Homeward Bound: An Incredible Journey from Pet Therapy to Jumping Performance

Exercise Science

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Introduction
In a collegiate athletic environment, strength and conditioning programs are essential to the athlete's success. These workouts are most effective when the athlete is giving their best effort. Additionally, studies have shown that an athlete's mood can be a predictor of performance outcomes (Beedie et al, 2008). A previous study found that when an athlete is in a state of emotional suppression, their power output decreases (Wagstaff, 2014). Therefore, if mood can be altered in the weight room, it could potentially influence the athlete's workout performance. Many studies have evaluated items that can alter one's emotional state as well as mood. A previously published study by Lesiuk in 2010, found that that the music a person listens to affects their mood. Another study has shown that taking supplements, such as iron, can affect an athlete's mood (Woods et al, 2014).

Many studies have evaluated the modalities to alter one's emotional state as well as mood. These athletes did not feel tired as quickly and felt as if they could do more after a few weeks of taking these supplements (Woods et al, 2014). A study by Lesiuk in 2010, found that when people listen to music that they prefer, their emotional state and mood drastically improved (Lesiuk, 2010). Another study that looks at the way music can affect an athlete's workout showed that people that listened to motivational music experienced being in a better mood and better performance (Lane et al, 2011). Some of the people in this study were allowed to select their own music (with some guidelines) and others were assigned a standardized playlist that had synchronized running music. Both groups said that running with the motivational music improved their experience by making them feel fewer unpleasant emotions (Lane et al, 2011). Other ergogenic aids have also been found to aid perception and mood. A study completed by Woods et al. in 2014 found that long distance runners taking iron supplements improved the way that they perceived their mood during and after distance running. There have been many studies completed that have shown that moderate caffeine consumption can have a positive influence on one's mood (Dodd et al, 2015). Ruxton et al. (2008), surveyed participants to evaluate mood and exercise by asking how they felt when they finished running and also the time that it took to complete a run. It is clear that there are many ways to alter mood and perception of athletes that could potentially aid performance.

Another potential novel method of altering mood and performance is the introduction of canines. Furthermore, there is support that dogs may improve an individual's mood and reduce stress. A study done on undergraduate female students found that the increase of participation in activities with therapy dogs decreased their stress levels and increased their psychological arousal levels (Crump & Derting, 2015). Also, a previously published study indicated that when children were exposed to canines, they showed an improved mood state and enthusiasm as well as an increased motivation to

complete physical activities (Niewiadomska & Makris, 2015). As demonstrated many studies have shown a positive effect of dogs on human mood and other psychological aspects. However, to date, no studies have attempted to assess the impact that dogs may have in a traditional strength and conditioning setting. Thus, the current study evaluated the impact of the presence of dogs during a typical strength and condition session on Division III female softball players' mood, perception, and performance.

Methods

The data were from 7 females (n = 7) that were a part of the LaGrange College Softball team for the 2017/2018 season (63.8 ± 9.6 kg). The data was collected during the team's normal weight lifting sessions using an online survey. This study was approved by the LaGrange College Institutional Review Board. Each participant signed a consent form stating that they would allow their vertical jump and SRPE data to be utilized for the purpose of this study.

The data were collected during the softball team's normal strength and conditioning sessions that included 4 total body lifting sessions. The session breakdown can be seen in Figure 1. The first day of weight lifting occurred without dogs present, while the second day data was taken with the presence of dogs. The schedule was flipped for the following week. Athletes were encouraged to interact with the dogs throughout the sessions where they were present. SRPE was assessed following each training session using an electronic survey on a tablet.

Week 1	**Day 1** 3x10 @55% Total Body Push No Dogs	**Day 2** 3x10 @55% Total Body Pull Dogs
Week 2	**Day 1** 3x10 @55% Total Body Push Dogs	**Day 2** 3x10 @55% Total Body Pull No Dogs

Figure 1. Weight lifting session design

To evaluate performance during jumps, the athletes stood with their hands on their hips and completed 2 countermovement jumps (CMJ) on a triaxial force plate collecting data at 1000 Hz (Bertec 6090, Columbus OH, USA). Ground reaction force data were analyzed with a customized program coded in R (R Core Team, 2016). Variables obtained from CMJ testing included jump height (JH), rate of force development (RFD), peak power (PP), peak force (PF), and peak force scaled by body mass (PF/kg). Mean data from each jump was used for statistical analysis.

Statistical analyses were completed with SPSS (version 17.0, An IBM company, New York, NY). Paired samples *t* tests were completed for comparisons of volume load and jump performance variables between conditions. For the non-parametric comparison (RPE), a Wilcoxon Signed Ranks Test was used. As a measure of practical significance, Cohen's *d* effect size estimates were used. Cohen's *d* effect size measurements were interpreted with a scale provided by Cohen (0-0.29 as trivial, 0.3-0.49

as small, 0.5-0.79 as moderate, and >.8 as large) (Cohen, 1988). 95% confidence intervals were also used.

Results

The only measure with statistical significance ($p \leq 0.05$) was the volume load comparison for the total body push days with and without dogs (Table 1). RPE and jump measures showed no statistical significance.

The volume load comparison for the total body push day showed a moderate practical significance with a 0.75 for Cohen's *d* (Table 1). The peak performance jump measurement comparison also showed a moderate practical significance with a value of 0.52 for Cohen's *d* (Table 3a)

Table 1. Volume Load Results

	Push	PushDog	Pull	PullDog
Mean±SD	3261.43 ± 844.80	3854.29 ± 655.33	2851.43 ± 650.93	2888.57 ± 882.15
95% CI	3241.41 - 3281.45	3838.75 - 3869.82	2836.00 - 2866.86	2867.66 - 2909.48
t test	0.00*		0.85	
Cohen's *d*	0.75		0.05	

* indicates statistical significance ($p \leq 0.05$)

Table 2. RPE Results

	Push	PushDog	Pull	PullDog
Mean±SD	5 ± 1.29	4.86 ± 1.95	4.83 ± 1.33	4.29 ± 1.38
95% CI	4.97 - 5.03	4.81 - 4.90	4.80 - 4.86	4.25 - 4.32
t test	0.71		0.16	
Cohen's *d*	0.09		0.41	

* indicates statistical significance ($p \leq 0.05$)

Table 3a. Jump Performance Results

	JH	JH Dog	PP	PP Dog
Mean±SD	0.27 ± 0.04	0.28 ± 0.05	2446.74 ± 303.32	2675.77 ± 548.17
95% CI	0.26 - 0.26	0.28 - 0.28	2439.55 - 2453.93	2662.78 - 2688.76
t test	0.19		0.28	
Cohen's *d*	0.3		0.52	

* indicates statistical significance (p ≤0.05)

Table 3b. Jump Performance Results

	RFD	RFD Dog	PF/kg	PF/kg Dog
Mean±SD	4665.12 ± 3300.36	5162.19 ± 3353.48	24.74 ± 5.18	25.44 ± 4.54
95% CI	4586.90 - 4743.34	5082.71 - 5241.67	24.61 - 24.86	25.33 - 25.55
t test	0.23		0.25	
Cohen's *d*	0.15		0.15	

* indicates statistical significance (p ≤0.05)

Discussion

The purpose of this study was to investigate the effects of introducing dogs into a strength and conditioning scenario on Division III female softball players' mood, perception, and performance. The

primary finding was that the presence of dogs in the weight room on a total body push day allowed for an increase in volume load. This may allow for a greater stimulus and therefore, a greater adaptation to training.

There were no statistically significant differences between RPE conditions or jump performance variable conditions. Practically speaking, there was only a moderate difference in jumping peak power (effect size 0.52). If the sample were larger, the chances of statistical significance may increase. While many of the athletes may have verbally indicated that they felt better when the dogs were present, the data did not reflect that. While pet therapy has been found to be beneficial (Niewiadomska & Makris, 2015), this does not seem to be the case in the weight room. While the study did not support an increase in acute performance, the presence of dogs may encourage athletes to attend strength and conditioning sessions more regularly. Future research may wish to investigate this.

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References

Beedie, C.J., Terry, P.C., Lane, A.M. (2008). The profile of mood states and athletic performance: Two meta-analyses. *Journal of Applied Sport Psychology,* 12(1). 49-68. https://doi.org/10.1080/10413200008484213

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). New Jersey: Lawrence Erlbaum.

Crump, C., Derting, T.L. (2015). Effects of pet therapy on the psychological and physiological stress levels of first-year female undergraduates. North American Journal of Psychology, 17(3), 575-590.

Dodd, F., Kennedy, D., Riby, L., & Haskell-Ramsay, C. (2015). A double-blind, placebo- controlled study evaluating the effects of caffeine and L-theanine both alone and in combination on cerebral blood flow, cognition and mood. Psychopharmacology, 232(14). 2563-2576. doi: 10.1007/s00213-015-3895-0.

Lane, A.M., Davis, P.A., Devonport, T.J. (2011). Effects of music interventions on emotional states and running performance. Journal of Sports Science & Medicine, 10. 400-407. http://www.jssm.org/vol10/n2/22/v10n2-22text.php

Lesiuk, Teresa. (2010). The effect of preferred music on mood and performance in a high-cognitive demand occupation. Journal of Music Therapy, 47(2). 137-154.

Niewiadomska M., Makris, M. (2015). Impact of canine assisted therapy on emotions and motivation level in children with reduced mobility in physical activity classes. Pedogogics, Psychology, Medical-biological Problems of Physical Training and Sports, 5. 62-66. http://dx.doi.org/10/15561/18189172.2015.0511.

R Core Team (2016). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Ruxton. C.S. (2008). The impact of caffeine on mood, cognitive function, performance and hydration: a review of benefits and risks. Nutrition Bulletin, 33(1). doi: 10.1111/j.1467-3010.2007.00665.x

Wagstaff, C.D. (2014). Emotion regulation and sport performance. Journal of Sport & Exercise Psychology, 36(4). 401-412. doi:10.1123/jsep.2013-0257.

Woods, A. Garvican-Lewis, L.A, Saunders, P.U., Lovell, G., Hughes, D., Fazakerley, R. & Thompson, K. G. (2014). Four weeks of IV iron supplementation reduces perceived fatigue and mood disturbance in distance runners. PLoS ONE, 9(9). http:// dx.doi.org/ 10.1037/t35071-000.

Link: https://s3.us-east-2.amazonaws.com/lagrangecollegecitations/PuppyPerformance.pdf