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The Effects Of A Pilates Intervention On Arterial Stiffness And Trunk Flexibility

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Abstract:

Arterial stiffness has been identified as an independent risk factor for cardiovascular disease, whereas low trunk flexibility has been suggested to be a predictor of arterial stiffening. Pilates has been shown to improve trunk flexibility in middle aged women however, the effect of Pilates on arterial compliance has not been investigated.

PURPOSE: To determine the effect of a Pilates intervention on arterial compliance and trunk flexibility.

METHODS: Twenty participants (age range: 24-61 years) were assigned into either Group A: physically active individuals with previous Pilates experience (PEPA, n=8) or Group B: individuals without previous Pilates experience and/or physically inactive (NPE-LPA, n=12). Both groups participated in two 55-minute Pilates sessions per week for six weeks. In addition, all subjects performed a 10-min home programme twice a week in between sessions. Augmentation index (AI; %), peripheral (pSys and pDia; mmHg) and central blood pressures (cSys and cDia; mmHg) were recorded using a vascular testing device. Trunk flexibility index was calculated by adding the scores from a trunk flexion (sit-and-reach test) and a trunk extension test. All measurements were conducted at baseline and immediately after the six week intervention. **RESULTS:** In the PEPA group, there were reductions in all blood pressures post-intervention (pSys: 106 ± 7 mmHg v 102 ± 6 mmHg; $p=0.011$; pDia: 68 ± 6 mmHg v 65 ± 4 mmHg, $p=0.015$; cSys: 100 ± 9 mmHg v 95 ± 7 mmHg; $p=0.016$; cDia: 69 ± 6 mmHg v 67 ± 4 ; $p=0.029$). In the NPE-LPA group, significant decreases were noted post-intervention in AI (pre: $81 \pm 46\%$ and post: $59 \pm 33\%$; $p=0.014$) and cSys (pre: 103 ± 13 mmHg and post: 99 ± 9 mmHg; $p=0.049$). Significant decreases in trunk flexibility were observed in both the PEPA (89.3 ± 17 cm v 95.4 ± 16.1 cm; $p=0.001$) and NPE-LPA group (70 ± 24.2 cm v 76.5 ± 20.2 cm; $p=0.026$). A link between poor trunk flexibility and arterial stiffness was observed, but was not statistically significant ($p>0.05$). **CONCLUSION:** Findings suggest that Pilates is effective for reducing arterial stiffness and/or maintaining the elastic properties of the arteries. The exact mechanisms could not be associated with increases in flexibility in this study. It might be that increases in muscle strength play a role, however further research is needed to ascertain this relationship.

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