



PHYSICAL LOADING IN FLOORBALL MATCH

Cross-sectional study between three different levels

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Sisältö

- Pohjustus
- Tutkimusasetelma ja -kysymykset
- Koehenkilöt, metodit ja rajaus
- Tulokset
- Johtopäätökset & Pohdinta
- Vahvuudet & Heikkoudet
- Lähdeluettelo



Johdanto

- Lajiliiton tarve päivittää fyysinen lajiansalyysi
- Yleinen näkemys lajin kehittymisestä – Väitteille perusta
- Lajiliiton tahtotilana tiedolla johtaminen
 - / Tutkitun tiedon tuominen osaksi valmennuksen arkea



Tutkimuskysymykset ja -asetelma

- Tutkimuskysymys 1: Eroaako ottelunaikainen kokonaiskuormitus tasojen välillä?
- H1: Kyllä. Erityisesti ulkoisen kuormituksen mittauksissa erot tulevat esille korkeamman intensiteettivaatimuksen kautta.
- Perustelu: Tutkimusnäyttöä eri lajeista on huomattavan paljon nykypäivänä. Ristiriitoja voidaan kuitenkin löytää tasojen sisäisistä eroista, sekä pelipaikkakohtaisista eroista. Vaikuttaisi kuitenkin siltä, että lajista riippumatta Elite –tason pelaaminen vaatii erityisesti korkeamman intensiteetin suorituskykyä.



Tutkimuskysymykset ja -asetelma

- Tutkimuskysymys 2: Onko tasojen välillä eroa kokonais- tai eräkohtaisen intensiteetin osalta?
- H2: Kyllä. Korkeamman tason pelaajat pystyvät tuottamaan korkean intensiteetin toistoja tiheämmällä frekvenssillä, ja näin ollen saavuttamaan pidempiä matkoja yhteenlasketun matkan suhteen korkeammilla nopeusalueilla.
- Perustelu: Esimerkiksi koripallon puolella on huomattu, että kansainvälisen tason pelaaja toteuttaa pelin aikana huomattavasti enemmän aktiivista toimintaa osana peliä verrattuna kansallisen tason pelaajaan. Vastaavasti futsalin puolella on tutkittu taktisen puolen merkitystä, huomaten että puolustuksen (pallottoman) osalta ei suuria eroja löydy tasojen väliltä pelaajien välisissä etäisyyksissä. Vastaavasti hyökkäyspelissä (pallollinen) PRO-tason (aikuiset) pelaajat olivat laajemmilla etäisyyksillä suhteessa toisiinsa.



Tutkimuskysymykset ja -asetelma

- Tutkimuskysymys 3: Onko ulkoisen ja sisäisen kuormituksen välillä yhteyksiä jokaisella tasolla?
- H3: Kyllä. Sisäisten ja ulkoisten kuormitusmuuttujien välillä on korrelaatioita keskenään.
- Perustelu: Sisäisten ja ulkoisten kuormitusmuuttujien on aiemman tutkimusnäytön mukaan osoitettu olevan yhteydessä toisiinsa. Esimerkiksi kuljetun matkan ja sisäisten muuttujien sekä intensiteetin välillä on löydetty yhtäläisyyksiä.

Rajaus

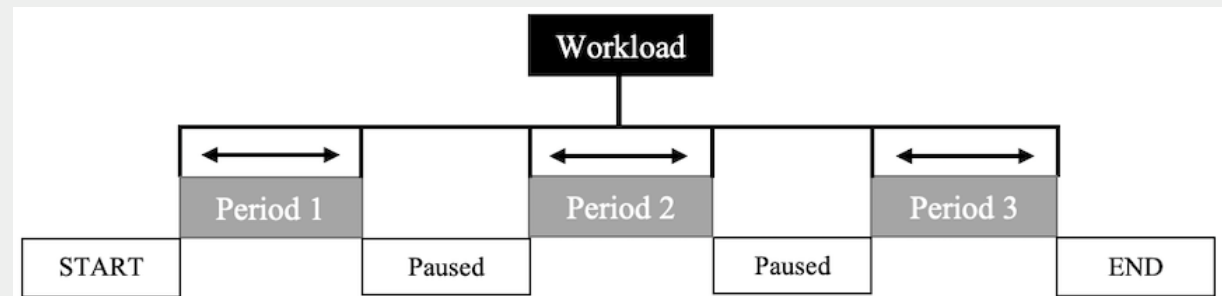
- 1. rajaus
 - / Korkean tason ottelu
 - Salibandyliiton asiantuntijoiden määrittämä
 - / Lähempänä runkosarjan loppua kuin alkua
 - / Maaliero alle 3 kolmannen erän alkaessa
- 2. rajaus
 - / Varsinainen peliaika
 - Ei jatkoaikaa
 - / Pelaaja on pelannut koko pelin
 - / Pelaaja on pelannut vähintään 4 vaihtoa / erä





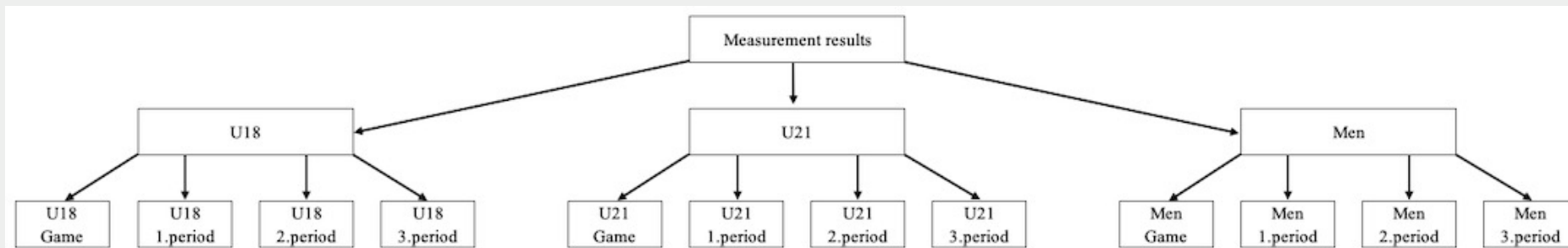
Asetelma, metodit ja koehenkilöt

SUBJECTS	n	Age (mean)	Weight (kg)	Height (cm)	Games (qty)	Measurements (qty)
U18 all	8	16.5 ± 0.3	69.1 ± 5.7	180.4 ± 6.0	9	47
U18 defender	3	16.4 ± 0.4	65.8 ± 4.7	178.0 ± 3.5	8	20
U18 winger	3	16.5 ± 0.4	70.0 ± 3.9	183.0 ± 9.2	9	21
U18 center	2	16.5 ± 0.3	72.5 ± 9.8	180.0 ± 4.2	5	6
U21 all	8	18.0 ± 0.6	68.1 ± 1.6	178.4 ± 4.2	6	23
U21 defender	3	17.6 ± 0.1	69.4 ± 0.8	180.7 ± 4.0	5	8
U21 winger	2	18.8 ± 0.4	67.4 ± 2.1	179.5 ± 0.7	5	6
U21 center	3	18.0 ± 0.4	66.9 ± 0.5	175.3 ± 4.7	6	9
Men all	8	25.8 ± 6.2	79.3 ± 6.4	181.6 ± 7.5	12	45
Men defender	2	31.3 ± 12.3	76.6 ± 1.2	178.5 ± 3.5	9	13
Men winger	3	23.7 ± 0.7	84.2 ± 6.8	187.0 ± 8.9	12	20
Men center	3	24.1 ± 4.2	76.3 ± 6.4	178.3 ± 6.4	8	12



Data collection

Subjects



Variable distribution



Tulokset

Tasojen väliset erot (koko ottelu)

Tilastollisesti ainoa merkittävä ero:

- Kalorikulutus
 - U18: 940 ± 79
 - U21: 877 ± 156
 - Miehet: 1206 ± 187

Oireilevaa tilastollista eroa:

- 80-89 % / HRmax
- 90-100 % / HRmax

VARIABLES	U18 GAME		U21 GAME		MEN GAME		p-value
	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	
Shifts (number / game)	21.9 ± 1.9	8	21.1 ± 2.7	8	23.6 ± 2.7	8	0.111
HRmin (bpm)	109.8 ± 10.1		102.0 ± 12.5		106.8 ± 9.5		0.368
HRavg (bpm)	149.2 ± 9.5		143.4 ± 10.4		147.6 ± 8.5		0.573
HRmax (bpm)	192.4 ± 7.2		187.2 ± 7.8		189.7 ± 7.1		0.424
HRmin (%)	52.6 ± 3.2		49.5 ± 5.6		53.0 ± 3.8		0.281
HRavg (%)	71.6 ± 3.1		69.4 ± 5.6		73.2 ± 3.8		0.208
HRmax (%)	92.4 ± 4.1		90.5 ± 4.7		94.2 ± 1.8		0.131
50–59%/HRmax (min:ss)	13:58 ± 09:36		19:01 ± 13:24		10:42 ± 08:49		0.406
60–69%/HRmax (min:ss)	33:29 ± 07:42		28:54 ± 05:56		29:46 ± 05:47		0.305
70–79%/HRmax (min:ss)	19:12 ± 05:40		20:15 ± 06:10		21:53 ± 05:00		0.493
80–89%/HRmax (min:ss)	18:10 ± 04:12		16:24 ± 05:35		22:12 ± 04:35		0.096
90–100%/HRmax (min:ss)	07:20 ± 06:34		04:39 ± 08:15		08:04 ± 03:25		0.113
Total Distance (m)	4023 ± 599		4085 ± 934		4389 ± 891		0.605
Average distance (m/min)	43.4 ± 6.3		44.3 ± 10.5		46.8 ± 8.3		0.728
Maximal speed (km/h)	26.8 ± 2.4		27.3 ± 1.8		27.3 ± 1.2		0.203
Average speed (km/h)	2.6 ± 0.4		2.7 ± 0.6		2.8 ± 0.6		0.761
Sprints (qty.)	11.2 ± 5.7		17.6 ± 11.6		19.8 ± 7.8		0.105
Distance in zone 1 (3.00 - 9.99 km/h) (m)	2188 ± 336		2032 ± 359		2263 ± 521		0.578
Distance in zone 2 (10.00 - 13.99 km/h) (m)	876 ± 191		892 ± 297		893 ± 283		0.993
Distance in zone 3 (14.00 - 17.99 km/h) (m)	530 ± 133		605 ± 226		619 ± 142		0.573
Distance in zone 4 (18.00 - 21.99 km/h) (m)	224 ± 68		285 ± 120		302 ± 142		0.203
Distance in zone 5 (22.00- km/h) (m)	100 ± 60		174 ± 137		202 ± 86		0.060
Calories (kcal)	940 ± 79		877 ± 156		1206 ± 187		0.005**
Accelerations 0.50 - 0.99 m/s ² (qty.)	193.3 ± 22.8		170.2 ± 20.9		193.2 ± 30.9		0.145
Accelerations 1.00 - 1.99 m/s ² (qty.)	225.0 ± 42.6		206.2 ± 30.7		227.6 ± 61.5		0.675
Accelerations 2.00 - 2.99 m/s ² (qty.)	78.3 ± 14.9		80.5 ± 28.8		87.3 ± 18.0		0.406
Accelerations 3.00 - 50.00 m/s ² (qty.)	0.5 ± 0.6		1.1 ± 1.4		1.3 ± 1.0		0.204
Decelerations -50.00 - -3.00 m/s ² (qty.)	17.7 ± 4.8		17.0 ± 8.4		22.1 ± 8.1		0.294
Decelerations -2.99 - -2.00 m/s ² (qty.)	59.0 ± 12.9		61.1 ± 15.8		70.1 ± 14.2		0.251
Decelerations -1.99 - -1.00 m/s ² (qty.)	249.1 ± 37.7		228.7 ± 32.3		241.7 ± 46.7		0.553
Decelerations -0.99 - -0.50 m/s ² (qty.)	212.4 ± 36.7		195.3 ± 34.6		208.9 ± 43.8		0.608

Tulokset (tasojen sisäiset eräkohtaiset erot)



VARIABLES	U18 PERIOD 1				U18 PERIOD 2				U18 PERIOD 3				U21 PERIOD 1		U21 PERIOD 2		U21 PERIOD 3		MEN PERIOD 1		MEN PERIOD 2		MEN PERIOD 3		
	Mean ± SD	Mean ± SD	Mean ± SD	n	p-value ^a	Mean ± SD	Mean ± SD	Mean ± SD	n	p-value ^b	Mean ± SD	Mean ± SD	Mean ± SD	n	p-value ^c	Mean ± SD	Mean ± SD	Mean ± SD	n	p-value ^c	Mean ± SD	Mean ± SD	Mean ± SD	n	p-value ^c
Shifts (number / game)	7.4 ± 0.5	6.9 ± 0.6	7.6 ± 1.0	8	0.061	6.7 ± 0.7	7.1 ± 0.8	7.3 ± 1.7	8	0.964	7.9 ± 0.5	7.5 ± 1.1	8.3 ± 1.4	8	0.014*										
HRmin (bpm)	108.0 ± 11.6	111.1 ± 9.6	110.2 ± 12.1		0.687	98.8 ± 11.5	105.7 ± 12.9	101.7 ± 16.5		0.093	103.0 ± 8.8	110.0 ± 9.8	107.5 ± 11.3		0.008**										
HRavg (bpm)	152.1 ± 9.2	147.4 ± 9.3	148.3 ± 10.9		0.044*	143.8 ± 10.3	144.8 ± 9.9	141.7 ± 12.0		0.115	146.5 ± 8.5	147.5 ± 9.1	148.7 ± 8.8		0.508										
HRmax (bpm)	193.4 ± 8.1	191.9 ± 7.0	191.8 ± 7.1		0.197	187.4 ± 9.3	186.0 ± 8.4	188.1 ± 7.1		0.657	190.1 ± 7.6	188.9 ± 7.3	190.0 ± 6.7		0.508										
HRmin (%)	51.7 ± 4.0	53.2 ± 3.4	52.7 ± 4.0		0.748	48.0 ± 6.6	51.2 ± 6.3	49.2 ± 8.2		0.093	51.1 ± 3.4	54.5 ± 4.0	53.2 ± 4.8		0.024*										
HRavg (%)	73.0 ± 3.4	70.7 ± 3.2	71.0 ± 3.5		0.044*	69.6 ± 5.1	70.0 ± 5.6	68.5 ± 6.5		0.115	72.7 ± 2.7	73.1 ± 3.0	73.8 ± 3.3		0.508										
HRmax (%)	92.9 ± 4.7	92.1 ± 4.1	92.1 ± 3.8		0.508	90.6 ± 4.3	90.0 ± 5.1	91.1 ± 5.2		0.587	94.5 ± 2.0	93.9 ± 1.6	94.3 ± 2.0		0.468										
50–59%/HRmax (min:ss)	03:10 ± 03:00	05:06 ± 03:39	05:42 ± 03:32		0.010**	05:43 ± 03:23	06:25 ± 04:53	06:54 ± 05:34		0.417	04:02 ± 03:00	02:55 ± 02:44	03:46 ± 03:33		0.417										
60–69%/HRmax (min:ss)	09:59 ± 02:15	12:52 ± 03:20	10:39 ± 02:38		0.002**	09:02 ± 02:14	09:36 ± 01:14	10:15 ± 03:23		0.687	09:13 ± 01:55	10:34 ± 02:10	10:00 ± 02:51		0.417										
70–79%/HRmax (min:ss)	06:59 ± 02:04	06:14 ± 01:51	06:00 ± 02:01		0.072	06:11 ± 01:45	07:24 ± 02:23	06:41 ± 02:24		0.223	06:46 ± 01:21	06:50 ± 01:58	08:18 ± 02:01		0.072										
80–89%/HRmax (min:ss)	05:55 ± 01:19	05:45 ± 01:18	06:31 ± 01:51		0.197	05:18 ± 00:58	05:35 ± 02:17	05:31 ± 02:39		0.417	06:59 ± 00:57	07:13 ± 01:47	08:01 ± 02:08		0.072										
90–100%/HRmax (min:ss)	02:46 ± 02:39	02:17 ± 02:13	02:16 ± 01:56		0.417	01:21 ± 02:33	01:40 ± 02:40	01:39 ± 03:09		0.962	02:27 ± 01:21	02:33 ± 01:05	03:04 ± 01:26		0.687										
Total Distance (m)	1341 ± 153	1361 ± 161	1321 ± 333		0.882	1254 ± 323	1428 ± 241	1403 ± 428		0.417	1372 ± 196	1423 ± 338	1594 ± 419		0.093										
Average distance (m/min)	46 ± 5	42 ± 5	42 ± 11		0.135	44 ± 12	46 ± 8	43 ± 12		0.542	46 ± 7	47 ± 9	48 ± 11		0.882										
Maximal speed (km/h)	25.4 ± 1.6	25.9 ± 2.4	25.3 ± 1.2		0.607	27.2 ± 1.7	26.2 ± 2.5	26.6 ± 1.5		0.030*	26.8 ± 0.9	26.8 ± 0.6	27.1 ± 1.7		0.882										
Average speed (km/h)	2.8 ± 0.3	2.5 ± 0.3	2.5 ± 0.6		0.072	2.7 ± 0.7	2.8 ± 0.5	2.6 ± 0.7		0.417	2.8 ± 0.4	2.8 ± 0.5	2.9 ± 0.7		0.607										
Sprints (qty.)	3.6 ± 1.9	3.7 ± 2.4	3.8 ± 2.1		0.966	5.4 ± 3.4	5.8 ± 3.9	6.4 ± 4.8		0.419	6.5 ± 2.9	6.5 ± 2.7	6.8 ± 2.7		0.905										
Distance in zone 1 (3.00 - 9.99 km/h) (m)	700 ± 59	762 ± 95	727 ± 206		0.197	604 ± 121	742 ± 99	686 ± 202		0.030*	679 ± 81	731 ± 213	835 ± 237		0.010**										
Distance in zone 2 (10.00 - 13.99 km/h) (m)	307 ± 64	277 ± 55	292 ± 89		0.607	289 ± 121	307 ± 85	295 ± 98		0.687	285 ± 78	288 ± 102	320 ± 119		0.135										
Distance in zone 3 (14.00 - 17.99 km/h) (m)	188 ± 57	174 ± 41	168 ± 45		0.607	200 ± 86	194 ± 69	211 ± 82		0.417	199 ± 55	199 ± 43	220 ± 60		0.687										
Distance in zone 4 (18.00 - 21.99 km/h) (m)	80 ± 33	77 ± 23	67 ± 15		0.325	85 ± 37	99 ± 44	101 ± 56		0.968	91 ± 34	103 ± 36	107 ± 33		0.030*										
Distance in zone 5 (22.00- km/h) (m)	34 ± 20	34 ± 24	32 ± 19		0.882	50 ± 31	50 ± 45	74 ± 64		0.011*	66 ± 32	66 ± 27	70 ± 31		0.417										
Calories (kcal)	305 ± 31	322 ± 28	313 ± 27		0.044*	270 ± 37	301 ± 48	306 ± 75		0.017*	379 ± 44	395 ± 73	432 ± 77		0.030*										
Accelerations 0.50 - 0.99 m/s ² (qty.)	60.5 ± 5.9	66.6 ± 5.7	66.2 ± 15.5		0.078	50.3 ± 6.8	61.5 ± 7.4	58.4 ± 9.6		0.002**	60.5 ± 7.2	63.3 ± 13.6	69.3 ± 14.1		0.206										
Accelerations 1.00 - 1.99 m/s ² (qty.)	74.8 ± 9.0	73.9 ± 14.9	76.3 ± 22.7		0.798	60.0 ± 14.2	73.2 ± 8.0	73.0 ± 17.9		0.223	71.1 ± 11.9	71.5 ± 23.2	85.0 ± 27.4		0.034*										
Accelerations 2.00 - 2.99 m/s ² (qty.)	26.1 ± 5.0	26.7 ± 4.9	25.5 ± 6.9		0.607	26.1 ± 8.6	27.0 ± 8.3	27.3 ± 13.1		0.792	28.4 ± 6.5	28.5 ± 5.9	30.3 ± 7.9		0.687										
Accelerations 3.00 - 50.00 m/s ² (qty.)	0.2 ± 0.3	0.2 ± 0.1	0.1 ± 0.2		0.692	0.3 ± 0.4	0.5 ± 1.0	0.3 ± 0.5		0.662	0.4 ± 0.3	0.5 ± 0.5	0.3 ± 0.3		0.565										
Decelerations -50.00 - -3.00 m/s ² (qty.)	6.5 ± 1.9	5.6 ± 1.4	5.6 ± 1.8		0.542	5.2 ± 2.9	5.9 ± 2.9	5.9 ± 3.2		0.968	6.9 ± 3.1	7.5 ± 2.7	7.8 ± 3.3		0.798										
Decelerations -2.99 - -2.00 m/s ² (qty.)	19.5 ± 3.7	19.9 ± 4.0	19.5 ± 7.0		0.648	19.8 ± 5.2	20.4 ± 4.9	20.9 ± 8.1		0.908	23.2 ± 3.8	22.8 ± 5.5	24.0 ± 5.9		0.508										
Decelerations -1.99 - -1.00 m/s ² (qty.)	80.1 ± 8.7	85.8 ± 10.0	82.5 ± 22.1		0.197	66.3 ± 13.5	82.5 ± 10.3	79.9 ± 18.6		0.093	74.8 ± 8.5	76.5 ± 16.4	90.4 ± 24.3		0.034*										
Decelerations -0.99 - -0.50 m/s ² (qty.)	66.0 ± 9.4	71.9 ± 9.3	74.5 ± 20.9		0.093	59.5 ± 13.8	70.8 ± 9.7	65.0 ± 14.7		0.072	65.9 ± 9.1	67.0 ± 18.4	76.0 ± 19.8		0.197										

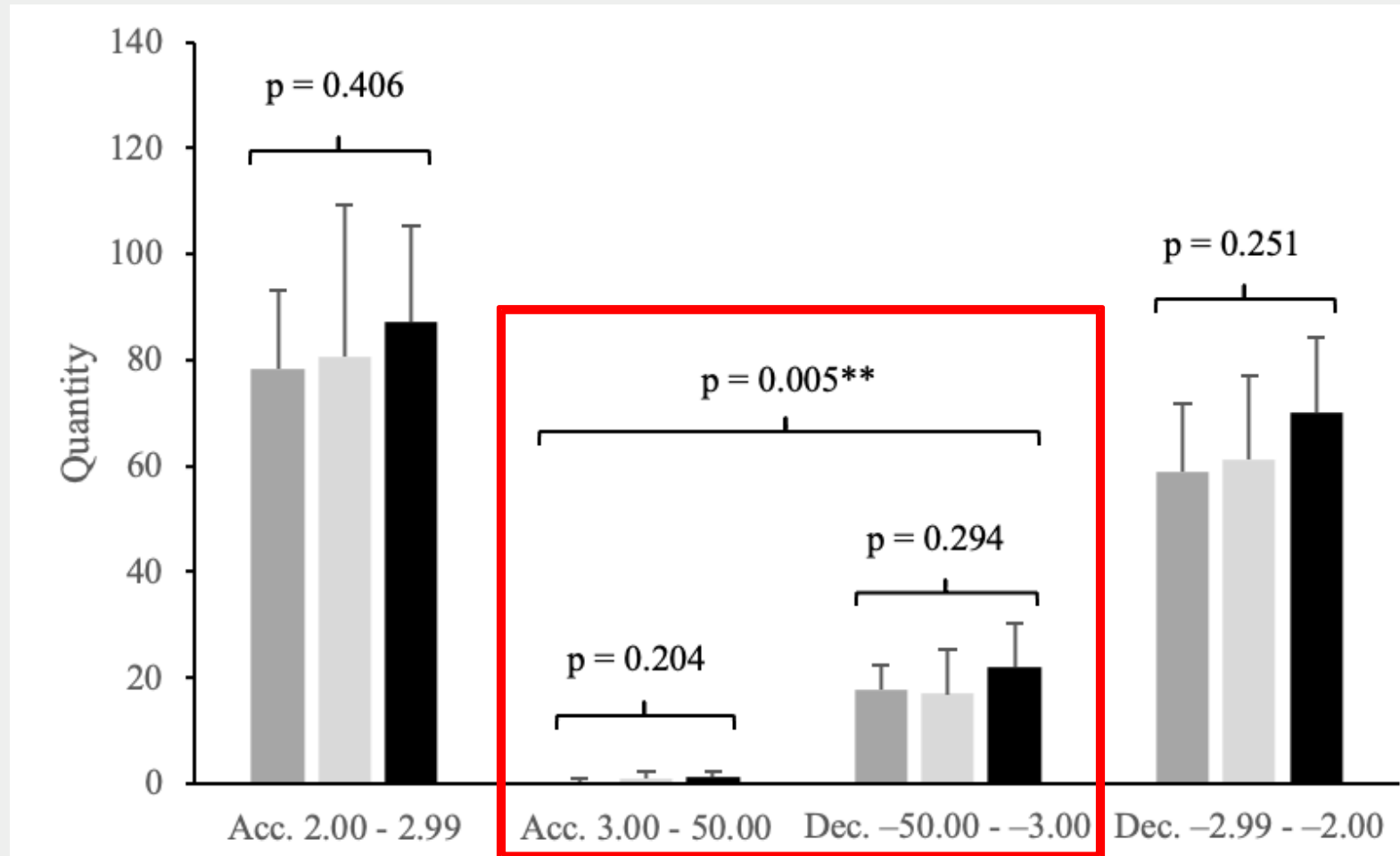


Tulokset (tasojen eräkohtaiset erot)

VARIABLES	U18 PERIOD 1			n	p-value ^a	U18 PERIOD 2			n	p-value ^b	U18 PERIOD 3			n	p-value ^c
	Mean ± SD	Mean ± SD	Mean ± SD			Mean ± SD	Mean ± SD	Mean ± SD			Mean ± SD	Mean ± SD	Mean ± SD		
Shifts (number / game)	7.4 ± 0.5	6.7 ± 0.7	7.9 ± 0.5	8	0.010**	6.9 ± 0.6	7.1 ± 0.8	7.5 ± 1.1	8	0.615	7.6 ± 1.0	7.3 ± 1.7	8.3 ± 1.4	8	0.130
Total Distance (m)	1341 ± 153	1254 ± 323	1372 ± 196		0.512	1361 ± 161	1428 ± 241	1423 ± 338		0.887	1321 ± 333	1403 ± 428	1594 ± 419		0.424
Average distance (m/min)	46 ± 5	44 ± 12	46 ± 7		0.761	42 ± 5	46 ± 8	47 ± 9		0.578	42 ± 11	43 ± 12	48 ± 11		0.493
Maximal speed (km/h)	25.4 ± 1.6	27.2 ± 1.7	26.8 ± 0.9		0.056	25.9 ± 2.4	26.2 ± 2.5	26.8 ± 0.6		0.064	25.3 ± 1.2	26.6 ± 1.5	27.1 ± 1.7		0.056
Average speed (km/h)	2.8 ± 0.3	2.7 ± 0.7	2.8 ± 0.4		0.763	2.5 ± 0.3	2.8 ± 0.5	2.8 ± 0.5		0.686	2.5 ± 0.6	2.6 ± 0.7	2.9 ± 0.7		0.493
Sprints (qty.)	3.6 ± 1.9	5.4 ± 3.4	6.5 ± 2.9		0.125	3.7 ± 2.4	5.8 ± 3.9	6.5 ± 2.7		0.150	3.8 ± 2.1	6.4 ± 4.8	6.8 ± 2.7		0.147
Distance in zone 1 (3.00 - 9.99 km/h) (m)	700 ± 59	604 ± 121	679 ± 81		0.185	762 ± 95	742 ± 99	731 ± 213		0.590	727 ± 206	686 ± 202	835 ± 237		0.357
Distance in zone 2 (10.00 - 13.99 km/h) (m)	307 ± 64	289 ± 121	285 ± 78		0.829	277 ± 55	307 ± 85	288 ± 102		0.797	292 ± 89	295 ± 98	320 ± 119		0.939
Distance in zone 3 (14.00 - 17.99 km/h) (m)	188 ± 57	200 ± 86	199 ± 55		0.968	174 ± 41	194 ± 69	199 ± 43		0.581	168 ± 45	211 ± 82	220 ± 60		0.203
Distance in zone 4 (18.00 - 21.99 km/h) (m)	80 ± 33	85 ± 37	91 ± 34		0.763	77 ± 23	99 ± 44	103 ± 36		0.240	67 ± 15	101 ± 56	107 ± 33		0.030*
Distance in zone 5 (22.00- km/h) (m)	34 ± 20	50 ± 31	66 ± 32		0.096	34 ± 24	50 ± 45	66 ± 27		0.072	32 ± 19	74 ± 64	70 ± 31		0.064
Accelerations 0.50 - 0.99 m/s ² (qty.)	60.5 ± 5.9	50.3 ± 6.8	60.5 ± 7.2		0.013*	66.6 ± 5.7	61.5 ± 7.4	63.3 ± 13.6		0.339	66.2 ± 15.5	58.4 ± 9.6	69.3 ± 14.1		0.161
Accelerations 1.00 - 1.99 m/s ² (qty.)	74.8 ± 9.0	60.0 ± 14.2	71.1 ± 11.9		0.096	73.9 ± 14.9	73.2 ± 8.0	71.5 ± 23.2		0.573	76.3 ± 22.7	73.0 ± 17.9	85.0 ± 27.4		0.793
Accelerations 2.00 - 2.99 m/s ² (qty.)	26.1 ± 5.0	26.1 ± 8.6	28.4 ± 6.5		0.602	26.7 ± 4.9	27.0 ± 8.3	28.5 ± 5.9		0.859	25.5 ± 6.9	27.3 ± 13.1	30.3 ± 7.9		0.399
Accelerations 3.00 - 50.00 m/s ² (qty.)	0.2 ± 0.3	0.3 ± 0.4	0.4 ± 0.3		0.283	0.2 ± 0.1	0.5 ± 1.0	0.5 ± 0.5		0.291	0.1 ± 0.2	0.3 ± 0.5	0.3 ± 0.3		0.553
Decelerations -50.00 - -3.00 m/s ² (qty.)	6.5 ± 1.9	5.2 ± 2.9	6.9 ± 3.1		0.454	5.6 ± 1.4	5.9 ± 2.9	7.5 ± 2.7		0.436	5.6 ± 1.8	5.9 ± 3.2	7.8 ± 3.3		0.324
Decelerations -2.99 - -2.00 m/s ² (qty.)	19.5 ± 3.7	19.8 ± 5.2	23.2 ± 3.8		0.195	19.9 ± 4.0	20.4 ± 4.9	22.8 ± 5.5		0.665	19.5 ± 7.0	20.9 ± 8.1	24.0 ± 5.9		0.438
Decelerations -1.99 - -1.00 m/s ² (qty.)	80.1 ± 8.7	66.3 ± 13.5	74.8 ± 8.5		0.093	85.8 ± 10.0	82.5 ± 10.3	76.5 ± 16.4		0.203	82.5 ± 22.1	79.9 ± 18.6	90.4 ± 24.3		0.651
Decelerations -0.99 - -0.50 m/s ² (qty.)	66.0 ± 9.4	59.5 ± 13.8	65.9 ± 9.1		0.508	71.9 ± 9.3	70.8 ± 9.7	67.0 ± 18.4		0.309	74.5 ± 20.9	65.0 ± 14.7	76.0 ± 19.8		0.471



Tulokset





Tulokset (korrelaatiomatriisi)

VARIABLES	HRmin (bpm)			HRavg (bpm)			HRmax (bpm)			HRmin (%)			HRavg (%)			HRmax (%)			50-59%/HRmax (min:ss)			60-69%/HRmax (min:ss)			70-79%/HRmax (min:ss)			80-89%/HRmax (min:ss)			90-100%/HRmax (min:ss)		
	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN
	Shifts	0.071	0.587	0.262	0.214	0.683*	0.395	-0.524	0.671*	0.214	-0.167	0.476	0.048	0.071	0.551	0.500	-0.190	0.563	-0.262	-0.071	-0.611	-0.143	-0.690*	0.096	-0.119	0.429	0.575	0.619	0.476	0.192	-0.857**	-0.238	0.539
TD	0.214	0.262	0.310	0.429	0.524	0.407	-0.143	0.476	0.143	-0.071	0.190	0.190	0.381	0.524	0.571	0.071	0.429	-0.310	-0.357	-0.595	-0.238	-0.667*	-0.381	0.143	0.405	-0.024	0.786*	0.524	0.310	0.929**	0.071	0.190	-0.190
AvgDistance	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071
MaxSpeed	0.571	0.643*	0.643*	0.595	0.643*	0.755*	0.524	0.524	0.500	0.190	0.690*	0.619	0.357	0.714*	0.833**	-0.214	0.762*	0.310	-0.333	-0.786*	-0.667*	0.405	0.190	-0.167	0.357	0.619	0.381	-0.476	0.524	0.381	-0.071	0.762*	0.429
AvgSpeed	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071
Sprints	0.515	0.667*	0.833**	0.599	0.738*	0.898**	0.850**	0.833**	0.595	0.168	0.667*	0.762*	0.647*	0.595	0.857**	0.299	0.643*	0.333	-0.587	-0.524	-0.857**	0.323	-0.119	0.143	0.108	0.381	0.476	-0.323	0.476	0.571	0.419	0.905**	0.452
TDSpeedzone1	0.214	0.690*	0.024	0.262	0.667*	0.132	-0.476	0.500	-0.095	-0.048	0.643*	-0.143	-0.119	0.714*	0.310	-0.476	0.714*	-0.476	0.000	-0.690*	0.071	-0.524	0.238	-0.190	0.405	0.690*	0.571	0.467	0.333	0.762*	-0.500	0.500	-0.405
TDSpeedzone2	-0.071	-0.119	0.310	0.262	0.238	0.419	0.095	0.310	0.429	-0.143	-0.119	0.238	0.429	0.310	0.548	0.381	0.333	0.048	-0.286	-0.357	-0.262	-0.714*	-0.548	0.524	0.143	-0.429	0.667*	0.500	0.333	0.810**	0.429	0.310	0.119
TDSpeedzone3	0.095	0.048	0.595	0.476	0.333	0.695*	0.262	0.452	0.262	0.095	0.095	0.595	0.643*	0.381	0.857**	0.381	0.405	0.048	-0.476	-0.333	-0.643*	-0.548	-0.762*	0.048	0.333	-0.405	0.690*	0.452	0.429	0.714*	0.524	0.500	0.310
TDSpeedzone4	0.429	0.476	0.762*	0.643*	0.595	0.850**	0.476	0.690*	0.500	0.286	0.548	0.738*	0.881**	0.595	0.905**	0.452	0.643*	0.286	-0.810**	-0.381	-0.810**	-0.024	-0.452	0.095	0.262	-0.024	0.548	0.190	0.595	0.595	0.595	0.833**	0.476
TDSpeedzone5	0.476	0.762*	0.833**	0.548	0.833**	0.898**	0.857**	0.905**	0.595	0.095	0.714*	0.762*	0.595	0.619	0.857**	0.310	0.619	0.333	-0.524	-0.619	-0.857**	0.310	0.000	0.143	0.071	0.524	0.476	-0.381	0.429	0.571	0.405	0.833**	0.452
Accelerations1	0.119	0.667*	-0.048	0.214	0.714*	0.048	-0.310	0.524	-0.095	-0.262	0.643*	-0.214	0.048	0.762*	0.167	-0.286	0.738*	-0.405	0.000	-0.714*	0.143	-0.310	0.524	-0.095	0.286	0.548	0.476	-0.048	0.548	0.690*	-0.286	0.524	-0.357
Accelerations2	0.000	0.571	-0.167	0.143	0.643*	-0.060	-0.310	0.690*	-0.190	-0.190	0.381	-0.238	-0.071	0.381	0.214	-0.333	0.333	-0.452	0.095	-0.429	0.214	-0.405	-0.048	-0.024	0.190	0.548	0.524	0.167	-0.048	0.643*	-0.286	0.310	-0.333
Accelerations3	0.000	0.238	0.595	0.262	0.429	0.731*	0.143	0.571	0.357	-0.048	0.310	0.476	0.452	0.452	0.833**	0.405	0.524	0.024	-0.381	-0.286	-0.571	-0.548	-0.643*	-0.119	0.024	-0.238	0.667*	0.524	0.500	0.810**	0.452	0.738*	0.190
Accelerations4	0.663*	0.098	0.719*	0.602	0.268	0.795**	0.157	0.366	0.599	0.482	0.122	0.623*	0.060	0.366	0.731*	-0.663*	0.537	0.419	-0.205	-0.293	-0.743*	0.349	-0.415	-0.084	0.602	-0.024	0.192	-0.096	0.268	0.311	-0.506	0.683*	0.467
Decelerations1	0.286	0.690*	0.690*	0.381	0.786*	0.802**	0.810**	0.881**	0.405	-0.071	0.690*	0.643*	0.571	0.619	0.905**	0.429	0.619	0.143	-0.405	-0.548	-0.714*	0.310	-0.190	0.024	-0.024	0.310	0.667*	-0.571	0.524	0.738*	0.500	0.857**	0.357
Decelerations2	0.167	0.667*	0.405	0.381	0.690*	0.515	-0.048	0.690*	0.286	0.024	0.667*	0.238	0.143	0.690*	0.619	-0.119	0.738*	-0.214	-0.167	-0.429	-0.310	-0.667*	-0.119	0.119	0.357	0.333	0.762*	0.619	0.476	0.952**	-0.071	0.762*	-0.143
Decelerations3	0.286	0.381	0.024	0.452	0.595	0.132	-0.043	0.738*	-0.095	-0.048	0.214	-0.143	0.286	0.310	0.310	-0.071	0.310	-0.476	-0.310	-0.381	0.071	-0.524	-0.071	-0.190	0.333	0.262	0.571	0.429	0.071	0.762*	-0.048	0.452	-0.405
Decelerations4	0.333	0.524	0.095	0.405	0.619	0.228	-0.333	0.548	0.071	0.000	0.467	0.024	0.143	0.619	0.476	-0.357	0.667*	-0.262	-0.214	-0.714*	-0.048	-0.333	0.143	0.119	0.429	0.548	0.690*	0.286	0.333	0.810**	-0.333	0.619	-0.119



Tulokset (korrelaatiot kahdella tasolla)

VARIABLES	HRmin (bpm)			HRavg (bpm)			HRmax (bpm)			HRmin (%)			HRavg (%)			HRmax (%)			50-59%/HRmax (min:ss)			60-69%/HRmax (min:ss)			70-79%/HRmax (min:ss)			80-89%/HRmax (min:ss)			90-100%/HRmax (min:ss)					
	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN
	Shifts	0.071	0.587	0.262	0.214	0.683*	0.395	-0.524	0.671*	0.214	-0.167	0.476	0.048	0.071	0.551	0.500	-0.190	0.563	-0.262	-0.071	-0.611	-0.143	-0.690*	0.096	-0.119	0.429	0.575	0.619	0.476	0.192	-0.857**	-0.238	0.539	-0.238		
TD	0.214	0.262	0.310	0.429	0.524	0.407	-0.143	0.476	0.143	-0.071	0.190	0.190	0.381	0.524	0.571	0.071	0.429	-0.310	-0.357	-0.595	-0.238	-0.667*	-0.381	0.143	0.405	-0.024	0.786*	0.524	0.310	0.929**	0.071	0.190	-0.190			
AvgDistance	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071			
MaxSpeed	0.571	0.643*	0.643*	0.595	0.643*	0.755*	0.524	0.524	0.500	0.190	0.690*	0.619	0.357	0.714*	0.833**	-0.214	0.762*	0.310	-0.333	-0.786*	-0.667*	0.405	0.190	-0.167	0.357	0.619	0.381	-0.476	0.524	0.381	-0.071	0.762*	0.429			
AvgSpeed	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071			
Sprints	0.515	0.667*	0.833**	0.599	0.738*	0.898**	0.850**	0.833**	0.595	0.168	0.667*	0.762*	0.647*	0.595	0.857**	0.299	0.643*	0.333	-0.587	-0.524	-0.857**	0.323	-0.119	0.143	0.108	0.381	0.476	-0.323	0.476	0.571	0.419	0.905**	0.452			
TDSpeedzone1	0.214	0.690*	0.024	0.262	0.667*	0.132	-0.476	0.500	-0.095	-0.048	0.643*	-0.143	-0.119	0.714*	0.310	-0.476	0.714*	-0.476	0.000	-0.690*	0.071	-0.524	0.238	-0.190	0.405	0.690*	0.571	0.467	0.333	0.762*	-0.500	0.500	-0.405			
TDSpeedzone2	-0.071	-0.119	0.310	0.262	0.238	0.419	0.095	0.310	0.429	-0.143	-0.119	0.238	0.429	0.310	0.548	0.381	0.333	0.048	-0.286	-0.357	-0.262	-0.714*	-0.548	0.524	0.143	-0.429	0.667*	0.500	0.333	0.810**	0.429	0.310	0.119			
TDSpeedzone3	0.095	0.048	0.595	0.476	0.333	0.695*	0.262	0.452	0.262	0.095	0.095	0.595	0.643*	0.381	0.857**	0.381	0.405	0.048	-0.476	-0.333	-0.643*	-0.548	-0.762*	0.048	0.333	-0.405	0.690*	0.452	0.429	0.714*	0.524	0.500	0.310			
TDSpeedzone4	0.429	0.476	0.762*	0.643*	0.595	0.850**	0.476	0.690*	0.500	0.286	0.548	0.738*	0.881**	0.595	0.905**	0.452	0.643*	0.286	-0.810**	-0.381	-0.810**	-0.024	-0.452	0.095	0.262	-0.024	0.548	0.190	0.595	0.595	0.595	0.833**	0.476			
TDSpeedzone5	0.476	0.762*	0.833**	0.548	0.833**	0.898**	0.857**	0.905**	0.595	0.095	0.714*	0.762*	0.595	0.619	0.857**	0.310	0.619	0.333	-0.524	-0.619	-0.857**	0.310	0.000	0.143	0.071	0.524	0.476	-0.381	0.429	0.571	0.405	0.833**	0.452			
Accelerations1	0.119	0.667*	-0.048	0.214	0.714*	0.048	-0.310	0.524	-0.095	-0.262	0.643*	-0.214	0.048	0.762*	0.167	-0.286	0.738*	-0.405	0.000	-0.714*	0.143	-0.310	0.524	-0.095	0.286	0.548	0.476	-0.048	0.548	0.690*	-0.286	0.524	-0.357			
Accelerations2	0.000	0.571	-0.167	0.143	0.643*	-0.060	-0.310	0.690*	-0.190	-0.190	0.381	-0.238	-0.071	0.381	0.214	-0.333	0.333	-0.452	0.095	-0.429	0.214	-0.405	-0.048	-0.024	0.190	0.548	0.524	0.167	-0.048	0.643*	-0.286	0.310	-0.333			
Accelerations3	0.000	0.238	0.595	0.262	0.429	0.731*	0.143	0.571	0.357	-0.048	0.310	0.476	0.452	0.452	0.833**	0.405	0.524	0.024	-0.381	-0.286	-0.571	-0.548	-0.643*	-0.119	0.024	-0.238	0.667*	0.524	0.500	0.810**	0.452	0.738*	0.190			
Accelerations4	0.663*	0.098	0.719*	0.602	0.268	0.795**	0.157	0.366	0.599	0.482	0.122	0.623*	0.060	0.366	0.731*	-0.663*	0.537	0.419	-0.205	-0.293	-0.743*	0.349	-0.415	-0.084	0.602	-0.024	0.192	-0.096	0.268	0.311	-0.506	0.683*	0.467			
Decelerations1	0.286	0.690*	0.690*	0.381	0.786*	0.802**	0.810**	0.881**	0.405	-0.071	0.690*	0.643*	0.571	0.619	0.905**	0.429	0.619	0.143	-0.405	-0.548	-0.714*	0.310	-0.190	0.024	-0.024	0.310	0.667*	-0.571	0.524	0.738*	0.500	0.857**	0.357			
Decelerations2	0.167	0.667*	0.405	0.381	0.690*	0.515	-0.048	0.690*	0.286	0.024	0.667*	0.238	0.143	0.690*	0.619	-0.119	0.738*	-0.214	-0.167	-0.429	-0.310	-0.667*	-0.119	0.119	0.357	0.333	0.762*	0.619	0.476	0.952**	-0.071	0.762*	-0.143			
Decelerations3	0.286	0.381	0.024	0.452	0.595	0.132	-0.043	0.738*	-0.095	-0.048	0.214	-0.143	0.286	0.310	0.310	-0.071	0.310	-0.476	-0.310	-0.381	0.071	-0.524	-0.071	-0.190	0.333	0.262	0.571	0.429	0.071	0.762*	-0.048	0.452	-0.405			
Decelerations4	0.333	0.524	0.095	0.405	0.619	0.228	-0.333	0.548	0.071	0.000	0.467	0.024	0.143	0.619	0.476	-0.357	0.667*	-0.262	-0.214	-0.714*	-0.048	-0.333	0.143	0.119	0.429	0.548	0.690*	0.286	0.333	0.810**	-0.333	0.619	-0.119			



Tulokset (korrelaatiot yhdellä tasolla)

VARIABLES	HRmin (bpm)			HRavg (bpm)			HRmax (bpm)			HRmin (%)			HRavg (%)			HRmax (%)			50-59%/HRmax (min:ss)			60-69%/HRmax (min:ss)			70-79%/HRmax (min:ss)			80-89%/HRmax (min:ss)			90-100%/HRmax (min:ss)		
	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN
	Shifts	0.071	0.587	0.262	0.214	0.683*	0.395	-0.524	0.671*	0.214	-0.167	0.476	0.048	0.071	0.551	0.500	-0.190	0.563	-0.262	-0.071	-0.611	-0.143	-0.690*	0.096	-0.119	0.429	0.575	0.619	0.476	0.192	-0.857**	-0.238	0.539
TD	0.214	0.262	0.310	0.429	0.524	0.407	-0.143	0.476	0.143	-0.071	0.190	0.190	0.381	0.524	0.571	0.071	0.429	-0.310	-0.357	-0.595	-0.238	-0.667*	-0.381	0.143	0.405	-0.024	0.786*	0.524	0.310	0.929**	0.071	0.190	-0.190
AvgDistance	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071
MaxSpeed	0.571	0.643*	0.643*	0.595	0.643*	0.755*	0.524	0.524	0.500	0.190	0.690*	0.619	0.357	0.714*	0.833**	-0.214	0.762*	0.310	-0.333	-0.786*	-0.667*	0.405	0.190	-0.167	0.357	0.619	0.381	-0.476	0.524	0.381	-0.071	0.762*	0.429
AvgSpeed	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071
Sprints	0.515	0.667*	0.833**	0.599	0.738*	0.898**	0.850**	0.833**	0.595	0.168	0.667*	0.762*	0.647*	0.595	0.857**	0.299	0.643*	0.333	-0.587	-0.524	-0.857**	0.323	-0.119	0.143	0.108	0.381	0.476	-0.323	0.476	0.571	0.419	0.905**	0.452
TDSpeedzone1	0.214	0.690*	0.024	0.262	0.667*	0.132	-0.476	0.500	-0.095	-0.048	0.643*	-0.143	-0.119	0.714*	0.310	-0.476	0.714*	-0.476	0.000	-0.690*	0.071	-0.524	0.238	-0.190	0.405	0.690*	0.571	0.467	0.333	0.762*	-0.500	0.500	-0.405
TDSpeedzone2	-0.071	-0.119	0.310	0.262	0.238	0.419	0.095	0.310	0.429	-0.143	-0.119	0.238	0.429	0.310	0.548	0.381	0.333	0.048	-0.286	-0.357	-0.262	-0.714*	-0.548	0.524	0.143	-0.429	0.667*	0.500	0.333	0.810**	0.429	0.310	0.119
TDSpeedzone3	0.095	0.048	0.595	0.476	0.333	0.695*	0.262	0.452	0.262	0.095	0.095	0.595	0.643*	0.381	0.857**	0.381	0.405	0.048	-0.476	-0.333	-0.643*	-0.548	-0.762*	0.048	0.333	-0.405	0.690*	0.452	0.429	0.714*	0.524	0.500	0.310
TDSpeedzone4	0.429	0.476	0.762*	0.643*	0.595	0.850**	0.476	0.690*	0.500	0.286	0.548	0.738*	0.881**	0.595	0.905**	0.452	0.643*	0.286	-0.810**	-0.381	-0.810**	-0.024	-0.452	0.095	0.262	-0.024	0.548	0.190	0.595	0.595	0.595	0.833**	0.476
TDSpeedzone5	0.476	0.762*	0.833**	0.548	0.833**	0.898**	0.857**	0.905**	0.595	0.095	0.714*	0.762*	0.595	0.619	0.857**	0.310	0.619	0.333	-0.524	-0.619	-0.857**	0.310	0.000	0.143	0.071	0.524	0.476	-0.381	0.429	0.571	0.405	0.833**	0.452
Accelerations1	0.119	0.667*	-0.048	0.214	0.714*	0.048	-0.310	0.524	-0.095	-0.262	0.643*	-0.214	0.048	0.762*	0.167	-0.286	0.738*	-0.405	0.000	-0.714*	0.143	-0.310	0.524	-0.095	0.286	0.548	0.476	-0.048	0.548	0.690*	-0.286	0.524	-0.357
Accelerations2	0.000	0.571	-0.167	0.143	0.643*	-0.060	-0.310	0.690*	-0.190	-0.190	0.381	-0.238	-0.071	0.381	0.214	-0.333	0.333	-0.452	0.095	-0.429	0.214	-0.405	-0.048	-0.024	0.190	0.548	0.524	0.167	-0.048	0.643*	-0.286	0.310	-0.333
Accelerations3	0.000	0.238	0.595	0.262	0.429	0.731*	0.143	0.571	0.357	-0.048	0.310	0.476	0.452	0.452	0.833**	0.405	0.524	0.024	-0.381	-0.286	-0.571	-0.548	-0.643*	-0.119	0.024	-0.238	0.667*	0.524	0.500	0.810**	0.452	0.738*	0.190
Accelerations4	0.663*	0.098	0.719*	0.602	0.268	0.795**	0.157	0.366	0.599	0.482	0.122	0.623*	0.060	0.366	0.731*	-0.663*	0.537	0.419	-0.205	-0.293	-0.743*	0.349	-0.415	-0.084	0.602	-0.024	0.192	-0.096	0.268	0.311	-0.506	0.683*	0.467
Decelerations1	0.286	0.690*	0.690*	0.381	0.786*	0.802**	0.810**	0.881**	0.405	-0.071	0.690*	0.643*	0.571	0.619	0.905**	0.429	0.619	0.143	-0.405	-0.548	-0.714*	0.310	-0.190	0.024	-0.024	0.310	0.667*	-0.571	0.524	0.738*	0.500	0.857**	0.357
Decelerations2	0.167	0.667*	0.405	0.381	0.690*	0.515	-0.048	0.690*	0.286	0.024	0.667*	0.238	0.143	0.690*	0.619	-0.119	0.738*	-0.214	-0.167	-0.429	-0.310	-0.667*	-0.119	0.119	0.357	0.333	0.762*	0.619	0.476	0.952**	-0.071	0.762*	-0.143
Decelerations3	0.286	0.381	0.024	0.452	0.595	0.132	-0.043	0.738*	-0.095	-0.048	0.214	-0.143	0.286	0.310	0.310	-0.071	0.310	-0.476	-0.310	-0.381	0.071	-0.524	-0.071	-0.190	0.333	0.262	0.571	0.429	0.071	0.762*	-0.048	0.452	-0.405
Decelerations4	0.333	0.524	0.095	0.405	0.619	0.228	-0.333	0.548	0.071	0.000	0.467	0.024	0.143	0.619	0.476	-0.357	0.667*	-0.262	-0.214	-0.714*	-0.048	-0.333	0.143	0.119	0.429	0.548	0.690*	0.286	0.333	0.810**	-0.333	0.619	-0.119



Tulokset (korrelaatiot tasoittain)

U18 = 16
U21 = 59
Miehet = 57

VARIABLES	HRmin (bpm)			HRavg (bpm)			HRmax (bpm)			HRmin (%)			HRavg (%)			HRmax (%)			50-59%/HRmax (min:ss)			60-69%/HRmax (min:ss)			70-79%/HRmax (min:ss)			80-89%/HRmax (min:ss)			90-100%/HRmax (min:ss)		
	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN	U18	U21	MEN
	Shifts	0.071	0.587	0.262	0.214	0.683*	0.395	-0.524	0.671*	0.214	-0.167	0.476	0.048	0.071	0.551	0.500	-0.190	0.563	-0.262	-0.071	-0.611	-0.143	-0.690*	0.096	-0.119	0.429	0.575	0.619	0.476	0.192	-0.857**	-0.238	0.539
TD	0.214	0.262	0.310	0.429	0.524	0.407	-0.143	0.476	0.143	-0.071	0.190	0.190	0.381	0.524	0.571	0.071	0.429	-0.310	-0.357	-0.595	-0.238	-0.667*	-0.381	0.143	0.405	-0.024	0.786*	0.524	0.310	0.929**	0.071	0.190	-0.190
AvgDistance	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071
MaxSpeed	0.571	0.643*	0.643*	0.595	0.643*	0.755*	0.524	0.524	0.500	0.190	0.690*	0.619	0.357	0.714*	0.833**	-0.214	0.762*	0.310	-0.333	-0.786*	-0.667*	0.405	0.190	-0.167	0.357	0.619	0.381	-0.476	0.524	0.381	-0.071	0.762*	0.429
AvgSpeed	0.190	-0.048	0.238	0.405	0.262	0.383	-0.071	0.333	0.143	-0.167	-0.048	0.119	0.310	0.333	0.595	0.024	0.357	-0.214	-0.262	-0.381	-0.190	-0.643*	-0.667*	-0.048	0.357	-0.333	0.667*	0.381	0.286	0.833**	0.024	0.333	-0.071
Sprints	0.515	0.667*	0.833**	0.599	0.738*	0.898**	0.850**	0.833**	0.595	0.168	0.667*	0.762*	0.647*	0.595	0.857**	0.299	0.643*	0.333	-0.587	-0.524	-0.857**	0.323	-0.119	0.143	0.108	0.381	0.476	-0.323	0.476	0.571	0.419	0.905**	0.452
TDSpeedzone1	0.214	0.690*	0.024	0.262	0.667*	0.132	-0.476	0.500	-0.095	-0.048	0.643*	-0.143	-0.119	0.714*	0.310	-0.476	0.714*	-0.476	0.000	-0.690*	0.071	-0.524	0.238	-0.190	0.405	0.690*	0.571	0.467	0.333	0.762*	-0.500	0.500	-0.405
TDSpeedzone2	-0.071	-0.119	0.310	0.262	0.238	0.419	0.095	0.310	0.429	-0.143	-0.119	0.238	0.429	0.310	0.548	0.381	0.333	0.048	-0.286	-0.357	-0.262	-0.714*	-0.548	0.524	0.143	-0.429	0.667*	0.500	0.333	0.810**	0.429	0.310	0.119
TDSpeedzone3	0.095	0.048	0.595	0.476	0.333	0.695*	0.262	0.452	0.262	0.095	0.095	0.595	0.643*	0.381	0.857**	0.381	0.405	0.048	-0.476	-0.333	-0.643*	-0.548	-0.762*	0.048	0.333	-0.405	0.690*	0.452	0.429	0.714*	0.524	0.500	0.310
TDSpeedzone4	0.429	0.476	0.762*	0.643*	0.595	0.850**	0.476	0.690*	0.500	0.286	0.548	0.738*	0.881**	0.595	0.905**	0.452	0.643*	0.286	-0.810**	-0.381	-0.810**	-0.024	-0.452	0.095	0.262	-0.024	0.548	0.190	0.595	0.595	0.595	0.833**	0.476
TDSpeedzone5	0.476	0.762*	0.833**	0.548	0.833**	0.898**	0.857**	0.905**	0.595	0.095	0.714*	0.762*	0.595	0.619	0.857**	0.310	0.619	0.333	-0.524	-0.619	-0.857**	0.310	0.000	0.143	0.071	0.524	0.476	-0.381	0.429	0.571	0.405	0.833**	0.452
Accelerations1	0.119	0.667*	-0.048	0.214	0.714*	0.048	-0.310	0.524	-0.095	-0.262	0.643*	-0.214	0.048	0.762*	0.167	-0.286	0.738*	-0.405	0.000	-0.714*	0.143	-0.310	0.524	-0.095	0.286	0.548	0.476	-0.048	0.548	0.690*	-0.286	0.524	-0.357
Accelerations2	0.000	0.571	-0.167	0.143	0.643*	-0.060	-0.310	0.690*	-0.190	-0.190	0.381	-0.238	-0.071	0.381	0.214	-0.333	0.333	-0.452	0.095	-0.429	0.214	-0.405	-0.048	-0.024	0.190	0.548	0.524	0.167	-0.048	0.643*	-0.286	0.310	-0.333
Accelerations3	0.000	0.238	0.595	0.262	0.429	0.731*	0.143	0.571	0.357	-0.048	0.310	0.476	0.452	0.452	0.833**	0.405	0.524	0.024	-0.381	-0.286	-0.571	-0.548	-0.643*	-0.119	0.024	-0.238	0.667*	0.524	0.500	0.810**	0.452	0.738*	0.190
Accelerations4	0.663*	0.098	0.719*	0.602	0.268	0.795**	0.157	0.366	0.599	0.482	0.122	0.623*	0.060	0.366	0.731*	-0.663*	0.537	0.419	-0.205	-0.293	-0.743*	0.349	-0.415	-0.084	0.602	-0.024	0.192	-0.096	0.268	0.311	-0.506	0.683*	0.467
Decelerations1	0.286	0.690*	0.690*	0.381	0.786*	0.802**	0.810**	0.881**	0.405	-0.071	0.690*	0.643*	0.571	0.619	0.905**	0.429	0.619	0.143	-0.405	-0.548	-0.714*	0.310	-0.190	0.024	-0.024	0.310	0.667*	-0.571	0.524	0.738*	0.500	0.857**	0.357
Decelerations2	0.167	0.667*	0.405	0.381	0.690*	0.515	-0.048	0.690*	0.286	0.024	0.667*	0.238	0.143	0.690*	0.619	-0.119	0.738*	-0.214	-0.167	-0.429	-0.310	-0.667*	-0.119	0.119	0.357	0.333	0.762*	0.619	0.476	0.952**	-0.071	0.762*	-0.143
Decelerations3	0.286	0.381	0.024	0.452	0.595	0.132	-0.043	0.738*	-0.095	-0.048	0.214	-0.143	0.286	0.310	0.310	-0.071	0.310	-0.476	-0.310	-0.381	0.071	-0.524	-0.071	-0.190	0.333	0.262	0.571	0.429	0.071	0.762*	-0.048	0.452	-0.405
Decelerations4	0.333	0.524	0.095	0.405	0.619	0.228	-0.333	0.548	0.071	0.000	0.467	0.024	0.143	0.619	0.476	-0.357	0.667*	-0.262	-0.214	-0.714*	-0.048	-0.333	0.143	0.119	0.429	0.548	0.690*	0.286	0.333	0.810**	-0.333	0.619	-0.119
	1	7	6	1	9	8	3	8	0	0	7	5	3	4	8	1	7	0	1	4	7	6	4	0	0	1	9	0	0	14	0	8	0



Johtopäätökset & Pohdinta

- Tasojen välillä ei tilastollisia merkitsevyyksiä (pl. kalorikulutus) ottelun kokonaiskuormituksessa
- Tasojen välisessä erävertailussa myös vähän eroavaisuuksia
- Vastaavasti tasojen sisäisessä erätarkastelussa löytyy enemmän eroja, painottaen miesten tasoa
 - / Vaikuttaisi siltä, että miesten pelin sisällä enemmän vaihtelua kuormituksen osalta erien välillä
 - Fyysinen valmius intensiteetin muutoksiin



Johtopäätökset & Pohdinta

- U18 ikäisten sisäisen ja ulkoisen kuormituksen korrelaatioissa muuttujien välillä huomattavasti vähemmän yhteyksiä verrattuna U21 tai Miehiin
- Miesten tasolla selkeä painotus korkean intensiteetin sisäisiin muuttujiin
 - / 80-89 % HRmax korrelaatiot ulkoisiin muuttujiin
 - Aerobisen ja anaerobisen kapasiteetin merkitys?
 - Energiantuottotapojen merkitys
 - Anaerobinen glykolyysi



Johtopäätökset & Pohdinta

- Intensiiteetin vaihtelut
 - / 3.00 – 50.00 m/s² ja -50.00 – -3.00 m/s² tulokset
 - Salibandyottelu vaikuttaisi olevan kuormitukseltaan enemmän eksentrisen lihastyötavan laji kuin konsentrisen
 - Aiempi tutkimustieto osoittanut kuormituksen aiheuttavan sydämen lihassoluvaurioita
 - Todennäköisempää miehillä kuin U18 tai U21?



Vahvuudet ja heikkoudet

- Vahvuudet
 - / Ensimmäinen poikkileikkaustutkimus Suomessa, ja mahdollisesti myös kansainvälisesti
 - / Korkeimpien sarjatasojen vertailu
 - / Virallisia, korkean tason otteluita
- Heikkoudet
 - / GPS-perustainen seurantajärjestelmä ulkoisen kuormituksen osalta
 - / Otoskoko
 - / Ei lihaksen sisäisiä mittauksia tai laktaatinäytteitä



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