Psychoeducation and Breathing Training for Stress Reduction in Student Athletes

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Overview

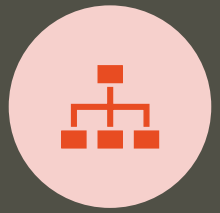
- Aim and rationale
- Methodology
- Results
- Discussion
- Conclusion and future recommendations

Why dual-career athletes?

- Dual career athletes are those who have "a career with major foci on sport and studies or work" (Stambulova & Wylleman, 2015, p.1)
- They face many challenges as elite sport and education/work cause pressure on time (Ryan, 2015) and maintaining this can cause fatigue, decrease in motivation, limited life experience outside of sport and education, increased overload and increased injury risk (McCormack & Walseth, 2013).
- Multiple demands and increases in perceived problems can occur during university studies (Aquilina & Henry, 2010; Brettschneider, 1999).
- Elite student athletes who pursue a school or university career in addition to their elite-level sport show high indicators of stress (Richartz & Sallen, 2017)

Slow paced breathing

Breathing at a specific pace (6 cycles per minute) couples respiration and blood pressure systems which triggers the resonance properties of the cardiovascular system and results in an increase in vagal afferences (Lehrer 2013).



Effective stress management technique (Wells et al. 2012)

Used in high stress sporting environments (Paul and Garg, 2012)

Can improve executive function (Laborde et al. 2021)

Improve subjective sleep quality (Laborde et al. 2019)

Increase vagal activity even in brief intervention (You et al., 2020)

Cost effective, easy to use and relevant to real world stressors (Borges et al., 2021)

Smartphone enabled slow paced breathing

- Smartphone applications to control slow paced breathing have yielded increases in cardiac vagal activity (Laborde et al., 2019)
- Make mental skills training more accessible particularly to the millennial student athlete (Rist and Pearce, 2017).
- When administering slow paced breathing through biofeedback – athletes have use specialist equipment or travel to the lab (i.e. Dupee., 2017)

Psychoeducation

It has been suggested that relaxation techniques, including slow paced breathing, can be more successful if pared with psychoeducation (Shah et al. 2014).

Psychoeducation intervention of ten weeks covering stress-management interventions can support dual careers (Sallen, Hemming and Richartz, 2018).

Studies using slow paced breathing often include a very brief period of education around the physiological technique of slow breathing prior to execution (Laborde et al. 2021; Hunt et al. 2018;)

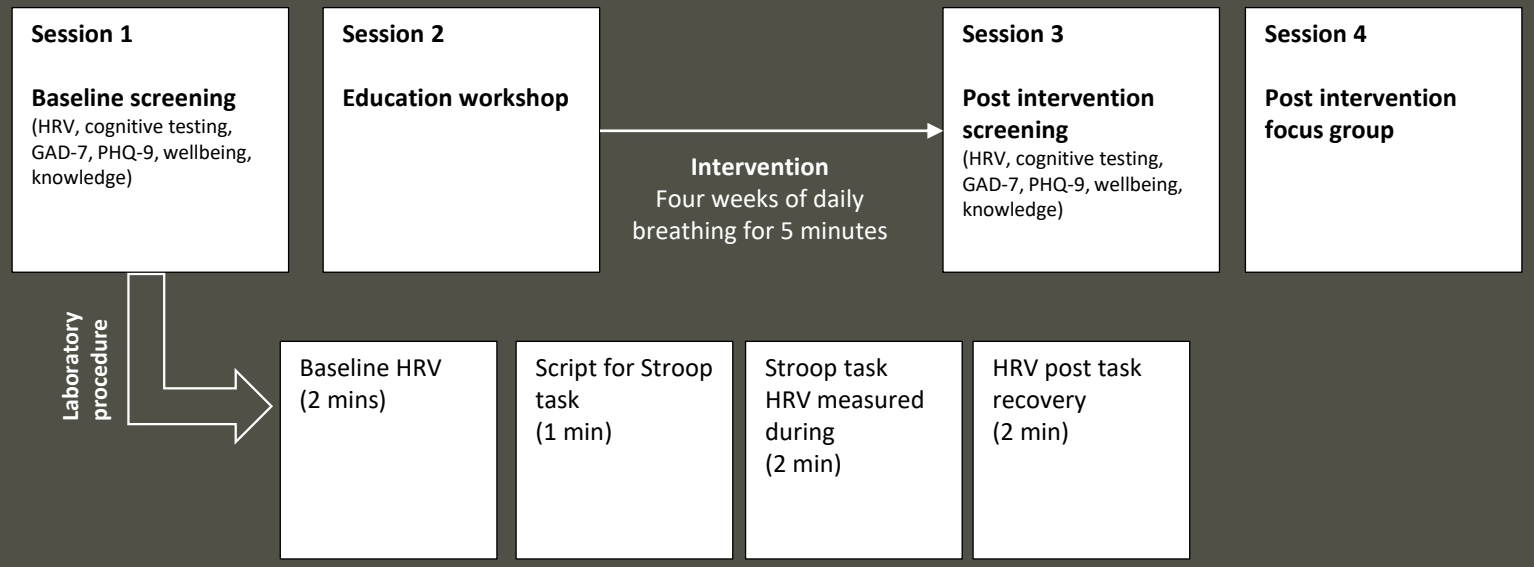
Aim

- The aim of this study is to investigate the effectiveness of a psychoeducation and smartphone enabled slow paced breathing intervention upon psychological wellbeing, resting cardiac vagal activity and brief cognitive performance.
- Acts as a pilot study for future intervention plans

Participants

- Eight dual career athletes (M^{age}=20.75, SD=1.38, 3 female)
- Competing at either national or international level
- Range of sports including wheelchair racing, athletics, basketball, football official.
- All participants had no underlying health conditions that would affect the heart or lungs in daily function.

Procedure


Session 1
Baseline screening
(HRV, cognitive testing, GAD-7, PHQ-9, wellbeing, knowledge)
Session 2
Education workshop
Intervention
Four weeks of daily breathing for 5 minutes
Session 3
Post intervention screening
(HRV, cognitive testing, GAD-7, PHQ-9, wellbeing, knowledge)
Session 4
Post intervention focus group
Laboratory procedure
Baseline HRV (2 mins)
Script for Stroop task (1 min)
Stroop task HRV measured during (2 min)
HRV post task recovery (2 min)

Procedure

Session 1

Baseline screening

(HRV, cognitive testing, GAD-7, PHQ-9, wellbeing, knowledge)

Baseline HRV (2 mins)

Stress VAS

Script for Stroop task (1 min)

Stroop task HRV measured during (2 min)

Stress VAS

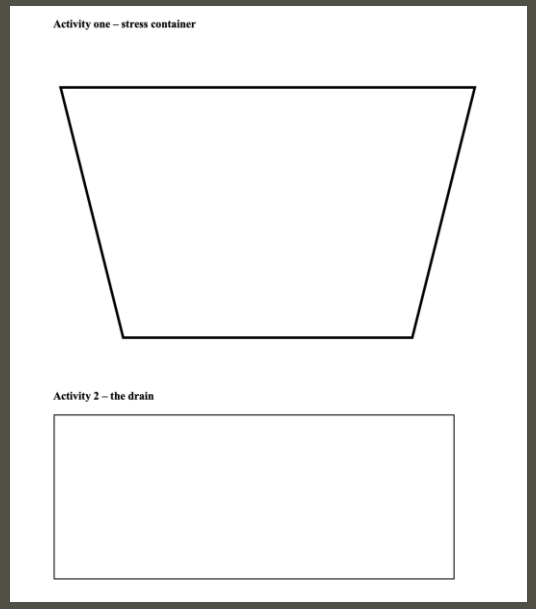
HRV post task recovery (2 min)

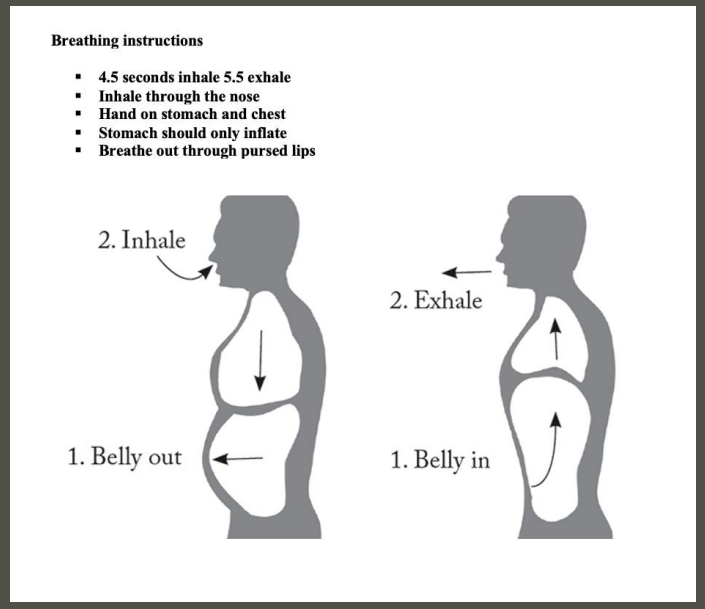
Stress VAS

Procedure

Session 2

Education workshop





Four weeks intervention, daily breathing 5 minutes and breathing dairy

Procedure

Session 3

Post intervention screening (HRV, cognitive testing, GAD-7, PHQ-9, wellbeing, knowledge)

Baseline HRV (2 mins)

Stress VAS

Script for Stroop task (1 min)

Stroop task HRV measured during (2 min)

Stress VAS

HRV post task recovery (2 min)

Stress VAS

Procedure

Session 4

Post intervention focus group

Analysis

Quantitative
Paired samples t-tests (pre vs post intervention)

Qualitative
Thematic analysis in line with Braun and Clarkes (2006) recommendations.

Results (quantitative)

- No significant differences from pre to post intervention in:
  - Psychological distress t(6)=1.663, p=.14
  - Overall wellbeing t(6)=-1.206(6), p=.27
  - RMSSD (resting, reactivity or recovery)
  - Stroop accuracy $t(6) = -1.536$, $p = .17$
- There was a significant decrease in reaction time from pre (M= 989.49, SD= 187.60) to post intervention (M= 861.14, SD= 139.97), $t(6) = 2.665$, $p = .03$).

Results (qualitative)

Themes derived from focus groups

Main theme	Subthemes	Examples with numbered participant tags
Psychoeducation and slow paced breathing training	Learning	Importance of education for breathing properly (4) At the beginning breathing was not deep (4,5)
	Adherence	Mostly completed every day, only a few days forgotten (2,3)
	Technique	Focussing on belly breathing (4) Easier with time (4,5)
	Routine	Before bed was most convenient (1,2,3,4)
Situational use and application of training	Gym	Used during isometric training in the gym (1)
	Pre-competition	To reduce nervousness before a game (3)
	Sleep	Using breathing before bed (1,2,3,4)
	Life application	Distract from life stressors (2) Used prior to presentations (3)
Psychological response	Relaxation	Increased relaxation before sleep (1,4)
	Improved Sleep	Sleep quality was improved (1) Faster to go to sleep (1, 2, 3, 4) Being able to turn off (4)
	Decrease nervousness	Used when feeling nervous (3, 5) Quietens the mind (4)
	Stress reduction and coping	Useful to cope with stress (1, 3, 4)
	Distraction	Using breathing to distract from poor performance (1)
	Emotional control	General control of emotions (1,2)

Key quotes

- "I've used it during the gym, when I need to stay in the same position… like the last set, I use it to maintain shape"
- "I used it before games, when I felt nervous"
- "I feel like my body was more relaxed before I dropped off to sleep"
- "I used it on the golf course once, because It was going badly and I thought I was going to lose my temper, so I focused on my breathing"

Discussion

Quantitative results of this study should be interpreted with caution

Dual-career athletes found multiple uses which aligned with previous research findings

Sleep was the main use of SPB

Small sample limits the application of the findings

Not all breathing diaries were returned, cannot be sure of adherence to the intervention

Future recommendations

- When conducting intervention research with SPB – qualitative data is very valuable
- Larger scale interventions needed
- Duration and frequency of training should be addressed
- Dual-career athletes may benefit from SPB interventions – practitioners should look to use these interventions

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