Influence of Recovery Modalities on Team Sport Performance, Perceptions and Physiological Variables

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This thesis is submitted as partial fulfilment of the requirements for the degree of Bachelor of Sports Science (Honours) at Murdoch University, Perth, Western Australia.

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

(Miss Laura Juliff)

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ABSTRACT

Purpose: In order to cope with the demands and stress of training and competition many team sports have begun to utilise contrast water therapy as their preferred recovery modality. Although popular, there may be an inability to access necessary facilities when at sporting venues or overseas therefore contrast showers may prove to be a convenient, accessible and effective alternative. Research examining the influence of contrast showers on sport performance and psychological and physiological variables is lacking. Therefore, this study sought to examine the effects of contrast showers and contrast water therapy on vertical jump and repeated agility performance, skin and core temperature and psychological measures following a netball specific circuit in elite female netball players. **Methods:** Eleven elite netball players completed three experimental sessions (randomised crossover design) followed by one of three post-exercise recovery interventions; (1) contrast water therapy (CWT, 38ºC and 15ºC), (2) contrast showers (CS, 38ºC and 18ºC) and (3) passive recovery (PAS, seated rest 20ºC). For each trial, participants performed a fatiguing netball specific circuit followed by one of the recovery interventions. Repeated agility, repeated vertical jump, skin and core temperature and muscle soreness were measured before, immediately after, 5 hours post and 24 hours post-exercise. **Results:** No significant differences ($p > 0.05$) were evident between conditions for exercise performance (vertical jump, repeated agility). Post-exercise CWT and CS provided similar cooling effects through decreased skin temperature (T_{skin}) results and a delayed drop in core temperature (T_{core}) of (-1.0%) when compared to a passive condition. Perceived perceptions overall were greater in the CWT (18.95 ± 13.77) and CS (17.70 ± 12.98) conditions when compared with a passive recovery (72.80 ± 14.26). Furthermore, a significant ($P<0.001$) change in

perception of CS recovery conditions was observed pre and post condition indicating a significant favourable change in perception. **Conclusion:** Although no improvements in performance were noted after CWT or CS, neither modality negatively influenced performance. Furthermore, both CWT and CS resulted in faster cooling responses and greater perceptions of recovery when compared with passive sitting. For this reason, it is suggested that CWT and CS are viable recovery modalities that can be used to help increase recovery in netballers after intense training or competition scenarios.

DEFINITION OF TERMS

For consistency of interpretation the preceding words are defined:

Active recovery: Low intensity exercise conducted post-exercise.

Agility: Ability to effectively and efficiently move and change direction of the body.

Contrast Water Therapy (CWT): The alternation of cold and hot water immersion.

Cold Water Immersion (CWI): The Immersion of the body in water temperatures of less than 15˚C[81].

Hot Water Immersion (HWI): The Immersion of the body in water temperatures greater than 37˚C[38].

Hydrostatic Pressure: Pressure exerted on the body through the weight of fluid.

Passive Recovery: A form of post-exercise recovery that involves periods of rest (i.e. passive sitting).

Recovery: A process of restoring the body physiologically and psychologically to pre-exercise levels following exercise.

Vasoconstriction: Narrowing of the blood vessels that increase peripheral resistance.

Vasodilation: Relaxation of the smooth muscles of the blood vessels that decreases peripheral resistance.

ABBREVIATIONS

Selected abbreviations used throughout the text

AFL: Australian Football League

AIS: Australian Institute of Sport

ANOVA: analysis of variance

ATP: adenosinetriphosphate

bpm: beats per minute

C: centre netball position

˚**C:** temperature in degrees centigrade

CHO: carbohydrate

CMJ: counter movement jump

CNS: central nervous system

CS: contrast showers

CWI: cold water immersion

CWT: contrast water therapy

DOMS: delayed onset muscle soreness

GK: goal keeper netball position

GS: goal shooter netball position

HWI: hot water immersion

ISAK: International Society for the Advancement of Kinanthropometry

kg: kilogram

PAS: passive recovery

PostEx: post-exercise measurement

PostRec: post-recovery measurement

RPE: rate of perceived exertion

T_{core}: core temperature

T_{mean}: mean body temperature

T_{skin}: skin temperature

VAS: visual analogue scale

W:R: work to rest ratio