APPENDICES

APPENDIX I

RAW DATA

Raw Data - Injury Survey

SI No.	Age	Height (ft)	Body Weight	Cricketing Experience (Years)	Skill Code	Hand Dominance	Leg Dominance	Injury side	Time of onset	Activity of onset	Date of Onset	Injury Mechanism (Cause)	Severity	Injury Management	Surgery/any treatment	Loss of play days
1	34	186	78	10	RAS	HR	LR	R	T	F	Dec	Over use (Gradual onset)	14 - 2 weeks	both	NIL	14
2	34	176	74	12	FB	HR	LR	R	M	BL	Jan	Over use (Gradual onset)	28 - 4 weeks	both	NIL	24
3	23	171	65	3	B	HR	LL	L	T	F	Feb	Contact with moving object/impact (ball)	28 - 4 weeks	both	NIL	30
4	21	172	65	2	WK	HR	LR	L	while sleeping	while sleeping	Feb	Over use (Gradual onset)	2- 2 days	Physiotherapy	NIL	3
5	23	180	72	3	B	HR	LR	R	M	F	Dec	Contact with moving object/impact (ball)	7 - 1week	Physiotherapy	NIL	7
6	22	170	71	10	B	HL	LL	R	T	F	Sep	Contact with moving object/impact (ball)	21 - 3 weeks	both	NIL	30
7	22	167	68	10	FB	HR	LR	L	M	BL	Sep	Over use (Sudden Onset)	7 - 1week	both	NIL	7
8	22	171	60	10	MP	HL	LL	R	M	BL	Jan	Over use (Gradual onset)	>30 - more than 4 weeks	both	NIL	60
9	22	173	73	10	FMP	HR	LR	R	M	BL	Oct	Recurrent of previous injury	7 - 1week	both	NIL	7

10	22	175	70	8	FB	HR	LR	L	T	BL	Sep	Over use (Sudden Onset)	21 - 3 weeks	both	NIL	14
11	31	152	60	5	B	HR	LR	R	M	F	Nov	Impact/Contact	7 - 1week	Physiotherapy	NIL	10
12	30	180	70	15	LAS	HL	LR	R	M	B	Jan	Sprinting while fielding/batting	14 - 2 weeks	both	NIL	12
13	22	176	65	2	FB	HL	LL	R	G	BL	Nov	Over use (Gradual onset)	>30 - more than 4 weeks	both	NIL	40
14	27	173	71	3	MP	HR	LR	L	T	F	Oct	Over use (Sudden Onset)	>180 - 6months or more	both	NIL	120
15	28	170	67	5	MP	HR	LR	L	M	BL	Jul	Over use (Sudden Onset)	>180 - 6months or more	Physiotherapy	NIL	30
16	24	177	72	1	MP	HR	LR	R	T	F	Feb	Overuse (Gradual onset)	>180 - 6months or more	both	NIL	30
17	33	180	73	12	FB	HR	LR	L	G	G	Aug	Over use (Gradual onset)	>180 - 6months or more	other method	Reconstructive Shoulder Surgery	120
18	29	174	67	5	RLS	HR	LR	R	G	G	Oct	Over use (Gradual onset)	21 - 3 weeks	Physiotherapy	NIL	28
19	18	176	73	1	MP	HR	LR	L	G	BL	Jul	Over use (Gradual onset)	>180 - 6months or more	Physiotherapy	NIL	180
20	23	176	75	1	MP	HR	LR	L	G	BL	Nov	Over use (Gradual onset)	>180 - 6 months or more	Physiotherapy	NIL	200
21	27	165	68	1	LAS	HL	LR	R	M	F	Dec	Contact with stagnant object	>30 - more than 4 weeks	both	NIL	38
22	20	180	78	1	MP	HR	LR	L	M	BL	Jun	Over use (Gradual onset)	>30 - more than 4 weeks	Physiotherapy	NIL	40

23	25	160	53	6	B	HL	LR	R	T	F	Dec	Over use (Gradual onset)	21 - 3 weeks	Physiotherapy	NIL	5
24	20	161	50	4	B	HL	LL	L	M	F	Nov	Contact with moving object/impact (ball)	7 - 1week	both	NIL	3
25	29	167	74	10	WK	HR	LR	R	M	F	Feb	Sprinting while fielding/batting	14 - 2 weeks	both	NIL	10
26	29	183	83	12	FMP	HL	LL	R	T	during warmup session	Mar	Contact with other player	>180 - 6 months or more	Other method	Knee Chondroplasty	25
27	30	163	61	8	B	HR	LR	L	T	Fielding Practice	Jun	Sprinting while fielding/batting	>30 - more than 4 weeks	both	NIL	20
28	23	184	68	2	FB	HR	LR	L	M	BL	Dec	Over use (Gradual onset)	>30 - more than 4 weeks	both	NIL	21
29	24	182	70	1	MP	HR	LR	L	M	BL	Jan	Over use (Sudden Onset)	28 - 4 weeks	both	NIL	16
30	22	180	68	5	WK	HR	LR	R	G	G	May	Recurrent of previous injury	>180 - 6 months or more	Other method	ACL Reconstruction surgery.	150
31	24	170	63	4	B	HR	LR	L	T	G	Jul	Over use (Gradual onset)	>180 - 6 months or more	other method	Diskectomy	180
32	23	172	67	5	B	HR	LR	R	M	F	Nov	Impact/Contact	7 - 1week	both	NIL	10
33	21	176	70	2	FB	HL	LL	R	G	BL	Dec	Over use (Gradual onset)	>30 - more than 4 weeks	both	NIL	40
34	22	174	61	5	RLS	HR	LR	R	G	F	Jan	Over use (Gradual onset)	21 - 3 weeks	Physiotherapy	NIL	28
35	19	181	74	2	MP	HR	LR	L	G	BL	Dec	Over use (Gradual onset)	>180 - 6months or more	Physiotherapy	NIL	180

OSICS 10.1 Classification

Level 1 - Body Region	Level 2 - Code	Level 3 - Common Diagnosis	Level 4 - Specific Diagnosis
Neck	NMYX	Neck muscle spasm/trigger points incl torticollis	Neck muscle spasm/trigger points incl torticollis
Shoulder	STSX	Supraspinatus tendinitis, Supraspinatus tendon tear	Supraspinatus tendon injury
	SUBX	Shoulder Injury	Slap Tear
	SUBX	Shoulder Injury	Slap Lesion
	SGSX	Shoulder Injury	Sub Acromial Impingement (rt)
	SMXX	Shoulder strain	supraspinatus spasm
	SMDX	Deltoid contusion	Deltoid contusion
	SGSA	Shoulder Injury	Acute subacromial impingement
	STST	Supraspinatus tendon injury	Supraspinatus tendinopathy
Elbow	EJXX	Anconeus Strain	Over Use Grade 1 Anconeus Strain
Wrist	WFMD	fracture 5th metacarpal	fracture 5th metacarpal
	WFMD	Finger Pain	Fracture 5th MP Joint Rt Hand
Trunk and Abdominal	OMMO	Side strain	Grade 1 tear of oblique muscle
	CHRX	Side Strain	Costochondritis 12th Rib- Left side
Thoracic Spine	DMEX	Back Pain	Thoracolumbar muscle strain
Lumbar Spine	LSRX	Lumbar stress reaction, lumbar disc injury, spondylolisthesis	Lumbar stress reaction
	LSPS	Back Pain	Stress Fracture L4

	LCPD	Disc Prolapse	Mild Posterior annular disc protrusion at L4-L5 Level
	LSPS	Back Pain	Stress Fracture L4
	LMXX	Back Pain	Lf. Side Internal obliques muscle strain
	LSRX	Lumbar stress reaction	Lumbar stress reaction
Pelvis/Buttock	GYOX	Pubic pain	Ostitis pubic
Hip and Groin	GMFX	Muscle strain	Grade 1 strain of rectus femoris muscle
	GYOX	Groin Pain	Grade 3 Osteitis Pubis
Thigh	KTHS	Hamstring strain grade 1,2,3	Bicep femoris strain
	TMHB	Hamstring strain	Biceps Femoris Grade 1 strain at musculotendinous Junction
	TMHB	Hamstring Strain	Grade II Biceps femoris tear at Musculotendinous Junction
Knee	KHMX	Knee MCL contusion	Knee MCL contusion
	KGPT	Knee injury	Left Patellar Tendinitis
	KCLX	Knee twisting injury - osteochondral injury	Lateral Femoral condylar osteochondral lesion, with loose body and poplitues tendon partial tear
	KJAC	Knee twist	Near complete tear involving upper part of Anterior Cruciate Ligament
Lower Leg	QMLX	Lower Leg Injury	Peroneus tendinitis
Ankle	AJXX	Ankle Injury	Ankle Sprain

Crossing Anatomical boundaries	WFFL	Fracture of little finger	Fracture of distal phalanx of little finger
	WJFX	Sprain	Collateral ligament sprain

Raw data - Yoga Module Validation

Qualification	Experience	Breathing Practices		Suryanamaskar	Asana - Standing										Asana - Sitting		
		Tiger Breathing	Pavanamuktasana Kriya	Suryanamaskar	Utthita Trikonasana	Parivrita Trikonasana	Parsvakonasana	Virabhadranasa I	Virabhadrasana II	Ardha Candrasana	Utthita Padangustasana	Prasarita Padottanasana	Vriksasana	Baddhakonasana	Upavista Konasana	Gomukhasana	Parivritta Janu Sirsasana
ME, MCA, PhD	20	3	4	4	3	3	4	3	2	3	2	3	4	3	3	4	2
PhD	20	1	1	4	1	2	1	1	1	2	1	1	1	2	1	1	1
BAMS, MD PhD	8	3	4	4	4	3	3	3	4	3	3	4	3	3	3	4	4
PhD	9	4	3	4	4	3	3	3	4	4	4	4	3	4	4	4	4
BNYS, PhD Scholar	9	4	4	4	4	4	4	4	3	2	4	2	3	4	4	3	2
PhD	18	2	2	3	2	3	3	2	3	3	3	3	3	3	3	3	4
MBBS, M.Sc(Sports Medicine & Exercise)	5	2	2	3	2	3	3	2	4	2	2	2	2	3	3	4	3
PhD	9	4	4	4	4	4	4	4	4	4	4	4	4	3	4	2	4
MBBS MD PhD	7	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
BAMS, Yoga Therapist	12	4	3	4	4	3	4	4	3	3	4	4	4	4	4	4	3
PhD	14	4	3	3	4	3	3	4	4	4	4	4	4	2	4	4	4
M.Sc., PhD in Yoga	14	2	3	3	3	2	3	3	2	2	3	3	4	3	2	2	2
MSc (Yoga), PhD (Yoga)	15	4	4	4	3	3	3	3	3	3	3	3	3	4	4	4	4

B.A.M.S.,M.Sc(Yoga).M.S(C&P).M.Sc(CN&D)	16	2	3	3	3	3	3	4	4	2	3	3	2	2	4	2	3
MBA, MSC (Yoga)	11	3	3	4	3	3	2	2	3	3	3	3	4	4	2	4	4
B.E MSC (Yoga)	5	4	4	3	3	3	4	4	4	4	4	4	2	4	4	3	4
MBA, MSC (Yoga)	7	3	2	4	4	2	1	3	1	2	0	3	4	1	1	1	2
MPT	12	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MBBS Ph.D. Neurophysiology	29	1	2	4	3	3	3	3	2	3	3	3	4	3	3	4	3

Raw data - Yoga module validation

		Asana - Prone				**Asana - Supine**				**Pranayama**			**Relaxation**		
Bharadvajasana	Ushtrasana	Virasana	Bhujangasana	Shalabasana	Dhanurasana	Supta Pandangusthasana	Salamba Sarvangasana	Matsyasana	Uttana Padasana	Setubandasana	Pavanamuktasana	Jathara Parivartanasana	Nadishuddhi	Bhramari	Deep Relaxation
3	4	3	4	4	3	4	3	4	3	3	2	3	4	4	4
1	3	2	3	3	3	1	1	2	1	2	2	1	2	2	2
3	4	4	4	4	3	4	4	3	4	4	4	3	4	4	4
3	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4
2	3	0	4	4	4	0	2	3	2	4	4	4	4	4	4
1	2	3	3	2	1	2	3	3	3	2	2	3	3	3	4
3	3	3	2	2	4	2	4	2	2	2	3	3	3	4	4
1	4	4	4	4	4	3	4	4	3	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	3	4	4	4	4	3	4	4	4	4	4	4
2	4	4	4	3	4	3	4	4	3	4	3	4	4	4	4
4	3	3	3	3	2	2	2	4	3	3	2	3	4	4	4
4	4	4	4	4	4	3	3	4	3	4	2	3	4	4	3

2	3	2	3	2	4	4	4	3	2	2	2	4	4	4	4
2	3	3	4	4	3	4	3	3	3	4	4	4	4	4	4
2	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4
2	3	3	3	3	3	1	3	2	3	1	1	3	4	4	4
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
3	3	3	4	4	4	3	4	4	3	3	3	3	3	4	4

Common injury incidents (%) by injury incidence and loss of play days

Injury - Common Diagnosis	Injury - Specific Diagnosis	LOPD
Lower Leg Injury	Peroneus tendinitis	14
Anoconeus Strain	Over Use Grade 1 Anconeus Strain	24
fracture 5th metacarpal	fracture 5th metacarpal	30
Neck muscle spasm/trigger points incl torticollis	Neck muscle spasm/trigger points incl torticollis	3
Knee MCL contusion	Knee MCL contusion	7
Fracture of little finger	Fracture of distal phalanx of little finger	30
Muscle strain	Grade 1 strain of rectus femoris muscle	7
Pubic pain	Ostitis pubic	60
Sprain	Collateral ligament sprain	7
Side strain	Grade 1 tear of oblique muscle	14
Supraspinatus tendinitis, Supraspinatus tendon tear	Supraspinatus tendon injury	10
Hamstring strain grade 1,2,3	Bicep femoris strain	12
Lumbar stress reaction, lumbar disc injury, spondylolisthesis	Lumbar stress reaction	40
Knee injury	Left Patellar Tendinitis	120
Ankle Injury	Ankle Sprain	30
Shoulder Injury	Slap Tear	30
Shoulder Injury	Slap Lesion	120
Shoulder Injury	Sub Acromial Impingement (rt)	28
Back Pain	Stress Fracture L4	180
Back Pain	Thoracolumbar muscle strain	200
Finger Pain	Fracture 5th MP Joint Rt Hand	38

Back Pain		40
Shoulder strain	Lf. Side Internal obliques muscle strain supraspinatus spasm	5
Deltoid contusion	Deltoid contusion	3
Hamstring strain	Biceps Femoris Grade 1 strain at musculotendinous Junction	10
Knee twisting injury - osteochondral injury		25
Hamstring Strain	Lateral Femoral condylar osteochondral lesion, with loose body and poplitues tendon partial tear Grade II Biceps femoris tear at Musculotendinous Junction	20
Groin Pain	Grade 3 Osteitis Pubis	21
Side Strain	Costochondritis 12th Rib- Left side	16
Knee twist	Near complete tear involving upper part of Anterior Cruciate Ligament	150
Lumbar disc prolapse	Mild Posterior annular disc protrusion at L4-L5 Level	180
Shoulder Injury	Acute subacromial impingement	10
Lumbar stress reaction, lumbar disc injury, spondylolisthesis	Lumbar stress reaction	40
Supraspinatus tendon injury	Supraspinatus tendinopathy	28
Back Pain	Stress Fracture L4	180

Raw data – Muscular functioning (Yoga group)

DLL_T1	DLL_T2	DLL_T3	SBT_Rt_T1	SBT_Rt_T2	SBT_Rt_T3	SBT_Lt_T1	SBT_Lt_T2	SBT_Lt_T3	BSR_Rt_T1	BSR_Rt_T2	BSR_Rt_T3	BSR_Lt_T1	BSR_Lt_T2	BSR_Lt_T3	BASR_IR_Rt_T1	BASR_IR_Rt_T2	BASR_IR_Rt_T3	BASR_IR_Lt_T1	BASR_IR_Lt_T2	BASR_IR_Lt_T3	BASR_ER_Rt_T1	BASR_ER_Rt_T2	BASR_ER_Rt_T3
74.1	59.5	62.3	31	45	25	50	79	46	24	32	25	26	31	46	70	94	92	78	96	94	93	98	96
70.5	56.3	58.2	41	90	62	144	181	112	35	34	31	31	33	32	71	73	74	92	96	94	98	102	98
47.2	54.3	56.8	59	130	126	62	105	98	37	41	40	35	43	38	90	92	90	90	90	91	98	104	101
42.1	56.9	58.4	55	102	98	63	94	91	26	32	32	27	33	32	80	84	79	93	95	84	98	102	101
52.3	31.2	43.4	94	153	126	98	135	138	26	34	33	31	39	38	89	92	91	96	105	99	90	99	98
80.1	58.3	60.1	69	72	56	90	81	89	27	31	30	25	30	30	58	61	59	98	101	94	98	107	102
35.9	68.1	48.9	32	123	116	44	72	56	32	37	34	33	37	36	43	43	44	60	61	67	92	96	94
60.1	32.5	41.6	73	114	105	82	128	118	23	36	35	24	35	31	83	88	89	74	79	83	98	99	90
80	42.4	48.9	88	124	102	107	131	117	26	38	37	24	31	30	76	84	86	81	92	92	92	93	94
79.4	52.1	48.4	118	128	121	150	192	143	34	33	34	38	37	33	81	83	84	78	87	81	97	99	90
77.3	58.3	61.4	42	98	86	61	118	98	24	30	22	25	32	24	66	68	70	66	65	72	90	92	90
62.5	31.2	48.2	64	81	52	62	104	68	24	32	30	26	35	31	80	89	84	83	85	86	91	92	90
77.4	43.1	56.1	126	132	142	90	108	134	24	30	29	24	28	26	73	79	82	76	84	81	91	92	91
72.8	49.4	52.3	62	108	98	78	129	75	38	46	42	35	33	30	89	93	92	91	94	95	98	99	98
62	54	56.5	43	104	112	91	127	105	31	46	39	36	43	41	54	54	55	61	68	69	80	82	81
69.3	43.8	45.2	91	111	104	94	117	98	28	39	28	25	39	24	84	87	82	79	79	79	111	113	104
71	64.8	66.2	84	112	108	90	107	94	24	37	31	26	35	35	78	82	82	81	83	80	72	78	75
74	35.3	63.2	129	182	132	76	124	132	24	24	26	31	28	24	69	74	72	73	74	73	98	103	101
52.5	46.9	51.8	104	117	106	120	142	98	31	38	32	29	39	36	97	101	98	94	103	91	94	100	92
78.2	64.9	58.9	94	89	63	114	123	102	31	37	36	30	36	36	90	89	72	68	69	70	90	92	108
83.4	75.9	79.8	69	84	64	118	131	72	25	27	28	30	32	27	85	92	72	69	74	71	78	84	90
68.4	59.3	62.5	94	108	98	111	124	63	27	29	29	28	32	30	105	108	60	51	68	63	70	82	108

62.8	42.1	56.7	45	91	108	94	121	74	26	30	28	28	34	32	73	82	70	77	82	75	100	108	90
81.4	75.1	77.5	141	182	165	162	198	142	27	31	27	29	36	29	68	72	70	70	77	72	102	105	101
78.3	64.9	66.2	94	99	84	98	112	72	27	30	28	26	36	29	80	83	80	92	101	86	90	94	90
78.2	44.1	48.9	131	139	124	127	132	101	27	30	29	27	29	29	90	97	87	94	89	81	90	97	93
77.8	42.1	58.1	94	128	126	104	161	131	26	32	29	30	34	30	78	81	80	84	91	84	96	96	95
79.4	60.4	58.2	121	184	204	132	189	219	24	35	35	26	30	32	56	73	74	63	66	73	89	91	93
76.8	54.1	58.3	94	114	91	81	99	89	27	31	33	26	30	35	76	89	83	81	84	82	98	109	106
80.2	66.7	69.6	114	132	121	108	146	101	26	38	36	32	36	32	65	63	63	72	76	75	83	89	86
73.6	54.3	52.1	105	122	131	108	139	146	23	28	29	24	32	35	90	103	105	93	108	109	110	112	112
62.7	43.5	40.2	45	91	105	94	125	210	26	28	29	30	34	36	79	83	85	82	84	87	92	98	99
84.9	71.4	70.4	34	79	98	59	99	105	20	28	27	24	32	26	84	92	93	79	88	91	98	99	100
79	63.5	60.1	71	94	105	98	139	118	24	26	27	24	30	28	75	86	86	77	92	92	102	111	112
72.6	69	68.3	51	74	181	72	89	216	24	28	30	26	30	34	79	70	73	83	79	79	102	112	114
80.4	75.6	73.2	32	69	91	69	87	95	30	33	34	24	26	34	82	84	81	84	84	82	95	96	98
68.3	62.3	60.5	39	124	101	55	84	132	27	28	26	30	31	27	82	84	83	74	79	81	98	99	100
64.8	61.9	58.2	82	121	91	118	120	98	26	28	30	29	31	32	72	74	81	79	84	82	99	103	101
71.9	54	56.3	120	132	123	130	148	91	25	26	27	24	27	28	82	85	83	87	89	85	98	99	101
64.8	52.1	55.1	104	125	121	104	136	101	35	37	38	33	39	34	74	77	73	71	75	75	98	101	101
68.3	64.2	60.8	59	71	98	68	94	112	24	25	27	27	26	29	82	83	82	87	89	87	98	99	101
74.9	72.1	70.3	64	82	141	71	103	98	26	27	25	28	28	24	74	71	70	77	73	71	94	99	98

Raw data – Muscular functioning (Yoga group)

BASR_ER_Lt_T1	BASR_ER_Lt_T2	BASR_ER_Lt_T3	SB_EO_Rt_T1	SB_EO_Rt_T2	SB_EO_Rt_T3	SB_EO_Lt_T1	SB_EO_Lt_T2	SB_EO_Lt_T3	SB_EC_Rt_T1	SB_EC_Rt_T2	SB_EC_Rt_T3	SB_EC_Lt_T1	SB_EC_Lt_T2	SB_EC_Lt_T3	BT_ANT_Rt_T1	BT_ANT_Rt_T2	BT_ANT_Rt_T3	BT_PM_Rt_T1	BT_PM_Rt_T2	BT_PM_Rt_T3	BT_PL_Rt_T1	BT_PL_Rt_T2	BT_PL_Rt_T3
82	90	90	43	160	138	40	165	140	11	51	35	18	67	49	49	88	52	46	92	58	52	88	48
96	108	104	44	210	156	21	295	184	15	23	31	19	22	21	47	89	72	53	91	76	54	102	84
92	110	104	34	92	84	31	138	141	4	39	12	19	40	16	51	86	72	54	76	78	53	84	91
91	98	96	36	66	56	37	146	112	12	9	8	7	47	38	55	88	84	53	71	92	56	87	91
98	102	99	32	204	184	45	165	161	69	98	92	16	69	89	55	73	71	53	71	70	55	79	65
108	114	113	56	141	98	105	127	86	14	23	14	16	56	19	44	51	48	39	49	52	43	51	54
90	98	96	41	85	61	22	125	134	17	18	9	16	37	24	41	95	84	52	99	56	54	96	92
102	108	98	50	124	119	34	78	89	5	17	21	13	23	19	68	90	69	69	91	65	73	92	75
98	99	98	107	148	132	68	129	126	10	21	24	6	14	18	37	52	51	32	56	55	34	54	35
102	105	98	128	141	121	190	241	132	34	41	24	28	31	19	49	39	61	48	41	63	44	48	61
71	79	92	123	202	182	142	202	196	12	24	13	14	97	12	44	68	62	46	61	65	43	64	58
101	107	98	37	94	69	31	81	79	17	22	12	13	34	24	79	94	84	82	110	64	84	107	72
98	99	94	80	98	84	96	124	105	38	41	38	34	65	52	40	40	42	38	40	38	32	40	38
102	116	108	42	84	62	52	95	78	23	31	34	42	67	45	64	90	64	71	103	94	63	107	107
72	76	77	32	121	108	121	280	118	11	28	18	12	25	19	52	79	81	42	78	68	47	79	71
98	101	102	54	181	162	129	183	179	8	16	13	4	16	2	72	94	94	73	95	96	77	98	84
91	98	84	121	124	115	29	54	79	21	41	32	7	12	14	41	62	66	42	68	62	34	60	52
104	107	103	67	91	90	92	124	84	12	31	32	4	41	14	43	52	56	34	57	61	44	50	52
97	103	94	20	138	108	34	264	164	6	12	31	4	11	24	43	94	82	56	100	98	56	104	91
90	94	91	47	79	49	68	112	64	7	18	16	12	31	28	34	52	49	35	49	38	40	51	56
94	99	91	59	108	102	49	78	54	4	32	31	17	49	16	47	59	61	44	58	52	43	57	50
112	114	105	34	89	94	41	69	72	19	34	37	8	19	23	32	47	51	31	59	42	30	43	55

90	98	92	8	51	32	41	74	43	3	14	16	13	31	19	43	52	58	38	43	51	43	67	61
90	94	90	49	78	64	52	94	72	13	29	16	19	36	21	71	89	72	70	83	81	68	87	85
92	93	92	39	41	52	49	68	61	14	16	18	21	28	29	79	74	71	73	78	68	84	77	72
98	104	99	13	52	52	14	31	61	8	13	14	4	9	18	73	89	81	72	84	92	78	81	72
90	92	93	39	64	72	42	79	89	12	19	21	28	30	32	71	83	83	62	82	86	60	85	79
90	95	95	30	49	52	48	72	51	14	31	14	22	54	21	62	85	82	68	83	80	71	87	89
99	105	105	56	79	82	64	94	91	29	32	23	38	61	16	38	59	61	39	59	64	30	57	57
92	92	89	18	49	51	31	64	67	3	14	18	18	34	42	61	78	78	53	71	71	50	73	78
98	107	107	41	69	78	32	82	87	18	33	41	25	47	52	41	52	63	43	54	61	50	58	62
95	102	105	52	71	84	84	102	98	14	19	21	21	45	32	50	68	71	35	66	69	58	71	72
104	109	103	34	129	132	52	144	149	19	31	32	11	19	45	68	91	92	69	90	95	73	93	78
106	121	121	41	65	108	71	92	121	8	42	38	21	40	49	74	94	84	79	93	92	83	92	87
113	114	120	32	112	113	59	98	128	4	11	43	10	16	45	82	98	84	73	98	86	77	92	78
98	97	101	44	119	113	59	124	226	25	31	49	18	27	65	49	71	68	42	72	71	51	74	75
104	107	99	41	196	186	58	147	152	34	39	53	19	41	59	41	61	52	39	63	52	52	62	48
101	104	99	34	61	73	54	49	79	6	11	18	5	19	25	33	68	52	54	63	53	58	68	68
92	90	105	46	68	123	43	101	156	5	13	32	3	21	41	37	74	72	48	73	74	49	71	71
95	104	105	20	71	53	26	34	64	4	12	19	8	17	14	43	75	68	51	68	65	51	67	71
94	93	100	34	69	74	31	74	83	12	4	12	19	18	12	45	71	61	49	72	62	49	77	71
100	103	93	31	77	72	49	62	61	4	9	14	1	18	8	51	81	81	52	91	79	61	98	84

Raw data – Muscular functioning (Yoga group)

BT_ANT_Lt_T1	BT_ANT_Lt_T2	BT_ANT_Lt_T3	BT_PM_Lt_T1	BT_PM_Lt_T2	BT_PM_Lt_T3	BT_PL_Lt_T1	BT_PL_Lt_T2	BT_PL_Lt_T3	BT_COMP_Rt_T1	BT_COMP_Rt_T2	BT_COMP_Rt_T3	BT_COMP_Lt_T1	BT_COMP_Lt_T2	BT_COMP_Lt_T3	BT_DELTA_T1	BT_DELTA_T2	BT_DELTA_T3	POA_10_DEO_T1	POA_10_DEO_T2
47	95	56	49	90	50	52	80	49	53.85	98.17	57.88	54.21	98.17	56.78	0.37	-1.10	-1.10	9.2	8.5
50	94	71	56	98	81	56	103	82	51.33	97.33	77.33	54.00	97.33	78.00	2.67	1.00	0.67	11.4	10.3
52	86	71	47	85	94	49	89	82	57.25	89.13	87.32	53.62	89.13	89.49	-3.62	5.07	2.17	11.5	9.8
51	87	89	53	84	113	56	85	118	61.42	95.88	114.98	59.93	95.88	119.85	-1.50	0.00	4.87	10.4	9.8
55	72	71	51	74	69	54	73	64	59.06	77.17	74.64	57.97	77.17	73.91	-1.09	2.17	-0.72	12.2	11.4
39	48	49	42	47	51	41	51	53	45.16	54.12	55.20	43.73	54.12	54.84	-1.43	-1.79	-0.36	9.6	10.3
45	97	91	49	97	85	56	98	101	49.00	96.67	94.00	50.00	96.67	92.33	1.00	0.67	-1.67	1.4	7.9
74	88	68	71	96	72	78	98	73	75.27	97.85	74.91	79.93	97.85	76.34	4.66	3.23	1.43	13.7	10.8
33	61	62	27	62	61	34	57	38	42.92	67.50	58.75	39.17	67.50	67.08	-3.75	7.50	8.33	2.8	9.6
51	37	62	49	43	65	44	45	58	47.47	43.10	62.29	48.48	43.10	62.29	1.01	-1.01	0.00	8.2	9.8
47	72	68	43	69	67	41	63	59	46.18	67.01	64.24	45.49	67.01	67.36	-0.69	3.82	3.13	7.9	10.1
91	98	91	90	130	81	88	107	81	84.16	105.94	72.61	88.78	105.94	83.50	4.62	7.92	10.89	10.5	10.1
42	71	41	41	40	41	31	40	44	34.27	37.38	36.76	35.51	37.38	39.25	1.25	0.31	2.49	10.3	10.1
69	94	79	72	99	95	74	96	94	72.53	109.89	97.07	78.75	109.89	98.17	6.23	-4.03	1.10	10.3	10.4
48	81	82	43	82	69	47	78	74	52.22	87.41	81.48	51.11	87.41	83.33	-1.11	1.85	1.85	9.8	10.4
79	98	98	78	96	95	72	97	98	73.27	94.72	90.43	75.58	94.72	96.04	2.31	1.32	5.61	10.3	10.1
34	41	78	37	52	61	35	59	58	45.88	74.51	70.59	41.57	74.51	77.25	-4.31	-14.90	6.67	9.2	10.3
41	58	58	34	61	53	37	53	51	46.36	60.92	64.75	42.91	60.92	62.07	-3.45	4.98	-2.68	7.9	9.8
54	103	81	52	103	96	59	106	94	59.78	111.59	98.19	59.78	111.59	98.19	0.00	1.45	0.00	11.4	10.2
33	48	48	33	44	51	36	51	52	40.37	56.30	60.37	37.78	56.30	55.93	-2.59	-3.33	-4.44	9.2	10.2
49	62	68	48	61	54	49	59	56	50.19	65.17	61.05	54.68	65.17	66.67	4.49	3.00	5.62	3.2	10.1
30	42	48	32	47	63	34	52	54	34.07	47.99	57.88	35.16	47.99	60.44	1.10	3.66	2.56	6.1	10.2

41	51	56	47	49	54	44	48	65	46.53	49.31	59.03	45.83	49.31	60.76	-0.69	2.08	1.74	9.8	10.2
73	84	73	74	81	82	78	90	86	67.64	83.82	77.02	72.82	83.82	77.99	5.18	-1.29	0.97	10.1	10.3
81	73	70	89	78	64	83	79	73	80.39	72.55	68.95	82.68	72.55	67.65	2.29	2.61	-1.31	6.2	8.9
71	83	90	64	88	94	60	80	89	75.08	85.52	89.23	65.66	85.52	91.92	-9.43	-1.01	2.69	5.4	10.5
63	81	82	59	82	87	58	83	72	64.33	83.33	82.67	60.00	83.33	80.33	-4.33	-1.33	-2.33	8.2	9.9
66	92	81	67	91	84	74	86	87	68.37	86.73	85.37	70.41	86.73	85.71	2.04	4.76	0.34	7.2	10.4
37	61	63	32	63	63	31	60	61	39.19	64.10	66.67	36.63	64.10	68.50	-2.56	3.30	1.83	5.2	10.2
60	75	76	51	70	72	49	52	74	58.16	78.72	80.50	56.74	78.72	78.72	-1.42	-8.87	-1.77	8.4	9.8
42	68	64	45	57	68	48	51	63	46.53	56.94	64.58	46.88	56.94	67.71	0.35	0.69	3.13	6.2	10.2
49	65	72	50	65	68	51	74	75	49.14	70.45	72.85	51.55	70.45	73.88	2.41	-0.34	1.03	6.1	8.4
74	92	104	73	92	96	79	92	92	70.71	92.26	95.96	76.09	92.26	98.32	5.39	0.67	2.36	9.4	10.1
63	90	89	67	94	89	60	82	91	77.89	92.08	86.80	62.71	92.08	88.78	-15.18	-4.29	1.98	4.1	8.2
72	94	81	74	95	83	71	89	91	74.36	92.31	79.49	69.55	92.31	81.73	-4.81	-3.21	2.24	5.2	7.3
53	68	67	52	69	69	72	77	79	50.35	76.95	75.89	62.77	76.95	76.24	12.41	-1.06	0.35	10.2	10.1
42	77	56	38	60	51	50	67	53	45.36	63.92	52.23	44.67	63.92	54.98	-0.69	-0.69	2.75	10.2	10.2
36	62	51	57	62	61	56	67	64	45.60	62.58	54.40	46.86	62.58	55.35	1.26	-2.52	0.94	4.8	7.9
34	74	71	48	78	73	52	74	74	44.67	72.67	72.33	44.67	72.67	72.67	0.00	2.67	0.33	8	10.1
39	73	61	51	67	72	49	62	73	49.32	71.43	69.39	47.28	71.43	70.07	-2.04	-2.72	0.68	10.6	10.1
51	63	68	57	72	69	56	74	74	48.64	74.83	65.99	55.78	74.83	71.77	7.14	-3.74	5.78	6.1	9.4
55	95	74	58	92	87	69	101	89	55.78	91.84	86.39	61.90	91.84	85.03	6.12	6.12	-1.36	5.9	10.3

Raw data – Muscular functioning (Yoga group)

POA_10_DEO_T3	POA_10_DEC_T1	POA_10_DEC_T2	POA_10_DEC_T3	POA_11_PEO_T1	POA_11_PEO_T2	POA_11_PEO_T3	POA_11_PEC_T1	POA_11_PEC_T2	POA_11_PEC_T3	POA_25_PEO_T1	POA_25_PEO_T2	POA_25_PEO_T3	POA_25_PEC_T1	POA_25_PEC_T2	POA_25_PEC_T3
8.6	7.1	7.9	3.5	11.6	10.2	11.8	10.5	10	6.8	25.4	22.3	26.2	19	24.5	14.2
9.9	17.5	12.3	12.3	13.6	12.4	11.8	16.5	11.9	13.4	27.8	26.3	24.3	33.5	28.4	28.3
9.6	12.9	11.2	10.2	12.5	13.2	13.8	26.3	14.5	26.4	27.5	22.1	28.3	42.6	24.6	32.3
6.6	18	14.4	8.4	18	13.2	14.5	6.5	12.9	12.2	26	27.2	23.2	11	23.5	24.6
12.4	17.4	9.9	9.8	12.3	10.3	11.2	15.6	10.7	4.3	26.3	26.4	26.6	29.5	24.8	21.2
9.9	17.3	12.2	14.3	8.7	10.4	8.6	10.1	11.3	6.8	17.1	26.4	25.2	18.8	21.7	14.3
9.6	4.5	8.4	8.6	11.6	10.7	10.4	19.6	12.3	2.3	20.9	20.3	26.3	27.1	26.3	12.5
9.8	12.8	11.3	6.5	13.6	10.9	12.5	18.3	12.6	6.2	30.7	26.2	23.4	48.4	24.9	21.2
8.6	3.3	10.8	2.3	12.6	11.4	18.6	19.6	9.6	16.7	22.7	26.1	24.4	25.6	28.3	13.5
8.4	8.9	10.1	6.6	10.5	10.6	11.8	17.3	11.2	5.3	17.2	23.4	21.2	22.1	22.9	16.8
6.6	6.3	11.2	3.2	7.2	10.9	11.2	8.4	11.5	4.5	21.2	24.6	24.6	20.1	28.3	31.2
10.4	8.7	10.7	7.8	11.9	11.2	10.5	9.1	12.8	8.2	26.9	25.2	23.2	15.6	29	14.2
9.2	9.5	9.2	6.8	5.7	10.5	11.5	5.2	9.1	5.6	11.7	22	23.2	13.6	20.4	14.5
10.4	8.9	7.8	12.3	14.6	11.2	11.4	30.3	11.9	13.4	28.2	26.3	21.6	42.2	24.1	13.2
9.4	4.1	9.8	5.6	9.2	11.3	10.2	3.4	10.1	13.4	26.1	25.4	21.5	29	27.3	21.2
9.6	13.5	10.8	2.5	11.4	11.3	11.8	16.1	10.1	16.5	26.1	25.3	24.3	29	23.1	20.4
8.4	8.1	10.8	6.8	9.3	10.5	10.2	4.4	10.1	5.2	25.5	20.1	21.5	20.1	23.4	25.4
8.6	6.2	12.1	3.2	12.1	11.4	11.8	10.8	13.2	9.6	17.9	24.1	22.1	15.6	21.3	18.4
10.1	19.4	10.1	6.2	12.1	11.2	11.8	25.9	12.9	16.4	26.4	25.2	23.5	36	24.3	21.2
9.6	8.3	9.9	3.8	9.9	10.9	11.2	2.6	12.1	6.6	13.2	16.2	21.2	10.1	9.2	18.4
9.4	4.1	10.8	4.6	6.6	11.2	11.2	3.1	12.3	3.4	20.1	24.9	25.6	11.2	23.2	16.8
9.8	5.2	8.9	6.6	11.2	11.2	10.4	6.4	11.9	8.9	30.1	25.1	25.1	35.9	27.9	17.6

10.2	5.2	10.9	6.8	10.4	11.3	11.5	9.3	10.2	4.6	25.1	25.8	25.8	29.4	21.2	15.2
9.4	4.1	8.4	6.6	11.1	11.5	11.5	11.8	11.2	2.4	25.2	25.9	25.9	23.1	20.2	17.6
6.8	2.1	6.6	2.5	12.8	11.5	11.4	11	11	5.6	22	25.3	20.4	20.1	23.6	20.2
6.8	1.6	8.1	2.3	9.4	11.2	11.4	2.4	11.1	8.4	25.1	24.1	21.2	11	25.2	12.4
10.5	3.1	10.3	8.5	11.2	11.3	11.9	13.4	7.4	16.2	25	25.2	25.2	37.4	24.3	14.5
9.6	1.1	8.3	13.4	10.5	11.2	11.2	3.2	13.9	11.6	25.2	20.1	23.2	12.1	25.2	21.4
12.2	3.1	8.3	4.6	10.4	11.4	13.1	8.1	7.2	6.5	20.1	23.2	26.2	9.2	20.2	21.4
9.6	2.1	8.1	6.7	11.2	11.1	11.1	3.4	8.2	9.4	17.2	24.1	23.1	10.2	20.2	21.2
10.5	5.9	8.1	8.9	8.5	10.9	11.4	8.7	9.1	9.8	14.6	18.2	25.2	19.8	15.3	16.8
8.4	2.3	9.1	5.3	11.2	11.1	11.6	10.3	10.9	8.5	25.1	25.3	23.2	29	23.1	11.5
9.6	2.1	5.6	6.1	11.3	11.2	10.9	2.9	8.4	3.2	24.1	25.1	21.2	10.2	20.2	16.8
8.4	1.9	5.8	6.3	11.4	11.1	11.5	2.8	11.9	11.4	22.1	23.6	21.2	9.2	17.4	20.4
8.4	1.7	5.9	6.3	10.4	11.4	11.5	17.2	10.9	6.3	21	24.6	21.2	20.2	23.4	12.6
9.4	7.3	8.1	6.3	11.2	11.2	10.5	5.1	9.4	3.4	25.2	25.1	21.2	34.1	23.2	10.5
9.6	9.8	10.1	5.9	11.2	11.3	10.6	8.4	12.1	3.2	25.1	25.3	25.1	27	23.4	19.9
8.9	2	5.1	7.2	4.2	10.4	11.5	3.8	10.1	10.1	11	13.7	23.2	11.4	13.9	20.1
10.5	7.1	10.3	14.3	9	11.2	11.2	8.5	10.1	16.9	27.1	25.3	21.2	19.7	23.1	26.8
10.1	14.5	9.8	8.4	15.3	11.2	11.3	12.5	12.1	4.6	27.2	25.2	25.1	25.4	26.9	16.7
10.5	3.2	8.1	2.5	11.2	11.2	10.9	2.1	10.2	6.8	20.1	21.2	24.3	11.6	16.7	20.2
9.8	3.8	8.8	6.5	10.4	11.1	11.6	17.4	9.4	5.8	25.1	25.3	25.4	35.1	26.6	17.3

Raw data – Muscular functioning (Control group)

DLL_T1	DLL_T2	DLL_T3	SBT_Rt_T1	SBT_Rt_T2	SBT_Rt_T3	SBT_Lt_T1	SBT_Lt_T2	SBT_Lt_T3	BSR_Rt_T1	BSR_Rt_T2	BSR_Rt_T3	BSR_Lt_T1	BSR_Lt_T2	BSR_Lt_T3	BASR_IR_Rt_T1	BASR_IR_Rt_T2	BASR_IR_Rt_T3	BASR_IR_Lt_T1	BASR_IR_Lt_T2	BASR_IR_Lt_T3	BASR_ER_Rt_T1	BASR_ER_Rt_T2	BASR_ER_Rt_T3
58.3	49.1	65.7	42	35	38	35	41	44	22	21	21	22	20	21	70	74	71	64	69	72	84	72	68
74.2	79.3	62.9	87	41	29	81	34	31	31	26	23	31	30	22	73	77	70	69	52	54	90	104	61
76.1	83.4	72.1	63	71	82	63	32	41	32	31	32	40	34	30	74	75	70	72	69	71	97	101	97
7.46	72.4	77.2	122	92	24	72	51	31	33	32	31	31	30	30	83	79	72	71	61	64	94	97	92
68.1	81.7	74.4	43	23	31	64	45	28	33	29	27	35	29	28	77	84	79	73	72	70	98	90	74
75.5	61.3	68.3	71	32	21	47	41	14	25	25	24	24	24	24	78	78	71	72	69	72	91	90	84
77.8	78.1	61.1	52	39	42	68	41	28	30	29	24	33	26	24	79	71	70	82	85	75	101	92	90
81.7	84.2	86.5	141	129	91	162	72	68	27	31	28	24	28	27	68	72	71	61	51	48	102	108	91
77.4	80.5	84.6	57	68	51	49	81	35	28	27	26	27	25	26	70	72	70	62	54	51	82	84	82
72.3	75.4	80.1	51	112	59	32	97	42	28	26	24	26	26	24	70	71	70	75	72	67	89	87	81
68.9	71.5	73.2	142	131	12.2	152	126	104	29	28	30	32	29	29	75	73	71	73	71	71	96	97	93
57.3	68.4	72.4	129	104	98	141	98	74	23	26	24	25	25	25	79	77	70	77	70	73	98	96	95
69.4	73.1	71.2	91	73	91	84	69	84	25	26	24	27	25	23	74	70	73	75	76	75	96	94	92
74.3	72.1	70.9	49	32	32	54	49	48	22	22	20	23	22	21	71	73	75	73	73	74	93	91	90
68.4	70.9	74.8	44	49	45	96	65	64	24	21	20	26	20	20	73	71	70	75	70	71	96	95	89
80.1	79.8	80.4	102	61	54	98	84	69	24	23	21	22	22	20	71	72	71	72	74	68	95	90	92
64.3	69.9	73.5	114	101	102	129	96	98	24	25	23	28	26	21	68	71	72	72	71	73	93	91	93
78.9	72.3	75.1	49	51	55	56	52	52	21	22	22	22	22	22	72	73	71	71	70	72	94	90	94
64.5	72.9	73.1	112	64	68	105	98	89	29	31	28	32	32	29	76	71	70	78	72	71	98	94	95
75.1	73.1	64	94	81	98	81	85	91	29	28	24	27	28	26	78	75	72	69	69	71	91	90	94
68.5	70.1	73.1	45	49	48	49	35	41	32	28	28	31	29	30	73	71	71	75	70	71	96	93	93
62.1	67.4	66.2	94	94	81	98	98	72	27	27	26	26	25	23	75	72	70	76	69	71	95	92	90

72.1	73.2	74.1	61	65	62	65	52	61	23	21	20	25	20	20	70	70	69	72	71	72	89	88	89
65.7	66.2	65.4	71	73	71	69	68	73	26	27	24	28	27	26	72	72	72	71	71	70	92	90	93
77.5	77.2	72.1	48	41	34	52	50	31	24	23	27	26	25	25	71	72	71	73	71	69	91	90	91
78.1	77.2	75.4	42	41	45	39	23	32	31	28	24	30	28	25	71	70	72	70	72	70	90	91	92
67.4	71.2	72.4	74	61	52	62	69	43	30	28	25	28	28	24	71	71	70	73	70	71	94	93	90
72.5	73.2	74.1	97	41	34	89	32	45	23	22	23	21	22	24	71	70	70	73	71	71	91	81	92
78.2	76.5	75.2	64	61	32	53	51	41	27	23	21	24	22	20	71	70	70	73	73	69	92	92	91
65.4	66.5	67.1	94	72	81	91	89	82	29	30	28	34	32	25	74	72	69	79	76	72	92	92	92
69.5	69.8	65.8	55	52	47	51	58	58	31	30	30	31	31	28	72	71	72	74	72	70	92	93	92
72.1	74.3	75.1	64	61	72	78	52	78	29	30	24	29	31	26	72	73	73	75	74	75	91	93	92
63.1	67.2	65.3	104	94	84	80	121	92	27	26	26	30	26	25	70	68	70	68	69	72	90	90	92
70.4	69.9	72.1	106	84	54	122	91	62	22	19	18	27	24	22	70	71	70	73	72	72	89	86	92
62.1	64.6	63.5	114	121	116	102	112	94	32	26	24	30	28	24	72	71	72	73	72	71	92	90	90
72.5	70.2	71.6	73	78	75	81	94	68	24	22	24	26	23	24	72	71	70	75	72	72	91	90	89
71.2	75.2	73.2	49	31	31	42	49	28	35	35	32	34	35	30	70	71	70	73	70	72	91	92	91
62.4	63.2	64.5	98	75	78	104	91	97	33	30	28	32	31	27	71	72	71	72	72	71	94	94	92
71.2	64.5	63.2	79	84	88	62	61	79	31	30	24	30	30	25	72	71	71	73	73	72	89	90	91
75.1	73.2	71.2	81	65	91	65	52	84	23	21	23	25	20	21	70	70	73	72	71	75	89	88	92

Raw data – Muscular functioning (Control group)

BASR_ER_Lt_T1	BASR_ER_Lt_T2	BASR_ER_Lt_T3	SB_EO_Rt_T1	SB_EO_Rt_T2	SB_EO_Rt_T3	SB_EO_Lt_T1	SB_EO_Lt_T2	SB_EO_Lt_T3	SB_EC_Rt_T1	SB_EC_Rt_T2	SB_EC_Rt_T3	SB_EC_Lt_T1	SB_EC_Lt_T2	SB_EC_Lt_T3	BT_ANT_Rt_T1	BT_ANT_Rt_T2	BT_ANT_Rt_T3	BT_PM_Rt_T1	BT_PM_Rt_T2	BT_PM_Rt_T3	BT_PL_Rt_T1	BT_PL_Rt_T2	BT_PL_Rt_T3
71	69	75	57	35	41	45	21	14	36	13	9	44	6	7	41	89	52	42	77	48	38	116	31
92	98	81	158	78	42	177	96	39	177	96	21	23	14	19	39	23	34	37	41	41	36	42	38
88	98	92	94	45	51	45	19	22	19	52	1	16	21	17	32	31	28	35	29	28	39	23	21
84	84	80	137	129	72	104	19	129	6	14	27	24	3	6	47	32	31	44	31	34	47	22	21
97	92	71	30	32	14	60	51	17	12	14	5	55	6	7	94	81	71	112	98	28	106	98	97
84	74	73	20	31	19	42	24	12	4	13	17	3	7	8	84	82	41	81	62	87	107	82	68
92	91	92	25	14	15	39	31	26	11	11	5	25	9	14	42	41	32	92	52	61	90	47	38
99	94	92	23	21	19	27	15	12	2	7	3	3	11	6	88	72	51	97	94	41	94	82	62
79	67	68	58	44	51	69	51	58	17	8	7	22	17	19	48	61	71	46	38	81	55	31	44
95	95	90	49	91	52	32	45	34	17	4	8	29	11	14	51	45	52	72	67	41	79	64	63
92	85	82	152	139	123	128	117	61	35	31	25	42	17	13	85	72	77	74	72	71	94	87	67
94	84	93	123	91	84	101	83	81	43	43	14	21	21	12	54	61	73	68	69	73	64	68	49
89	81	83	103	84	74	107	99	81	51	44	23	17	9	17	74	69	65	72	74	58	52	51	59
95	96	90	94	69	58	87	78	62	23	26	14	19	24	16	83	71	68	63	64	51	58	64	58
97	93	86	125	107	81	118	105	90	49	32	18	54	19	11	75	81	73	71	74	52	65	71	54
98	93	95	74	56	59	81	61	68	41	21	14	48	28	12	78	81	71	41	59	68	52	52	73
96	92	90	89	65	67	104	95	84	34	12	13	51	14	14	81	78	79	79	71	62	76	69	74
96	91	95	65	71	42	41	61	43	15	8	11	12	9	9	68	71	75	52	51	72	61	62	61
97	97	93	95	84	78	89	78	76	28	12	14	21	7	19	75	71	75	68	61	67	52	58	68
89	92	91	45	32	41	68	49	52	21	20	21	19	13	15	85	81	86	72	71	72	68	74	75
97	91	94	121	101	101	116	105	93	48	32	34	56	19	17	75	78	76	71	70	72	63	63	64
92	91	84	95	81	72	84	82	51	31	30	29	29	28	21	72	71	68	78	71	67	79	74	72

92	90	91	92	99	49	98	98	61	33	32	13	29	34	14	73	71	72	78	78	62	72	71	69
90	91	91	52	49	51	45	61	42	13	18	14	19	12	9	83	79	78	78	78	74	71	70	71
92	91	88	121	94	98	113	88	94	32	13	25	38	19	31	73	73	75	69	72	78	78	72	72
91	91	90	42	39	43	51	49	51	21	22	14	19	21	9	68	61	71	42	50	78	61	62	72
95	94	89	132	124	121	116	119	101	42	23	13	31	14	9	71	72	74	68	71	61	69	64	61
94	92	91	42	51	25	59	45	19	19	13	9	17	11	11	78	71	71	69	71	71	72	75	68
94	93	88	48	51	49	61	61	52	15	19	21	8	4	11	81	80	78	79	75	72	76	71	75
95	94	93	101	91	92	92	95	98	25	21	21	29	28	20	81	82	81	74	72	79	71	72	73
95	92	90	94	92	84	73	52	42	23	14	21	14	15	27	75	72	72	71	73	72	74	68	65
93	94	93	74	52	58	95	88	81	29	31	38	32	25	39	75	74	75	78	72	70	77	79	73
91	92	90	50	51	49	54	32	52	13	14	11	18	6	9	38	39	41	30	49	77	52	52	52
92	93	91	42	41	43	41	38	24	29	31	16	7	8	9	31	51	41	38	38	48	40	45	45
96	93	92	55	38	42	78	61	51	19	18	21	23	29	16	78	81	76	52	51	38	48	49	70
93	92	91	94	59	79	89	84	82	23	13	25	16	19	19	61	62	58	52	58	68	42	51	52
94	94	90	51	52	48	59	48	42	19	21	20	17	15	14	62	61	59	63	64	51	62	61	62
96	96	93	112	105	110	124	120	112	28	26	35	32	34	20	71	72	71	74	78	62	72	75	68
92	92	90	25	21	20	39	26	25	11	10	13	16	7	9	59	56	52	65	62	73	68	68	68
92	90	83	82	99	74	98	98	81	33	32	23	29	34	17	85	81	65	72	71	68	68	74	59

Raw data – Muscular functioning (Control group)

BT_ANT_Lt_T1	BT_ANT_Lt_T2	BT_ANT_Lt_T3	BT_PM_Lt_T1	BT_PM_Lt_T2	BT_PM_Lt_T3	BT_PL_Lt_T1	BT_PL_Lt_T2	BT_PL_Lt_T3	BT_COMP_Rt_T1	BT_COMP_Rt_T2	BT_COMP_Rt_T3	BT_COMP_Lt_T1	BT_COMP_Lt_T2	BT_COMP_Lt_T3	BT_DELTA_T1	BT_DELTA_T2	BT_DELTA_T3
53	87	32	61	117	50	59	113	42	44.32	114.29	45.42	63.37	116.12	45.42	19.05	1.83	0
41	39	37	37	38	31	41	37	34	38.49	36.43	34.36	40.89	39.18	35.05	2.41	2.75	0.69
29	32	31	37	31	32	37	19	16	36.05	28.23	28.23	35.03	24.49	26.87	-1.02	-3.74	-1.36
43	39	35	44	44	35	45	32	17	47.92	29.51	27.78	45.83	15.63	16.32	-2.08	-13.89	-11.46
89	74	74	111	79	92	111	94	104	107.22	95.19	87.63	106.87	84.88	92.78	-0.34	-10.31	5.15
90	59	32	102	98	81	107	93	75	92.52	76.87	57.82	101.7	85.03	63.95	9.18	8.16	6.12
115	61	58	88	73	68	88	78	64	102.72	47.62	37.76	98.98	72.11	64.63	-3.74	24.49	26.87
84	81	57	104	97	82	85	71	69	101.4	87.02	68.07	95.79	87.37	72.98	-5.61	0.35	4.91
52	42	68	58	44	39	58	45	47	57.09	49.81	59.77	64.37	50.19	59	7.28	0.38	-0.77
69	68	64	84	79	72	88	81	78	76.52	66.67	70.45	91.29	86.36	81.06	14.77	19.7	10.61
81	80	84	89	84	52	81	83	58	86.94	79.38	74.57	86.25	84.88	66.67	-0.69	5.5	-7.9
63	62	64	71	74	52	73	71	42	68.13	72.53	65.93	75.82	75.82	57.88	7.69	3.3	-8.06
79	73	63	69	62	53	58	55	62	73.33	71.85	64.81	76.3	70.37	65.93	2.96	-1.48	1.11
74	69	72	61	63	49	62	58	51	74.73	72.89	65.2	72.16	69.6	63	-2.56	-3.3	-2.2
78	83	71	67	78	63	72	67	58	73.26	78.47	67.71	75.35	79.17	66.67	2.08	0.69	-1.04
62	84	78	46	51	68	57	58	45	58.76	65.98	70.79	56.7	66.32	65.64	-2.06	0.34	-5.15
84	76	77	76	70	70	69	74	68	88.39	81.65	84.27	85.77	82.4	80.52	-2.62	0.75	-3.75
66	72	73	54	52	62	65	62	54	67.04	68.15	75.19	68.52	68.89	70	1.48	0.74	-5.19
80	72	81	67	68	78	69	57	71	67.71	65.97	74.65	75	68.4	79.86	7.29	2.43	5.21
91	84	79	78	78	78	71	63	61	74.26	74.59	76.9	79.21	74.26	71.95	4.95	-0.33	-4.95
78	71	70	67	71	68	78	67	68	74.91	75.63	74.19	79.93	74.91	73.84	5.02	-0.72	-0.36
67	72	71	52	58	52	69	65	68	84.81	80	74.81	69.63	72.22	70.74	-15.19	-7.78	-4.07

79	79	73	79	79	79	81	78	73	81.68	80.59	78.75	87.55	86.45	82.42	5.86	5.86	3.66
74	71	71	63	62	64	72	71	72	80.56	78.82	78.82	72.57	70.83	71.88	-7.99	-7.99	-6.94
71	78	73	74	74	79	72	78	75	70.51	69.55	72.12	69.55	73.72	72.76	-0.96	4.17	0.64
62	62	73	54	51	49	58	52	66	55.88	56.54	66.67	56.86	53.92	61.44	0.98	-2.61	-5.23
72	71	73	72	73	65	68	62	60	75.36	75	74.64	76.81	74.64	71.74	1.45	-0.36	-2.9
79	78	73	73	72	69	71	77	71	76.84	76.14	74.04	78.25	79.65	74.74	1.4	3.51	0.7
82	74	80	77	79	77	75	70	75	81.94	78.47	80.56	81.25	77.43	80.56	-0.69	-1.04	0
80	81	78	79	75	75	70	71	68	76.87	76.87	76.87	77.89	77.21	75.17	1.02	0.34	-1.7
72	71	71	73	70	74	78	69	68	70.51	68.27	66.35	71.47	67.31	68.27	0.96	-0.96	1.92
72	75	76	79	78	72	72	75	76	79.04	77.32	77.32	76.63	78.35	76.98	-2.41	1.03	-0.34
40	50	39	52	51	51	51	53	51	32.63	49.12	49.47	50.18	54.04	49.47	17.54	4.91	0
41	48	46	40	39	39	43	41	41	37.07	45.58	42.18	42.18	43.54	42.86	5.1	-2.04	0.68
69	78	77	56	52	71	41	51	76	59.93	60.94	72.05	55.89	60.94	75.42	-4.04	0	3.37
63	64	59	56	59	49	51	55	53	53.26	58.76	55.33	58.42	61.17	55.33	5.15	2.41	0
68	69	61	58	62	61	65	66	64	63.61	63.27	62.24	64.97	67.01	63.27	1.36	3.74	1.02
79	71	72	76	77	75	72	78	70	73.06	75.76	71.38	76.43	76.09	73.06	3.37	0.34	1.68
62	61	56	62	63	61	63	64	64	65.31	63.27	63.95	63.61	63.95	61.56	-1.7	0.68	-2.38
81	84	63	78	78	53	71	63	62	72.82	73.14	56.63	74.43	72.82	57.61	1.62	-0.32	0.97

Raw data – Muscular functioning (Control group)

POA_10_DEO_T1	POA_10_DEO_T2	POA_10_DEO_T3	POA_10_DEC_T1	POA_10_DEC_T2	POA_10_DEC_T3	POA_11_PEO_T1	POA_11_PEO_T2	POA_11_PEO_T3	POA_11_PEC_T1	POA_11_PEC_T2	POA_11_PEC_T3	POA_25_PEO_T1	POA_25_PEO_T2	POA_25_PEO_T3	POA_25_PEC_T1	POA_25_PEC_T2	POA_25_PEC_T3
12.7	10.2	10.3	8.5	14.5	11.3	15.4	11.2	11.3	18.7	21.5	14.9	25.7	23.1	23.1	21.3	12.8	19.8
12.2	11.2	10.1	11	25.2	2.8	2.3	10.4	11.2	6.4	3.2	2.1	10	21.1	20.1	10.3	14.3	11.2
2.6	3.4	4.2	6.9	11.2	2.8	19	11.3	11.2	13	2.4	3.8	27	25.6	21.4	24	12.1	16.2
10.1	10.3	10.2	13.8	22.4	5.2	14.9	11.6	11.2	16	5.2	7.2	23.5	24.7	23.5	35.7	13.2	16.9
14.1	10.5	10.2	9.2	24.2	4.9	11.4	11.5	11.2	9.8	4.3	3.2	27.3	26	25.1	22.7	13.2	17.7
11	10.2	9.8	13.7	6.9	2.9	11.5	10.7	11.2	23.2	3.1	5.6	26.5	23	24.1	43.5	17.2	27.8
11	10.5	10.2	5.9	7.2	2.3	11.9	21.2	11.5	24.3	14.8	15.9	20.6	25.2	24.1	31	15.9	15.1
9.9	9.8	9.8	10.4	13.3	3.5	11	14.9	10.9	20.1	3	4.6	26.2	14.9	17.2	27.8	7.8	4.9
7	6.2	10.2	2	12.4	3.1	11.2	11.5	11.2	3.1	5.2	10.4	21.5	20.1	21.2	13.2	7.5	8.9
8.1	9.2	10.4	4.2	13.1	5.1	11.2	11.6	11.2	2.8	6.9	9.1	22.5	24.8	21.2	14.1	19.4	13.1
10.5	9.8	10.2	9.5	6.5	3.2	11.3	11.7	10.2	7.8	11.8	3.2	25.2	22.1	21.2	19.8	8.2	16.8
10.4	10.1	10.2	6.2	17.8	4.2	11.1	21.2	11.3	2.8	3.4	7.8	20.4	21.1	26.1	7.9	4.8	19.8
10.4	10.5	10.7	13.7	10.6	3.1	11.9	11.4	11.7	18.9	12.9	2.5	24.9	22.1	23.4	32.6	12.9	6.4
10.5	10.1	9.4	2.4	8.4	12.8	11.5	11.6	11.2	3.2	9.8	14.9	24.5	24.1	23.1	18.7	29.9	18.2
10.7	9.8	10.4	4.6	17.4	4.3	11.3	11.9	11.8	7.4	13.6	2.1	25.6	25.1	24.6	28.9	30.1	11.8
9.1	10.4	10.9	4.8	9.4	2.3	11.2	2.8	11.7	7.8	3.1	7.9	23.1	24.5	24.3	25.9	12.2	19.8
10.2	10.1	10.2	10.1	14.4	8.4	11.2	11.3	11.2	4.9	5.6	6.5	25.1	25.2	24.2	13.2	10.2	2.3
10.9	10.5	10.9	7.8	4.9	2.3	11.2	30.9	11.4	2.1	6.9	4.8	24.2	24.3	23.1	10.2	12.9	12.5
10.1	10.5	10.1	5.8	10.9	2.3	11.4	11.5	11.2	12.4	5.9	2.8	23.2	23.2	24.1	19.2	10.2	9.6
10.4	10.1	9.4	5.9	4.3	16.1	11.8	11.2	19.4	4.9	5.2	2.1	25.4	21.2	21.5	21.2	15.5	23.2
9.2	9.8	9.9	4.4	7.4	3.2	11.2	11.9	11.4	8.1	13.6	10.2	21.9	25.1	25.1	20.4	13.2	10.9
9.7	10.8	9.4	5.1	12.3	9.8	11.5	11.5	11.2	6.2	4.8	5.8	19.4	20.1	22.1	9.8	12.9	14.5

10.1	10.2	10.5	4.9	22.5	5.2	11.2	11.3	11.4	11.5	4.4	6.2	25.2	24.9	25.5	24.9	21.2	23.2
10.4	10.1	10.1	4.9	8.5	5.2	11.8	11.2	11.1	3.4	5.5	5.8	25.2	21.2	25.1	21.2	20.4	10.5
10.1	10.2	9.9	3.2	4.2	6.5	11.2	11.5	11.2	5.2	5.8	2.5	25.1	24.1	24.1	12.5	11.2	12.8
10.1	10.2	9.4	5.9	10.5	4.1	11.5	11.2	11.2	10.1	3.4	3.4	24.2	21.2	23.1	21.2	4.9	6.2
10.5	19.4	9.5	12.5	8.5	6.6	11.2	11.9	11.5	4.5	4.6	8.9	24.5	23.5	24.2	11.4	15.6	19.5
10.1	10.5	10.6	6.6	13.4	2.4	11.3	11.7	11.8	8.4	16.2	14.8	25.6	25.5	25.6	16.7	19.2	28.5
10.1	10.4	10.6	4.8	5.6	2.5	11.4	11.8	11.5	6.5	6.8	11.8	25.2	24.5	22.1	21.2	20.2	25.8
10.2	10.1	10.9	6.9	7.2	7.5	11.1	17.5	11.2	5.2	6.6	5.1	24.6	22.1	25.5	13.4	14.5	20.2
10.2	9.9	10.5	3.5	16.2	10.1	11.4	11.5	11.2	6.8	7.2	9.4	24.9	26.9	25.2	13.5	20.4	19.8
8.4	7.7	7.2	3.2	12.5	3.5	11.4	10.9	10.2	11.8	2.5	4.9	25.1	25.9	23.2	12.3	14.6	16.5
8.6	9.6	10.1	8.1	10.2	8.2	12.7	11.5	11.6	22.5	9.9	24.5	29.5	25.2	25.6	30.5	19.6	30.4
6	7.8	8.1	10.6	3.2	6.6	11.4	11.2	11.4	9.5	6.6	5.2	25.3	25.6	23.1	28.4	12.6	16.8
9.2	9	10.2	4.3	16.2	4	11.8	11.2	11.2	2.3	4.6	5.6	26.6	21.2	26.1	14.6	6.5	16.7
8.5	8.6	7.7	6.6	12.2	6.8	11.2	10.8	11.8	6.6	5.9	10.6	21.6	23.2	23.4	3.2	6.6	19.1
9.9	8.5	8.9	6.3	15.6	2.3	10.4	11.2	11.4	2.3	8.6	7.8	20.5	23.2	24.9	6.3	19.4	16.2
10.4	10.1	10.3	5.6	14.5	4.6	11.8	11.2	10.1	6.8	6.6	8.8	24.5	21.4	23.2	13.2	12.5	5.6
9.4	9.9	8.5	4.5	13.2	3.7	11.2	16.8	10.5	6.5	6.8	6.9	24.6	23.2	23.2	19.6	18.4	16.5
9.1	10.5	10.7	6.6	12.4	3.1	11.3	11.7	11.7	8.4	16.2	2.5	25.6	25.5	23.4	18.7	29.2	6.4

Raw data – Mindfulness (Yoga group - T1)

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3	3	5	1	1	1	1	1	3	2	2	2	2	2	2	4	3	2	1	1	2	2	2
2	2	4	4	3	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	3	3	3
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FFMQ 24	FFMQ 25	FFMQ 26	FFMQ 27	FFMQ 28	FFMQ 29	FFMQ 30	FFMQ 31	FFMQ 32	FFMQ 33	FFMQ 34	FFMQ 35	FFMQ 36	FFMQ 37	FFMQ 38	FFMQ 39	OBS	D	AA	NJ	NR	Total
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1	4	5	3	2	2	3	2	5	3	3	5	2	3	2	4	16	18	15	22	15	86
3	5	3	2	3	3	3	3	3	3	2	2	2	2	4	3	17	18	20	20	15	90
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3	3	3	3	4	1	1	2	3	2	2	2	2	2	3	3	16	19	20	20	16	91
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4	2	4	4	4	3	2	3	4	3	4	4	4	3	2	4	23	28	29	21	20	121
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2	2	4	2	3	3	2	2	2	3	2	2	2	2	2	3	19	18	19	18	17	91
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2	2	2	3	3	3	2	2	3	2	3	4	1	1	4	3	16	20	20	22	15	93
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Raw data – Mindfulness (Yoga group - T2)

FFMQ 1	FFMQ 2	FFMQ 3	FFMQ 4	FFMQ 5	FFMQ 6	FFMQ 7	FFMQ 8	FFMQ 9	FFMQ 10	FFMQ 11	FFMQ 12	FFMQ 13	FFMQ 14	FFMQ 15	FFMQ 16	FFMQ 17	FFMQ 18	FFMQ 19	FFMQ 20	FFMQ 21	FFMQ 22	FFMQ 23
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4	2	2	4	5	5	5	5	5	5	4	4	4	4	3	4	30	34	32	29	27	152
3	3	5	3	2	2	3	2	5	3	2	5	2	2	3	5	21	29	21	28	20	119
3	3	2	3	2	3	3	3	4	3	4	3	3	3	2	3	25	24	24	24	21	118
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3	4	4	4	4	4	5	3	4	4	5	4	4	3	5	2	22	32	35	28	25	142
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1	2	3	3	4	2	2	3	3	4	4	3	2	3	4	3	21	27	32	23	19	122
3	3	2	4	4	3	4	2	2	4	4	4	3	3	4	4	23	27	29	27	25	131
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3	3	2	4	4	5	5	3	4	3	4	3	5	2	4	3	28	32	31	24	23	138
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3	3	2	4	2	4	4	3	4	4	4	4	5	4	4	3	29	31	33	28	28	149
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4	1	1	5	4	4	5	4	4	4	5	5	4	3	4	5	30	33	33	32	25	153
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Raw data – Mindfulness (Yoga group - T3)

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FFMQ 24	FFMQ 25	FFMQ 26	FFMQ 27	FFMQ 28	FFMQ 29	FFMQ 30	FFMQ 31	FFMQ 32	FFMQ 33	FFMQ 34	FFMQ 35	FFMQ 36	FFMQ 37	FFMQ 38	FFMQ 39	OBS	D	AA	NJ	NR	Total
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3	1	2	1	5	3	1	5	4	1	5	5	4	1	5	2	26	19	27	21	16	109
3	4	2	3	4	3	4	2	3	3	5	5	3	3	4	5	22	29	31	33	16	131
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3	3	1	3	5	1	3	2	5	3	2	4	2	2	4	3	16	25	24	24	17	106
3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	2	24	23	22	24	20	113
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3	3	3	3	4	2	3	3	3	3	3	2	4	4	1	3	26	26	26	20	20	118
3	4	3	4	3	4	3	3	4	4	4	4	4	4	3	4	16	15	22	18	16	87
3	4	3	4	4	4	5	3	4	4	5	3	4	3	4	4	16	23	26	25	19	109
4	3	2	4	3	4	4	3	3	4	3	4	4	3	3	4	16	19	20	20	16	91
3	4	2	3	3	4	4	3	4	3	3	4	3	3	2	4	15	13	18	16	11	73
4	3	3	3	3	3	2	2	3	3	3	4	3	3	4	3	14	14	21	19	13	81
4	3	4	3	3	2	4	5	5	4	5	3	3	3	4	3	18	18	24	17	20	97
2	3	3	2	3	3	2	3	3	5	5	4	3	3	3	4	16	19	23	21	18	97
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3	3	3	4	4	3	4	4	3	3	4	4	4	4	4	5	15	19	24	22	17	97
4	3	3	4	4	4	3	3	3	3	5	4	5	4	5	3	21	19	21	19	18	98
4	3	3	3	3	2	4	5	3	3	5	4	5	5	3	3	29	28	27	22	23	129
4	4	2	4	5	5	5	4	5	5	5	5	5	4	4	5	23	28	29	21	20	121
4	4	4	4	4	4	3	3	3	4	3	4	4	3	3	4	27	26	29	23	20	125

3	4	2	4	2	5	5	4	5	5	5	4	4	3	3	4	25	30	21	21	27	124
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3	3	1	4	3	4	4	4	3	4	4	3	4	4	3	4	27	29	27	22	23	128
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4	3	4	5	4	4	5	4	4	4	5	5	5	3	4	4	16	20	20	22	15	93
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Raw data – Mindfulness (Control group - T1)

FFMQ 1	FFMQ 2	FFMQ 3	FFMQ 4	FFMQ 5	FFMQ 6	FFMQ 7	FFMQ 8	FFMQ 9	FFMQ 10	FFMQ 11	FFMQ 12	FFMQ 13	FFMQ 14	FFMQ 15	FFMQ 16	FFMQ 17	FFMQ 18	FFMQ 19	FFMQ 20	FFMQ 21	FFMQ 22	FFMQ 23
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3	4	3	5	3	3	4	3	4	3	3	4	3	1	1	1	21	27	22	25	18	113
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2	2	2	1	1	2	1	2	1	1	1	2	2	1	2	3	13	14	12	17	11	67
4	3	2	3	3	2	3	3	4	1	5	3	4	1	3	2	19	21	25	20	15	100
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3	3	4	3	3	3	3	3	3	3	4	3	4	4	3	4	26	24	27	24	21	122
3	3	4	4	3	3	3	3	4	2	3	3	3	4	4	3	28	30	24	23	19	124
4	2	4	4	3	4	3	4	4	4	4	4	2	4	4	4	25	30	30	27	27	139
3	3	3	3	4	3	2	2	3	2	4	4	4	2	4	5	19	25	24	25	17	110
5	3	2	3	2	3	1	1	1	3	5	4	4	1	3	2	17	23	21	21	20	102
1	1	1	1	1	1	1	2	2	1	1	1	1	1	4	3	13	15	18	15	11	72
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1	3	4	3	4	5	1	1	1	1	4	3	4	2	2	3	18	22	23	19	17	99
2	2	2	2	2	1	1	2	2	2	2	2	2	2	1	1	13	15	13	13	11	65
3	4	5	1	1	1	1	1	1	1	2	3	2	3	3	2	18	17	16	20	14	85
3	4	3	3	3	2	2	1	1	1	1	1	1	1	1	1	10	17	16	18	15	76
2	2	4	3	4	4	4	4	3	3	2	3	3	3	2	2	18	20	18	21	15	92
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2	3	2	2	1	1	3	2	2	1	1	2	2	1	2	2	17	15	20	18	9	79
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3	4	3	3	3	3	4	2	4	2	2	3	2	1	4	2	20	21	26	27	18	112
4	3	3	2	2	2	2	2	4	2	2	2	1	2	2	1	21	18	22	21	18	100
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2	3	3	1	1	1	1	1	1	2	3	1	3	2	2	3	18	17	20	21	16	92
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2	1	1	1	2	2	3	3	2	2	2	1	1	2	3	4	19	20	21	24	14	98
2	2	2	2	2	3	2	2	2	1	3	3	3	1	3	2	18	22	21	22	19	102
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Raw data – Mindfulness (Control group - T2)

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2	2	3	3	2	2	2	2	2	2	1	1	1	1	2	3	1	1	1	1	2	3	3
3	3	3	3	4	4	5	5	5	4	5	4	5	5	2	3	3	3	3	3	4	5	5
1	1	1	3	3	3	2	4	2	3	3	4	3	3	2	3	3	4	2	2	2	3	3
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1	1	3	2	2	3	4	4	3	2	3	4	3	3	2	3	3	2	1	1	2	3	2
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FFMQ 24	FFMQ 25	FFMQ 26	FFMQ 27	FFMQ 28	FFMQ 29	FFMQ 30	FFMQ 31	FFMQ 32	FFMQ 33	FFMQ 34	FFMQ 35	FFMQ 36	FFMQ 37	FFMQ 38	FFMQ 39	OBS	D	AA	NJ	NR	Total
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3	3	2	2	2	3	3	3	3	4	4	5	2	5	3	4	19	21	22	25	18	105
2	2	2	3	3	2	2	2	2	2	3	3	4	2	4	3	16	18	19	17	14	84
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3	1	2	2	3	3	4	1	3	4	4	5	1	4	5	5	21	29	33	25	25	133
3	3	4	3	3	3	3	3	3	3	3	3	3	4	4	2	25	25	26	24	22	122
3	4	2	4	4	4	3	4	3	3	5	4	5	5	4	5	28	32	35	25	24	144
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3	2	1	3	4	2	2	3	3	3	5	4	3	4	5	3	18	27	35	21	18	119
1	2	2	2	5	2	3	2	2	2	5	4	2	2	4	4	14	19	34	22	13	102
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3	2	1	1	3	1	1	2	2	2	3	3	3	1	3	1	14	13	19	13	14	73
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3	3	3	3	3	3	2	2	2	4	5	4	3	1	1	3	21	20	22	24	19	106
4	4	3	2	2	1	1	1	1	1	1	1	2	3	2	1	16	18	18	17	15	84
2	2	1	1	1	1	2	2	2	1	1	1	1	2	2	1	11	14	15	10	12	62
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3	3	3	2	4	2	2	2	2	1	1	1	2	1	3	2	14	13	20	15	14	76
3	3	3	2	2	2	2	3	3	2	2	2	2	2	2	3	20	19	16	20	16	91
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4	3	1	1	4	1	4	2	3	3	3	2	1	2	3	4	14	17	23	24	18	96
2	2	1	1	1	2	2	2	2	2	3	2	2	1	2	2	16	17	19	16	13	81
2	3	2	2	2	2	2	3	3	3	3	2	2	2	2	3	20	19	23	21	15	98
2	2	2	2	4	5	3	2	2	4	3	2	2	1	3	2	20	15	27	21	21	104
5	3	2	2	3	4	3	2	2	3	2	3	2	3	4	5	20	22	20	27	20	109
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3	2	4	2	3	3	3	3	2	2	2	3	2	3	3	4	21	20	22	24	18	105
3	3	2	3	3	4	3	2	3	4	3	4	3	1	4	3	18	17	22	23	22	102
2	2	2	2	2	3	2	3	2	2	2	3	3	2	2	3	23	18	18	19	17	95
2	2	2	2	2	3	4	2	3	3	2	2	2	1	1	1	16	21	18	20	16	91
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Raw data – Mindfulness (Control group - T3)

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2	2	5	2	4	2	3	1	1	4	3	1	1	1	1	1	1	1	2	2	2	3	3
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3	3	4	2	2	3	4	2	4	3	3	2	2	1	2	2	21	20	24	21	17	103
2	3	3	3	3	3	2	2	3	1	1	1	2	1	3	2	15	15	20	16	15	81
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3	3	3	2	3	2	4	3	2	1	2	2	3	2	3	3	17	18	21	20	15	91
2	4	3	3	3	3	2	2	2	3	2	3	2	2	2	3	19	17	22	23	16	97
4	3	3	3	3	2	2	2	2	2	2	3	1	1	1	1	19	25	22	21	18	105
1	5	1	3	3	3	4	4	3	3	2	4	1	1	4	1	18	22	21	29	14	104
2	3	2	2	2	1	2	2	2	3	3	2	2	1	2	2	14	13	20	21	15	83
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2	2	3	2	4	1	1	1	1	1	1	3	2	2	3	3	16	19	22	19	15	91
2	3	4	2	3	2	3	2	2	1	1	1	2	1	3	4	16	14	16	18	12	76
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5	1	5	2	3	2	2	2	1	1	3	4	3	1	3	3	19	13	21	19	15	87
3	2	2	2	3	3	2	2	2	2	3	3	2	2	3	3	17	22	25	20	20	104

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3	3	3	3	2	2	2	2	2	5	4	3	3	1	3	3	20	20	25	25	19	109
2	3	2	2	3	2	3	3	2	2	2	3	4	4	3	2	23	22	20	23	17	105
1	1	2	3	5	2	5	3	3	3	4	4	3	2	3	3	18	21	23	22	17	101
3	3	3	2	3	4	3	3	2	3	2	2	2	2	3	3	22	18	22	22	19	103
2	3	2	2	3	2	1	1	1	2	3	4	3	2	4	3	20	18	20	21	17	96
2	3	4	5	2	2	3	3	2	3	2	3	3	2	3	4	22	21	19	24	15	101
5	5	1	5	1	4	3	1	1	3	3	1	1	4	3	1	17	23	16	22	21	99
2	2	2	2	2	3	3	2	2	2	2	3	1	2	2	2	14	15	17	17	17	80
2	2	3	2	2	2	1	1	1	1	1	2	3	2	2	3	20	20	17	20	13	90
3	2	4	4	3	2	1	1	1	1	3	4	3	1	3	3	20	19	23	20	16	98
2	2	3	3	2	2	2	2	2	2	2	3	2	3	4	1	18	20	22	17	18	95
4	3	4	2	2	1	1	1	1	1	1	3	2	1	3	2	22	21	23	20	17	103

APPENDIX II

INSTITUTIONAL ETHICS COMMITTEE APPROVAL

स्वामी विवेकानन्द योग अनुसंधान संस्थान
Swami Vivekananda Yoga Anusandhāna Samsthāna
(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)
Eknath Bhavan, # 19, Gavipuram Circle, Kempegowda Nagar, Bangalore - 560 019
Ph: 080 - 2661 2669, Telefax: 080 - 2660 8645
E-mail: svyasa@svyasa.org Website: www.svyasa.org

RES/IEC-SVYASA/114/2018 **03/10/2018**

To,
Smt Manasa R Rao,
Research Scholar,
S-VYASA University,
Bengaluru.

Reference:

"Yoga Biomechanics in Facilitating Muscular dynamism and mindfulness among Asymptomatic Cricket Players", - Committee Approval of the above mentioned study.

Dear Smt Manasa R Rao,

We have received from you the following study related documents vide your letter dated 30 November 2017

1	Project Proposal
2	Informed consent form

Ethics committee meeting was held on **02 December 2017** between 2:00 PM and 5:00 PM at Eknath Bhavan, Bengaluru. Above documents were examined and discussed in the meeting. After due consideration, the committee has decided to approve conducting the aforementioned study.

APPROVED

INSTITUTIONAL ETHICS COMMITTEE
SVYASA, BANGALORE

स्वामी विवेकानन्द योग अनुसंधान संस्थान
Swami Vivekananda Yoga Anusandhāna Samsthāna
(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)
Eknath Bhavan, # 19, Gavipuram Circle, Kempegowda Nagar, Bangalore - 560 019
Ph: 080 - 2661 2669, Telefax: 080 - 2660 8645
E-mail: svyasa@svyasa.org Website: www.svyasa.org

This is to confirm that neither Smt Manasa R Rao nor any staff participating in this study were involved in the voting procedures and decision making.

The Institutional Review Board / Institutional Ethics Committee (IEC) are expected to be informed about the progress of the study / any changes in the protocol and patient information / informed consent. The investigators are also expected to submit a copy of the final report to IEC for records.

This approval is valid up to the completion of the study at the site.

Please submit to the IEC, the status report of the study as per the SOPs.

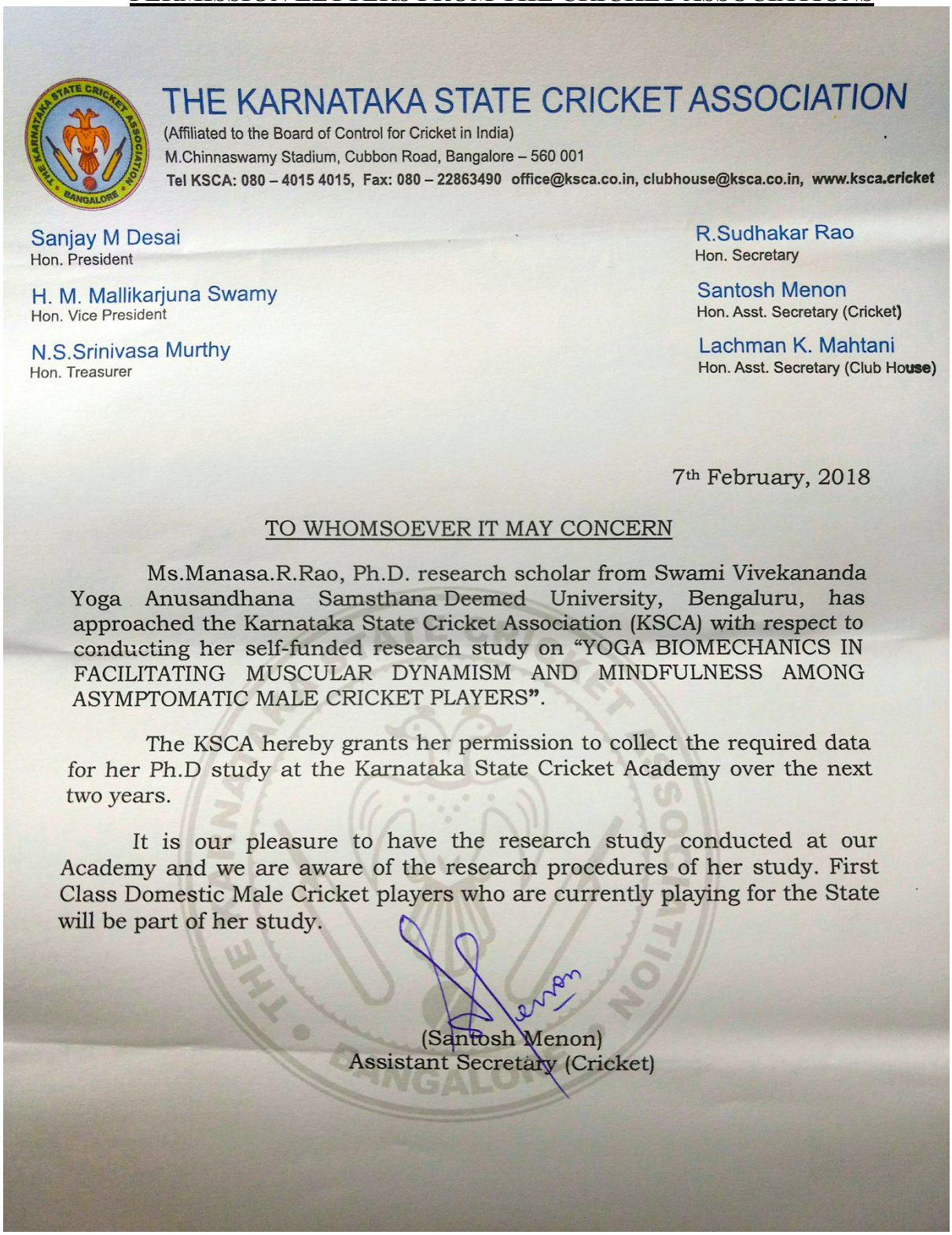
The IEC is organized & operates according to the requirements of ICH-GCP, Indian Council of Medical Research Guidelines & Schedule Y.

Best Wishes,

Dr. Sanjib Kumar Patra,
Member Secretary,
Institutional Ethics Committee,
S-VYASA, Bengaluru.

APPENDIX III

PERMISSION LETTERS FROM THE CRICKET ASSOCIATIONS



THE KARNATAKA STATE CRICKET ASSOCIATION

(Affiliated to the Board of Control for Cricket in India)

M.Chinnaswamy Stadium, Cubbon Road, Bangalore – 560 001

Tel KSCA: 080 – 4015 4015, Fax: 080 – 22863490 office@ksca.co.in, clubhouse@ksca.co.in, www.ksca.cricket

Sanjay M Desai
Hon. President

H. M. Mallikarjuna Swamy
Hon. Vice President

N.S.Srinivasa Murthy
Hon. Treasurer

R.Sudhakar Rao
Hon. Secretary

Santosh Menon
Hon. Asst. Secretary (Cricket)

Lachman K. Mahtani
Hon. Asst. Secretary (Club House)

7th February, 2018

TO WHOMSOEVER IT MAY CONCERN

Ms.Manasa.R.Rao, Ph.D. research scholar from Swami Vivekananda Yoga Anusandhana Samsthana Deemed University, Bengaluru, has approached the Karnataka State Cricket Association (KSCA) with respect to conducting her self-funded research study on "YOGA BIOMECHANICS IN FACILITATING MUSCULAR DYNAMISM AND MINDFULNESS AMONG ASYMPTOMATIC MALE CRICKET PLAYERS".

The KSCA hereby grants her permission to collect the required data for her Ph.D study at the Karnataka State Cricket Academy over the next two years.

It is our pleasure to have the research study conducted at our Academy and we are aware of the research procedures of her study. First Class Domestic Male Cricket players who are currently playing for the State will be part of her study.

(Santosh Menon)
Assistant Secretary (Cricket)

Regd. No.: F/881/Vadodara Dated 4/11/1996

Baroda Cricket Association

(AFFILIATED TO THE BOARD OF CONTROL FOR CRICKET IN INDIA)

'BCA HOUSE', 78, Hari Bhakti Extension, Race Course, Vadodara - 390 007 GUJARAT - INDIA
P: + 91 265 2336625 / 26/27 E: brdca1@cricketbaroda.com W: www.barodacricketassociation.com

Estd.: 1937

NO/BCA/17-18/

April 2, 2018

To
Ms. Manasa Rao
Bengaluru.

Madam,

This has reference to your mail dated: 20.03.18, wherein you have shown your eagerness to conduct survey on **"Prevalence, nature and mechanism of the musculoskeletal injuries among injured male cricket players"** with our State association players for your PhD studies from Yoga University.

We hereby give our approval to you for conducting the above survey.

In case of any assistance, please feel free to contact at the office.

Thanking you,

Yours faithfully,

Snehal Parikh / Amar Petiwale
Hon. Jt. Secretaries

HIMACHAL PRADESH
CRICKET ASSOCIATION
AFFILIATED TO THE BOARD OF CONTROL FOR CRICKET IN INDIA
CIN: U92411HP2005NPL031707

Dated: 13th April 2018

To
Ms. Manasa Rao,
Bengaluru

Dear Madam,

1. This has reference to your mail dated 20th March 2018, wherein you have shown your eagerness to conduct survey "Prevalence, nature and mechanism of the musculoskeletal injuries among injured male cricket players" with our state association players for your PhD studies from SVYASA Deemed University (Swami Vivekananda Yoga Anusandhana Samsthana) Bengaluru.
2. We hereby give our approval to you for conducting the above survey.

Thanking you,

With Warm Regards,

Himachal Pradesh Cricket Association HPCA

Col. (Retd)H.S. Manhas,
GM Administration, HPCA

HIMACHAL PRADESH CRICKET STADIUM DHARAMSHALA, DISTT. KANGRA (H.P.)
Ph. : 01892-229539 Fax : 01892-223539 e-mail: hpcadharamsala@yahoo.com

President
ANAND JAISWAL

Hon. Secretary
B.S. BHATTI

Dt.04.09.2018

To

Ms.Manasa Rao,PhD scholar,
SVYASA Deemed University,
Bengaluru.

Dear Madam,

We have noted your survey of 7 injuries data collected from our Association's physiotherapists.

We hope this will further your studies in **"Prevalence, nature and mechanism of the musculoskeletal injuries among injured male cricket players"** and also help the cricketers in injury prevention.

We wish you best in your endevour.

Yours Sincerely,

Farokh Dastoor,
CEO, VCA.

VIDARBHA CRICKET ASSOCIATION, NAGPUR

VIDARBHA CRICKET ASSOCIATION
(Affiliated to The Board of Control for Cricket in India)
Civil Lines, Nagpur-440 001. Tel.:2541908/2527467 Fax: (0712) 2524006 Email: admin@vca.co.in

KERALA CRICKET ASSOCIATION

(MEMBER, BOARD OF CONTROL FOR CRICKET IN INDIA)

KCA COMPLEX, T.C. 24/131(1)
SASTHAMKOVIL ROAD, THYCAUD
THIRUVANANTHAPURAM - 695 014

TELE & FAX : 0471 2326522
E-MAIL : keralacricketone@gmail.com
WEBSITE : www.keralacricketassociation.com

To

Smt.Manasa Rao

PhD Scholar

SVYASA Deemed University

Bengaluru

Dear Manasa Rao,

This has reference to your mail request dated 18.04.2018 regarding your PhD Research study from SVYASA Deemed University on **"Prevalence, nature and mechanism of the musculoskeletal injuries among injured male cricket players"**

We are pleased to extend you support and grant approval to collect required data for the cricket injury survey among male cricket players between the age group 18 to35 years of Kerala Cricket Association.

Wishing you all the best

Yours sincerely

Jayesh George
Hon.Secretary

30.05.2018
Thiruvananthapuram

APPENDIX IV

INFORMED CONSENT FORM

SWAMI VIVEKANANDA YOGA ANUSANDHANA SAMSTHANA
(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)
Bengaluru - 560019, India

Manasa R Rao
(Principal Investigator)
Mob - +91 9880106669

This is an Informed Consent Form for Cricket players from Karnataka State Cricket Academy, who we are inviting to participate in research on: "Yoga Biomechanics in facilitating Muscular Dynamism and Mindfulness among Asymptomatic Male Cricket Players".

Title of the research project:
Yoga Biomechanics in facilitating Muscular Dynamism and Mindfulness among Asymptomatic Male Cricket Players

PART I - INFORMATION

Introduction:
I am Manasa R Rao doing my research on "**Yoga Biomechanics in facilitating Muscular Dynamism and Mindfulness among Asymptomatic Male Cricket Players"**. I am going to give you information and invite you to be part of this research. You do not have to decide today whether you will participate in the research or not. Before you decide, you can talk to anyone you feel comfortable with about the research. There may be some words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them as well.

Purpose of the research

Cricket is the most prominent and celebrated sport in India. Despite high fitness levels and often-intensive strength training programs, athletes still suffer from varied injuries that can be catastrophic to their career. Today's highly competitive sporting world is extremely unpredictable in nature because the gap between athletes' physical skills as well as the margin of victory seems to be narrowing. The British Sports Council reports 2.6 injuries for every 10,000 hours of play. And the Australian Cricket Board conducted a similar survey which reports a much higher rate of 24.2 injuries for every 10,000 hours of play (J. Orchard & James, 2003). Considering the popularity of the game, this high prevalence is cause for concern. One of the best lessons athletes can learn from practicing Yoga is how to respect their body's strengths and limitations which could help in preventing sports injuries. Yoga is a powerful biofeedback tool that can help athletes develop better body awareness. Listening to the body and responding to its messages is a way to honour the body and not push it over the edge.

Type of Research Intervention

The Cricket players will receive the 'Yoga Biomechanics Module – For Cricket players' for 60 minutes per session for 5 days per week for a duration of 6 weeks.

Participant selection

You have been identified as a prospective participant as you have been playing as a first-class domestic cricket player for the Karnataka State Cricket Academy. You may be allocated into either the Yoga Biomechanics Group or the Control Group.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. You may change your mind later and stop participating even if you agreed earlier.

Procedures and Protocol

If, you are in the Yoga Biomechanics group, you will receive the 'Yoga Biomechanics Module – For Cricket players' for 60 minutes per session for 5 days per week for duration of 6 weeks. The Yoga Biomechanics module will be practiced along with the routine fitness sessions. The Yoga sessions will be conducted at Karnataka State Cricket Association, Bengaluru by a Yoga expert. However, the control group will follow their normal daily routine during the study period. Assessments will be done on the first day before the Yoga session, at the end of intervention period of six weeks and after the follow-up period of three months.

If you happen to be in the control group, you will be given the Yoga Biomechanics Module post the study period.

Duration

The research will take place over a period of 6 weeks and a follow up assessment will be made after a period of 3 months. At the end of the follow-up period, the research will be concluded.

Risks

There is no significant increase in the risk as a result of participating in this study. There will be no harm to the you with utmost respect to your rights and dignity.

Benefits

You will be learning the first ever, Yoga Biomechanics module that is exclusively designed for the cricket players with a view of enhancing the physical, mental and emotional well-being of a cricket player.

Reimbursements

There is no cost for participation in this study. Participation is completely voluntary and no payment will be provided to the study subjects.

Confidentiality

Information obtained in this study is strictly confidential unless the law requires disclosure. Your name and other personal identifiers will not be used in the reporting of information in publications or presentations. You will be assigned a unique study number as a participant in this study. Only this number will be used on any research-related information collected about you during the course of this study, so that your identity [i.e. your name or any other information that could identify you] as a participant in this study will be kept confidential.

Sharing the Results

The knowledge that we get from doing this research will be shared with you before it is made widely available to the public. Confidential information will not be shared. After sharing the results with you, we will publish the results in order that other interested people may learn from our research.

Right to Refuse or Withdraw

You have the right to refuse participation in this study, the right to withdraw from this study at any point in time, and the right to have your data destroyed at any point during or after the study, without penalty. You can withdraw from the study even without stating any reason.

Who to Contact

If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact at - Mrs. Manasa Rao (98801 06669/mansarao@gmail.com)

This proposal has been reviewed and approved by Institutional Ethic Committee (IEC) of Swami Vivekananda Yoga Anusandhana Samasthana (SVYASA), which is a committee whose task is to make sure that research participants are protected from harm.

You can ask me any more questions about any part of the research study, if you wish to. Do you have any questions?

PART II: CERTIFICATE OF CONSENT

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked, have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Name of Participant:
Signature of Participant:
Date:
Day/month/year

If illiterate
A literate witness must sign (if possible, this person should be selected by the participant and should have no connection to the research team). Participants who are illiterate should include their thumb-print as well.

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Print name of witness*_____** ***AND ***Thumb print of participant***

***Signature of witness* _____**

Date _____
Day/month/year

Statement by the researcher/person taking consent
I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. **Understanding of the background of this research study.**
2. **Understanding of their responsibilities in the research work like participation in pre and post data and undergoing of intervention.**
3. **Signing of the certificate of the consent.**

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this ICF has been provided to the participant.

Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____
Date _____
Day/month/year

APPENDIX V

YOGA INTERVENTION – MUSCULAR FUNCTIONING SCORE SHEET

Name of the Player:

Age:

Height:

Body Weight:

Cricketing experience at a professional level:

CORE STABILITY

NAME OF THE TEST	PRE - SCORE	POST - SCORE
Double Leg lowering Test		

NAME OF THE TEST	PRE - SCORE		POST - SCORE	
	Right	Left	Right	Left
Side Bridge Test				

FLEXIBILITY

NAME OF THE TEST	PRE - SCORE	POST - SCORE
Back saver sit and reach		

RANGE OF MOTION

NAME OF THE TEST	PRE - SCORE		POST - SCORE	
	IR	ER	IR	ER
Bilateral active shoulder rotation range of motion				

STATIC BALANCE

NAME OF THE TEST	PRE - SCORE		POST - SCORE	
	EO	EC	EO	EC
Stork Balance Stand Test				

DYNAMIC BALANCE

NAME OF THE TEST	PRE - SCORE					
	Anterior		Postereomedial		Postereolateral	
	R	L	R	L	R	L
Y Balance test						

NAME OF THE TEST	POST - SCORE					
	Anterior		Postereomedial		Postereolateral	
	R	L	R	L	R	L
Y Balance test						

PROPRIOCEPTION OF THE ANKLE

NAME OF THE TEST	PRE – SCORE					
	10˚ Dorsiflexion		11˚Plantar flexion		25˚Plantar Flexion	
	EC	EO	EC	EO	EC	EO
Active Reproduction Test						

NAME OF THE TEST	POST – SCORE					
	10˚ Dorsiflexion		11˚Plantar flexion		25˚Plantar Flexion	
	EC	EO	EC	EO	EC	EO
Active Reproduction Test						

YOGA INTERVENTION – MUSCULAR FUNCTIONING FOLLOW-UP SCORE SHEET

CORE STABILITY

NAME OF THE TEST	Right	Left
Double Leg lowering Test		

NAME OF THE TEST	Right	Left
Side Bridge Test		

FLEXIBILITY

NAME OF THE TEST	Right	Left
Back saver sit and reach		

RANGE OF MOTION

NAME OF THE TEST	IR	ER
Bilateral active shoulder rotation range of motion		

STATIC BALANCE

NAME OF THE TEST	EO		EC	
	Right	Left	Right	Left
Stork Balance Stand Test				

DYNAMIC BALANCE

NAME OF THE TEST	Anterior		Postereomedial		Postereolateral	
	R	L	R	L	R	L
Y Balance test						

PROPRIOCEPTION OF THE ANKLE

NAME OF THE TEST	10˚ Dorsiflexion		11˚Plantar flexion		25˚Plantar Flexion	
	EO	EC	EO	EC	EO	EC
Active Reproduction Test						

APPENDIX VI

FIVE-FACET MINDFULNESS QUESTIONNAIRE

Five Facet Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements with the number that best describes *your own opinion* of what is *generally true for you.*		**Never or very rarely true**	**Rarely true**	**Sometimes true**	**Often true**	**Very often or always true**
FFQM 1	When I'm walking, I deliberately notice the sensations of my body moving. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 2	I'm good at finding words to describe my feelings. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 3	I criticize myself for having irrational or inappropriate emotions. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 4	I perceive my feelings and emotions without having to react to them. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 5	When I do things, my mind wanders off and I'm easily distracted. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 6	When I take a shower or bath, I stay alert to the sensations of water on my body. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 7	I can easily put my beliefs, opinions, and expectations into words. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 8	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 9	I watch my feelings without getting lost in them. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 10	I tell myself I shouldn't be feeling the way I'm feeling. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 11	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 12	It's hard for me to find the words to describe what I'm thinking. (D-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 13	I am easily distracted. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 14	I believe some of my thoughts are abnormal or bad and I shouldn't think that way. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 15	I pay attention to sensations, such as the wind in my hair or sun on my face. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 16	I have trouble thinking of the right words to express how I feel about things. (D-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 17	I make judgments about whether my thoughts are good or bad. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 18	I find it difficult to stay focused on what's happening in the present. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
FFQM 19	When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 20	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 21	In difficult situations, I can pause without immediately reacting. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 22	When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words. (D-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 23	It seems I am "running on automatic" without much awareness of what I'm doing. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 24	When I have distressing thoughts or images, I feel calm soon after. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 25	I tell myself that I shouldn't be thinking the way I'm thinking. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 26	I notice the smells and aromas of things. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 27	Even when I'm feeling terribly upset, I can find a way to put it into words. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 28	I rush through activities without being really attentive to them. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 29	When I have distressing thoughts or images, I am able just to notice them without reacting. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 30	I think some of my emotions are bad or inappropriate and I shouldn't feel them. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 31	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow. (OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 32	My natural tendency is to put my experiences into words. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 33	When I have distressing thoughts or images, I just notice them and let them go. (NR)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 34	I do jobs or tasks automatically without being aware of what I'm doing. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 35	When I have distressing thoughts or images, I judge myself as good or bad depending what the thought or image is about. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 36	I pay attention to how my emotions affect my thoughts and behavior. OBS)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

		Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true
FFQM 37	I can usually describe how I feel at the moment in considerable detail. (D)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
FFQM 38	I find myself doing things without paying attention. (AA-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
FFQM 39	I disapprove of myself when I have irrational ideas. (NJ-R)	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

Scoring:
(Note: R = reverse-scored item)

Subscale Directions	Your Score TOTAL	Your score item Avg.
Observing: Sum items 1 + 6 + 11 + 15 + 20 + 26 + 31 + 36		
Describing: Sum items 2 + 7 + 12R + 16R + 22R + 27 + 32 + 37.		
Acting with Awareness: Sum items 5R + 8R + 13R + 18R + 23R + 28R + 34R + 38R.		
Nonjudging of inner experience: Sum items 3R + 10R + 14R + 17R + 25R + 30R + 35R + 39R.		
Nonreactivity to inner experience: Sum items 4 + 9 + 19 + 21 + 24 + 29 + 33.		
TOTAL FFMQ (add subscale scores)		

NOTE: Some researchers divide the total in each category by the number of items in that category to get an average category score. The Total FFMQ can be divided by 39 to get an average item score.

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*(1), 27-45.

APPENDIX VII

DIAGRAMS - *YOGA* MODULE

BREATHING PRACTICE

SŪRYA NAMASKĀRA

ĀSANĀS IN STANDING POSITION

UTTHITATRIKOṆĀSANA

PARIVṚTTATRIKOṆĀSANA

PĀRŚVAKOṆĀSANA

VĪRABHADRĀSANA I

VĪRABHADRĀSANA II

UTTHITAHASTAPĀDĀṄGUṢṬHĀSANA

PRASĀRITAPĀDOTTĀNĀSANA

VṚKṢĀSANA

ĀSANĀS IN SITTING POSITION

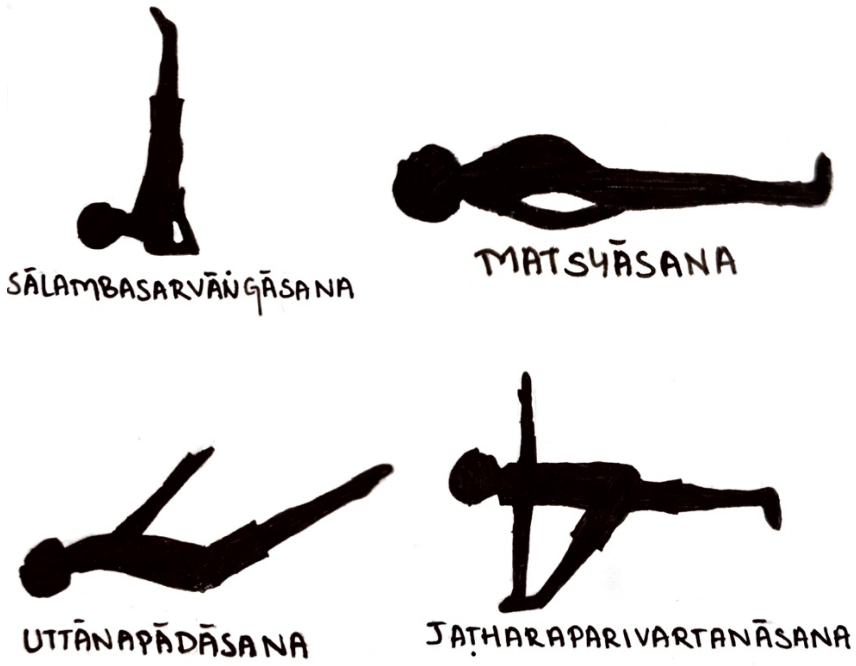
BADDHAKOṆĀSANA

UPAVIṢṬAKOṆĀSANA

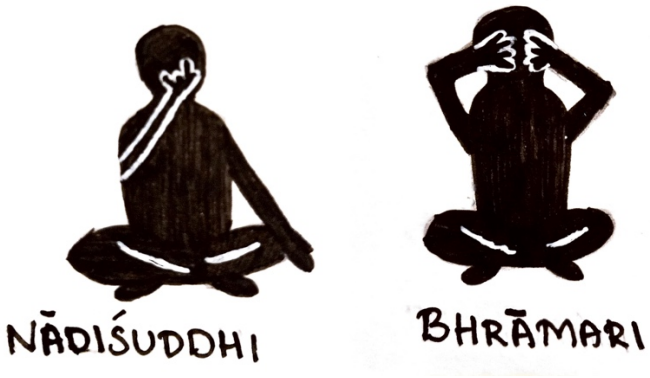
GOMUKHĀSANA

ĀSANĀS IN PRONE POSITION

ĀSANĀS IN SUPINE POSITION



PRĀṆĀYĀMA



RELAXATION IN SUPINE POSITION

APPENDIX VIII

LINEAR MIXED EFFECT MODELS

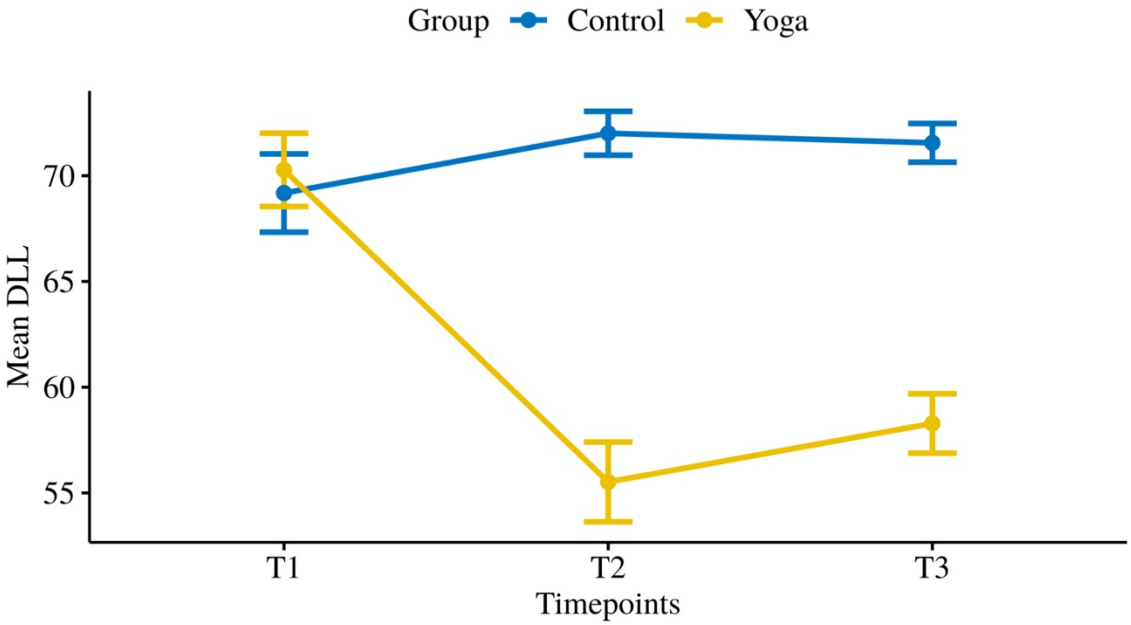


Figure 9: Comparison of double leg lowering test – DLL between the groups at pre (T1), post (T2) and follow-up (T3).

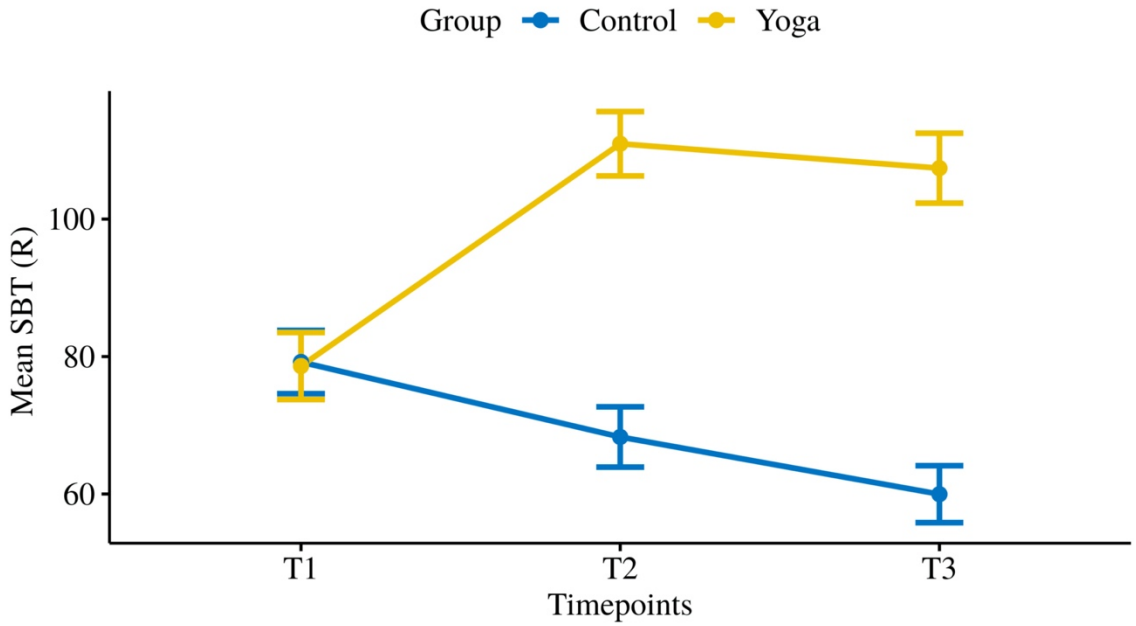


Figure 10: Comparison of side bridge test – SBT (R) between the groups at pre (T1), post (T2) and follow-up (T3).

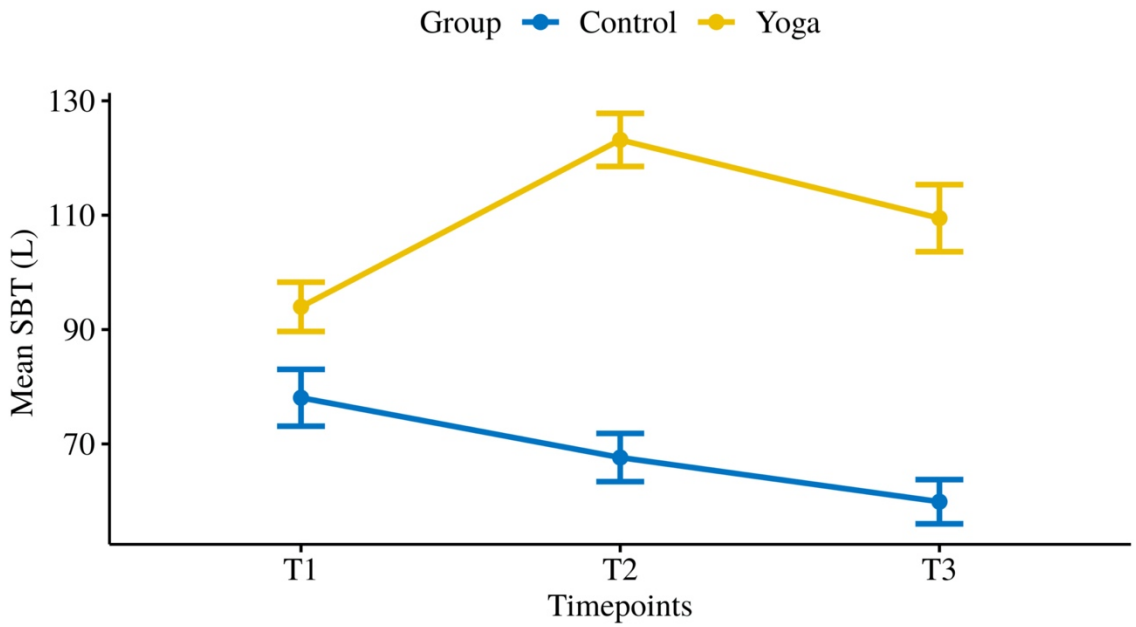


Figure 11: Comparison of side bridge test – SBT (L) between the groups at pre (T1), post (T2) and follow-up (T3).

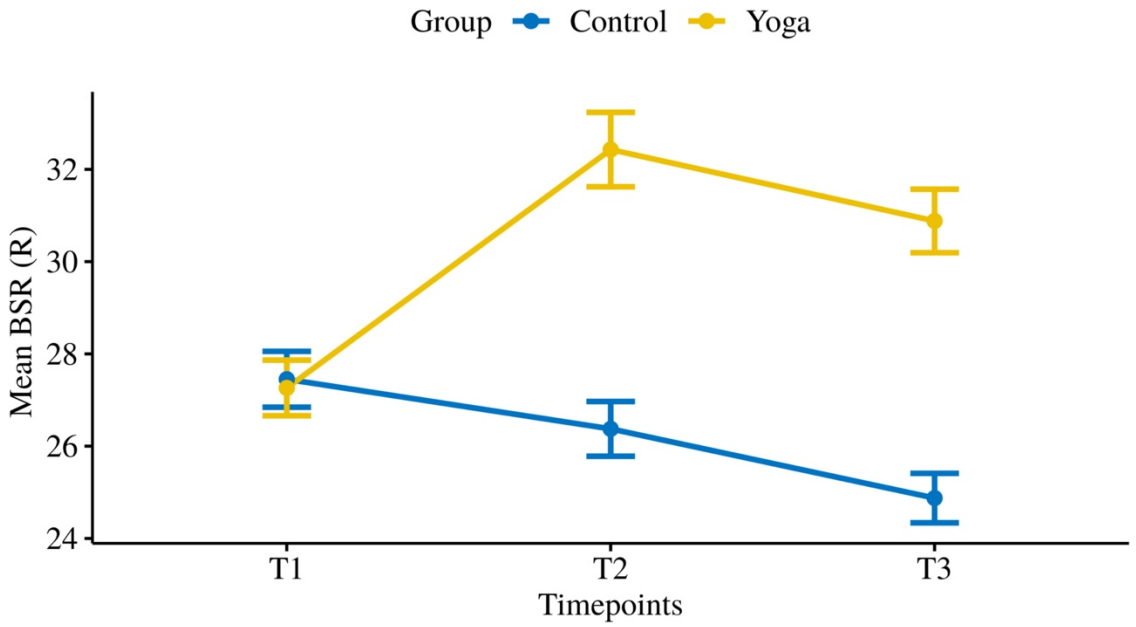


Figure 12: Comparison of back saver sit and reach test – BSR (R) between the groups at pre (T1), post (T2) and follow-up (T3).

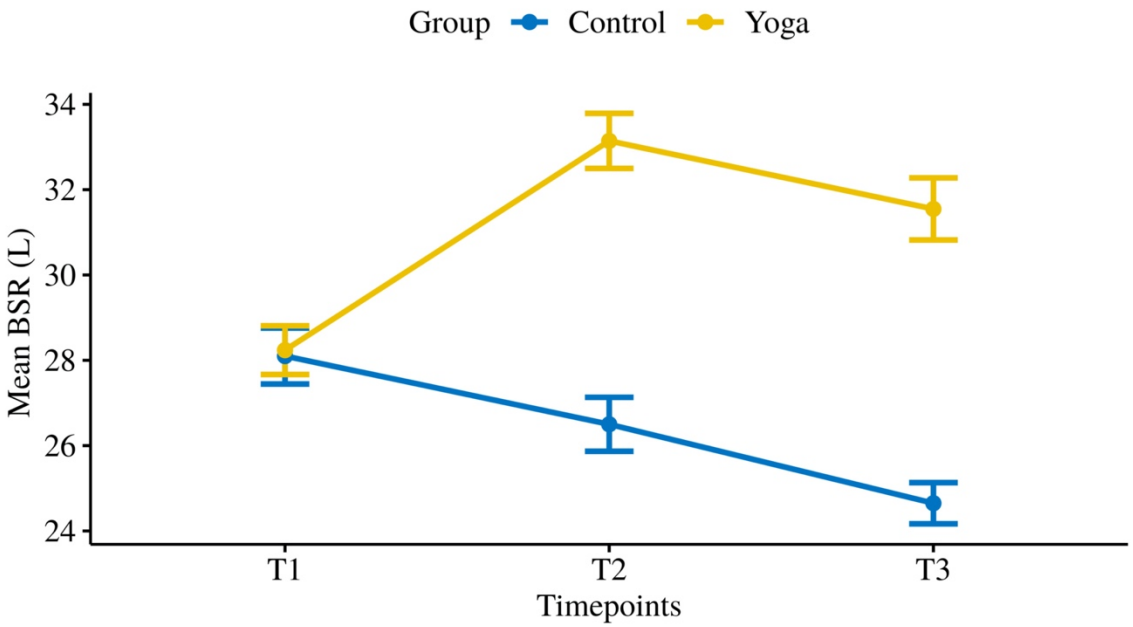


Figure 13: Comparison of back saver sit and reach test – BSR (L) between the groups at pre (T1), post (T2) and follow-up (T3).

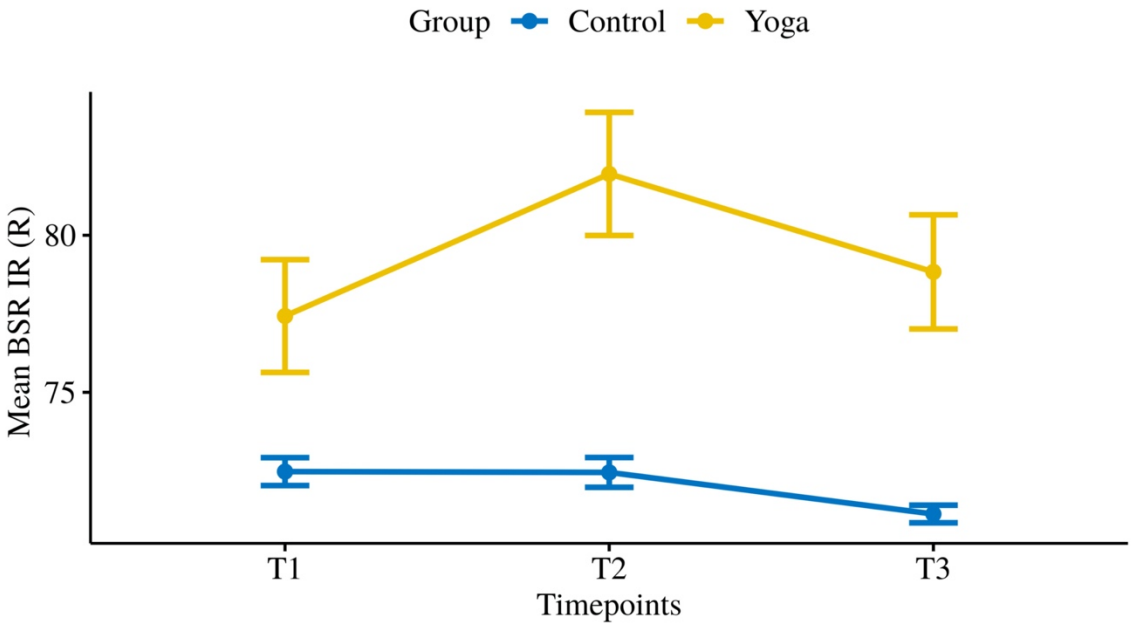


Figure 14: Comparison of bi-lateral shoulder rotation – BASR IR (R) between the groups at pre (T1), post (T2) and follow-up (T3).

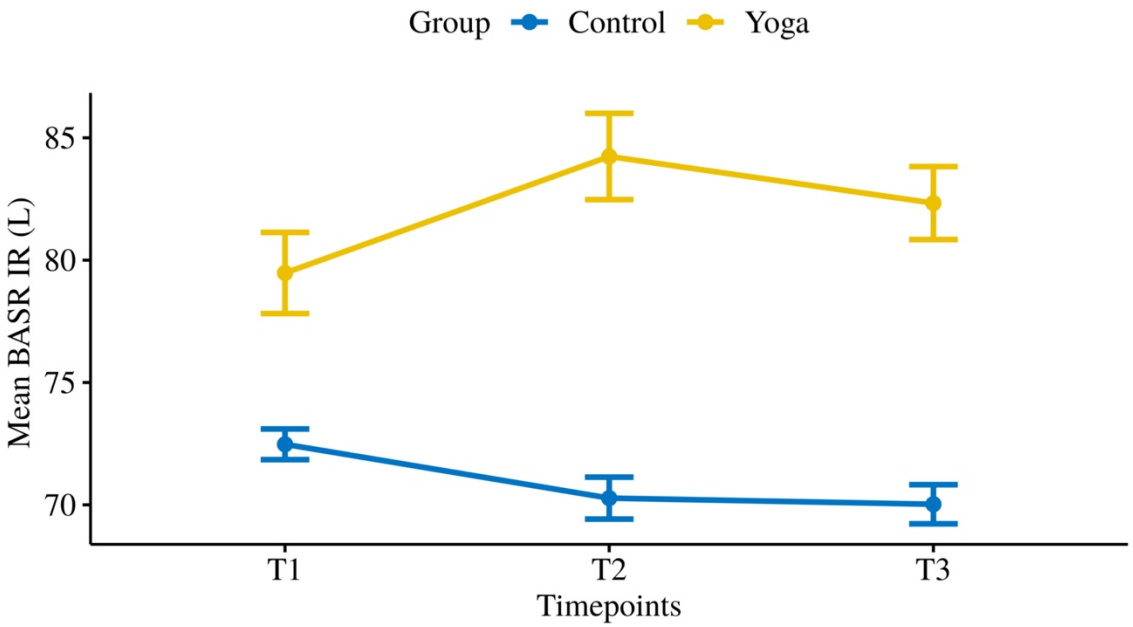


Figure 15: Comparison of bi-lateral shoulder rotation – BASR IR (L) between the groups at pre (T1), post (T2) and follow-up (T3).

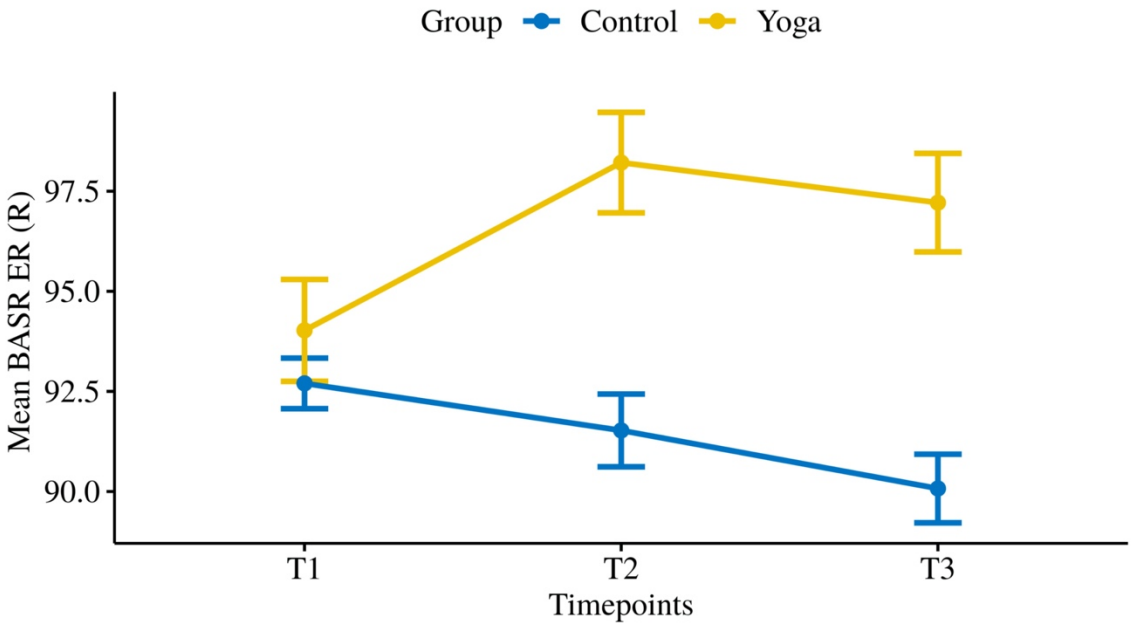


Figure 16: Comparison of bi-lateral shoulder rotation – BASR ER (R) between the groups at pre (T1), post (T2) and follow-up (T3).

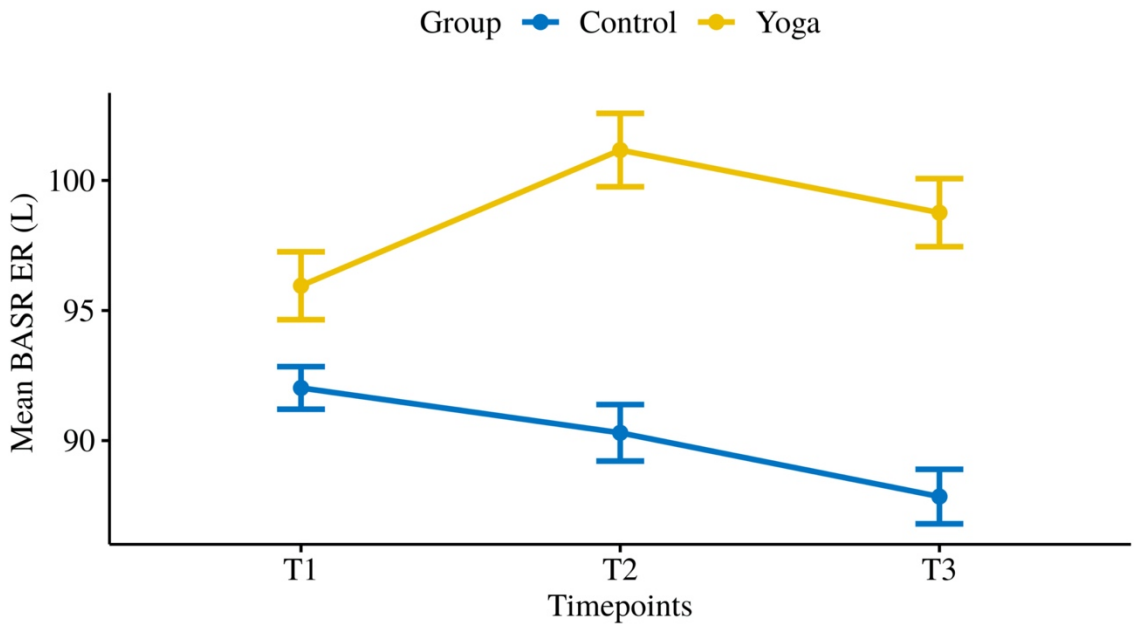


Figure 17: Comparison of bi-lateral shoulder rotation – BASR ER (L) between the groups at pre (T1), post (T2) and follow-up (T3).

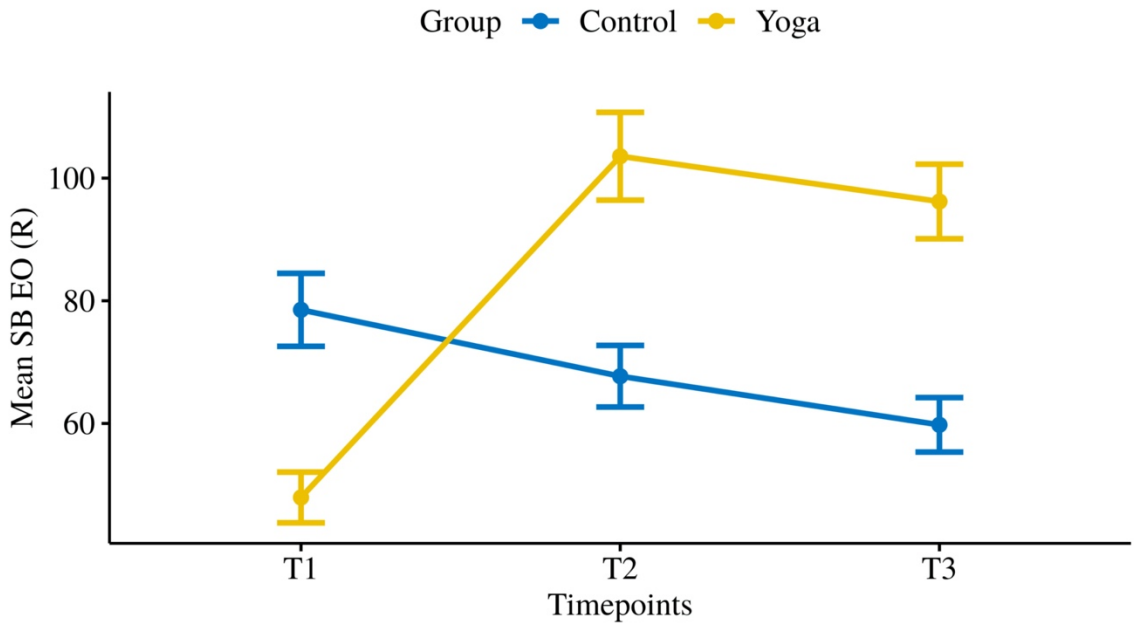


Figure 18: Comparison of stork Balance – SB EO (R) between the groups at pre (T1), post (T2) and follow-up (T3).

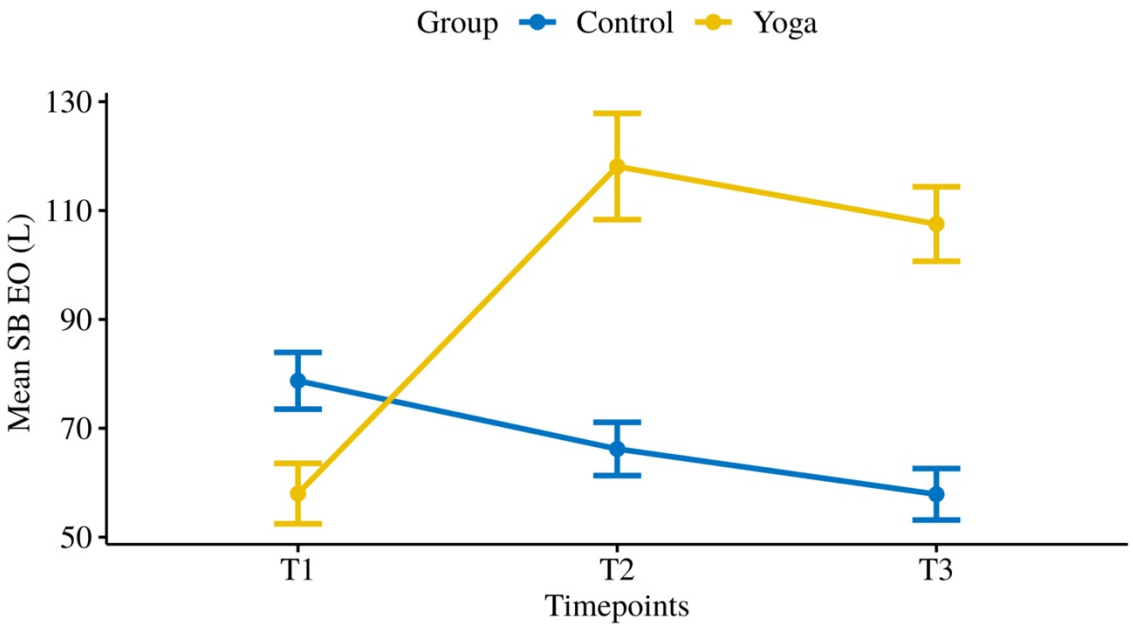


Figure 19: Comparison of stork Balance – SB EO (L) between the groups at pre (T1), post (T2) and follow-up (T3).

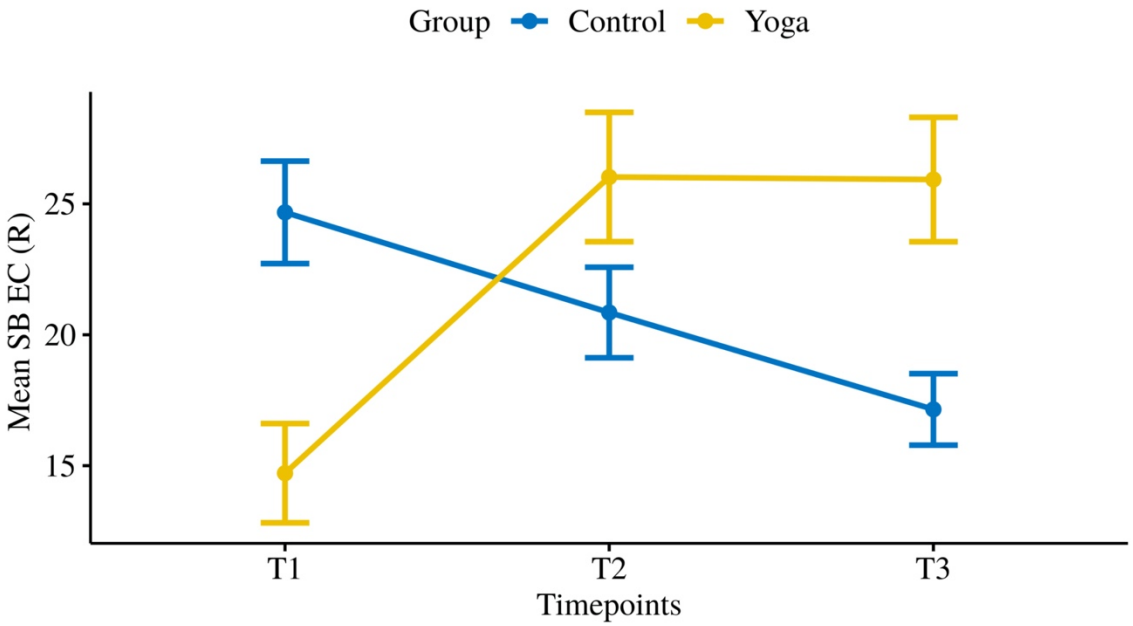


Figure 20: Comparison of stork Balance – SB EC (R) between the groups at pre (T1), post (T2) and follow-up (T3).

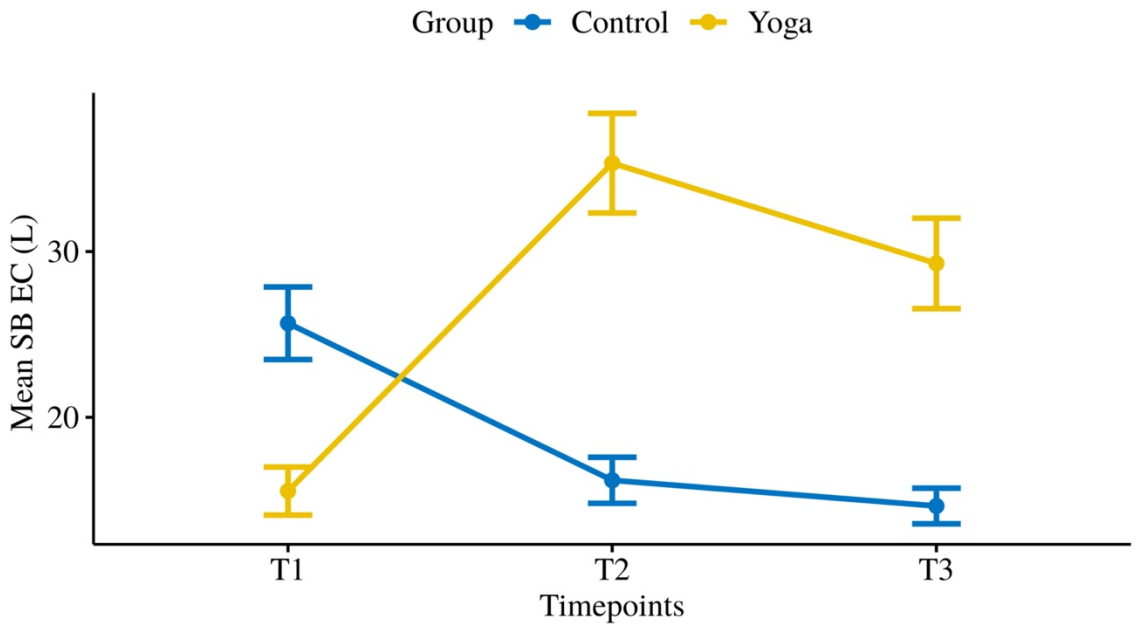


Figure 21: Comparison of stork Balance – SB EC (L) between the groups at pre (T1), post (T2) and follow-up (T3).

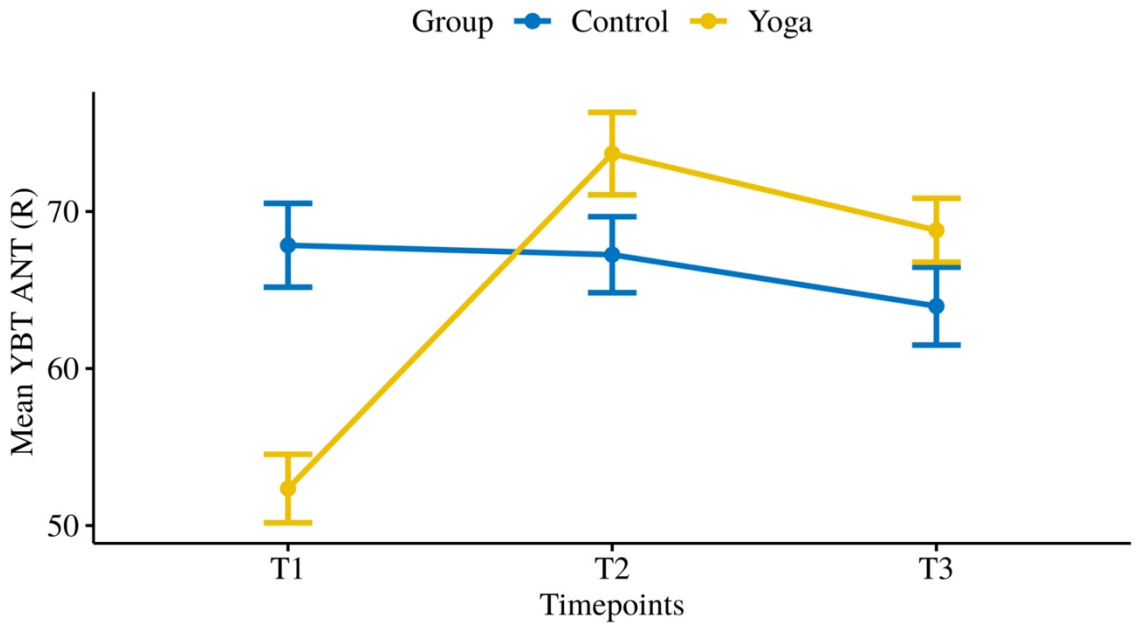


Figure 22: Comparison of Y balance test – YBT ANT (R) between the groups at pre (T1), post (T2) and follow-up (T3).

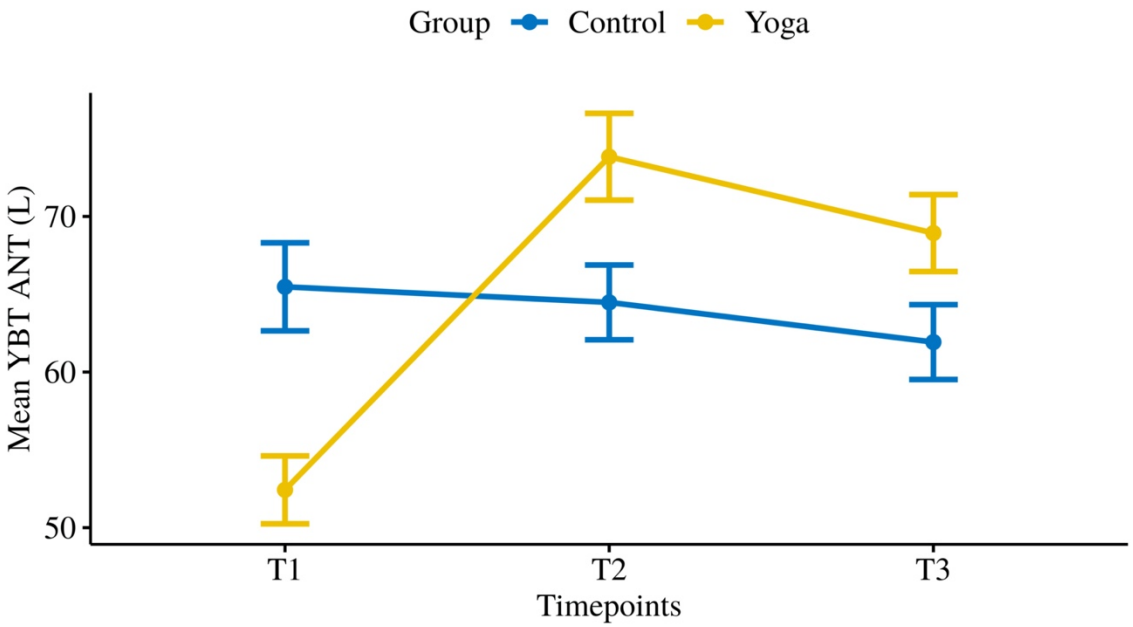


Figure 23: Comparison of Y balance test – YBT ANT (L) between the groups at pre (T1), post (T2) and follow-up (T3).

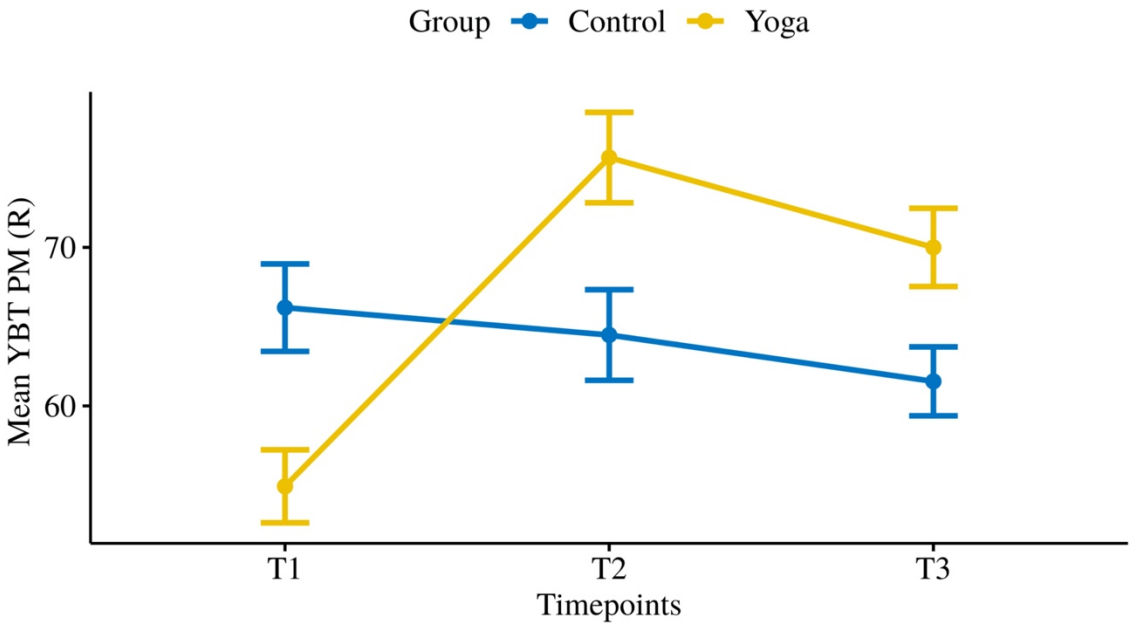


Figure 24: Comparison of Y balance test – YBT PM (R) between the groups at pre (T1), post (T2) and follow-up (T3).

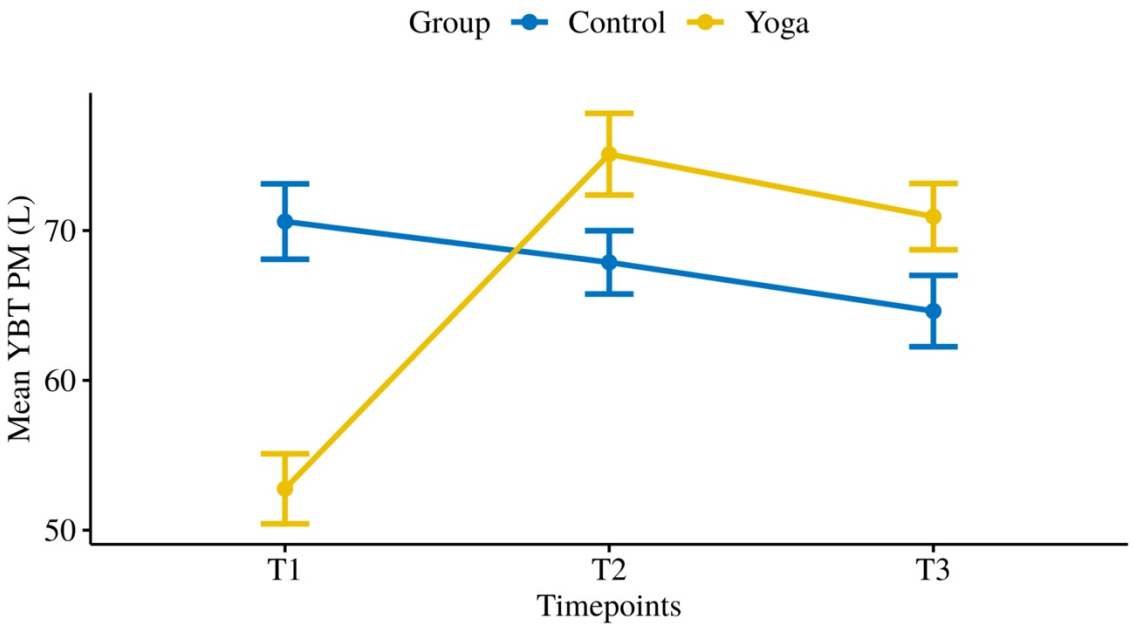


Figure 25: Comparison of Y balance test – YBT PM (L) between the groups at pre (T1), post (T2) and follow-up (T3).

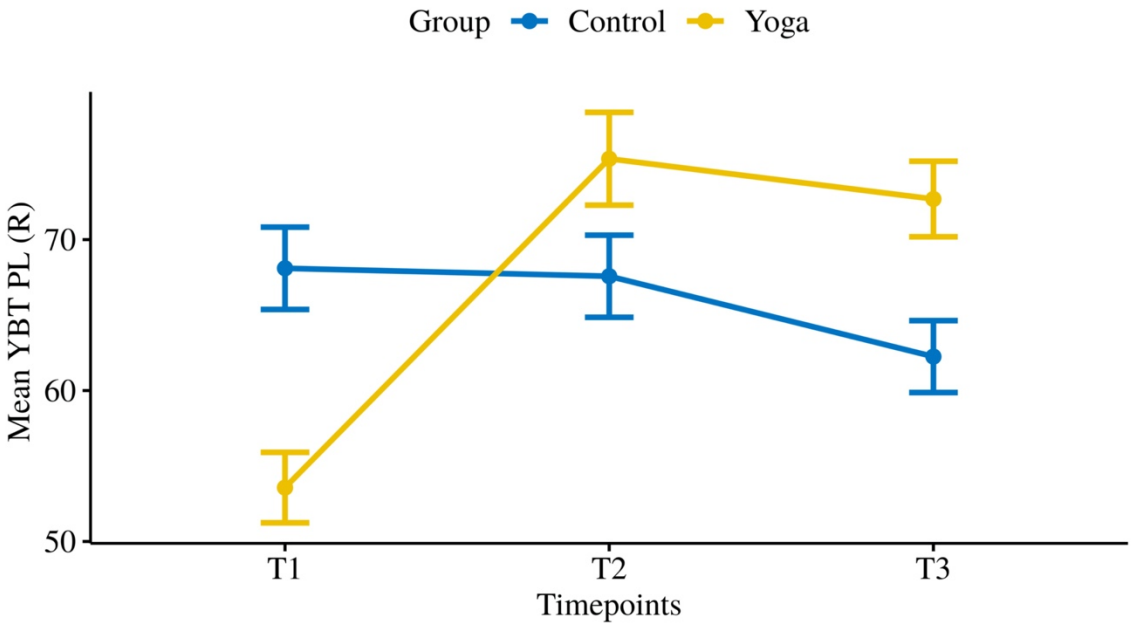


Figure 26: Comparison of Y balance test – YBT PL (R) between the groups at pre (T1), post (T2) and follow-up (T3).

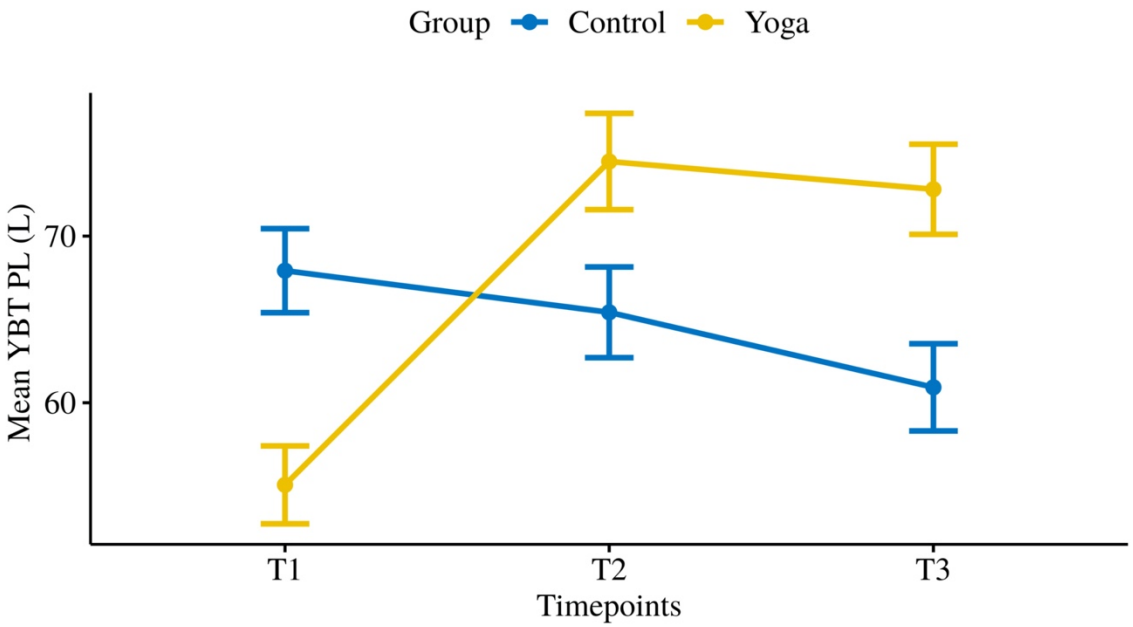


Figure 27: Comparison of Y balance test – YBT PL (L) between the groups at pre (T1), post (T2) and follow-up (T3).

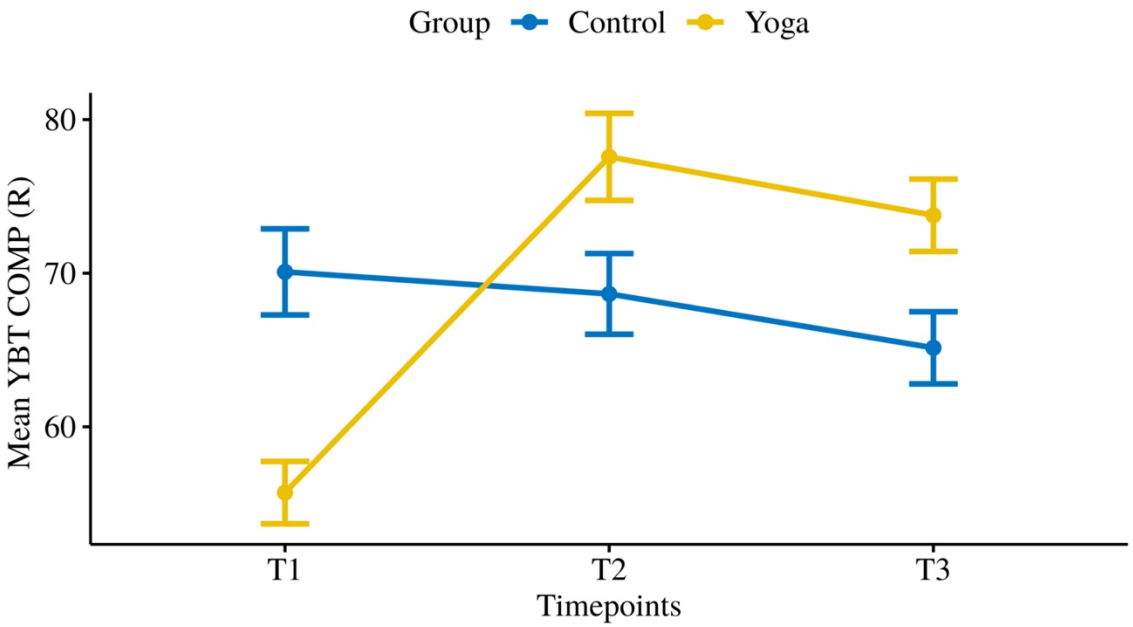


Figure 28: Comparison of Y balance test – YBT COMP (R) between the groups at pre (T1), post (T2) and follow-up (T3).

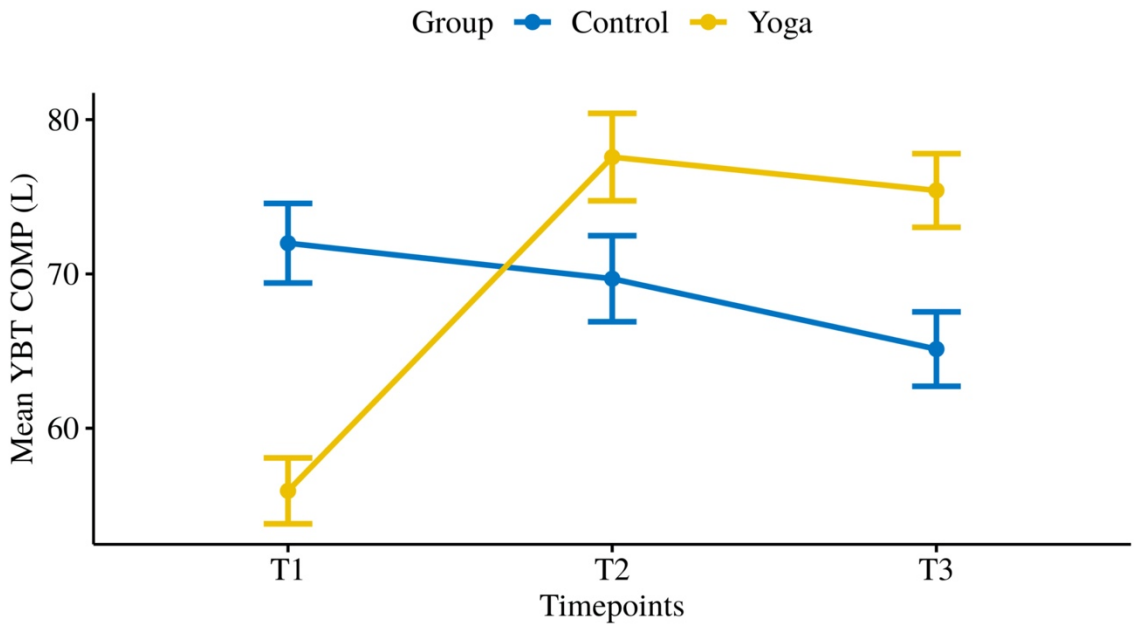


Figure 29: Comparison of Y balance test – YBT COMP (L) between the groups at pre (T1), post (T2) and follow-up (T3).

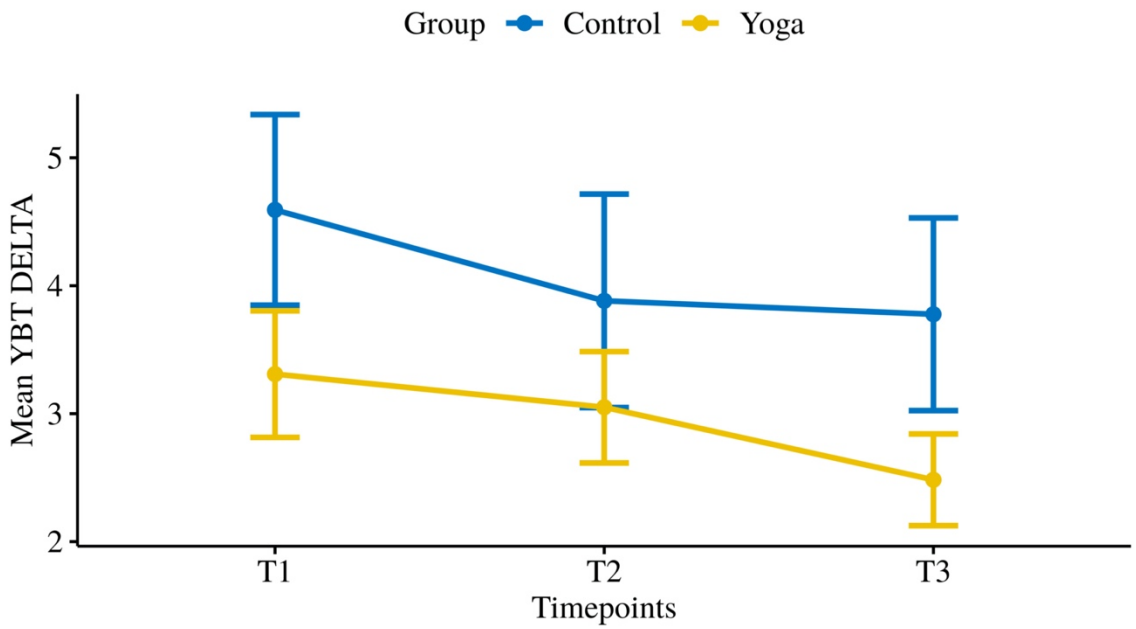


Figure 30: Comparison of Y balance test – YBT DELTA between the groups at pre (T1), post (T2) and follow-up (T3).

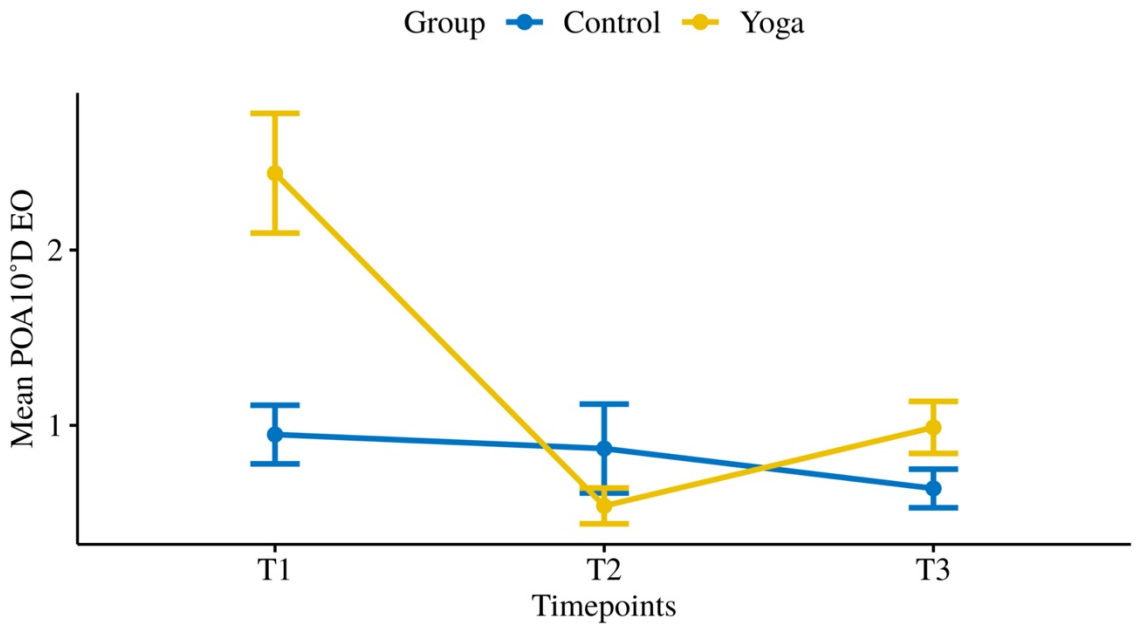


Figure 31: Comparison of proprioception of the ankle – POA 10˚D EO between the groups at pre (T1), post (T2) and follow-up (T3).

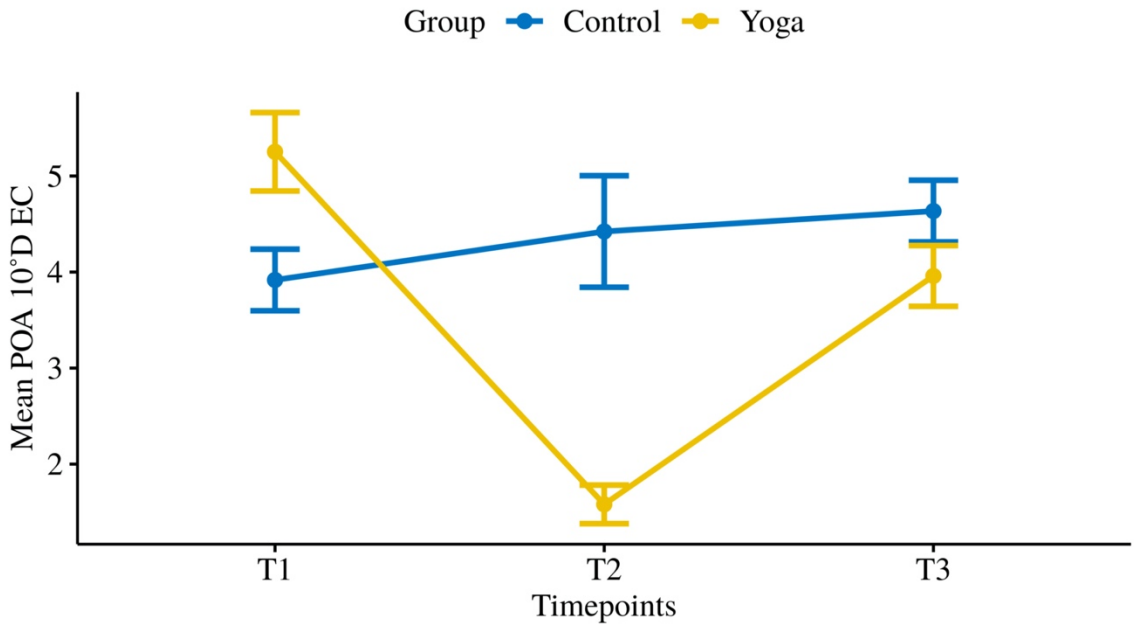


Figure 32: Comparison of proprioception of the ankle – POA 10˚D EC between the groups at pre (T1), post (T2) and follow-up (T3).

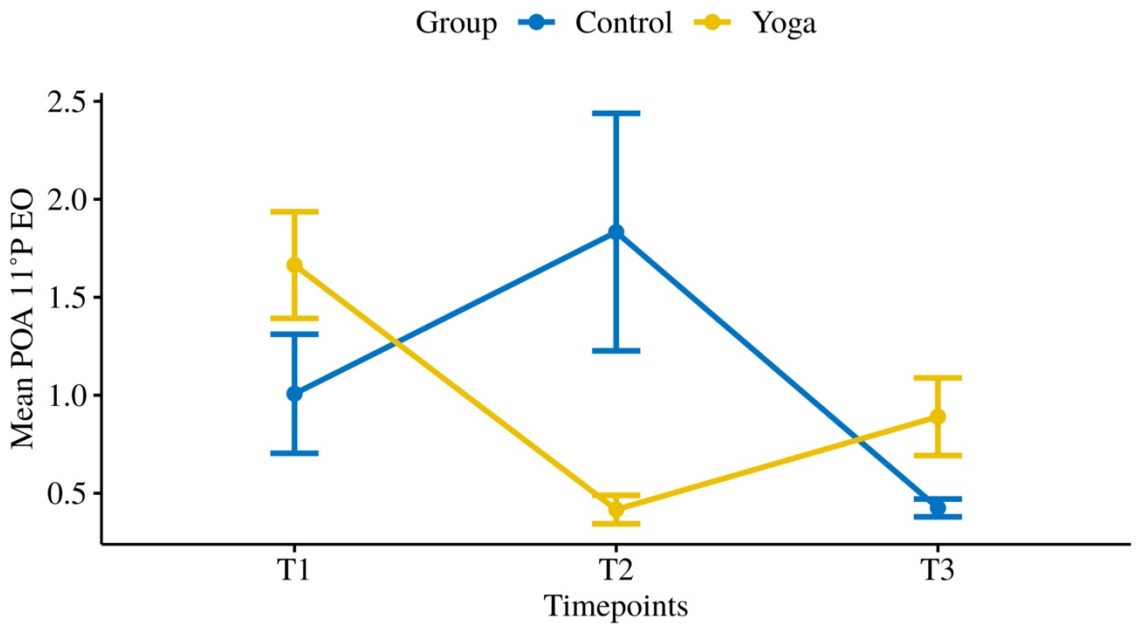


Figure 33: Comparison of proprioception of the ankle – POA 10˚D EC between the groups at pre (T1), post (T2) and follow-up (T3).

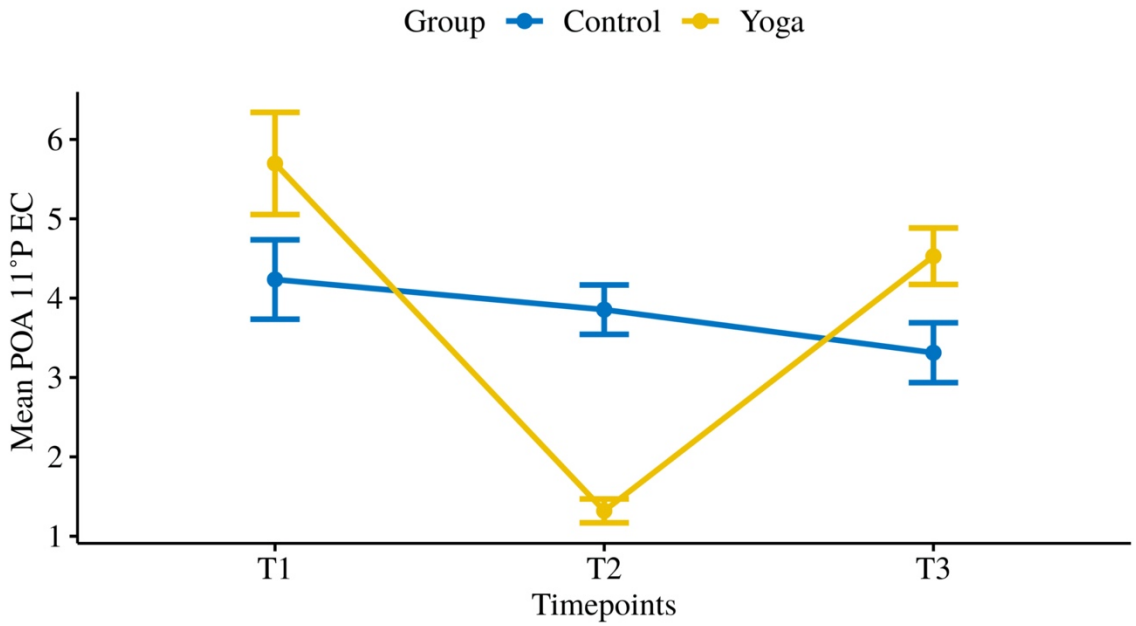


Figure 34: Comparison of proprioception of the ankle – POA 11˚P EC between the groups at pre (T1), post (T2) and follow-up (T3).

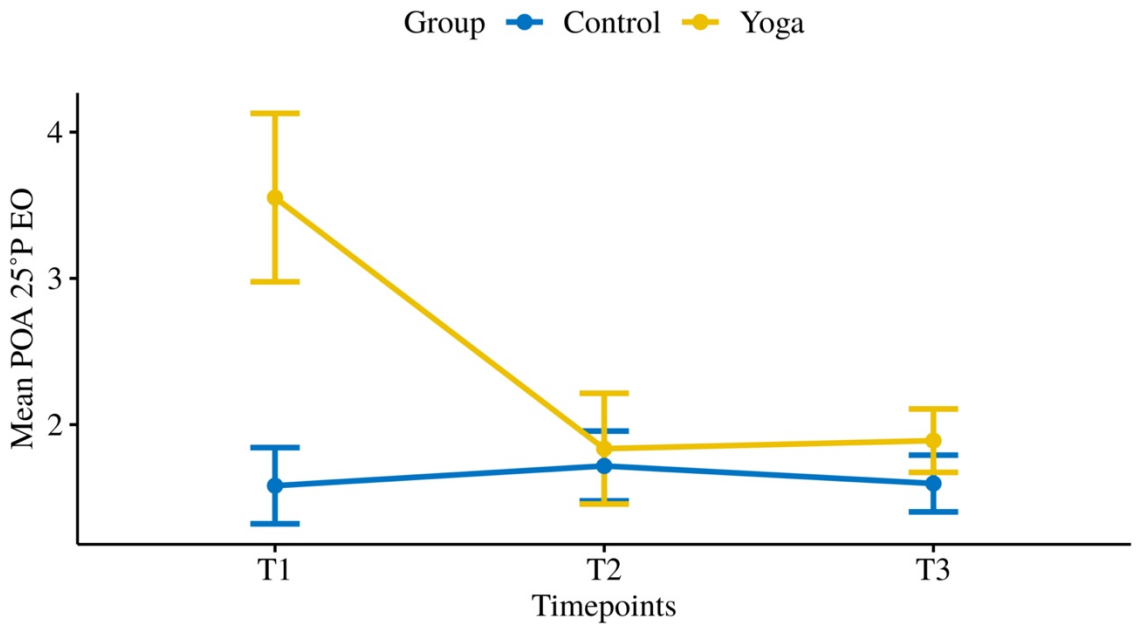


Figure 35: Comparison of proprioception of the ankle – POA 25˚P EO between the groups at pre (T1), post (T2) and follow-up (T3).

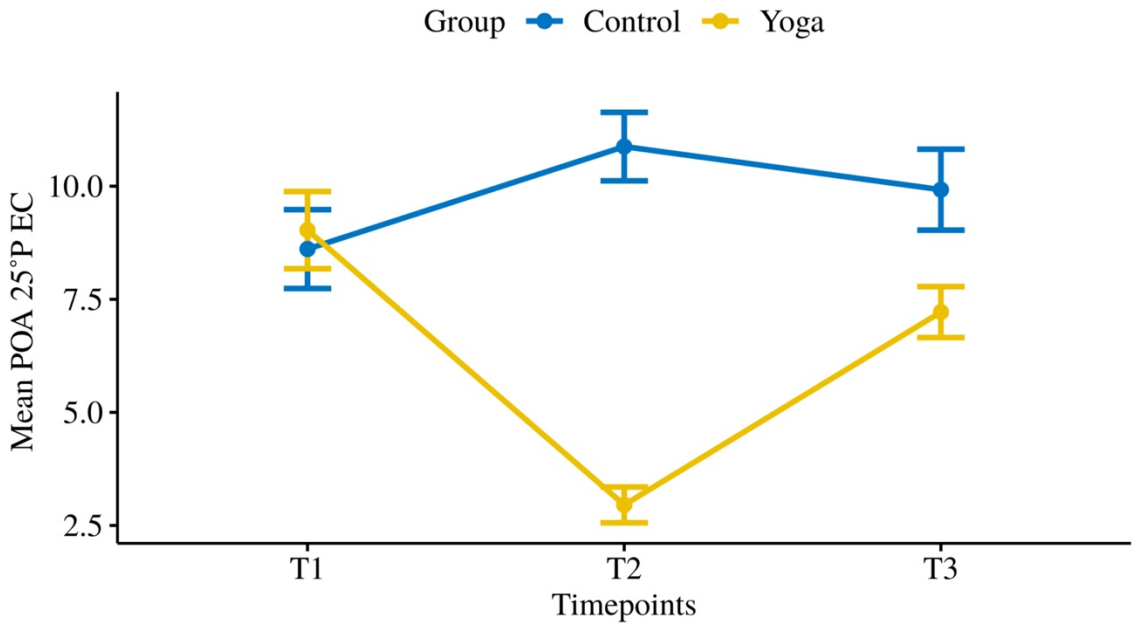


Figure 36: Comparison of proprioception of the ankle – POA 25˚P EC between the groups at pre (T1), post (T2) and follow-up (T3).

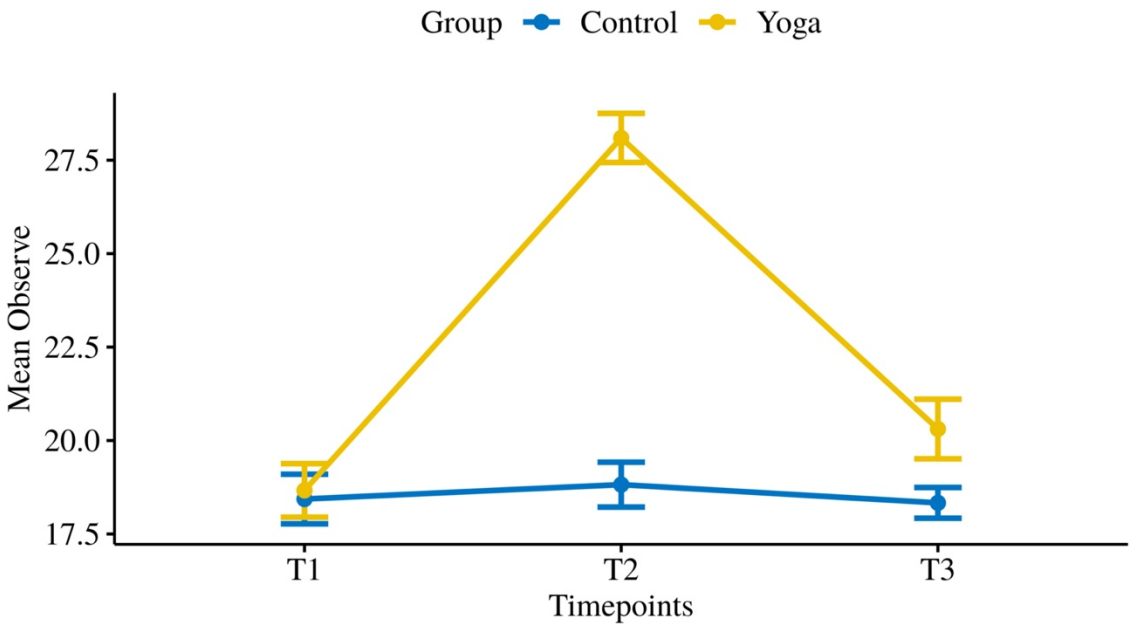


Figure 37: Comparison of the facet of observe between the groups at pre (T1), post (T2) and follow-up (T3).

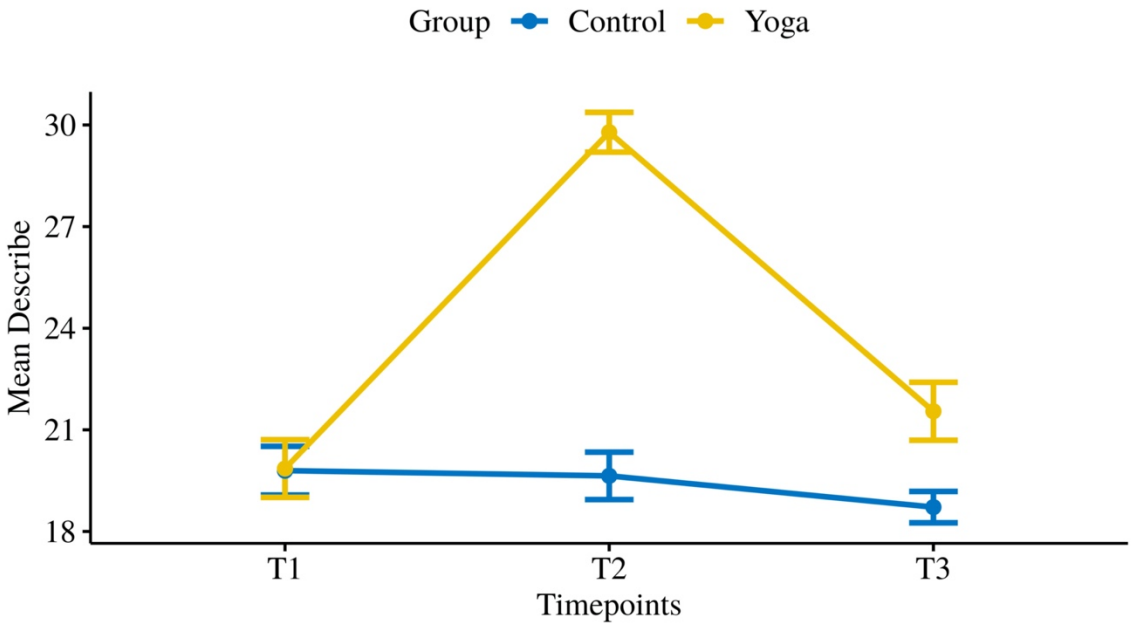


Figure 38: Comparison of facet of describe between the groups at pre (T1), post (T2) and follow-up (T3).

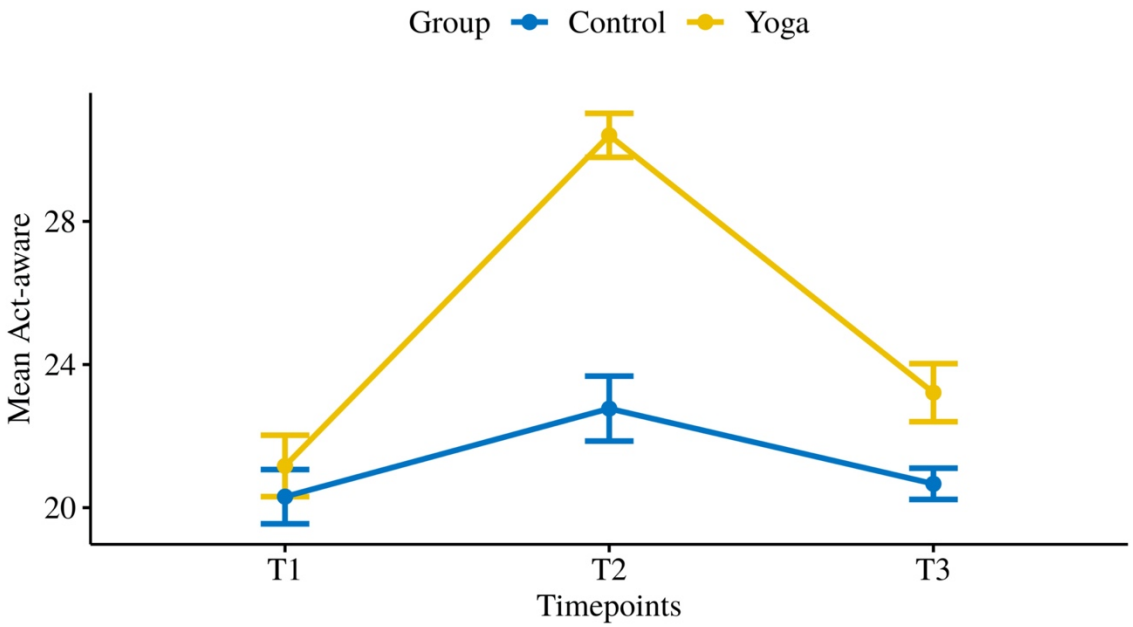


Figure 39: Comparison of facet of act aware between the groups at pre (T1), post (T2) and follow-up (T3).

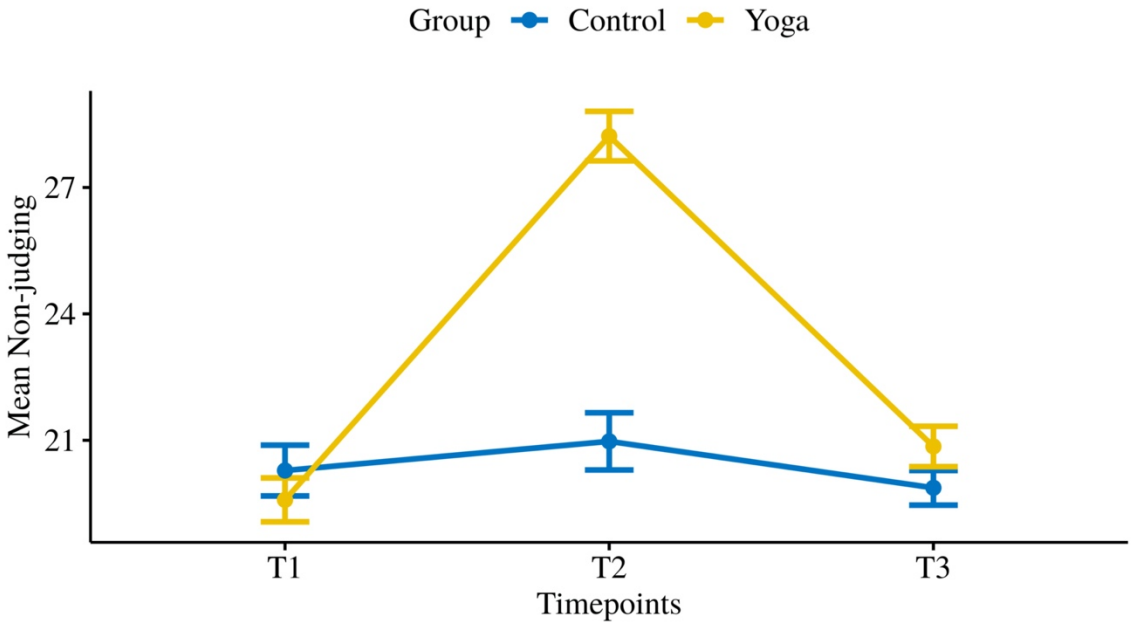


Figure 40: Comparison of facet of non-judging between the groups at pre (T1), post (T2) and follow-up (T3).

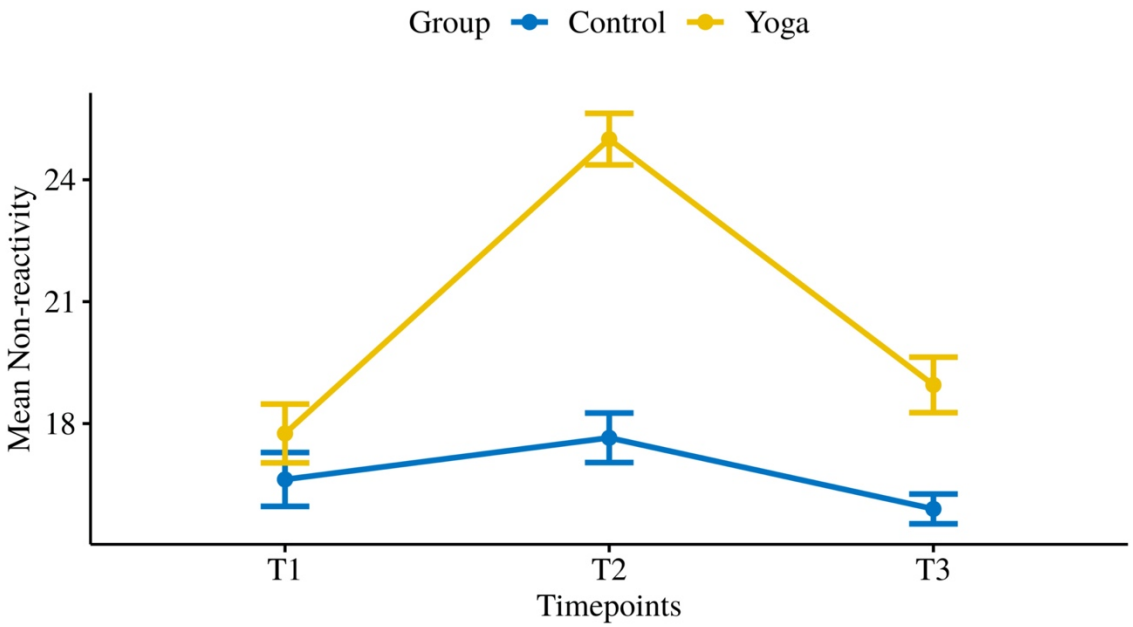


Figure 41: Comparison of facet of non-reactivity between the groups at pre (T1), post (T2) and follow-up (T3).

APPENDIX IX

LIST OF PUBLICATIONS FROM THIS DOCTORAL THESIS

Sl. No	Name of the Article / Title	Published/ Accepted	web link of article if published	Name of the Journal and Publisher	Is it indexed journal? Yes/No If yes provide details	Impact Factors (Thomson Reuters-2018)	UGC Listed Yes/No If yes provide the details
1.	Efficacy of yoga in facilitating mindfulness among asymptomatic male cricket players	Published - 24/06/20	https://indjst.org/articles/efficacy-of-yoga-in-facilitating-mindfulness-among-asymptomatic-male-cricket-players	Indian Journal of Science and Technology	Web of Science (Zoological Record); Chemical Abstracts Services (CAS); J-Gate Plus; Research Bible; EBSCO Publishing's Electronic Databases, USA; Urlich's Periodical Directory, USA; Indian Science Abstracts, India; Index Copernicus, Poland.	-	YES
2.	Epidemiology of annual musculoskeletal injuries among male cricket players in India	Published - 30/09/20	https://www.iapsmupuk.org/journal/index.php/IJCH/article/view/1840z	Indian Journal of Community Health	CINAHL, Emerging Sources Citation Index, Indian Science Abstracts, IndMed, Scimago Journal Ranking, SCOPUS, Web of Science.	-	Yes
3.	Understanding the concept of mind and mindful awareness according to Indian scriptures	Published-17/03/21	https://www.ijoyppp.org/article.asp?issn=2347-5633;year=2021;volume=9;issue=1;spage=8	International Journal of Yoga – Philosophy, Psychology and Parapsychology	Baidu Scholar, CNKI (China National Knowledge Infrastructure), EBSCO Publishing's Electronic Databases, Ex Libris – Primo Central, Google Scholar, Hinari, Infotrieve, National Science Library, ProQuest, TdNet, Wanfang Data.	-	-

			;epage=15;aulast=Rao				
4.	Impact of Yoga in Facilitating Muscular Functioning among Asymptomatic Male Cricket Players: Longitudinal Randomized Controlled Study	Published – 10/03/21	https://doi.org/10.1016/j.jbmt.2021.02.022	Journal of Bodywork and Movement Therapies	Scopus, CINAHL, Neuroscience Abstracts, Embase, Cambridge Scientific Abstracts, Cochrane Center, Calcium and Calcified Tissue, MANTIS, CHID(AM, PubMed/Medline	Cite score – 2.0	Yes

INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY

RESEARCH ARTICLE

Efficacy of yoga in facilitating mindfulness among asymptomatic male cricket players

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mansarao@gmail.com

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Competing Interests: None

Published By Indian Society for Education and Environment (iSee)

Abstract

Background: Cricket scenario across the globe has undergone tremendous changes in the last two decades. Premier league designs have exposed the players to immense aggression, competitiveness, and expectations. **Objective:** To evaluate the efficacy of yoga in facilitating mindfulness among asymptomatic male cricket players. **Methods and materials:** First-class domestic male cricket players in the age group of 18-35 years from the Karnataka State Cricket Association were randomized into yoga group n=40 and wait-list control group n=42. Players received the yoga module for five days/week for a duration of six weeks. Five-facet mindfulness questionnaire was given at baseline, immediate post-intervention, and a follow-up after six months of intervention. **Statistical analysis:** Group differences in the change in parameters over time was modelled using linear mixed-effects regression method using the lme4 package in R, as two groups were compared over three unevenly spaced assessment time points. **Findings:** Comparison of the model fit indicates a significant ($p<0.001$) difference between the model as compared to the baseline model among all the five facets. There was no significant effect ($p>0.001$) at either time or group, however, there was a significant interaction effect at T2 (immediate post-intervention) among all the facets. No significant interaction effect (group*time interaction) was found in the follow-up study. **Application:** Regular practice of this yoga module may enhance the likelihood to maintain a state of mindfulness among the male cricket players. Integrating yoga into the competitive world of cricket appears to be promising in enhancing mindfulness.

Keywords: Sports performance; mindfulness; Yoga; cricket players; wellbeing

1 Introduction

One of the most important aspects of sports performance is the player's ability to train the mind to put themselves in the best situation to compete with an optimum athletic ability and focus, where there is little room for error. Expectations to be perfect and

fear of defeat can hinder any player's performance during intense competition. The pursuit of excellence in sport encompasses four significant components, namely physical, technical, tactical and mental skills[1]. The facilitative role of mental skills in high level sports participation has been strongly emphasised over the past three decades. Mental factors such as self-confidence, commitment, concentration, coping skills, imagery and visualisation goals have emerged as key antecedents to achieving athletic success at the highest level of sports participation[2,3].

Mindfulness techniques have been widely utilized in clinical psychology, often as an adjunct to cognitive or behavioural interventions[4]. It has become relevant in sport considering the fact that the practice inculcates a present moment awareness that is crucial in athletic performance[5]. An early study integrating mindfulness in sport was conducted by Jon Kabat-Zinn, who designed the mindfulness-based stress reduction[6]. Mindfulness, defined as the non-judgmental focus of one's attention on the experience that occurs in the present moment[7], aids in addressing issues related to tendencies of present moment focus. Current moment awareness, a crucial component of peak sport performance also helps in generating a state of 'flow', or a state of complete focus[8]. Mindfulness-based interventions for sports are efficient in minimizing external distractions[9]. Mindfulness training allows the individual to channelize on being non-judgmental rather than restricting negative thoughts. With the present moment acceptance of internal experience, an athlete can focus on the positives and learn to cope through challenging times[10].

Historically, mindfulness has its origins in Eastern contemplative spiritual traditions and has been considered the core of Buddhist meditation[6]. Dhyansky explains that, based on the so-called 'Proto-Siva' from Mohenjodaro, discovered by Marshall and Mackay, reveal that the five 'Proto-Siva' seals, clearly indicates that yoga was known and practiced by the people of the Indus Valley civilization in the North Western part of India about five thousand years ago. Further, yoga maintained the oral tradition till Patanjali systematized it in his Yogasutra[11]. Patanjali discusses the mind and its bondage, and gives a detailed prescription for it accordingly, in his multicomponent process of Raja yoga[12]. The yogic technology of Raja yoga overlaps with meditative traditions such as Buddhism[13]. Eventually, as the discipline of yoga became the common property of humanity, it was applied as a therapeutic intervention in the twentieth century yielding various psychophysiological benefits. Each component of yoga such as – physical postures (asanas), breathing techniques (pranayama), deep relaxation, and meditation comprise its own distinct emphasis cultivating an awareness and ultimately more profound states of consciousness[14]. Yoga prescribes to reach the state of meditation through breath and it introduces syncing of the breath with purposeful movement, as its foundation. Likewise, breathing technique is also the crux of the mindfulness skills as described by Kabat-Zinn[15].

Yoga focuses on systematically directing awareness toward internal sensations emanating during yoga movement sequences that are performed slowly and gently without being physically taxing, thereby, facilitating mindful awareness[16]. A study that investigated the relationship between home practice of mindfulness meditation exercises and levels of mindfulness, medical and psychological symptoms, perceived stress, and psychological well-being on adults in a clinical Mindfulness-Based Stress Reduction (MBSR) program. This study found that yoga practice time to be more strongly correlated with self-reported improvements in mindfulness, perceived stress, anxiety, and psychological well-being than formal sitting meditation time[17]. Another study that explored the utility, feasibility, and potential efficacy of a comprehensive mindfulness intervention for student athletes with modified MAC (Mindfulness-Acceptance-Commitment) intervention sessions immediately followed by 1-hr hatha yoga session, reported greater mindfulness, greater goal-directed energy, and less perceived stress than before the intervention[18]. The yogic techniques, thus, aim at bringing focus by incorporating body movement to quieten the mind[19]. Recent lines of evidence suggest that yoga training can have a positive impact on a range of physiological, cognitive, and performance aspects that include facets of mindfulness and flow[20].

To date, there has been no attempt to carry out an experimental study on the effects of yoga on mindfulness on a large group of cricket players. The current study is thus an attempt to fill this major gap in this field. Cricket, being the most prominent sport, has undergone tremendous changes in the last two decades. Unlike the temperate countries, cricket is generally played all year round in the tropical countries. The premier league designs has exposed the players to unique playing conditions, game formats, and sheer absence of the off season and an escalated workload[21]. Competitive shorter versions of the game has also led to greater aggression and an upsurge in the number of cricketing injuries[22]. Hence, a mind-body intervention such as yoga was introduced addressing the current scenario. The aim of this study was to evaluate the efficacy of yoga in facilitating mindfulness among asymptomatic male cricket players.

2 Method

2.1 Participants

A total of 82 first class domestic cricket players from the Karnataka State Cricket Association were randomly selected for the study. Male cricketers in the age group of 18-35 years, with an experience of 2-15 years in playing for the cricketing association,

with no physical signs of an injury in the past three months and who were willing to participate for the entire duration of the intervention, were selected for the study.

2.2 Procedure

The players were randomized into yoga group n=40 and wait-list control group n=42. Cricket players received the yoga module for 80 minutes per session for 5 days/week for duration of 6 weeks. The players in the yoga group practiced the module as mentioned in Table 1, along with their routine fitness sessions, while the control group followed their regular daily routine during the study period. The yoga sessions were conducted by a yoga expert. The duration of the follow-up was for a period of six months. The five-facet mindfulness questionnaire (FFMQ) was completed by the players at baseline, immediate post-intervention and a follow-up after six months of intervention.

The Karnataka State Cricket Association had extended their consent for conducting this study. Written informed consent from the participants was obtained before the intervention. The players were explained in detail about the nature of the study and the voluntary nature of participation. Confidentiality was assured as a part of the research process. This study was approved by Institutional Ethics Committee (IEC) of Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA University).

2.3 Measures

Five-facet mindfulness questionnaire (FFMQ) is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as conceptualized in the psychological literature. The five facets are observing, describing, acting with awareness, non-judging of inner experience and non-reactivity to inner experience. The internal consistency of the five subscales is of adequate to good consistency - cronbach alpha values: observing = .83, describing = .91, acting with awareness = .87, non-reactivity to inner experiences = .75 and non-judging of inner experiences = .87 [23].

2.4 Statistical Analysis

Data were coded and recorded in MS Excel spreadsheet program. R Statistical Software, RStudio Team (2019) was used for data analysis. Descriptive statistics were presented as appropriate. Validity of the FFMQ was examined using Bartlett's test of sphericity to evaluate whether or not the variables intercorrelate and Cronbach's alpha for internal consistency. Intercorrelations between FFMQ facets were conducted to examine if facets represent related but distinct constructs. Regression analyses were conducted to predict each FFMQ facet from the other four facets combined. The adjusted R^2 indicates the variance accounted for by the dependents relationship with the other facets, hence revealing the extent to which facets are non-overlapping [24]. Data were explored for normal distribution using the criteria of absolute skewness < 2, absolute kurtosis < 3, and a non-significant Shapiro-Wilk Test. The presence of outliers was investigated using Grubb's test and boxplots. Outliers were checked for accuracy of data, and analysis was performed using both the outlier removed and the outlier included dataset to ensure that the outliers were not significant influencers. Results are presented for the outlier removed datasets. Group differences in the change in parameters over time was modelled using linear mixed-effects regression method as two groups were compared over three unevenly spaced assessment time points. Linear mixed-effects approach was employed as it has important advantages over traditional methods of repeated measures analysis, while seamlessly dealing with unequally spaced observations over time [25]. Linear mixed-effect regression method was conducted using the lme4 package in R, with each outcome parameter respectively as the dependent variable, main effect of Group and Timepoint and their interaction as the fixed effects, and allowing for a random intercept for each subject and a random slope for Time.

Full models were compared against baseline models with no fixed effects for deriving the significance of model fit. Statistical significance was assumed at $p<0.05$.

3 Results

A total of 42 cricket players were taken in each group. However, there were two dropouts from the control group as they were lost to both the post and the follow-up assessments due to their unavailability. Hence, in the yoga group n=40 and in control group n=42. Prior to performing any statistical analysis for comparison, the data were compiled to obtain the descriptive statistics. There were no missing data at T1 (baseline), T2 (immediate post-intervention) and at T3 (follow-up after six months of intervention).

Table 1. List of yoga practices

Type of yoga practice	**Name of the practice**	Duration **(min)**
Breathing practice	Pavanamuktasana Kriya	3
Suryanamaskara	Suryanamaskara - 12 steps	10
Asanas in standing position	Utthita Trikonasana	2
	Parivrita Trikonasana	2
	Parsvakonasana	2
	Virabhadranasa I	2
	Virabhadrasana II	2
	Utthita Padangustasana	2
	Prasarita Padottanasana	2
	Vriksasana	2
Asanas in sitting position	Baddhakonasana	1
	Upavista Konasana	1
	Gomukhasana	2
	Parivritta Janu Sirsasana	2
	Ushtrasana	2
	Virasana	2
Asana in prone position	Bhujangasana	3
	Shalabasana	2
	Dhanurasana	2
Asana in supine position	Salamba Sarvangasana	2
	Matsyasana	2
	Uttana Padasana	1
	Jathara Parivartanasana	2
Pranayama	Nadishuddhi	10
	Bhramari	2
Relaxation in supine position	Deep Relaxation	15

Bartlett's test of sphericity was confirmed as significant ($\chi^2(10)=321.070$, $p<0.001$). Cronbach's alpha coefficients indicated that the subscales observe - 0.672, describe - 0.742, acting with awareness - 0.729 and non-reacting - 0.731 were internally consistent, falling within acceptable range except non-judging with an alpha of 0.406. The intercorrelations presented in Table 2 show that all FFMQ sub scales were significantly intercorrelated.

Table 2. Inter-correlations between the facets of five-facet mindfulness questionnaire

	OBS	D	AA	NJ
Observe				
Describe	.801			
Act-aware	.695	.777		
Non-judging	.594	.729	.715	
Non-reactivity	.736	.798	.753	.677

Note - All $p < .001$
OBS - Observe, D - Describe, AA - Act-aware, NJ - Non-judging

Results of the regression analyses predicting each FFMQ facet from the other four facets combined revealed extremely significant models with observe - ($F=(4,77)=39.608$, $p<0.001$) with an R^2 of 0.656, describe - ($F=(4,77)=71.556$, $p<0.001$) with an

R^2 of 0.777, act with awareness - (F=(4,77)=42.242, p<0.001) with an R^2 of 0.671, non-judging - (F=(4,77)=28.439, p<0.001) with an R^2 of 0.575, non-reactivity - (F=(4,77)=45.474, p<0.001) with an R^2 of 0.687, indicating that although intercorrelated, a substantial proportion of the variance in each facet is distinct from the other four facets and contributed independently towards the prediction of mindfulness [4,24]. For all the variables, there seemed no difference of significance and direction of association between the original, outlier removed model. Hence, the outlier-removed model was retained.

3.1 Linear mixed-effect model

As indicated by the comparison of the model fit there was a significant (p<0.001) difference between the model as compared to the baseline model among all the five facets. When including the interaction term in the model, there was no significant fixed effect (p>0.05) of time for the all the facets at T2 and T3 as compared to the T1. Also, no significant fixed.

Table 3. Repeated measures results using linear mixed effects model

		Value	Std.Error	t-value	DF	p-value
Baseline	(Intercept)	19.77	0.42	47.46	80	<0.001
Model 1	(Intercept)	18.44	0.71	26.12	79	<0.001
Observe	Group (yoga vs control)	0.23	0.98	0.24	79	0.814
	Time T2	0.38	0.74	0.52	79	0.603
	Time T3	-0.10	0.64	-0.16	79	0.872
	GroupYoga:TimeT2	9.04	1.02	8.85	79	<0.001
	GroupYoga:TimeT3	1.75	0.88	1.98	79	0.052
		Conditional R^2: 0.661; Marginal R^2: 0.416				
		Comparison of Model Fit:		$X^2(5)$=119.16, p<0.001		
Baseline	(Intercept)	21.06	0.47	44.90	80	<0.001
Model 2	(Intercept)	19.79	0.81	24.47	79	<0.001
Describe	Group (yoga vs control)	0.06	1.12	0.06	79	0.956
	Time T2	-0.15	0.81	-0.19	79	0.850
	Time T3	-1.08	0.65	-1.66	79	0.101
	GroupYoga:TimeT2	10.08	1.13	8.95	79	<0.001
	GroupYoga:TimeT3	2.77	0.90	3.07	79	0.003
		Conditional R^2: 0.669; Marginal R^2: 0.414				
		Comparison of Model Fit:		$X^2(5)$=128.49, p<0.001		
Baseline	(Intercept)	22.96	0.45	50.97	80	<0.001
Model 3	(Intercept)	20.31	0.83	24.47	79	<0.001
Act With Awareness	Group (yoga vs control)	0.86	1.15	0.75	79	0.458
	Time T2	2.46	0.94	2.61	79	0.011
	Time T3	0.36	0.63	0.57	79	0.573
	GroupYoga:TimeT2	6.78	1.31	5.18	79	<0.001
	GroupYoga:TimeT3	1.69	0.88	1.92	79	0.059
		Conditional R^2: 0.589; Marginal R^2: 0.347				
		Comparison of Model Fit:		$X^2(5)$=96.38, p<0.001		
Baseline	(Intercept)	20.88	0.29	71.24	79	<0.001
Model 4	(Intercept)	20.28	0.57	35.70	78	<0.001
Non-Judging	Group (yoga vs control)	-0.70	0.79	-0.88	78	0.383
	Time T2	0.69	0.77	0.90	78	0.370
	Time T3	-0.41	0.52	-0.79	78	0.429
	GroupYoga:TimeT2	7.94	1.07	7.41	78	<0.001
	GroupYoga:TimeT3	1.68	0.72	2.33	78	0.023
		Conditional R^2: 0.575; Marginal R^2: 0.428				
		Comparison of Model Fit:		$X^2(5)$=94.73, p<0.001		
Baseline	(Intercept)	18.17	0.39	46.51	80	<0.001
Model 5	(Intercept)	16.63	0.70	23.79	79	<0.001

Continued on next page

Table 3 continued

		Value	Std.Error	t-value	DF	p-value
Non-Reactivity	Group (yoga vs control)	1.13	0.98	1.15	79	0.253
	Time T2	1.02	0.75	1.36	79	0.176
	Time T3	-0.73	0.60	-1.21	79	0.231
	GroupYoga:TimeT2	6.22	1.06	5.89	79	<0.001
	GroupYoga:TimeT3	1.92	0.84	2.28	79	0.026
		Conditional R^2: 0.583; Marginal R^2: 0.364				
		Comparison of Model Fit:		$X^2(5)$=105.26, p<0.001		

T2 – Time 2, at the end of yoga intervention; T3 –Time 3, at the end of follow-up period

effect in group (yoga as compared to controls) can be noted for all the facets. However, significant interaction effect (group*time interaction) at T2 can be found among all the facets. There was no significant interaction effect (group*time interaction) for all the facets at T3 as illustrated in Table 3.

4 Discussion

The present study was the first of its kind to explore the efficacy of yoga in facilitating mindfulness among asymptomatic male cricket players. In today's competitive sporting world, the gap between players physical skills as well as the margin of victory is narrowing. Every player is in a pursuit of achieving sporting excellence. Adopting yoga as a holistic mind-body intervention fosters the development of several personal, sport and performance-relevant psychological skills where goal-oriented behaviour and automatic goal-focused processes are facilitated .

The findings of this study indicate that yoga training had produced no significant effect of time or group, however, significant interaction effect at T2 among all the facets except for the facets indicate the impact of yoga on the facets of observe, describe, act with awareness, non-judging and non-reactivity. The follow-up study indicates no significant interaction effect (group*time interaction) for all the facets at T3. Overall, this study, shows the impact of yoga post the 6 weeks of training and no significant impact after 6 months of follow-up, hence this study partially supports the previous study on the effects of a yoga intervention on mindfulness and dispositional flow of elite youth swimmers [20], where no significant changes in mindfulness and dispositional flow were identified. In the present study, the frequency, intensity and the duration of the yoga sessions might have contributed towards significant changes in the outcome measures at T2.

Hatha yoga practices have previously proven to have been beneficial in improving sport performance [26], facilitating secretion of melatonin from the pineal gland, which may be acting as a psycho-sensitive hormone, improvements in the autonomic balance, respiratory performance and well-being [27]. It has also demonstrated to have reduced state anxiety [28], enhancing mindfulness and decreasing stress [18,29], greater goal-directed energy [18], upregulating the antioxidant capacity of cells to combat oxidative stress [30], and also facilitating self-regulation and mindful awareness by cultivating 'witness consciousness' [31]. Another study on participants from Vipassana and Zen meditation has shown that the mindfulness components non-judge and act-aware were significant predictors of depression. Non-judge is seen as a significant predictor of anxiety and stress [4]. In line with the earlier studies that validated the advantages of yoga on mental well-being, this study also demonstrated that comprehensive yoga module that encompasses postures, breathing techniques and deep relaxation is likely to increase the cricket player's ability to maintain a state of mindfulness.

During the follow-up period, not practicing the yoga module in its entirety or being irregular in their yoga practice might have resulted in no changes in the facets of mindfulness. This clearly indicates that, long term benefits of yoga on mindfulness can be brought about chiefly by internalising the practices by the players into their lives off the mat as well. Continuous and sustained practice will be beneficial in adapting to emotional and homeostatic perturbations of their daily life.

Further investigation on the mechanisms underlying the effect of yoga on mindfulness in performance of the cricket players needs to be undertaken. Future studies can delve into, the yoga practices that can be beneficial before an actual match, effect of one-on-one yoga training, and also an in-depth qualitative analysis on the benefits of yoga on cricket players that stretch beyond the sport.

5 Conclusions

The current study was a first step in understanding the holistic yoga approach to mindfulness with equal and immense emphasis on postures, breathing techniques and deep relaxation. The results provide an insight that a regular practice of yoga may increase the likelihood to maintain a state of mindfulness among the cricket players. Integrating ancient wisdom of yoga into the competitive world of cricket appears to be promising as a holistic approach in enhancing mindfulness.

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SHORT ARTICLE

Epidemiology of annual musculoskeletal injuries among male cricket players in India

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Abstract

Background: Injury surveillance and prevention are as significant as early detection and treatment. This study describes injuries and risk factors involved so that preventive measures can be identified. **Aim**: To examine the epidemiology of the annual musculoskeletal injuries among injured male cricket players. **Method**: This study assessed 319 male cricket players, across five State Cricket Associations from January 2017 to January 2018. **Results**: With an annual injury prevalence of 10.97%, prominent anatomical sites of injury were shoulder (22.85%), lumbar spine (17.14%) and knee (11.42%). Medium pacers sustained 25.71% of the injuries. Age range of 18-24 years had a prominent 37.14% of overuse injuries of which 71.42% were lumbar spine injuries. Lumbar spine injuries resulted in a distinct loss of play days (34.64%). Bowling injuries with 49.5% of loss of play days was most predisposed. Report suggests an upswing in rate of injuries in December (20%). Four surgeries were reported (11.42%). **Conclusion**: Overuse injuries among young cricket players need prompt attention. Shoulder, lumbar spine and knee are principal anatomical regions that are prone to injuries.

Keywords

Cricket sport; Shoulder Injuries; Sports

Introduction

With the introduction of T20 cricket into the international and domestic schedules, physical preparedness of elite cricket players has become complex.(1) Premier league designs have exposed the players to unique playing conditions, game formats and an increased intensity across player positions. Twenty20 format has unfolded a high match injury incidence with a steady increase in injury incidences in each form of cricket.(2) Considering an ever growing popularity of cricket in the Indian subcontinent, a lack of substantial injury data of the players at elite level is an extreme cause for concern. Sustaining an injury may prove to be catastrophic for the career cricket player, it becomes imperative to identify the injuries and risk factors

involved so that preventative measures can be identified, assessed and integrated.

Aims & Objectives

To access the epidemiology of the annual musculoskeletal injuries among injured male cricket players.

Material & Methods

Study type - Cross sectional retrospective study.

Study population – Domestic cricket players who represent their respective State Cricket Association either as a domestic first-class player or as a U23.

Sampling - Purposive/selective sampling was adopted.

Sample Size - Two squads from each Association, a total of 10 squads comprising of 319 cricket players were assessed.

Study duration - January 2017 to January 2018.

Inclusion criteria - Cricket players with a contract with the State Cricket Association who were considered as being part of the squad; male cricket players with an age range of 18-35 years, who have been injured during the period of January 2017 - January 2018; who go through an injury while playing a match/during a training session (fitness session, warm up games and net sessions); who due to his injury is unavailable for selection during a major match; who due to his injury is unable to bat, bowl, or keep wicket when required by either the rules or the team's captain.

Data collection - Data were obtained from the respective team physiotherapists. For the purpose of this research, the most recent consensus definitions published in 2016 in the British Journal of Sports Medicine was adopted.(3) Anthropometrical data (age, height and body weight); Details for each injury recorded; Skill code (B - batsmen, FB - fast bowler, FMP- fast medium pace bowler, MP - medium pace bowler, RAS - right arm off spinner, RLS - right arm leg spinner, LAS - left arm spinner and WK - wicket keeper); Hand dominance (HR- hand right, HL – hand left); Leg dominance (LR – Leg right, LL - Leg left); Injury side - left/right/bilateral/not applicable; time of onset - match/training/gradual/other; Activity of onset - batting/bowling/fielding/gradual; Date of onset of the injury; Mechanism of the injury – overuse (gradual/sudden), recurrent, contact/impact, sprinting (while fielding or batting), insidious (gradual and no identifiable mode of onset), medical illness; Loss of play days due to an injury; Management of the injury – physiotherapy, medication, both or other method; Details of any surgery required or any other major treatment were collected. Data were statistical analyzed using Microsoft excel.

Ethical approval - Injury surveillance was non-interventional and preserved the confidentiality of the players. All the five State Cricket Associations had extended their consent for conducting this surveillance. The method had been approved by the Institutional Ethics Committee.

Results

Mean and standard deviations (SD) of anthropometric measurements of age: 24.71±4.37 years, height: 173.51±7.40 cm, body weight: 68.40±6.83 kg, BMI: 22.70±1.72 kg/m^2 and cricketing experience: 5.60±4.05 years were noted. [Figure 1] shows the details of the injured players in each role. Over the study period, 35 significant injuries were recorded. Prominent anatomical sites of the injury are - shoulder (22.85%), lumbar spine (17.14%), knee (11.42%) and thigh (8.57%). Injuries were predominantly muscles (40%), fracture and others (28.57%), tendon (14.28%) and ligament (11.42%). Batsmen and medium pacers sustained 25.71% of injuries followed by fast bowlers 20%, wicket keepers 8.57%. Injuries that manifested during fielding were 42.85% followed by 40% of bowling injuries. Match (45.85%) and training (28.57%) injuries were most common. A total of 22 injuries were recorded as overuse (gradual/sudden), 8 were contact/impact, 3 were during sprinting while batting/fielding and 2 were recurrent injuries. Among the overuse injuries 25.71% of them were sustained by medium pacers and 20% of them were sustained by fast bowlers. Age range of 18 to 24 years had an alarming rate of 37.14% of overuse injuries. Shoulder injuries were spread across all the age groups, but 71.42% of lumbar spine injuries manifested in the age group of 18 – 24 years. Entire range of lumbar spine injuries that were recorded was all overuse injuries with a gradual onset. Players with right hand dominance (HR) were 74.28% more prone to injuries than players with left hand dominance (HL) that was 25.71%. Right hand dominant players showed more injuries on the left side while players with left hand dominance suggest injury on right side of the body. Players who were right leg dominant (LR) were 77.14% vulnerable to injuries as opposed to left leg dominant (LL) players with 22.85%. Though right leg dominant players

were marginally prone to injuries on right side (40%), left leg dominant players exhibited noticeable injuries onto the right as well (17.14%). Data on injury side also reveals that, 75% of shoulder injuries were on right side, while 71% of lumbar spine injuries were onto left side of the body. Though shoulder was most pronounced anatomical region of injury, it was lumbar spine injuries that resulted in distinct loss of play days of 34.64%. Age group of 18-24 years had 45% of injuries with 56% loss of play days. It was again medium pacers who had highest loss of play days (45.95%). Bowling injuries showed a 49.5% loss of play days, thus, being most predisposed activity for occurrence of an injury. There was an upswing in rate of injuries during the month of December (20%). According to this study, both medication and physiotherapy are employed in management of injury. Also, four surgeries were reported (11.42%).

Discussion

This study is believed to be the first to throw light on injury patterns and mechanisms among elite domestic cricket players in India. Similar to a study on South African cricket players(4) this survey also witnessed injuries predominantly to muscles. An injury prevalence of 12.5% was recorded in Australian men's cricket.(5)The prevalence rate of injury of this study is much lesser than previous study from Haryana (39%)(6) and similar to the study from Punjab Cricket Association (10.14%).(7) As demonstrated by previous studies, here too it was noted that lumbar injuries occurred on non-dominant side of the player.(8) In 2016, Australian report(5) indicated that despite having a lower incidence, it was lumbar stress fractures that caused more missed playing time than hamstring strains. This trend remains true in our study as well, where, though it was shoulder injuries that were distinctly prevalent, it was lumbar spine injuries that resulted in distinct loss of play days, as it took greater recovery time for each lumbar spine injury. Fielding and bowling injuries(9) are seemingly in the forefront as the players are exposed to unique playing conditions, acute workload and game formats that spans throughout the year. Though the time of onset was mostly during a match and subsequently during training, it was the injuries with gradual onset that indicated highest loss of play days, suggesting a possibility of an inadequate acclimatization to escalated workload. Previous studies have indicated that tendon injuries also appear to be particularly related to variations in workloads. While overuse injuries need attention, underuse injuries, chiefly due to a rapid intensification of workload is of an equal concern.(10)

Conclusion

This study reveals that overuse injuries among young cricket players (18-24 years) needs utmost attention. In the same age category, severity of shoulder and lumbar spine injuries during a match while bowling/fielding is extremely significant. It is the medium pacers and fast bowlers who easily come under this spell of overuse injuries. Shoulder, lumbar spine and knee are principal anatomical regions that are prone to injuries. There is a soaring loss of play days due to injuries to lumbar spine.

Recommendation

This study provides a detailed pattern of the cricket injuries across multiple first class State Cricket Associations in India along with their current approach towards the injuries. The data can be further used in employing preventative measures that could be identified, assessed and integrated.

Limitation of the study

A prospective documentation with greater sample size and a follow-up of the injuries will certainly raise an awareness in the course of time. Future studies can be designed to include, how psychological and psychosocial factors interact with physiological and mechanical factors to increase injury vulnerability.

Relevance of the study

This survey brings forth a detailed pattern of injuries across multiple first class State Cricket Associations in India along with their current approach towards injuries. This data can be used to identify, assess and integrate appropriate preventative measures.

Authors Contribution

All the authors have contributed equally.

Acknowledgement

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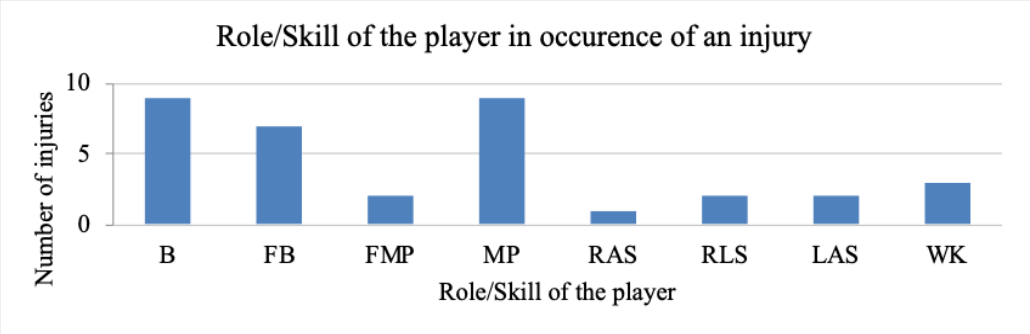
Figures

FIGURE 1 OCCURRENCE OF INJURIES ACCORDING TO THE ROLE OF THE PLAYERS



*B - Batsman, FB - Fast bowler, FMP - Fast medium pace, MP - Medium pace bowler, RAS - Right arm spin, RLS - Right arm leg spinner, LAS - Left arm spinner, WK - Wicket keeper.

Review Article

Understanding the Concept of Mind and Mindful Awareness According to Indian Scriptures

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Abstract

A human being is like a miniature world. By tuning inward, one can unravel the nature of the universe. The goal of human existence has been to harness and train the *citta* (mind) from time immemorial. Tracing back, Indian scriptures have references that guide us toward creating a mindful awareness. It elucidates mindful awareness as a practicable mode of being. Practice of *pratyāhāra,* accentuates mastery over sensory perceptions and *citta's* reaction to them. This is precisely why *pratyāhāra* can be a potent tool in comprehending *citta* that is caught in a web of thoughts. *Citta* is constantly grappling the deeply ingrained fear of – defeat, doubt, and uncertainty. By incorporating the practice of *pratyāhāra*, one can put to rest the elements of disturbance, distraction, and distortion of the perception of reality. In contrary to the concept of mindfulness that is prevalent in the clinical interventions, this study expounds the concept of mindful awareness as a means to transcend *citta* embarking on the practice of *pratyāhāra.* Here, the concept of *pratyāhāra* is explored with excerpts from the *Bhagavadgītā*, *Yogasūtra,* and *Yoga Vāsiṣṭha*, that lucidly show that mindful awareness can be embedded into everyday living with the practice of: stabilizing the *citta*, *samatvam* (reaching a state of equanimity), *ātmavicāra* (self-inquiry), *vairāgya* (renouncing of mental impressions), *karma yoga* (renouncing the fruits of the one's own action), control of *prāṇa* (restraint of the life-force) all of which fundamentally lead to the most dynamic technique of *pratyāhāra* (tuning inward), thereby bringing about mindful awareness.

Keywords: *Bhagavadgītā, mindful, prāṇa, pratyāhāra, yogasūtra, yoga*

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Introduction

In order to fathom the state of mindful awareness, it becomes essential to comprehend what mind is. Is mind – matter, energy, a field or an emotional state? When was it exactly created? Or who created it? Is it timeless? The answers are beyond our ken. Most of the scientific literature, particularly conventional psychology consider mind as an epiphenomenon of the brain. The seat of the mind being the brain, often, the term consciousness and mind are considered synonymous. However, in the Indian system, there is a co-existence between the stream of philosophy and psychology. Mind and consciousness are fundamentally distinct.[1]

The earliest of the philosophy to have emerged from the *vedic* corpus through logical reasoning is Sage Kapila's *Sāṅkhya*. *Sāṅkhya* philosophy has outlined a systematic structure of creation, comprising of 25 *tattvās* or evolutes.[2] It propounds that the phenomenal universe is of a dynamic order and is an eternal process of unfolding/enfolding,

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without a beginning or an end. The consciousness principle coupled with existence becomes *puruṣa* (the conscious spiritual-energy principle) and the existence principle, without consciousness becomes *prakṛti* (the nonconscious material-energy principle). These are the two eternally co-existent principles that are beyond time, space, and thought, they are without difference, attribute, and form.[3] *Puruṣa* and *prakṛti* constitute the transcendental level or source of evolution. The subjective fields are the ten *indriyās* (five *karmendriya*/capacities for action along with five *jñānendriyās*/capacities for perception), *manas* (analytical process), *ahaṅkāra* (cosmic ego), and *mahat/buddhi* (cosmic intelligence). The objective fields are the five *tanmātrās* (subtle elements) and the five *mahābhūtās* (gross elements). The process of evolution occurs at two levels – the inner and the outer.[2] *Puruṣa* is pure *cit* or consciousness. *Antaḥkarṇa* (consisting of the trio – *buddhi, ahaṅkāra,* and *manas* wherein, Sage Patañjali adds the component of *citta* to this) is due to the reflection of the *ātman* in *prakṛti*, which is composed of three *guṇās* (constituents): *sattva* (purity), *rajas* (activity), and *tamas* (insensibility).

According to *Sāṅkhya*, out of *prakṛti* emerges *mahat* or *buddhi*; from *buddhi* emerges *ahaṅkāra*; from *ahaṅkāra* emerges, the *manas* and ten organs of sense and action. Thus, the *antaḥkarṇa chatuṣṭaya,* i.e., *buddhi* (*niścayātmikam* – intellect that decides), *ahaṅkāra* (that which identifies everything with itself), *manas* (*saṅkalpa vikalpātmikam* – mind that thinks), and *citta* (*dhāraṇatmikam* – that which remembers past) are the functional modes of the mind. The mind is used for all these four aspects: *Citta, manas, buddhi,* and *ahaṅkāra* operate either simultaneously or in succession. They also divide the mind into understanding, feeling, and willing. They operate with the assistance of the ten *indriyās.*

Manas is regarded as both an organ of sense and an organ of action, for the reason that it directs the activities of both kinds of organs.[4] *Manas* moves out of its resting place (place of residence) through the five senses to take the form of an object/thought and creates a panaroma of the world around us that we react to. An unsteady *citta* alienates us from seeking that ultimate truth.[5] To still, the unsteady *citta* beyond the building blocks of our core conditioning with its multitudinous nature is the goal of *yoga*. Mindful awareness is both a state of *citta* and a practice to negotiate with its wandering tendencies. Indian scriptures illustrate means to accomplish this. The references from Indian texts – *Yogasūtra, Bhagavadgīta,* and *Yoga Vāsiṣṭha* are enumerated here.

Mindful Awareness According to the *Yogasūtra* of Sage Patañjali

Kapila's *Sāṅkhya* is the metaphysics and Patañjali's *yoga* is the method (*sādhana*).[2] In his work on the *Yogasūtra* of Patañjali, Georg Feuerstein says that, Patañjali is visible proof for the fact that mysticism can be approached rationally and that, equally importantly, contemplative interests and intellectual pursuits can be fruitfully combined in one person.[6]

Focusing on the aspect of mindful awareness according to *Yogasūtra*, what shines forth is Sage Patañjali's design of familiarizing us, to the primary obstacles/*antarāyaḥ* that help us in leaping beyond these hurdles (of the *citta*) with an awareness of their existence. As mentioned, the text spells out that, in the course of progress, there could be certain impediments that invariably hinder and disturb *citta* (*citta vikṣepa*), and they are:

व्याधिस्त्यानसंशयप्रमादालस्याविरति-भ्रान्तिदर्शनालब्धभूमिकत्वानवस्थितत्वानि चित्तविक्षेपास्तेऽन्तरायाः ॥१.३०॥

vyādhistyānasaṁśayapramādālasyāviratibhrāntidarśanālabdhabhūmikatvānavasthitatvāni cittavikṣepāste'ntarāyāḥ ||PYS. 1.30||

Sickness, incompetence, doubt, delusion, mental and physical fatigue, inability to withdraw from the sense cravings, false visions, inability to reach the goal, and inability to retain it all these throw our citta outward. These distractions are the impediment.[7]

The nine obstacles can be classified into four categories – physical, mental, intellectual, and spiritual. *Vyādhi* and *styāna* are physical obstacles: *saṁśaya, pramāda, ālasya,* and *avirati* are mental obstacles; *bhrāntidarśana* is an intellectual obstacle; while *alabdhabhūmikatva and anavasthitatva* are spiritual in nature.[8] Most times, these hindrances occur subsequently, at varying degrees. Even the finest practitioners/*sādhakās* encounter one/many of these obstacles, at some point in time. In the process of defending, these obstacles that upset our body and *citta*, considerable amount of resources collapse that could otherwise be channelized toward a higher purpose. Beyond these barriers, Sage Patañjali indicates a group of five more obstacles – *kleśās*.

अविद्यास्मितारागद्वेषाभिनिवेशाः क्लेशाः॥२.३॥

avidyāsmitārāgadveṣābhiniveśāḥkleśāḥ ||PYS. 2.3||

Misapprehension about the real nature of things, egoism, attachment, aversion, and fear of death are the five afflictions or kleśās.

The breeding ground for all obstacles or modifications is *avidya* (ignorance), and the rest of the *kleśās* follows

it. *Kleśās* are either *prasupti* (dormant that awakens with an appropriate stimulus), *tanu* (attenuated or one that is thinned by *Kriyā yoga*), *vicchinna* (interrupted/ suppressed by other *kleśās*) or *udāra* (active).[7] As the burnt seed does not sprout again, so does the *kleśās* weaken with the practice of concentration (*eka tattva abhyāsa*). The dark and heavy qualities of *tamas* and the agitated *citta* of the *rajas* will also get nullified in the process facilitating further progress. With this understanding of the afflictions, here is a glance upon certain practices in mindful awareness (to tackle the modifications of the *citta*) that are referred to in the *Yogasūtra.*

मैत्रीकरुणामुदितोपेक्षाणां सुखदुःखपुण्यापुण्यविषयाणांभावनातश्चित्तप्रसादनम्॥१.३३॥

maitrīkaruṇāmuditopekṣāṇāṁsukhaduḥkhapuṇyāpuṇyavi ṣayāṇāṁbhāvanātaścittaprasādanam ||PYS. 1.33||

In the worldly relationships, the citta becomes subtler and subtler by cultivating of right attitude of friendliness toward those who are happy, compassion for those who are suffering, goodwill toward those who are virtuous, and indifference or neutrality toward those we perceive as wicked or evil.[3]

Sailing through life, we encounter four types of people – those who are happy, those who are miserable, those who are virtuous, and also those who are vicious. However, by adopting a sublime attitude toward them, as indicated in this *sūtra*, one remains dynamic while interacting with this material world. Nonetheless, the burden of past tendency is the greatest impediment. Sage Patañjali brings awareness to the fact that, the way out of the negative thoughts is not through suppression. Instead, when *citta* is entertained with thoughts of negative sentiments, one needs to detach from the thought, substitute a positive thought and then bring about a sublimation of the negative thought in succession - *pratipakṣa bhāvanam*.[9] Constant adherence and vigilance are crucial in preventing slipping back to the natural tendencies. Further, Sage Patañjali also presents us with practical methods of conscious re-alignment of the *citta* by moving beyond the mundane to a higher value of *vairāgya*.

दृष्टानुश्रविकविषयवितृष्णस्य वशीकारसंज्ञा वैराग्यम्॥१.१५॥

dṛṣṭānuśravikaviṣayavitṛṣṇasyavaśīkārasaṁjñāvairāgyam || PYS. 1.15||

When the citta loses desire even for objects seen or described in a tradition or in scriptures, it acquires a state of utter desirelessness (vaśīkāra), that is called non-attachment (vairāgya).

Vairāgya, is not merely, turning away from a craving or becoming indifferent, rather a total mastery and control.[5] *Vairāgya* as a practice also focuses on clearing the *citta* of *vāsanās* or strong habits. This practice decolorizes the *citta* and brings it to a state where the *citta* remains unaffected by thoughts, deeds, and action.[10] *Vaśīkāra* or the desirelessness is attained by the discriminatory knowledge (*vivekakyāti*) and reflection (*nidhidhyāsana*) over the demerits of the objects of the world. A careful distinction between the indispensable and the dispensable, the essential and the trivial, is the principle of *vivekakyāti,* which in turn internalizes the practice of *vaśīkāra.* Although *yoga* is a union, here, Sage Patañjali also injects us with the idea that, it is as much a union as it is a disunion or *viyoga*. It is disunion from all the afflictions that create the shades of modifications in the *citta*. As he puts it, the impurities/obstacle/afflictions can be shattered solely by diligent practice. With the afflictions being addressed, the further ascent to the state of mindful awareness remains in the core practice of *indriyanigraha* or withdrawal of the *indriyās*/sense perception.

स्वविषयासंप्रयोगे चित्तस्वरूपानुकार इवेन्द्रियाणां प्रत्याहारः॥२.५४॥

svaviṣayāsaṁprayogecittasvarūpānukāraivendriyāṇāṁpra tyāhāraḥ || PYS. 2.54||

The mental organs of senses and actions (indriyās) cease to be engaged with the corresponding objects in their mental realm, and assimilate or turn back into the mind-field from which they arose is called pratyāhāra and is the fifth step (in the eight-limbed/aṣtāṅga yoga).[11]

Sensory activities are withdrawn from the objects and the senses begin to imitate the *citta*. The senses imitate the nature of the *citta*, when the *citta* pause so does the senses. Thus, the state of mindful awareness is created by the suspension of activities of the *citta* while retracting the senses. *Pratyāhāra,* is thus, fundamental in the path of renunciation.[8]

At every level, the things that need to be renounced are in a perpetual flux, the practice of *pratyāhāra* is being in a ceaseless process of perpetual vigilance, of the senses and its objects. *Pratyāhāra* is the sublimation of the *citta* and the senses.[8] Consciousness becomes far more sensitive when it detaches from the senses. The practices of *pratyāhāra* free our conscious awareness from old patterns and habitual thinking. The senses follow the *citta* like bees follow the queen bee, explains *Vyāsa* in his commentary on the *Yogasūtra*.[3]

Weighing the appropriate and the inappropriate, the real and the unreal, employing the intuitive forces, withdrawing the *citta* from the clutches of the sense experience and channelizing the organs of perception

to an object at will, is the mastery over mindful awareness through the practice of *pratyāhāra*. With this recalibration, one can expect a smooth sail through the hustle of the mechanical life. Although compact and cryptic, the *sūtrās* cited above resonates with the fact that, they have immense practical utility in disciplining the *citta* which always thinks of mastering the external world. Sage Patañjali, with his finesse, enchants us with his mode of mastering the *citta* to gain access not to the external world but to tap that immense ocean of dynamic intelligence, happiness, and freedom within.

Mindful Awareness According to the *Bhagavadgītā*

The song of the God is veritably the most beloved scripture of India. The comprehensive dialogue between the *Bhagavān* and his preceptor, with its 700 verses is endeared for being as much philosophical as it is psychological in its spirit. Although being a tiny part of *Mahabhārata*, this *Smṛti* text, is revered on par with *Upaniṣad*. While all other philosophies were given either in a forest, temple, or a cave, the *Bhagavān* chooses the tumultuous battlefield of *Kurukṣetra* to expound his universal message on the science and art of human possibilities. In his work, the essence of the *Bhagavadgītā,* Swami Kriyananda says, this body is a battlefield. Allegorically, the opposing armies here represent the opposition within every unenlightened human being, between his upward tendencies (good qualities) and downward tendencies (evil tendencies).[12]

Self-preservation is the very basic instinct of life. As reflected in the *Gītā* of the *Bhagavān*, the conflict of this life at its deepest core is not of an ambition, it is for the accomplishment of – righteousness. A greater triumph of good over evil, within! Then, how does one leap beyond the opposing forces and the dualities that frequent the *citta*? How does one gain victory over the five senses (*Pāṇdavās*) as opposed to the hundred varied desires (*Kauravās*) that cloud the *citta* incessantly? The desire or sense inclinations are steadily backed by the blinded sense of the *citta* (as in *Dhrtarāṣtra*, the father of the *Kauravās*). As each person fights his/her own battle with their senses and the *citta*, the *Bhagavān* rescues us repeatedly with his words of wisdom. Here, discussed are a few verses by the *Bhagavān* himself that can be clinged on to, dwelled upon and practiced every moment to find *samatvam*/balance/ equilibrium/a state of mindful awareness.

A *citta* that gets identified with sense sensation is unable to differentiate between its own happiness and the pleasures of its senses. With the practice of *pratyāhāra*, *citta* concentrates on its own real joy, then the pleasures of the senses seem repugnant.[13]

यदा संहरते चायं कूर्मोऽङ्गानीव सर्वशः।
इन्द्रियाणीन्द्रियार्थेभ्यस्तस्य प्रज्ञा प्रतिष्ठिता॥

yadāsaṁharatecāyaṁkūrmo'ṅgānīvasarvaśaḥ |

indriyāṇīndriyārthebhyastasyaprajñāpratiṣṭhitā || B.G. 2.58||

When the yogi, like a tortoise withdrawing its limbs, can fully retire his senses from the objects of perception, his wisdom manifests steadiness.[13]

This capacity of an individual to withdraw his senses at will from the fields-of-objects is called in *yoga śāstra* as *pratyāhāra* which the *yogin* accomplishes through *prāṇāyāma* (control of breath).[14] Restraint of the sense organs is called *dama* while the restraint of the internal organ, as in the *citta* is called *sama*. Restraining the organs of the sense and action (*jñānendriya* and *karmendriya*) by the employing the *citta's* capacity of reasoning is called *pratyāhāra*. Craving creates new challenges and new temptations all the time. Only with the uprooting of the cravings, the knowledge of one's own nature as the infinite *ātman* gets revealed.[15] In order to be on guard from the predatory senses, a physical renunciation must go hand in hand with the mental renunciation. Else, the mounting desires obstruct, agitate, and delude the *citta.* If both cause and consequences are actions (*karma*) then one has to move toward unburdening the merits and the demerits of its outcome that continually bind.

सर्वकर्माणि मनसा संन्यस्यास्ते सुखं वशी।
नवद्वारे पुरे देही नैव कुर्वन्न कारयन्-

sarvakarmāṇimanasāsaṁnyasyāstesukhaṁvaśī |

navadvāre pure dehīnaivakurvannakārayan || B.G. 5.13||

The embodied soul, controller of senses, having mentally relinquished all activities, remain blissfully in the bodily city of nine gates - neither performing actions itself nor making others (the senses) to perform actions.[13]

In other words, total withdrawal of the senses is achieved by one who practices *pratyāhāra*. It is not simply the controlling or subjucating the senses; the senses may still see, hear, feel, etc., external objects; however, there is nullification of participation and one becomes observer of events of the world through changes in *guṇās* resulting in the state of *pratyāhāra*.

ब्रह्मण्याधाय कर्माणि सङ्गं त्यक्त्वा करोति यः।
लिप्यते न स पापेन पद्मपत्रमिवाम्भसा-॥५-१०॥

brahmaṇyādhāyakarmāṇisaṅgaṁtyaktvākarotiyaḥ |

lipyatenasapāpenapadmapatramivāmbhasā|| B.G. 5.10||

As the lotus leaf remain untouched or unaffected by the water, so does a yogi who acts without attachment, offering his actions to the divine, his self remains unaffected by the sensory perceptions.[14]

As far as the *citta* is active, it must attach to something. Therefore, detachment from the false can be successful only when we attach ourselves to the real.[14] To detach from the sensory system is the fundamental step toward unravelling the inherent potentialities of the *citta*. The process of mindful awareness commences with this practice. With the practice of *pratyāhāra* one can master the sensory perceptions and with the practice of *karma yoga* one can fine tune actions of the inner and the outer world by surrendering it to a higher source of consciousness. That way, both these practices need to be integrated such that one finds the highest state of equanimity. Passing through the phases of life, with changing seasons, what we are to the world outside of us is but a reflection of what we are within ourselves.

ज्ञानविज्ञानतृप्तात्मा कूटस्थो विजितेन्द्रियः।

युक्त इत्युच्यते योगी समलोष्टाश्मकाञ्चनः॥६-८॥

jñānavijñānatṛptātmākūṭasthovijitendriyaḥ |

yuktaityucyateyogīsamaloṣṭāśmakāñcanaḥ ||B.G. 6.8||

The yogi who is satisfied with knowledge and wisdom, stays unshaken, to whom a lump of earth, a stone and gold are the same, is said to be harmonized (i.e., is said to have attained nirvikalpa samādhi).[16]

Such a *yogi* is free from all the charms and temptations of the external world and remains in self-delight. The joy he finds is not temporary.[16] In the ordinary world, we see individuals nourishing their sensory attractions endlessly. As they say, God always provides for our needs and not for our greed. In reality, sensory satisfaction has zero value beyond the sensory level of this human life and that's precisely what the *Bhagavān* is pointing to us in this verse. Such a process of equanimity is not forced upon but occur naturally with reasoning. In order to reach that state, one has to fashion their inner world with calmness, such that they become open and receptive to the happiness to flow in aplenty. Nevertheless, for this to manifest, one need not have to isolate oneself from the varied stimulus of the external world. The honing of the practice lies in being here and now.

Mindful Awareness According to *Yoga Vāsiṣṭha*

In the *Bhagavadgītā* (a conversation from *dvāparayuga*) Arjuna is a seeker, the *Bhagavān* is his guru whereas, in *Yoga Vāsiṣṭha* (a conversation from *tretāyuga*) the *Bhagavān* himself is a seeker, *Ṛṣi Vasiṣṭa* is his guru. Being one of the earliest and vivid scripture on the *Vedānta*, *Yoga Vāsiṣṭha* is a conversation between Lord Rāma and *Ṛṣi Vasiṣṭa* in the form of 32000 couplets whose writership is attributed to *Ṛṣi Vālmiki*, the author of *Rāmāyaṇa*.[17] However, this colossal work was summarized as *Laghu Yoga Vāsiṣṭha* into 4829 couplets by Gauda Abhinanda.[18] Analyzing the mind, its notions and its reasoning, *Yoga Vāsiṣṭha* is a user's manual that elucidate the timeless truth in a *purāṇic* way of storytelling to dispel the sorrow of Lord Rāma.

Here, discussed are the verses on *pratyāhāra*, *ātmavicāra*, renunciation of *vāsanās* and control of *prāṇa* to fathom mindful awareness, from this revered and extensive text.

वासनाप्राणसंरोधात् अनिमेषं मनः कुरु

यत्र नाभ्युदितं चित्तं तद्वै सुखं अनुत्तमम्॥२३.६॥

vāsanāprāṇasamrodhatanimeṣaṁmanaḥ kuru

yatra nābhyuditaṁcittaṁtadvesukhaṁanuttamam ||Y.V.23.6||

By complete restraint of mental impressions (knowledge derived from memory) and the prāṇa/vital air/bio-energy, make manas steadfastly fixed. Where citta (the seat of memory) does not oscillate, that indeed is unsurpassed happiness.[19]

For everlasting peace and eternal bliss, nullification of *vāsanās* (deep imprinted mental impressions) and *ahaṅkāra* (ego) is pivotal. Endowing oneself with - śānti (quiescence of mind), *santoṣa* (contentment), *satsaṅga* (association with sages), and *vicāra* (self-enquiry) as suggested by Sage *Vasiṣṭa*, one becomes crucial in aligning toward perfection. Thus, mindful awareness is a ramification of such a state of cognizance. In order to reach such a state, the practice of *pratyāhāra* should be synchronous to self-enquiry or *ātmavicāra*.

वासना विविधा शाखाः फलन्त्यो विविधं फल॥१.८॥

शाखाविलवनं गौणं मुख्यं मूलविकर्तनम्।

स्वात्मतत्त्वविचरो हि चित्त बीजस्य नाशकः॥१.९॥

vāsanāṁvividhāṁśākhāḥphalantyovividhaṁphalam|| Y.V.1.8||

śākhāvilavanaṁgauṇaṁmukhyaṁmulavikartanam |

svātmatatvavicāro hi cittabījasyanaśakaḥ || Y.V.1.9||

The mental impressions are the various branches yielding diverse fruits. Just cutting off the branches is subordinate (or indirect). The foremost (requisite) is the cutting off the roots. The investigation (or inquiry) into the nature of one's own self is alone destructive of the seed of the citta.[19]

An inner dialog or introspection brings us closer to the various functions of *antaḥkaraṇa* (*manas, buddhi, ahaṁkāra,* and *citta*). Thereby, it assists us in resolving the conflicts that arise when the seeker is under the clutches of the old habit patterns that are grueling to the *citta*. Collaborating with *vicāra* helps us weigh the sense pleasures and calming the roaming tendency of the *citta* with utmost wisdom. With practice it also unravels the transient nature of the existence. By embracing the ceaseless process of self-enquiry, one unravels the eclipsed *vāsanās* and its mysterious ways that frequently surfaces to deceive the human mind. Thus, it becomes necessary to abandon something transient to attain that which is eternal.

Whatever are the pains or impediments to progress that arise in the *citta*, one can keep oneself firmly grounded by being the observer of the thoughts that arise and by bringing in awareness into the present moment, keeps one firmly grounded. While *prāṇa* is grosser than the *citta*, it is subtler than the body. Manifesting itself as mental power, it can only be controlled by mental means. Wherever there is *prāṇa*, there is *citta* also. Hence, along with the rejection of the mental impressions one has to resort to disciplining the *prāṇa*. With self-enquiry, as one recognizes and prepares to discard the vexing latent impressions one can latch on to grasping movement of *prāṇa*.

प्राणाधीनपरिस्पन्दं चित्तं आहुः मनीषिणः।

तस्मिन् संरोधिते नूनं उपशान्तं भवेत् मनः॥४५॥

prāṇādhīnaparispandaṁcittamāhuḥmanīṣiṇaḥ |

tasminsaṁrodhitenūnaṁupaśāntaṁbhavetmanaḥ|| Y.V.45||

Wise men call citta as having the movement dependent on prāṇa (or vital air). When the prāṇa is controlled, the citta certainly becomes tranquil.[19]

Prāṇa is the core and the essence of life and it flows through everything that exists and permeates the entire universe. The breath is truly a vehicle for *prāṇa.* The four means for controlling the *citta* are - the cognition of the supreme, the association with the wise, the renunciation of the painful *vāsanās* and the control of the fluctuation of *prāṇa*. Persons who resort to other means than these to control the *citta*, are like those who, having turned their face from the light, try to dispel darkness through darkness itself.[17]

Significance of Mindful Awareness

A clouded *citta* is a serious threat in establishing the present moment awareness. The mind plays a double *(dvandva)* role. Its role is to connect the ten organs *(indriyās),* on the one hand, and, on the other, to connect the intelligence, consciousness, and core. This dual role affects the *citta* so that it plays a double game. Thus, *pratyāhāra, is* a practice of *indriyajaya* – mastery over the senses.[20] *Pratyāhāra* commences with the quietening of the *citta* and withdrawing of the senses.

More often, it is an undisciplined *citta* which is a victim of the messages brought to it by the senses.[20] As humans, we sometimes reflect with a purpose and other times completely goalless. Sometimes, we are rational and other times utterly irrational; sometimes compelling and other times totally vague. Sometimes, the thoughts are guided by love and at other times, hugely by hatred. This rolling mental movement creates impressions *(saṁskārās)* that are so potent that it dictates the individual's *citta*. The *vṛtti saṁskārā cakra* or the wheel of thoughts with the subtle impressions that it creates has been spinning since the origin of the human mind.[10] The ancient scriptures, as explained above, expounds that in order to attain mastery over this wheel of thoughts the practice of *pratyāhāra* (withdrawal of the senses) can be a fundamental tool.

As illustrated above, the excerpts from the *Bhagavadgītā*, *Yogasūtra,* and *Yoga Vāsiṣṭha*, lucidly show that the mode of being with mindful awareness can be embedded into the everyday living with the practice of: stabilizing the *citta*, reaching a state of equanimity, through self-inquiry, by renouncing of mental impressions, renouncing the fruits of the one's own action, by the control of *prāṇa* and fundamentally by the most dynamic technique of *pratyāhāra* (tuning inward). These practices are incredibly interconnected. Incorporating just one of these methods means to align oneself to the mode of being in mindful awareness [Figure 1].

The vicious circle of innate subtle impressions that gets heavily ingrained, agitate the *citta* in response to anything less than an expected outcome. An agitated mind lacks clarity and concentration. Restoring and refining the inner luminosity by shattering the mental fabrications that pose a barrier is the goal of the *yogic* practices.[10] By incorporating *yogic* technique of *pratyāhāra* as a way of life, one can possibly put to rest the elements of disturbance, distraction, and distortion of the perception of reality.

Future Directions

The concepts proposed in this study intends to encourage future research in contemplative sciences to perceive mind not just as an umbrella term that consolidates multiple traditions and meanings. Moving beyond the unitary dimension can provide a broader framework to design and examine specific models for each dimension of the mind independently. Furthermore, the effect of each of the above-mentioned paths toward *pratyāhāra* on mindful awareness can be further explored.

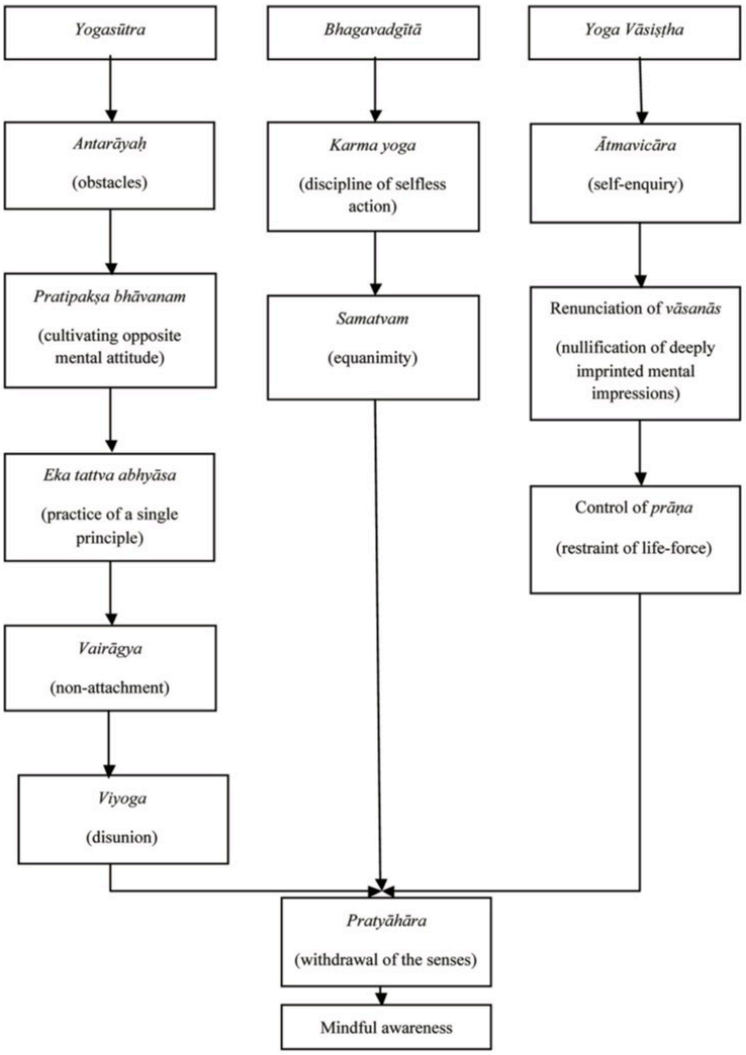

Figure 1: Flow diagram depicting confluence of the each path toward mindful awareness

Conclusion

The current study suggests that the mind has multi-functional layers to it and *citta* can possibly be transcended with the practice of *pratyāhāra*. It is *pratyāhāra* which helps in cultivating a comprehensive mindful awareness, thereby maintaining a comfortable inner environment that enhances clarity of thought and action.

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Conflicts of interest

There are no conflicts of interest.

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Impact of yoga in facilitating muscular functioning among asymptomatic male cricket players: Longitudinal randomized controlled study☆

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ABSTRACT

Background: Cricket is one of the prominent global team sports. With an emergence of Twenty20 tournaments, the physical preparation of elite cricket players has become complex with high match injury incidence. Yoga as a body-mind training is associated with having positive effects on a person's physical and psychological conditions, bringing in better mind-body equilibrium.
Objectives: Evaluating the impact of yoga in facilitating muscular functioning and mindfulness among asymptomatic male cricket players.
Method: First-class domestic male cricket players in the age group of 18–35 years were randomized into yoga group n=42 and wait-list control group n=40. Players received the yoga module for five days per week for a duration of six weeks. Primary outcome measures of muscular functioning were core stability, flexibility, range of motion, static balance, dynamic balance and proprioception of the ankle. Assessments were held at baseline, immediate post-intervention, and a follow-up after six months of intervention.
Results: A statistical significance with $p < .001$ was observed for most of the variables at T2 and T3. Comparison of the model fit shows a highly significant $p < 0.001$ difference between the model as compared to the baseline model among most of the variables.
Conclusion: This yoga module was appropriate for enhancing muscular functioning variables of this study. Continuous practice of this yoga module can reinforce sustainable benefits for male cricket players.

1. Introduction

Among the prominent global team sports, cricket has both a high rate of gradual onset injuries and great variations in player workload (Orchard et al., 2010). Neoteric premier league designs of the 21st century have exposed the players to unique playing conditions, game formats, and a sheer absence of the off season (Dhillon et al., 2016). With the emergence of Twenty20 tournaments, physical preparation of elite cricket players has become more complex. There has been no concurrent reduction in the amount of first-class or one-day cricket, and this has resulted in an escalated workload. The injury prevalence has inflated in conjunction with an increase in the density of cricket calendar (Orchard et al., 2010).

Biomechanics, as a study of humans, has varied dimensions from the inner workings of a cell, the mechanical properties of soft and hard tissues, to the development and movement of neuro-musculoskeletal system of the body. Mechanical factors affect the form, performance and function of the musculoskeletal system. Any injury or lesion of any of the individual elements of the musculoskeletal system will change the mechanical interaction and cause degradation, instability or disability of movement. Proper modification, manipulation and control of the mechanical environment can help prevent injury, correct abnormality, and speed healing and rehabilitation (Lu and Chang 2012).

Yoga, applied as a therapeutic purpose, has been found to create positive influences on the musculoskeletal system (Muammer et al., 2015). It has also exerted a positive influence on the

☆ **Study was carried out at:** Karnataka State Cricket Association (No. 1, M Chinnaswamy Stadium, cubbon road, Bengaluru, Karnataka, 560001).

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activation of core muscles (Omkar 2012), may contribute to enhance health status and wellness (Gaurav 2011), minimize fear of falling and improve balance (Schmid 2010), cardio-vascular fitness (Cowen and Adams 2007), muscular strength, agility (Singh et al., 2015), muscular endurance (Mclean 2009; Brynzak and Burko 2013), flexibility (Brynzak and Burko 2013; Polsgrove et al., 2015; Zannotti et al., 2002) and cardiovascular endurance (Brynzak and Burko 2013), shoulder flexibility and decline in lower and upper extremity injuries (Mclean 2009), flexibility, balance, preparedness and athletic performance (Brynzak and Burko 2013), range of motion of the shoulder and hip (Sager and Grenier 2014) flexibility and balance as well as whole-body measures (Polsgrove et al., 2015), strength, balance, and steadiness in one-legged balance and modest improvements in strength (Brian et al., 2013), improve torso-pelvic separation and long game performance (Sorbie et al., 2019). With the above available evidence, yoga may be associated with having positive effects on a person's physical and psychological conditions, bringing in better mind-body equilibrium.

To date, there has been no attempt to carry out an experimental study on the effects of yoga on muscular functioning on a large group of cricket players. Thus, the current study aimed at evaluating the impact of yoga in facilitating muscular functioning among asymptomatic male cricket players.

2. Methods

2.1. Participants

The sample size was calculated using GPower software. The derived sample size was 72 (36 in each group) under an alpha of 0.05, a power of 0.8, and an ES of 0.677. However, 90 participants (45 in each group) were recruited as a precaution for a possible 20% loss at follow-up.

2.2. Procedure

The yoga module with a total of 32 practices was designed targeting a steady effect on the anatomical regions that are prone to injuries among male cricket players. These anatomical regions were determined by a one-year retrospective survey on the prevalence, nature and mechanism of the musculoskeletal injuries among male cricket players that was undertaken by the authors. Based on which the module was further presented for the course of validation. Subject matter experts (SMEs) from the field of yoga, ayurveda, sports medicine and physiotherapy with a minimum experience of 5 years were contacted. 19 SMEs with an average experience of 12 years provided their responses for the validation of this module through a Google survey form. A total of 32 practices (Breathing practices - 2; Suryanamskara - 12 steps; Asanas - 26; Pranayama - 2; Deep relaxation) were suggested and discussed for the process of validation. The validation data was further analysed using Lawshe's content validity ratio (CVR) (Gilbert and Prion 2016). CVR was calculated for all the 32 yoga practices. Six yoga practices that did not meet the intended CVR were rejected. Thus, a total of 26 practices out of 32 practices were considered to be retained. The validated practices are mentioned in Table 1.

A total of 92 first class domestic cricket players from the cricket association were assessed for eligibility for the study. Male cricketers in the age group of 18–35 years, with an experience of 2–15 years in playing for the cricketing association, with no physical signs of an injury in the past three months and who were willing to participate for the entire duration of the intervention, were selected for the study. After the initial screening, 8 players who did not meet the inclusion criteria were excluded. Player recruitment started on 5 November 2018 and closed on 23 November 2018.

Table 1
- Validated yoga practices with CVR ≥0.33 as per Lawshe's formula.

Yoga practices	Ne*	N**	N/2	Ne-N/2	CVR***
Pavanamuktāsana kriya	14	19	9.5	4.5	0.47
Sūryanamaskāra	19	19	9.5	9.5	1
Utthita Trikoṇāsana	16	19	9.5	6.5	0.68
Parivṛtta Trikoṇāsana	16	19	9.5	6.5	0.68
Pārśvakoṇāsana	16	19	9.5	6.5	0.68
Vīrabhadrāsana I	15	19	9.5	5.5	0.57
Vīrabhadrāsana II	14	19	9.5	4.5	0.47
Utthitahasta Pādāṅguṣṭhāsana	15	19	9.5	5.5	0.57
Prasārita Pādottānāsana	16	19	9.5	6.5	0.68
Vṛkṣāsana	15	19	9.5	5.5	0.57
Baddhakoṇāsana	15	19	9.5	5.5	0.57
Upaviṣṭa Koṇāsana	15	19	9.5	5.5	0.57
Gomukhāsana	14	19	9.5	4.5	0.47
Parivṛtta Jānuśīrṣāsana	14	19	9.5	4.5	0.47
Uṣṭrāsana	18	19	9.5	8.5	0.89
Vīrāsana	16	19	9.5	6.5	0.68
Bhujaṅgāsana	18	19	9.5	8.5	0.89
Śalabhāsana	16	19	9.5	6.5	0.68
Dhanurāsana	17	19	9.5	7.5	0.78
Sālamba Sarvāṅgāsana	16	19	9.5	6.5	0.68
Matsyāsana	16	19	9.5	6.5	0.68
Uttāna Pādāsana	15	19	9.5	5.5	0.57
Jaṭhara Parivartanāsana	18	19	9.5	8.5	0.89
Nāḍiśuddhi	18	19	9.5	8.5	0.89
Bhrāmari	18	19	9.5	8.5	0.89
Deep Relaxation	18	19	9.5	8.5	0.89

Ne* - Total number of essentials for each pertinent Yoga practice.
N**- Total number of experts in the validation panel.
CVR*** - Content Validity Ratio.

Those players who signed the informed consent form were randomized into yoga group and control group. Baseline pre-intervention measure for both the groups were completed on 29 November 2018. The six week intervention commenced on 3 December 2018 and was completed on 11 January 2019. The duration of the follow-up was for a period of six months. The assessment for both the groups were done at the end of the follow-up period (July 2019) wherein, the yoga group was expected to continue the practice of the yoga module on their own during the follow-up period (Fig. 1). The wait-list control group received the yoga module in August–September 2019.

2.3. Intervention

Cricket players received the yoga module for 80 min per session for 5 days/week for duration of 6 weeks. The sessions were conducted in the morning (7:30am–8:50am) before the routine fitness session at the cricket association by a qualified yoga therapist (MSc Yoga, PhD scholar) who took utmost care in monitoring the alignment of each and every āsana, breathing patterns and optimum relaxation at the end of the session. The players were repeatedly reminded to maintain a non-competitive and non-comparative approach with their peers while on the mat and perform the practices at the best of their ability with complete awareness of their breath and body. While the players in the yoga group received the module along with their routine fitness sessions, the wait-list control group followed their regular daily routine during the study period. However, the wait-list control group received the yoga module post the follow-up period by the same yoga therapist. All the outcomes of this study aimed at analysing the effect of this validated yoga module on specific anatomical areas that are prone to injury such as shoulder, lumbar spine and knee among male cricket players in particular. The assessments were done by the yoga therapist at baseline, immediate post-intervention, and a follow-up after six months of intervention.

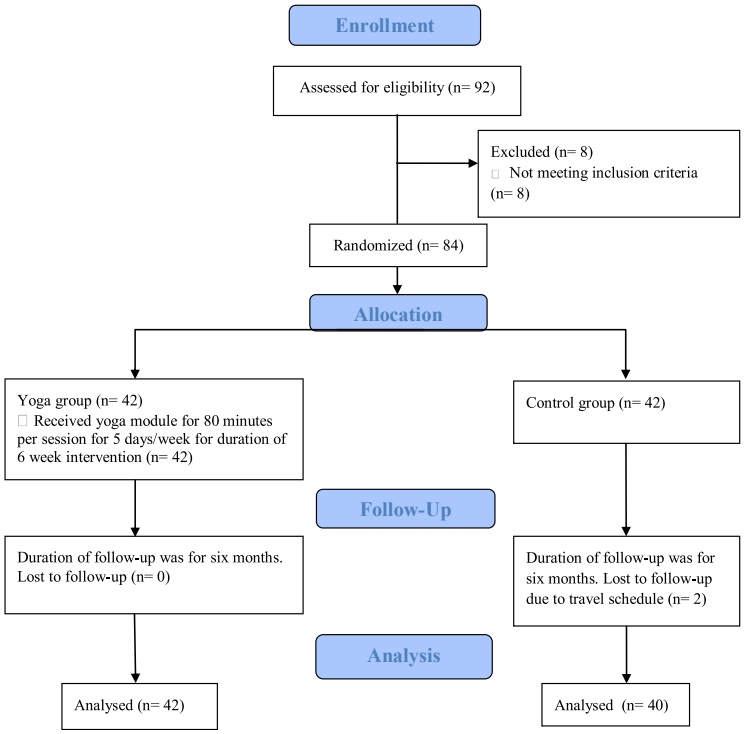

Fig. 1. Flowchart depicting the enrollment, allocation, follow-up and analysis.

2.4. Ethics

The Karnataka State Cricket Association had extended their consent for conducting this study. Written informed consent from the participants was obtained before the intervention. The players were explained in detail about the nature of the study and the voluntary nature of participation. Confidentiality was assured as a part of the research process. This study was approved by the Institutional Ethics Committee (IEC), S-VYASA Deemed-to-be University.

2.5. Measures

Core stability: Double leg-lowering test (DLL). Here, the stability of the abdominal muscles was measured by the player's ability to keep the pelvis in a posterior tilt and to hold the lumbar spine flat while in the supine position with forearms folded across the chest with fingers touching the opposite shoulders. Digital inclinometer that was fastened parallelly along the axis of the femur of the player recorded the angle of the legs in degrees from the floor (Zannotti et al., 2002; Krause et al., 2005)

Core Stability: Side bridge test (SBT). This test measured the control and endurance of the lateral core stabilizing muscles (McGill et al., 1999).

Flexibility: Back saver sit and reach (BSSR). Sit and reach box was used to measure the functional hip region flexibility, including the lower back and hamstring muscles (Baltaci 2003).

Range of motion (ROM): Bilateral active shoulder rotation range of motion test (BASR). Digital goniometer was used to measure the player's glenohumeral joint abduction in supine position with internal and external rotation (IR, ER) with the shoulder complex at 90° of abduction and elbow flexed to 90° in the coronal plane (Stuelcken et al., 2008).

Static Balance: Stork Balance Stand Test (SB) - Eyes Open (EO) and Eyes Closed (EC). In this test, the ability of the player to balance on the ball of the foot was assessed (Hammami et al., 2015).

Dynamic Balance: Y Balance test (YBT) - anterior (A), posteromedial (PM), and posterolateral (PL). This test measured dynamic balance that is required for strength, flexibility, and proprioception. The composite score was calculated by dividing the sum of the maximum reach distance in the anterior (A), posteromedial (PM), and posterolateral (PL) directions by three times the limb length (LL) of the individual, then multiplied by 100 {[(A + PM + PL)/(LL X 3)] X100} for each side (Filipa et al., 2010).

Proprioception of the ankle: Active reproduction test of 10° dorsiflexion, 11° plantar flexion and 25° plantar flexion - Eyes Open (EO) and Eyes Closed (EC) were measured. Measurements were done using a digital goniometer (Cay et al., 2018; Senol et al., 2019).

2.6. Statistical analysis

Data were coded and recorded in MS Excel spreadsheet program. R Statistical Software, RStudio Team (2019) was used for data analysis. Descriptive statistics were presented as appropriate. Independent *t*-test was conducted to check the statistical significance between the groups at each time points. Group differences in the change in parameters over time was modelled using linear mixed-effects regression method as two groups were compared over three

unevenly spaced assessment time points. Linear mixed-effects approach was employed as it has important advantages over traditional methods of repeated measures analysis, while seamlessly dealing with unequally spaced observations over time (Gueorguieva R & Krystal JH 2004). Linear mixed-effect regression method was conducted using the lme4 package in R, with each outcome parameter respectively as the dependent variable, main effect of group and timepoint and their interaction as the fixed effects, and allowing for a random intercept for each subject and a random slope for time. Full models were compared against baseline models with no fixed effects for deriving the significance of model fit. Statistical significance was assumed at $p < 0.05$.

3. Results

A total of 42 cricket players were taken in each group. However, there were two dropouts from the control group as they were lost to both post and the follow-up assessments due to their unavailability. Hence, in the yoga group $n = 42$ and in control group $n = 40$. During the follow-up period, continuation of yoga practice of the yoga group was monitored using a group formed on a multiplatform messaging application by the yoga therapist. In this phase, the therapist noted a drop of 10% every month in the rate of continuation of practice. Prior to performing any statistical analysis for comparison, the data were compiled to obtain the descriptive statistics. There were no missing data at T1 (baseline), T2 (post-yoga intervention) and at T3 (follow-up). Basic demographic details of age, height, body weight, and cricketing experience at the professional level were analysed using descriptive statistics as shown in Table 2. The scores which showed statistical significance with $p < .001$ at baseline were further evaluated. These scores were substituted at T2 with the difference between the individual raw scores of T2 and baseline score (T2-T1) and at T3 with the difference between the individual raw scores of T3 and baseline score (T3-T1). Thus, obtained scores (T2-T1 and T3-T1) were further tested for significance using unpaired *t*-test. A statistical significance with $p < .001$ was observed for all the variable at T2 and T3 except YBT PL (R), YBT DELTA, POA 11°PEO and POA 25°PEO at T2 and BASR IR (R), YBT DELTA, POA 10°DEO, POA 10°DEC, POA 11°PEO, POA 25°PEO and POA 25°PEC at T3 as indicated in Table 3. Mean ± SD of the muscular functioning indicators of yoga group and control group have been shown in Table 4. For all the variables, there seemed no difference of significance and direction of association between the original, outlier removed and the transformed model. Hence, the outlier-removed model was retained.

3.1. Linear mixed-effect model

As indicated by the comparison of the model fit there was a significant ($p < 0.001$) difference between the model as compared to the baseline model among all the variables except for YBT DELTA and POA 25°P EO. Overall there was no significant fixed effect ($p > 0.05$) of time except for the variables SB EC (L) at T2 as compared to T1, and significant difference with the variables SBT (R), BSR (R), BSR (L), BASR ER (L), SB EO (R), SB EC(R), YBT PL (L) at T3 as compared to the T1. Significant fixed effect in group (yoga as compared to controls) can be noted for the variables BASR IR (R), BASR IR (L), SB EO (R), SB EC(R), SB EC(L), YBT ANT (R), YBT ANT (L), YBT PM (L), YBT PL (R), YBT PL (L), YBT COMP (R), YBT COMP (L) and POA10°D EO as illustrated in table 5 (supplementary material).

Evidence of interaction effect suggests significant group*time interaction at both time points of T2 and T3 except for the variables - YBT DELTA, POA11°D EO, POA 25°P EO at T2 and for the variables BSR IR (R), YBT DELTA, POA10°D EO, POA10°D EC, POA11°D EO, POA10°D EC, POA 25°P EO and POA 25°P EC at T3.

Table 2
- Anthropometric measures at Baseline.

Variable	Yoga group	Control group
Number of cricket players (n)	42	40
Age (year) mean ± SD value	21.07 ± 4.19	21.72 ± 3.29
Height (cm) mean ± SD value	176.95 ± 6.13	177.52 ± 4.88
Body weight (kg) mean ± SD value	69.62 ± 8	69.75 ± 7.55
Cricketing experience (year) mean ± SD value	5.47 ± 3.14	6.37 ± 2.69

4. Discussion

The current research explored the effects of 6 weeks of yoga training on asymptomatic cricket players on the muscular functioning parameters of core stability, flexibility, range of motion, static balance, dynamic balance, and proprioception of the ankle. It also evaluates how well the effect of yoga was retained after 6 months of self-practice. Overall the result of this research indicates that yoga training has enhanced all the measures under muscular functioning in comparison to the control group.

Preceding studies have emphasised that core stability is crucial in maximising efficient athletic development (Reed et al., 2012) and also in addressing the problems associated with the lumbosacral spine. The deficit in core stability has shown to have increased the risk of upper extremity athletic injuries (Kibler et al., 2006). Studies have also noted that core-focused yoga and yoga-stabilization combined exercise may be used to enhance the isokinetic trunk strength, body balance (Park et al., 2015), improve muscle activity and IAP (intra-abdominal pressure) and stability in lumbopelvic region (Gaurav 2011). The diaphragm serves as the roof of the core, and diaphragmatic breathing that co-ordinates diaphragm, and abdominal muscles are of paramount importance in core-strengthening (Akuthota et al., 2007). Hence, in this study, the yogic practices that engage diaphragmatic breathing, in tandem, may have intensified the muscular functioning surrounding the lumbar spine, improving the scores of DLL and SBT in the yoga group, as indicated by the results of this study. The findings of the present study are in line with previous studies that have investigated the effect of yoga on flexibility. Earlier studies have revealed beneficial improvement due to yoga in muscular strength, muscular endurance, flexibility and agility on female hockey players (Mclean 2009), cardiovascular endurance, muscular strength and endurance, and flexibility on Chinese adults (Brynzak and Burko 2013), improved hamstring and shoulder flexibility and decline in lower and upper extremity injuries among baseball athletes (Sager and Grenier 2014), flexibility, balance and preparedness among basketball players (Polsgrove et al., 2014). The results of this study substantiates previous research, with a highly significant result in the flexibility test of BSR, thus, validating the effect of yoga on hip region flexibility, including the lower back and hamstring muscles. Evidence suggests that after four weeks of yoga on a healthy population showed a significant improvement in range of motion of the shoulder and hip compared to static stretching (Brian et al., 2013). Yoga program in the pre-season high volume training among Italian short track speed skating team observed improvements in eleven of the 14 angles measured with no injuries linked to the high volume of training thus signifying possibility to integrate yoga in high-volume athlete training and also suggested that yoga can be inserted into, out-of-season training cycles (Brunelle et al., 2015). Similar results in the current study exhibited a marked improvement in the yoga group in the internal and external rotation of the shoulder in this BASR test. Specifically, shoulder is at high risk of injury in overhead sports, and earlier studies have also indicated a possible dysfunction of the shoulder

Table 3
Individual comparison at each timepoints.

Name	T1	T2	T3
1. DLL	t(65.64) = −0.01, p = .989, d < 0.01	t(56.77) = 8.25, p < .001, d = 1.81*	t(68.54) = 7.66, p < .001, d = 1.70*
2. SBT (R)	t(78.83) = 0.24, p = .810, d = 0.05	t(79.00) = −6.55, p < .001, d = −1.46*	t(78.28) = −7.27, p < .001, d = −1.61*
3. SBT (L)	t(77.84) = −2.42, p = .018, d = −0.54	t(79.61) = −8.86, p < .001, d = −1.95*	t(70.41) = −7.06, p < .001, d = −1.54*
4. BSR (R)	t(79.93) = 0.22, p = .826, d = 0.05	t(74.46) = −6.05, p < .001, d = −1.33*	t(76.30) = −6.88, p < .001, d = −1.51*
5. BSR (L)	t(77.82) = −0.60, p = .552, d = −0.13	t(77.89) = −7.62, p < .001, d = −1.70*	t(72.23) = −8.28, p < .001, d = −1.84*
6. BASR IR (R)	t(45.81) = −3.51, p < .001, d = −0.77*	t(60.7) = −5.06, p < .001, d = −1.31*	t(50.9) = −5.28, p = 0.07, d = −1.15
7. BASR IR (L)	t(48.51) = −3.64, p < .001, d = −0.78*	t(76.32) = 6.98, p < .001, d = −1.48*	t(72.68) = 4.57, p < .001, d = −1.53*
8. BASR ER (R)	t(60.19) = −1.29, p = .202, d = −0.28	t(67.41) = −4.55, p < .001, d = −1.01*	t(60.95) = −4.51, p < .001, d = −1.00*
9. BASR ER (L)	t(55.55) = −2.80, p = .007, d = −0.62	t(62.47) = −6.68, p < .001, d = −1.47*	t(69.08) = −6.38, p < .001, d = −1.41*
10. SB EO (R)	t(65.80) = 4.63, p < .001, d = 1.04*	t(57.5) = 9.16, p < .001, d = −0.88*	t(66.73) = 10.01, p < .001, d = −1.04*
11. SB EO (L)	t(77.90) = 3.25, p = .002, d = 0.73	t(60.02) = −4.63, p < .001, d = −1.02*	t(70.44) = −5.72, p < .001, d = −1.27*
12. SB EC (R)	t(70.72) = 4.70, p < .001, d = 1.05*	t(64.5) = −5.77, p < .001, d = −0.31*	t(52.06) = 5.03, p < .001, d = −0.71*
13. SB EC (L)	t(67.25) = 3.67, p < .001, d = 0.83*	t(79.55) = 8.7, p < .001, d = −1.29*	t(78.87) = 6.98, p < .001, d = −1.24*
14. YBT ANT (R)	t(76.17) = 4.49, p < .001, d = 1.00*	t(78.42) = 8.47, p < .001, d = −0.40*	t(768.29) = 7.93, <.001, d = −0.33*
15. YBT PM (R)	t(74.22) = 3.65, p < .001, d = 0.81*	t(79.96) = 8.94, p < .001, d = −0.56*	t(57.92) = 4.95, <.001, d = −0.45*
16. YBT PL (R)	t(76.81) = 3.14, p = .002, d = 0.70	t(79.94) = −2.77, p = .007, d = −0.61	t(79.19) = −2.57, p = .012, d = −0.57
17. YBT ANT (L)	t(79.21) = 5.19, p < .001, d = 1.15*	t(79.9) = 8.03, p < .001, d = −0.46*	t(74.5) = 7.95, p < .001, d = −0.43*
18. YBT PM (L)	t(75.50) = 4.04, p < .001, d = 0.90*	t(78.29) = 7.92, p < .001, d = −0.51*	t(76.35) = 8.55, p < .001, d = −0.64*
19. YBT PL (L)	t(79.20) = 3.74, p < .001, d = 0.83*	t(79.93) = 8.57, p < .001, d = −0.50*	t(79.66) = 8.75, p < .001, d = −0.70*
20. YBT COMP (R)	t(71.86) = 4.15, p < .001, d = 0.92*	t(75.35) = 7.32, p < .001, d = −0.51*	t(77.61) = 7.65, p < .001, d = −0.57*
21. YBT COMP (L)	t(75.50) = 5.02, p < .001, d = 1.12*	t(79.98) = 8.63, p < .001, d = −0.38*	t(78.74) = 9.7, p < .001, d = −0.63*
22. YBT DELTA	t(62.61) = 1.60, p = .114, d = 0.37	t(52.77) = 1.07, p = .289, d = 0.25	t(61.49) = 1.94, p = .057, d = 0.44
23. POA 10°DEO	t(54.27) = −4.21, p < .001, d = −0.92*	t(75.03) = 3.33, p < .001, d = 0.25*	t(59.72) = 2.59, p = .012, d = −0.56
24. POA 10°DEC	t(75.91) = −2.43, p = .017, d = −0.53	t(48.97) = 4.57, p < .001, d = 1.04*	t(78.64) = 1.59, p = .116, d = 0.35
25. POA 11°PEO	t(76.93) = −2.05, p = .043, d = −0.46	t(38.56) = 2.45, p = .019, d = 0.57	t(44.84) = −2.00, p = .052, d = −0.43
26. POA 11°PEC	t(75.82) = −1.91, p = .060, d = −0.43	t(59.75) = 7.90, p < .001, d = 1.81*	t(74.34) = −3.37, p < .001, d = −0.75*
27. POA 25°PEO	t(58.24) = −2.91, p = .005, d = −0.64	t(74.84) = 0.29, p = .773, d = 0.06	t(77.83) = −1.00, p = .320, d = −0.22
28. POA 25°PEC	t(78.97) = −0.25, p = .803, d = −0.06	t(55.11) = 9.73, p < .001, d = 2.18*	t(66.71) = 2.49, p = .015, d = 0.56

•DLL – Double leg lowering test.
•SBT – Side bridge test.
•BSR- Back saver sit and reach test.
•BASR – Bi-lateral active shoulder rotation range of motion; IR – Internal rotation; ER – External rotation.
•SB – Stork balance; EO – Eyes open; EC – Eyes closed.
•YBT – Y Balance Test; Ant – Anterior; PM – Posterio medial; PL – Posterio lateral.
•POA – Proprioception of the ankle; 10°D – 10°dorsiflexio; 11°P – 11°plantar flexion; 25°P – 25°plantar flexion; EO – Eyes open; EC – Eyes closed.
•T1 – Baseline.
•T2 – Post yoga intervention.
•T3 – Follow-up.
*<0.001 – exponential significance.

rotators, combined with a front-on bowling action and external rotation hypermobility being possible predisposing factors for chronic shoulder injuries in cricket among the fast bowlers (Aginsky et al., 2004) and shoulder injuries that are common can also become chronic or recurrent among cricket players (Ranson and Gregory 2008). Glenohumeral Internal Rotation Deficit (GIRD) has been found to be starting at a young age, even among asymptomatic athletes who participate in overhead sports (Hibberd et al., 2014). A recent study with recovery-themed yoga training on male baseball pitchers has revealed a significant increase in pelvic flexion, non-dominant shoulder abduction, non-dominant shoulder internal rotation, and dominant trunk rotation (Hansen et al., 2019). Thus, shoulder impairments can be effectively addressed with yogic techniques to augment the range of motion and thus, possibly preventing an injury.

Another study on yoga training for male college athletes demonstrated an increase in flexibility and balance as well as whole-body measures (Zannotti et al., 2002). The effects of Bikram yoga on strength, balance, and steadiness among a younger population found substantial improvements in one-legged balance and modest gains in strength among their participants (McGill et al., 1999). Theoretically, while static balance is the ability to maintain the center of gravity within a base of support in an upright position during standing or sitting, dynamic balance is maintaining an upright posture while the center of gravity is moving outside the base of support. Better balance becomes crucial in enhancing athletic performance, and it is negatively associated with lower limb sports injuries. Additionally, ankle proprioception contributes to balance control in sport and provides essential information to enable adjustment of ankle positions and movements of the upper body, to successfully perform the complex motor tasks required in elite sport (Winter et al., 2015). Hence, ankle proprioception that plays a vital role in body balance was studied in the current study. The results are promising in all aspects of static and dynamic balance. The study indicates a significant group(yoga)*time(T2 and T3) interaction among all the variables of static balance and dynamic balance showing the overall significant effect of yoga on balance. Previous studies have also shown unfavourable outcomes on ankle proprioception due to stress (Senol et al., 2019). This study indicate that though there was no significant fixed effect at either time points (T2 and T3), there was a significant interaction effect (group yoga*T2) after 6 weeks of the yoga intervention in ankle dorsiflexion (11°) and plantar flexion (11° and 25°) with eyes closed. Clearly, practicing yoga that aim at establishing an awareness of the body and breath has shown extreme relevance in static balance, dynamic balance, and ankle proprioception in this study.

Though there have been significant results in the follow-up study, among most of the variables, the co-efficient of the variables at T3 indicate a slight dip in the values as compared to the values at T2. Non-continuous and selective practicing (choosing only a few practices from the yoga module) could have culminated in such an occurrence.

This study has demonstrated the virtues of a yoga protocol that can complement the routine fitness regime among asymptomatic

Table 4
Mean ± SD of the muscular functioning indicators of yoga group and control group.

Name	T1 (Mean ± SD)		T2 (Mean + SD)		T3 (Mean + SD)	
	Yoga	Control	Yoga	Control	Yoga	Control
1. DLL	70.28 ± 11.23	69.18 ± 11.70	55.52 ± 12.22	72.01 + 6.56	58.29 ± 9.1	71.55 ± 5.79
2. SBT (R)	78.62 ± 31.6	79.2 ± 29.1	110.95 ± 30.35	68.3 + 27.73	107.4 ± 32.96	59.98 ± 26.19
3. SBT (L)	93.98 ± 27.92	78.08 ± 31.42	123.17 ± 30.06	67.63 + 26.66	109.48 ± 37.99	59.9 ± 24.44
4. BSR (R)	27.17 ± 4.04	27.45 ± 3.83	32.43 ± 5.23	26.38 + 3.75	30.88 ± 4.46	24.88 ± 3.39
5. BSR (L)	28.24 ± 3.7	28.1 ± 4.15	33.14 ± 4.18	26.5 + 4	31.55 ± 4.72	24.65 ± 3.05
6. BASR IR (R)	77.43 ± 11.64	72.73 ± 3.27	81.95 ± 12.7	72.45 + 3	78.83 ± 11.78	71.13 ± 1.77
7. BASR IR (L)	79.48 ± 10.75	72.48 ± 3.96	84.24 ± 11.42	70.03 + 6.05	82.33 ± 9.67	69.78 ± 5.85
8. BASR ER (R)	94.02 ± 8.25	92.7 ± 3.99	98.21 ± 8.13	91.53 + 5.75	97.21 ± 7.98	89.33 ± 7.1
9. BASR ER (L)	95.95 ± 8.45	92.25 ± 5.28	101.17 ± 9.14	90.3 + 6.87	98.76 ± 8.48	87.85 ± 6.62
10. SB EO (R)	47.36 ± 27.45	78.53 ± 37.63	103.57 ± 46.37	67.7 + 31.77	96.19 ± 39.42	59.78 ± 28.09
11. SB EO (L)	58 ± 35.97	78.73 ± 32.97	118.1 ± 63.23	66.2 + 30.94	107.52 ± 44.32	57.88 ± 29.91
12. SB EC (R)	14.71 ± 12.28	28.68 ± 27.02	26.02 ± 16	22.85 + 16.11	25.93 ± 15.39	17.15 ± 8.63
13. SB EC (L)	15.55 ± 9.39	25.68 ± 13.84	35.33 ± 19.47	16.20 + 8.79	29.29 ± 17.68	14.65 ± 6.8
14. YBT ANT (R)	52.36 ± 14.14	67.85 ± 16.89	73.69 ± 17.01	67 + 15.95	68.81 ± 13.18	63.98 ± 15.69
15. YBT PM (R)	52.43 ± 14.14	65.48 ± 17.88	73.83 ± 18.07	64.48 + 15.19	68.93 ± 16.01	61.93 ± 15.22
16. YBT PL (R)	54.93 ± 14.92	66.2 ± 17.44	75.67 ± 18.48	64.48 + 18.08	70 ± 16	60.8 ± 15.43
17. YBT ANT (L)	52.76 ± 15.15	70.35 ± 16.5	75.1 ± 17.66	68.63 + 13.58	70.93 ± 14.34	64.63 ± 15.05
18. YBT PM (L)	53.57 ± 15.13	68.1 ± 17.25	75.36 ± 19.92	67.58 + 17.2	72.69 ± 16.22	62.25 ± 15.07
19. YBT PL (L)	55.07 ± 15.15	67.93 ± 15.95	74.48 ± 18.72	65.43 + 17.22	72.81 ± 17.53	60.93 ± 16.55
20. YBT COMP (R)	55.72 ± 13.16	70.09 ± 17.73	77.57 ± 18.36	68.65 + 16.62	73.77 ± 15.26	65.14 ± 14.87
21. YBT COMP (L)	55.94 ± 13.83	71.99 ± 16.3	77.57 ± 18.36	69.69 + 17.63	75.41 ± 15.47	65.13 ± 15.25
22. YBT DELTA	0.23 ± 4.63	1.91 ± 6.33	0.32 ± 4.17	1.04 + 6.5	1.64 ± 2.99	0.01 ± 6.11
23. POA 10°DEO	8.19 ± 2.76	9.8 ± 1.8	9.83 ± 0.84	9.92 + 2.07	9.38 ± 1.24	9.77 ± 1.23
24. POA 10°DEC	7.29 ± 5.26	6.87 ± 3.13	9.39 ± 1.97	12.03 + 5.42	6.84 ± 3.17	5.22 ± 3.20
25. POA 11°PEO	10.92 ± 2.44	11.54 ± 2.10	11.19 ± 0.6	12.52 + 4.17	11.57 ± 1.46	11.45 ± 1.35
26. POA 11°PEC	10.67 ± 7.11	9.06 ± 6.14	10.95 ± 1.65	7.36 + 4.46	8.73 ± 5.11	7.3 ± 4.74
27. POA 25°PEO	23.04 ± 4.79	24.04 ± 3.08	23.87 ± 2.86	23.37 + 2.28	23.69 ± 1.97	23.51 ± 1.81
28. POA 25°PEC	22.89 ± 10.51	19.36 ± 8.59	22.97 ± 4.07	14.84 + 6.18	18.69 ± 5.09	15.7 ± 6.66

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•T2 – Post yoga intervention.
•T3 – Follow-up.

male cricket players. The strength of this study exists in the control group that comprised of the cricket players of the same caliber which ensured that the differences in outcome were not the result of inequities in physical conditioning but the outcome of the yoga intervention. However, the various components of this yoga protocol that might benefit in injury rehabilitation are unknown at the time and warrants further investigation.

5. Conclusion

The study provides an insight into the potential for cricket players to develop physical fitness benefits with an awareness of the breathing pattern with yoga. Holistic yoga protocol, such as the current study, which has an amalgamation of asana, breath training, and deep relaxation, can prove to be of optimal benefit. This yoga module can be appropriate and replicable in enhancing the core stability, flexibility, range of motion, static balance, dynamic balance and proprioception of the ankle. Sustainable benefits can be derived from continuous yoga practice.

Clinical relevance

- The current study is an essential first step in understanding the relevance, acceptance, and participation in mind-body training such as yoga for male cricket players.
- The results provide an insight into the potential for cricket players to develop physical fitness benefits with an awareness of breathing patterns.
- This yoga protocol which targets the anatomical regions that are prone to injuries among male cricket players can be used as a preventative tool.

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CRediT authorship contribution statement

Manasa R. Rao: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, writing – editing, Visualization, Supervision, Project administration. **Ravi Kumar Itagi:** Conceptualization, Methodology, Validation, Writing – review & editing, Visualization, Supervision. **T.M. Srinivasan:** Conceptualization, Methodology, Validation, Writing – review & editing, Visualization, Supervision.

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Appendix A. Supplementary data

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PLATE 1 – YOGA INTERVENTION SESSIONS AT KARNATAKA STATE CRICKET ASSOCIATION

PLATE 2 – ASSESSMENT OF MUSCULAR FUNCTIONING VARIABLES