

Lampiran 1

Data Awal Latihan Knee Tuck Jump dan Barrier Hops

NO	NAMA	BARRIER HOPS	
		TES AWAL	TES AKHIR
1	ANDI	66 CM	72 CM
2	ROJIK	50 CM	59 CM
3	DAVID	56 CM	65 CM
4	VIAN	50 CM	58 CM
5	SAMUEL	60 CM	69 CM
6	BANI	77 CM	85 CM
7	FAISAL	52 CM	59 CM
8	AFIF	58 CM	66 CM
9	AGUNG	50 CM	57 CM
10	RYAN	50 CM	58 CM
11	DAVID. A	58 CM	66 CM
12	BAGAS	46 CM	54 CM
13	MARSANI	58 CM	66 CM
14	DWI	52 CM	59 CM
15	ARMAN	45 CM	53 CM

NO	NAMA	KNEE TUCK JUMP	
		TES AWAL	TES AKHIR
16	REZA	43 CM	44 CM
17	THOHIRIN	56 CM	64 CM
18	AAN	37 CM	43 CM
19	JAELANI	55 CM	56 CM
20	SAMSUL	57 CM	56 CM
21	HASAN	72 CM	74 CM
22	DANIEL	60 CM	62 CM
23	KEVIN	52 CM	53 CM
24	ANDRIAN	54 CM	55 CM
25	DONI	56 CM	53 CM
26	SYAIFUL	44 CM	45 CM
27	GERY	45 CM	56 CM
28	JUAN	43 CM	44 CM
29	CITO	72 CM	74 CM
30	ASDAR	42 CM	43 CM

Lampiran 2

Deskripsi Data

Hasil Tes awal Kelompok X (BARRIER HOPS)

No.	X	X ²
1	66	4356
2	50	2500
3	56	3136
4	50	2500
5	60	3600
6	77	5929
7	52	2704
8	58	3364
9	50	2500
10	50	2500
11	58	3364
12	46	2116
13	58	3364
14	52	2704
15	45	2025
Total	828	46662

Rata-rata

$$\begin{aligned}\bar{X} &= \frac{\Sigma X}{n} \\ &= \frac{828}{15} = 55,20\end{aligned}$$

$$\begin{aligned}S^2 &= \frac{n \cdot \Sigma X^2 - (\Sigma X)^2}{n \cdot (n - 1)} & S &= \sqrt{S^2} \\ &= \frac{15 \cdot 46662 - (828)^2}{15 \cdot (15 - 1)} & &= \sqrt{63,314} \\ &= \frac{699930 - 685584}{210} & &= 8,265 \\ &= 63,314\end{aligned}$$

Tabel Distribusi Frekuensi

Menentukan rentang (R)

$$\begin{aligned} R &= \text{Max} - \text{Min} \\ &= 77 - 45 \\ &= 32 \end{aligned}$$

Menentukan Banyaknya kelas (K)

$$\begin{aligned} K &= 1 + 3,3 (\log n) \\ &= 1 + 3,3 (\log 15) \\ &= 1 + 3,88 \\ &= 4,88 \approx 5 \end{aligned}$$

Panjang kelas (P)

$$P = \frac{R}{K} = \frac{32}{5} = 6,4$$

No.	Interval	Titik Tengah	Frekuensi Absolut	Frekuensi Relatif
1	45 – 51	48	6	40,0
2	52 – 58	55	6	40,0
3	59 – 65	62	1	6,7
4	66 – 72	69	1	6,7
5	73 – 79	76	1	6,7
	Total		15	100

Lampiran 3

Hasil Tes Akhir Kelompok X (BARRIER HOPS)

No.	X	X ²
1	72	5184
2	59	3481
3	65	4225
4	58	3364
5	69	4761
6	85	7225
7	59	3481
8	66	4356
9	57	3249
10	58	3364
11	66	4356
12	54	2916
13	66	4356
14	59	3481
15	53	2809
Total	946	60608

Rata-rata

$$\begin{aligned}\bar{X} &= \frac{\sum X}{n} \\ &= \frac{946}{15} = 63,07\end{aligned}$$

$$\begin{aligned}S^2 &= \frac{n \cdot \sum X^2 - (\sum X)^2}{n \cdot (n - 1)} & S &= \sqrt{S^2} \\ &= \frac{15 \cdot 60608 - (946)^2}{15 \cdot (15 - 1)} & &= \sqrt{67,638} \\ &= \frac{909120 - 894916}{210} & &= 8,224 \\ &= 67,638\end{aligned}$$

Tabel Distribusi Frekuensi

Menentukan rentang (R)

$$\begin{aligned} R &= \text{Max} - \text{Min} \\ &= 85 - 53 \\ &= 32 \end{aligned}$$

Menentukan Banyaknya kelas (K)

$$\begin{aligned} K &= 1 + 3,3 (\log n) \\ &= 1 + 3,3 (\log 15) \\ &= 1 + 3,88 \\ &= 4,88 \approx 5 \end{aligned}$$

Panjang kelas (P)

$$P = \frac{R}{K} = \frac{32}{5} = 6,4$$

No.	Interval	Titik Tengah	Frekuensi Absolut	Frekuensi Relatif
1	53 – 59	56	8	53,3
2	60 – 66	63	4	26,7
3	67 – 73	70	1	6,7
4	74 – 80	77	1	6,7
5	81 – 87	84	1	6,7
	Total		15	100

Lampiran 4

Hasil Tes awal Kelompok Y (KNEE TUCK JUMP)

No.	Y	Y ²
1	43	1849
2	56	3136
3	37	1369
4	55	3025
5	57	3249
6	72	5184
7	60	3600
8	52	2704
9	54	2916
10	56	3136
11	44	1936
12	53	2809
13	43	1849
14	72	5184
15	42	1764
Total	796	43710

Rata-rata

$$\begin{aligned}\bar{Y} &= \frac{\Sigma Y}{n} \\ &= \frac{796}{15} = 53,07\end{aligned}$$

$$\begin{aligned}S^2 &= \frac{n \cdot \Sigma Y^2 - (\Sigma Y)^2}{n \cdot (n - 1)} & S &= \sqrt{S^2} \\ &= \frac{15 \cdot 43710 - (796)^2}{15 \cdot (15 - 1)} & &= \sqrt{0,613} \\ &= \frac{655650 - 633616}{210} & &= 10,243 \\ &= 104,924\end{aligned}$$

Tabel Distribusi Frekuensi

Menentukan rentang (R)

$$\begin{aligned} R &= \text{Max} - \text{Min} \\ &= 72 - 37 \\ &= 35 \end{aligned}$$

Menentukan Banyaknya kelas (K)

$$\begin{aligned} K &= 1 + 3,3 (\log n) \\ &= 1 + 3,3 (\log 15) \\ &= 1 + 3,88 \\ &= 4,88 \approx 5 \end{aligned}$$

Panjang kelas (P)

$$P = \frac{R}{K} = \frac{35}{5} = 7,00$$

No.	Interval	Titik Tengah	Frekuensi Absolut	Frekuensi Relatif
1	37 – 44	40.5	5	33,3
2	45 – 52	48.5	1	6,7
3	53 – 60	56.5	7	46,7
4	61 – 68	64.5	1	6,7
5	69 – 76	72.5	1	6,7
	Total		15	100

Lampiran 5

Hasil Tes akhir Kelompok Y (KNEE TUCK JUMP)

No.	Y	Y ²
1	44	1936
2	64	4096
3	43	1849
4	56	3136
5	56	3136
6	74	5476
7	62	3844
8	53	2809
9	55	3025
10	53	2809
11	45	2025
12	56	3136
13	44	1936
14	74	5476
15	43	1849
Total	822	46538

Rata-rata

$$\begin{aligned}\bar{Y} &= \frac{\Sigma Y}{n} \\ &= \frac{822}{15} = 54,80\end{aligned}$$

$$\begin{aligned}S^2 &= \frac{n \cdot \Sigma Y^2 - (\Sigma Y)^2}{n \cdot (n-1)} & S &= \sqrt{S^2} \\ &= \frac{15 \cdot 46538 - (822)^2}{15 \cdot (15-1)} & &= \sqrt{106,600} \\ &= \frac{698070 - 675684}{210} & &= 10,325 \\ &= 106,600\end{aligned}$$

Tabel Distribusi Frekuensi

Menentukan rentang (R)

$$\begin{aligned} R &= \text{Max} - \text{Min} \\ &= 74 - 43 \\ &= 31 \end{aligned}$$

Menentukan Banyaknya kelas (K)

$$\begin{aligned} K &= 1 + 3,3 (\log n) \\ &= 1 + 3,3 (\log 15) \\ &= 1 + 3,88 \\ &= 4,88 \approx 5 \end{aligned}$$

Panjang kelas (P)

$$P = \frac{R}{K} = \frac{31}{5} = 6,2$$

No.	Interval	Titik Tengah	Frekuensi Absolut	Frekuensi Relatif
1	43 – 49	46	5	33,3
2	50 – 56	53	6	40,0
3	57 – 63	60	1	6,7
4	64 – 70	67	1	6,7
5	71 – 77	74	2	13,3
	Total		15	100

Lampiran 6

Perhitungan Uji-t Paired (BARRIER HOPS)

No. Resp.	Awal (X ₁)	Akhir (X ₂)	D (X ₂ - X ₁)	D ²
1	66	72	6	36
2	50	59	9	81
3	56	65	9	81
4	50	58	8	64
5	60	69	9	81
6	77	85	8	64
7	52	59	7	49
8	58	66	8	64
9	50	57	7	49
10	50	58	8	64
11	58	66	8	64
12	46	54	8	64
13	58	66	8	64
14	52	59	7	49
15	45	53	8	64
Jumlah	828	946	118	938

Diketahui :

$$\Sigma D = 118$$

$$\Sigma D^2 = 938$$

Dicari

$$M_D = \frac{\Sigma D}{n} = \frac{118}{15} = 7,867$$

$$Sd_D = \sqrt{\frac{\Sigma D^2}{n} - \left(\frac{\Sigma D}{n}\right)^2}$$

$$= \sqrt{\frac{938}{15} - \left(\frac{118}{15}\right)^2}$$

$$= \sqrt{62,533 - 7,867^2} = \sqrt{0,649} = 0,806$$

$$\begin{aligned}
 SE_{MD} &= \frac{SD_D}{\sqrt{n-1}} \\
 &= \frac{0,806}{\sqrt{15-1}} \\
 &= \frac{0,806}{3,742} \\
 &= 0,215
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= \frac{M_D}{SE_{MD}} \\
 &= \frac{7,867}{0,215} \\
 &= 36,540
 \end{aligned}$$

Mencari t_{tabel} :

$$\begin{aligned}
 &= (\alpha ; n-1) \\
 &= (0,05 ; 14) \\
 &= 1,76
 \end{aligned}$$

Dari data tersebut diperoleh t_{hitung} sebesar 36,540 t_{tabel} dengan uji satu sisi pada taraf signifikan 0,05 dengan $n-1 = 14$ adalah 1,76, maka $t_{hitung}(8,45) > t_{tabel} (1,76)$, berarti terjadi peningkatan yang signifikan antara latihan Barrier Hops tes awal dan tes akhir pada klub sepak bola putra Indonesia.

Lampiran 7

Perhitungan Uji-t Paired (Knee Tuck Jump)

No. Resp.	Awal (Y ₁)	Akhir (Y ₂)	D (Y ₂ - Y ₁)	D ²
1	43	44	1	1
2	56	64	8	64
3	37	43	6	36
4	55	56	1	1
5	57	56	-1	1
6	72	74	2	4
7	60	62	2	4
8	52	53	1	1
9	54	55	1	1
10	56	53	-3	9
11	44	45	1	1
12	53	56	3	9
13	43	44	1	1
14	72	74	2	4
15	42	43	1	1
Jumlah	796	822	26	138

Diketahui :

$$\Sigma D = 26$$

$$\Sigma D^2 = 138$$

Dicari

$$M_D = \frac{\Sigma D}{n} = \frac{26}{15} = 1,733$$

$$\begin{aligned} Sd_D &= \sqrt{\frac{\Sigma D^2}{n} - \left(\frac{\Sigma D}{n}\right)^2} \\ &= \sqrt{\frac{138}{15} - \left(\frac{26}{15}\right)^2} \\ &= \sqrt{9,2 - 0,733^2} = \sqrt{6,196} = 2,489 \end{aligned}$$

$$\begin{aligned}
 SE_{MD} &= \frac{SD_D}{\sqrt{n-1}} \\
 &= \frac{2,489}{\sqrt{15-1}} \\
 &= \frac{2,489}{3,742} \\
 &= 0,665
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= \frac{M_D}{SE_{MD}} \\
 &= \frac{1,733}{0,665} \\
 &= 2,606
 \end{aligned}$$

Mencari t_{tabel} :

$$\begin{aligned}
 &= (\alpha ; n-1) \\
 &= (0,05 ; 14) \\
 &= 1,76
 \end{aligned}$$

Dari data tersebut diperoleh t_{hitung} sebesar 2,606 t_{tabel} dengan uji satu sisi pada taraf signifikan 0,05 dengan $n-1 = 14$ adalah 1,76, maka $t_{hitung}(2,606) > t_{tabel} (1,76)$, berarti terjadi peningkatan yang signifikan antara latihan Knee Tuck Jump tes awal dan tes akhir pada klub sepak bola putra Indonesia.

Lampiran 8

Perhitungan Uji-t Independent
(perbandingan Barrier Hops dengan Knee Tuck Jump)

No. Resp.	X	Y	X ²	Y ²
1	72	44	5184	1936
2	59	64	3481	4096
3	65	43	4225	1849
4	58	56	3364	3136
5	69	56	4761	3136
6	85	74	7225	5476
7	59	62	3481	3844
8	66	53	4356	2809
9	57	55	3249	3025
10	58	53	3364	2809
11	66	45	4356	2025
12	54	56	2916	3136
13	66	44	4356	1936
14	59	74	3481	5476
15	53	43	2809	1849
Jumlah	946	822	60608	46538

Diketahui

$$n_x = 15$$

$$n_y = 15$$

$$\Sigma X = 946$$

$$\Sigma Y = 822$$

$$\Sigma X^2 = 60608$$

$$\Sigma Y^2 = 46538$$

Dicari :

$$\begin{aligned}\bar{X} &= \frac{\Sigma X}{n} \\ &= \frac{946}{15} = 63,07\end{aligned}$$

$$\begin{aligned}S^2 &= \frac{n \cdot \Sigma X^2 - (\Sigma X)^2}{n \cdot (n-1)} \\ &= \frac{15 \cdot 60608 - (946)^2}{15 \cdot (15-1)} \\ &= \frac{909120 - 894916}{210} \\ &= 67,638\end{aligned}$$

$$\begin{aligned}\bar{Y} &= \frac{\Sigma Y}{n} \\ &= \frac{822}{15} = 54,80\end{aligned}$$

$$\begin{aligned}S^2 &= \frac{n \cdot \Sigma Y^2 - (\Sigma Y)^2}{n \cdot (n-1)} \\ &= \frac{15 \cdot 46538 - (822)^2}{15 \cdot (15-1)} \\ &= \frac{698070 - 675684}{210} \\ &= 106,600\end{aligned}$$

Varians Gabungan

$$\begin{aligned}
 S^2_{\text{gab}} &= \frac{(n_X - 1)S_X^2 + (n_Y - 1)S_Y^2}{n_X + n_Y - 2} \\
 &= \frac{(15 - 1) 67,638 + (15 - 1) 106,600}{15 + 15 - 2} \\
 &= \frac{946,93 + 1492,40}{28} \\
 &= 87,12 \\
 S &= \sqrt{87,12} \\
 &= 9,33
 \end{aligned}$$

$$\begin{aligned}
 t_0 &= \frac{\bar{X} - \bar{Y}}{s \sqrt{\frac{1}{n_X} + \frac{1}{n_Y}}} \\
 &= \frac{63,07 - 54,80}{9,33 \sqrt{\frac{1}{15} + \frac{1}{15}}} \\
 &= \frac{8,27}{9,33 \times 0,36} \\
 &= \frac{8,27}{3,41} \\
 &= 2,42
 \end{aligned}$$

Mencari t_{tabel} :

$$\begin{aligned}
 &= (\frac{1}{2} \alpha ; n-2) \\
 &= (0,025 ; 13) \\
 &= 2,42
 \end{aligned}$$

Dari data tersebut diperoleh t_{hitung} sebesar 2,42 t_{tabel} dengan taraf signifikan 0,05 dengan df $(n-2) = 28$ adalah 2,16, maka $t_{\text{hitung}} (2,42) > t_{\text{tabel}} (2,16)$, berarti terdapat perbedaan yang signifikan antara latihan *Barrier Hops* dengan *Knee Tuck Jump* pada klub sepak bola Putra Indonesia.