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EFFECTS OF A SHORT TERM, SHORT DURATION, HIGH INTENSITY EXERCISE INTERVENTION ON BODY COMPOSITION AND INTRA-ABDOMINAL FAT

RESEARCHERS

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PRESENTATION OVERVIEW

- INTRODUCTION
- METHODOLOGY
- RESULTS
- DISCUSSION

INTRODUCTION:

- WHAT IS HIGH INTENSITY INTERVAL TRAINING (HIIT)? (SHIRAEV & BARCLAY, 2012)
 - REPEATEDLY EXERCISING AT A HIGH INTENSITY (ABOVE 80% VO_2 MAX)
 - 30SECONDS – SEVERAL MINUTES
 - RESTING 1-5 MINUTES BETWEEN BOUTS
- WHAT IS TABATA? (EMBERTS, PORCARI, DOBERSTEIN, STEFFEN, & FOSTER, 2013)
 - A FORM OF HIIT, PERFORMED AT MAXIMAL EFFORT
 - 20 SECONDS OF WORK FOLLOWED BY 10 SECONDS OF REST
 - REPEATED FOR A TOTAL OF 8 ROUNDS

INTRODUCTION: KNOWN BENEFITS

- HIGH INTENSITY INTERVAL TRAINING (BOUTCHER, 2011)
 - IMPROVEMENT IN BODY COMPOSITION
 - SUBCUTANEOUS AND VISCERAL FAT, BODY MASS, WAIST TO HIP RATIO
 - INCREASE IN VO_2 MAX
 - IMPROVES COGNITIVE FUNCTION (DRIGNY *ET AL.*, 2012)
- TABATA
 - RECENT RESEARCH SHOWS 13.5 CAL BURNED PER MINUTE & DOUBLED METABOLIC RATES FOR 30 MINUTES POST WORKOUT (ROSSI, 2013)
 - A 4 MIN TABATA JUMP SQUAT PROTOCOL

INTRODUCTION: DISEASE PREVENTION

HIGH INTENSITY INTERVAL TRAINING CAN IMPROVE:

- METABOLIC SYNDROME: A GROUP OF RISK FACTORS THAT RAISE YOUR RISK FOR CARDIOVASCULAR DISEASE, STROKE, DIABETES.
 - ONE OF THE RISKS IS ABDOMINAL OBESITY, EXCESS INTRA-ABDOMINAL FAT STORES (IAF).
- CARDIOVASCULAR DISEASE PREVENTION: 30 MINUTES, 5 DAYS PER WEEK OF MODERATE AEROBIC EXERCISE IS RECOMMENDED FOR CARDIOVASCULAR HEALTH (ACSM, 2010)

DO WE HAVE THE TIME?

HYPOTHESIS

- SHORT TERM (10 SESSIONS), SHORT DURATION HIIT (8-ROUNDS TABATA) WILL SIGNIFICANTLY IMPROVE BODY COMPOSITION (BODY MASS, BODY FAT %) AND THE AMOUNT OF INTRA-ABDOMINAL FAT.

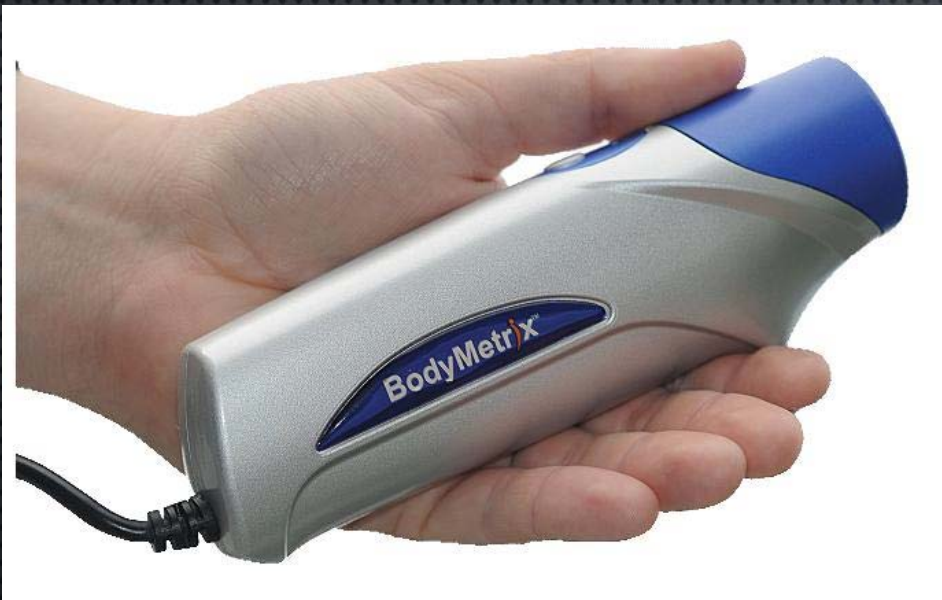
METHODS: EQUIPMENT

- THE BOD POD WAS USED TO ASSESS BODY COMPOSITION (BODY MASS (BM) , BODY FAT % (BFP))
- ULTRASOUND (US), BY BODYMETRIX, WAS USED TO ASSES INTRA-ABDOMINAL FAT DEPTH (IAF)
 - ULTRASOUND IS COMPARABLE TO MRI & CT SCANS FOR ASSESSING FAT DEPTH
 - STARTING 2CM TO THE RIGHT OF THE UMBILICUS, SCANNED HORIZONTALLY 4CM TO THE RIGHT

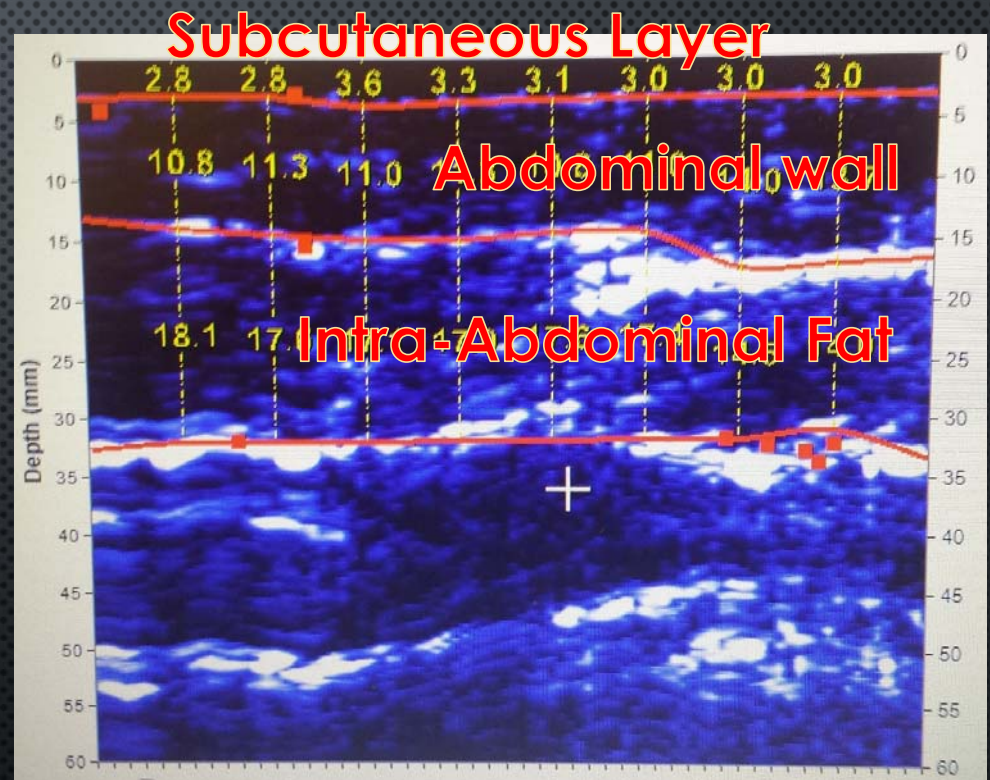


Bod Pod Machine

METHODS: EQUIPMENT



BodyMetrix Ultrasound Device



Ultrasound Abdominal Measurement

METHODS: PROTOCOL

- A REPEATED JUMP SQUAT PROTOCOL WAS SELECTED FOR THE TABATA EXERCISE
 - SANDS, *ET AL.* PROTOCOL FOR A BOSCO TEST WAS USED AS GUIDELINE FOR JUMP SQUATS (2004)
- PARTICIPANTS COMPLETED 10 SESSIONS, EVERY OTHER DAY, OVER A 3-WEEK PERIOD
- A 5-MIN WARM UP RUN AT A MODERATE PACE WAS PERFORMED PRIOR TO EACH SESSION ALONG WITH 5 LOWER BODY DYNAMIC STRETCHING MOVEMENTS.
- PRE-TESTING WAS DONE TWO DAYS PRIOR TO FIRST SESSION
- POST-TEST WAS COMPLETED WITHIN TWO DAYS OF LAST SESSION

RESULTS

Table 1.

Analysis of Body Composition and IAF After Body-Weight Tabata Intervention

	Pre Test		Post Test		<i>p</i> -value
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
BFP (%)	20.23	5.39	20.78	6.23	.26
BM(kg)	67.08	16.21	67.27	15.47	.60
US	17.55	5.52	16.82	5.27	.03**

***p* < .05, *M*=Mean, *SD*=Standard Deviation

DISCUSSION

- STUDIES HAVE SHOWN HIIT TO BE SUCCESSFUL IN IMPROVING BODY COMPOSITION AND IAF FAT DEPTH (BOUTCHER, 2011).
- FEW STUDIES HAVE BEEN DONE WITH SUCH A SHORT DURATION (10 TOTAL SESSIONS)
- WHILE SIGNIFICANCE WAS FOUND IN IAF, NO SIGNIFICANCE WAS SEEN IN EITHER BM OR BFP
- POSSIBLY ATTRIBUTABLE TO ERROR IN TECHNIQUE WITH US

Study	Subcutaneous fat (kg)	Abdominal/trunk fat (kg)	Body mass (kg)	Waist circumference (cm)	Type of HIIE	Length of intervention	$\dot{V}O_{2\max}$ ml·kg ⁻¹ ·min ⁻¹	Insulin sensitivity
Boudou et al. [8]	↓ 18%	↓ 44%	↓ 1.9 kg (2%)	—	SSE + 5 × 2/3 min R	8 weeks	—	↑ 58%
Burgomaster et al. [37]	—	—	↔	—	4–6 Wingate/4.5 min R	6 weeks	↑ 7%	—
Dunn [46]	↓ 2.6 kg (8%)	↓ .12 kg (3%)	↓ 1.9 kg (3%)	↓ 3.5 cm (4%)	60 × 8 s/12 s R	12 weeks	↑ 18%	↑ 36%
Helgerud et al. [39]	—	—	↓ .8 kg (1%)	—	15 s/15 s R	8 weeks	↑ 6%	—
Helgerud et al. [39]	—	—	↓ 1.5 kg (2%)	—	4 × 4 min/4 min R	8 weeks	↑ 7%	—
Mourier et al. [40]	↓ 18%	↓ 48%	↓ 1.5 kg (2%)	↓ 1.00 cm (1%)	SSE + 5 × 2/3 min R	8 weeks	↑ 41%	↑ 46%
Perry et al. [41]	—	—	↓ .2 kg (.03%)	—	10 × 4 min/2 min R	2 weeks	↑ 9%	—
Talanian et al. [42]	—	—	—	—	10 × 4 min/2 min R	2 weeks	↑ 13%	—
Tjønnå et al. [43]	—	—	↓ 2.3 kg (2.5%)	↓ 5.0 cm (5%)	4 × 4 min/3 min R	16 weeks	↑ 26%	↑ 19%
Tjønnå et al. [3]	↓ 2.4 kg (7%)	↓ 1.5 kg (8%)#	↑ .1 kg (.3%)	↓ 7.2 cm (7%)	4 × 4 min/3 min R	12 weeks	↑ 10%	↑ 29%
Trapp et al. [5]	↓ 2.5 kg (10%)	↓ .15 kg (10%)#	↓ 1.51 kg (2%)	—	60 × 8 s/12 s R	15 weeks	↑ 24%	↑ 33%
Tremblay et al. [38]	↓ 15%*	↓ 12%*	↓ .1 kg (.1%)	—	15 × 30 s	24 weeks	↑ 20%	—
Warburton et al. [44]	—	—	↓ 3.0 kg (4%)	—	7 × 2 min/2 min R	16 weeks	↑ 10%	—
Whyte et al. [45]	—	—	↓ 1.0 kg (1%)	↓ 2.4 cm (2%)	4–6 Wingate/4.5 min R	2 weeks	↑ 9%	↑ 25%

DISCUSSION

- LIMITATIONS
 - TECHNIQUE AND EXPERIENCE WITH US DEVICE AND SOFTWARE
 - LACK OF MAXIMAL EFFORT BY PARTICIPANTS
- FUTURE RESEARCH
 - USE OF HEART RATE MONITORS
 - CONTROL FOR OUTSIDE ACTIVITY AND EXERCISE
 - 10 SESSIONS DONE ON BACK TO BACK DAYS
 - DIFFERENT FULL BODY, BODY-WEIGHT EXERCISES
 - SEDENTARY VERSUS ACTIVE POPULATION

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BODYMETRIX SYSTEM VS. SKINFOLD CALIPER VALIDATION STUDIES.

[HTTP://INTELAMETRIX.COM/FULLSITE/IMAGES/BODYMETRIX%20VALIDATION%20STUDIES.PDF](http://intelamatrix.com/fullsite/images/bodymetrix%20validation%20studies.pdf)

THANK YOU

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QUESTIONS?