5
3.	C3	17
Quantity		25

Based on Table 4.1, it is known that the number of research samples is 25 referees consisting of 17 C3 license referees, 5 C2 license referees, and 3 C1 license referees. This difference in the number of samples is due to the availability of active referees at each license level at ASKAB PSSI Blitar Regency.

Table 1. 2 VO2max Measurement Results of ASKAB PSSI Football Referees Blitar Regency

No	Name	Lisensi	Results	Distance Tempuh	VO2max	Category
1	SSA	C1	40	4000	80,8	Excellent
2	AR	C1	30	3000	66,8	Good
3	TKR	C1	20	2000	52,8	Enough
4	DDT	C2	40	4000	80,8	Excellent
5	IS	C2	20	2000	52,8	Enough
6	JT	C2	20	2000	52,8	Enough
7	TSB	C2	20	2000	52,8	Enough
8	SHD	C2	10	1000	38,8	Less
9	WYI	C3	40	4000	80,8	Excellent
10	ARR	C3	10	1000	38,8	Less
11	FUY	C3	30	3000	66,8	Good
12	MSH	C3	30	3000	66,8	Good
13	MAD	C3	20	2000	52,8	Enough
14	GBS	C3	16	1600	47,2	Less
15	ZLA	C3	20	2000	52,8	Enough



16	ON	C3	10	1000	38,8	Less
17	DDW	C3	10	1000	38,8	Less
18	SDK	C3	20	2000	52,8	Enough
19	FRH	C3	12	1200	41,6	Less
20	AYE	C3	12	1200	41,6	Less
21	MFH	C3	12	1200	41,6	Less
22	FYA	C3	12	1200	41,6	Enough
23	GGs	C3	10	1000	38,8	Less
24	RHW	C3	10	1000	38,8	Less
25	WDJ	C3	10	1000	38,8	Less

Based on the table above, the results of the description analysis presented by the researcher are the result of a categorization based on research data in four categories, namely: excellent, good, adequate, and lacking.

Tabel 1. 3 Statistik Deskriptif VO₂max

Lisensi	N	Max	Min	Mean	Standar Deviasi
C1	3	80,8	52,8	66,8	14
C2	5	80,8	38,8	55,6	15,34
C3	17	80,8	38,8	48,18	12,56

Based on table 4.3 above, it is known that the C1 license group has the highest average VO₂max of 66.8 ml/kg/min with a standard deviation of 14 which is in the **good** category, the C2 license group has an average of 55.6 with a standard deviation of 15.34 which is in the **sufficient** category. While the C3 license group has the lowest average of 48.18 ml/kg/min with a standard deviation of 12.56 and is included in the **poor category**.



**Table 1. 4 Results of Sprint Speed Measurement of ASKAB PSSI Football Referees
Blitar Regency**

No	Name	Lisensi	Results						Track- Track Sprint	Category
			1	2	3	4	5	6		
1	SSA	C1	5,9	5,8	6,07	5,95	6,1	6,05	5,98	Excellent
2	AR	C1	6,09	6,08	6,05	5,48	6,03	6,02	5,96	Excellent
3	TKR	C1	6,1	6,03	5,9	6,05	6,08	5,8	5,99	Excellent
4	DDT	C2	6,09	5,96	6,08	6,09	6,1	6,08	6,07	Good
5	IS	C2	6,13	6,07	6,1	6,07	6,12	6,15	6,11	Enough
6	JT	C2	6,02	6,1	6,09	6,05	6,1	6,08	6,07	Good
7	TSB	C2	6,1	6,29	6,1	6,39	6,05	6,12	6,18	Enough
8	SHD	C2	6,05	6,1	6,09	6,08	6,09	6,1	6,09	Good
9	WYI	C3	6,35	6,3	6,32	6,4	6,32	6,1	6,30	Less
10	ARR	C3	6,2	6,23	6,25	6,3	6,22	6,25	6,24	Less
11	FUY	C3	6,15	6,1	6,2	6,1	6,12	6,11	6,13	Enough
12	MSH	C3	6,02	6,03	6,07	6,08	6,09	6,1	6,07	Good
13	MAD	C3	6,5	6,5	6,2	6,25	6,3	6,4	6,36	Very Less
14	GBS	C3	6,00	6,2	6,02	6,08	6,1	6,03	6,11	Enough
15	ZLA	C3	6,08	5,72	6,5	6,12	5,8	6,1	6,05	Good
16	ON	C3	6	6,62	6	6,32	6,3	6,38	6,27	Less
17	DDW	C3	6,02	6,25	6,1	6,2	6,1	6,03	6,12	Enough
18	SDK	C3	6,09	6,07	6,07	6,1	6,09	6,1	6,09	Good
19	FRH	C3	6,41	6,1	6,12	6,1	6,05	6,03	6,14	Enough
20	AYE	C3	6,35	6,3	6,15	6,2	6,24	6,23	6,25	Less
21	MFH	C3	6,09	6,1	6,07	6,08	6,09	6,12	6,09	Good
22	FYA	C3	6,09	6,07	6,09	6,1	6,07	6,07	6,08	Good
23	GGs	C3	6,35	6,32	6,3	6,34	6,35	6,3	6,33	Very Less

24	RHW	C3	6,15	6,23	6,3	6,32	6,25	6,62	6,31	Very Less
25	WDJ	C3	6,29	6,25	6,24	6,25	6,35	6,3	6,28	Less

Based on the table, the results of the descriptive analysis presented by the researcher are the results of categorizing research data which is divided into five levels, namely very good, good, adequate, less and very poor.

Table 1. 5 Descriptive Statistics of RSA Sprint

Lisensi	N	Minimum	Maximum	Mean	Std. Deviation
C1	3	5,99	5,96	5,98	0,01756
C2	5	6,18	6,07	6,10	0,04390
C3	17	6,36	6,05	6,19	0,10562

Based on the results of descriptive statistics, it is known that the C1 license referee group has the highest average sprint time of 5.98 seconds with a standard deviation of 0.01756 and is in the **very good** category. The C2 referee license referee group has an average sprint value of 6.10 seconds with a standard deviation of 0.04390 and is in the **good** category. And lastly, the C3 license group has an average sprint of 6.19 seconds with a standard deviation of 0.10562 and is included in the **fair category**.

Table 1. 6 Results of Measuring the Agility of ASKAB PSSI Football Referees Blitar Regency

No	Name	Lisensi	Results		Average Results	Category
			1	2		
1	SSA	1	10,07	10,05	10,06	Good
2	AR	1	10,09	10,06	10,08	Good
3	TKR	1	10,22	10,26	10,24	Enough
4	DDT	2	10,09	10,08	10,09	Good
5	IS	2	10,27	10,18	10,23	Enough

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6	JT	2	10,3	10,29	10,30	Enough
7	TSB	2	10,25	10,23	10,24	Enough
8	SHD	2	10,22	10,2	10,21	Enough
9	WYI	3	10,02	10,16	10,09	Good
10	ARR	3	11,76	10,39	11,08	Very Less
11	FUY	3	10,21	10,05	10,13	Good
12	MSH	3	10,07	10,12	10,10	Good
13	MAD	3	11,03	11,67	11,35	Very Less
14	GBS	3	11,03	11,36	11,20	Very Less
15	ZLA	3	11,09	10,35	10,72	Less
16	ON	3	10,02	10,08	10,05	Good
17	DDW	3	10,28	10,27	10,28	Enough
18	SDK	3	10,45	11,01	10,73	Less
19	FRH	3	10,69	10,78	10,74	Less
20	AYE	3	11,2	11,09	11,15	Very Less
21	MFH	3	11,35	10,97	11,16	Very Less
22	FYA	3	11,29	11,26	11,28	Very Less
23	GGs	3	10,79	10,68	10,74	Less
24	RHW	3	10,66	10,78	10,72	Less
25	WDJ	3	11,12	11,28	11,2	Very Less

Based on the table, the results of the descriptive analysis presented by the researcher are the results of categorizing research data which is divided into five levels, namely very good, good, adequate, less and very poor.

Table 1. 7 Descriptive Statistics of CODA Agility

Lisensi	N	Minimum	Maximum	Mean	Std. Deviation
C1	3	10,24	10,06	10,125	0,09987



C2	5	10,295	10,085	10,211	0,07741
C3	17	11,35	10,05	10,745	0,46320

Based on the results of descriptive statistics, it is known that the C1 license referee group has an average CODA time of 10.125 seconds with a standard deviation of 0.09987 and is in the **Good** category, while the C2 license group has an average of 10.211 seconds with a standard deviation of 0.07741 and is in the **Adequate** category. Finally, the C3 license group has an average of 10.745 seconds with a standard deviation of 0.46320 and is in the **Less** category.

Table 1. 8 Normality Test Results
Tests of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Say.	Statistic	df	Say.
Interval	,279	25	,160	,843	25	,225
Tes						
TAIL	,186	25	,359	,851	25	,567
RSA	,164	25	,083	,934	25	,106

Lilliefors Significance Correction

Based on the results of the normality test, the significance value of the Interval Test variable was 0.225, the CODA (*Change of Direction Ability*) variable was 0.567, and the RSA (*Repeated Sprint Ability*) variable was 0.106. All of these significance values were greater than 0.05 (Sig. > 0.05), so it can be concluded that the data on the three research variables are normally distributed. Thus, the data has met the assumption of normality and can be continued in the next parametric statistical test, namely the homogeneity test and the One Way ANOVA test.

Table 1. 9 CODA Results on the Homogeneity Test
Test of Homogeneity of Variances Sprint Test

Levene Statistic	df1	df2	Say.
.915	2	22	.415

**Table 1.10 RSA Results on Homogeneity Test
Test of Homogeneity of Variances Agility Test**

Levene Statistic	df1	df2	Sig.
.617	2	22	.198

**Table 1. 11 Results of Interval Test in the Homogeneity Test
Test of Homogeneity of Variances Interval Test**

Levene Statistic	df1	df2	Sig.
.009	2	22	.992

Agility Test

**Table 1 12 CODA Results on the ANOVA One Way Test
ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	179.658	2	89.829	4.215	.028
Within Groups	900038.102	22	40910.823		
Total	900217.760	24			

Sprint Test

**Table 1. 13 RSA Results on the ANOVA One Way Test
ANOVA**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1268.632	2	634.316	7.428	.003
Within Groups	1878.808	22	85.400		
Total	3147.440	24			

Interval Test

Table 1. 14 Interval Test Results in the ANOVA One Way Test

ANOVA					
	Sum of Squares	Df	Mean Square	F	Say.
Between Groups	96869.195	2	48434.598	3.587	.045
Within Groups	385635.765	22	17528.898		
Total	482504.960	24			

Tests of Normality

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**Table 1. 9 CODA Results on the Homogeneity Test
Test of Homogeneity of Variances**

Sprint Test

Levene Statistic	df1	df2	Say.	
.915		222	.415	

**Table 1.10 RSA Results on Homogeneity Test
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Agility Test

Levene Statistic	df1	df2	Say.
.617		222	.198

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Total	482504.960	24			

DISCUSSION

The results of the study showed that there were differences in the physical condition of ASKAB PSSI football referees in Blitar Regency based on the C1, C2, and C3 license levels. Measurements were carried out through *Interval Test*, *Repeated Sprint Ability* (RSA), and *Change of Direction Ability* (CODA). In general, the C1 license group showed the best physical condition, followed by C2 and C3. In the C3 group, the average $VO_2\text{max}$ was 48,188 ml/kg/min and was in the low category. The RSA ability had an average of 6,188 seconds, while CODA was 10,745 seconds and was in the poor category. These conditions show that the C3 group still needs increased aerobic endurance, repetitive sprint ability, and agility. Low physical condition can be related to the frequency of exercise, match experience, age, motivation, and consistency in running a fitness program

The C2 group had an average $VO_2\text{max}$ of 55.6 ml/kg/min and was in the adequate category. The RSA value of 6.101 seconds and CODA of 10.211 seconds showed physical ability

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that was at an intermediate level compared to C1 and C3. The variation in aerobic ability in the C2 group was also quite large, so a more structured exercise program was needed to improve physical condition evenly. Meanwhile, the C1 group showed the relatively best physical condition. The average $VO_2\text{max}$ reached 66.8 ml/kg/min and was the highest value compared to C2 and C3. The average RSA of 5.977 seconds and CODA of 10.125 seconds were also the best results. These conditions showed better aerobic endurance, repetitive sprints, and changes of direction in C1 referees

The results of the *One-Way ANOVA* test showed significant differences in RSA (Sig. = 0.003), CODA (Sig. = 0.028), and *Interval Test* (Sig. = 0.045), as the overall significance value was less than 0.05. These findings suggest that the level of license is related to differences in repetitive sprint ability, agility, and physical endurance. However, the aerobic capacity represented by $VO_2\text{max}$ cannot be fully explained based on the level of license alone. The difference in physical condition between levels of license can be influenced by the experience of leading the competition, the demands of the match, the frequency and intensity of training, lifestyle, and the individual's commitment to maintaining fitness. Referees with good physical condition will be better able to maintain mobility, follow changes in the tempo of the game, maintain observation positions, and maintain the quality of decision-making during the match. Thus, the higher the level of referee licensing in this study, the more likely it is to be followed by better physical condition, especially in the ability to repeat sprints, agility, and endurance. However, improving physical condition is still needed in all licensing groups through structured training, continuous, and in accordance with the demands of modern football refereeing.

CONCLUSION

Based on the results of the research, it can be concluded that there are differences in the physical condition of ASKAB PSSI football referees in Blitar Regency based on C1, C2, and C3 licenses. Descriptively, C1 license referees showed the best relative physical condition with an average $VO_2\text{max}$ of 66.80 ml/kg/minute, an RSA of 5.98 seconds, and a CODA of 10.125 seconds. Group C2 was at a moderate level with an average $VO_2\text{max}$ of 55.60 ml/kg/minute, RSA of 6.10 seconds, and CODA of 10.211 seconds, while group C3 had the lowest relative physical condition with an average $VO_2\text{max}$ of 48.18 ml/kg/minute, RSA of 6.19 seconds, and CODA of 10.745 seconds.



The results of the *One-Way ANOVA* test showed significant differences in *Interval Test* ($p = 0.045$), *CODA* ($p = 0.028$), and *RSA* ($p = 0.003$) between the C1, C2, and C3 license groups. Thus, the level of license is related to differences in endurance ability, repetitive sprints, and agility of referees. These findings confirm the importance of a planned, structured, and continuous physical training program at all levels of licensing to improve physical readiness and support referee performance during matches.

IMPLICATIONS

1. Theoretical Implications

Theoretically, the results of this study strengthen the theory that the physical condition of the referee is a multidimensional component consisting of aerobic endurance, speed, and agility as the main elements that support the performance of the referee during the match. The results of the study show that these three components have an important role in supporting the ability of the referee during the match process. In addition, this study also shows that the condition of the referee, in addition to being determined by the referee's license and flying skills, is also the result of the interaction of various physiological factors, experience and training habits possessed by each individual.

2. Practical Implications

Practically, the results of this study can be evaluated for ASKAB PSSI Blitar Regency in compiling referee coaching and development programs. Although no significant differences in physical condition were found between licenses, descriptive results showed that there was a variation in physical abilities in each group of referees. Therefore, a structured, measurable, and continuous physical training program is needed to improve aerobic endurance, sprint speed, and agility of all referees regardless of license level.

The results of this study can also be an input for referees to pay more attention to physical condition as one of the important factors in supporting performance when leading the match. With good physical condition, referees will be better able to follow the tempo of the game, maintain an optimal observation position, and make decisions appropriately and consistently during the match.



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