

The effect of external-focus using a paper balloon on the activity of upper limb and trunk muscles during static and dynamic tasks

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Abstract

BACKGROUND:

External focus isometric exercises using a paper balloon can change trunk muscle activation in the chest squeeze; however, it is unknown whether this method affects muscle activities in conventional exercises.

OBJECTIVE:

To check variations of trunk muscle activity during front plank (static task) and shoulder press (dynamic task) both with and without instruction to avoid crushing an object.

METHODS:

Twenty-six healthy adult males aged 19–49 were recruited. Ten trunk muscle activities were measured using surface electromyography during a front plank and dynamic shoulder press exercises, both with and without external-focus instruction.

RESULTS:

Adding the external-focus using the paper balloon to the front plank significantly activated 8 out of the 10 muscles. In the downward shoulder press, 5 out of 10 muscles with 50% 1 RM, 2 out of 10 muscles with 100% 1 RM were significantly activated.

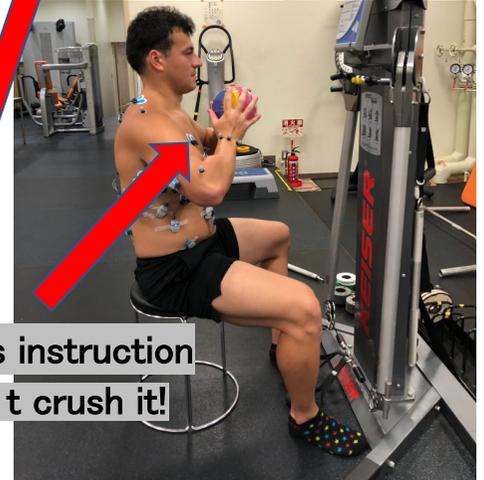
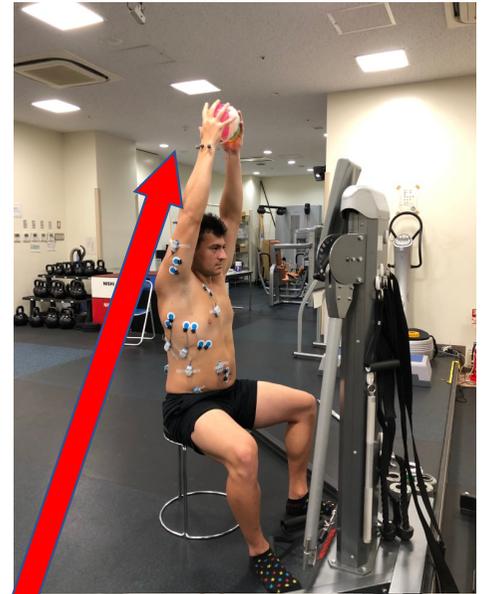
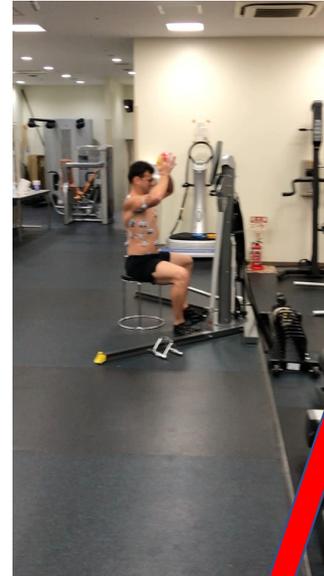
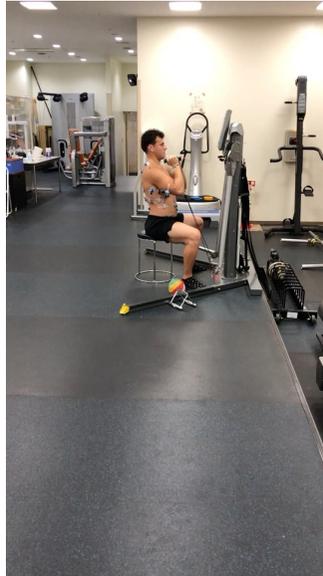
CONCLUSIONS:

Adding external-focus instruction using paper-balloon increases trunk muscles in front plank and shoulder press while possibly improving trunk stability. Novel exercises using paper balloon may efficiently activate specific muscles without external loading thus possibly reducing the stress on the involved joints during exercise.

Seated press task プレス課題



100% max, 50% max



Keep external focus instruction
press hard but don't crush it!

VS

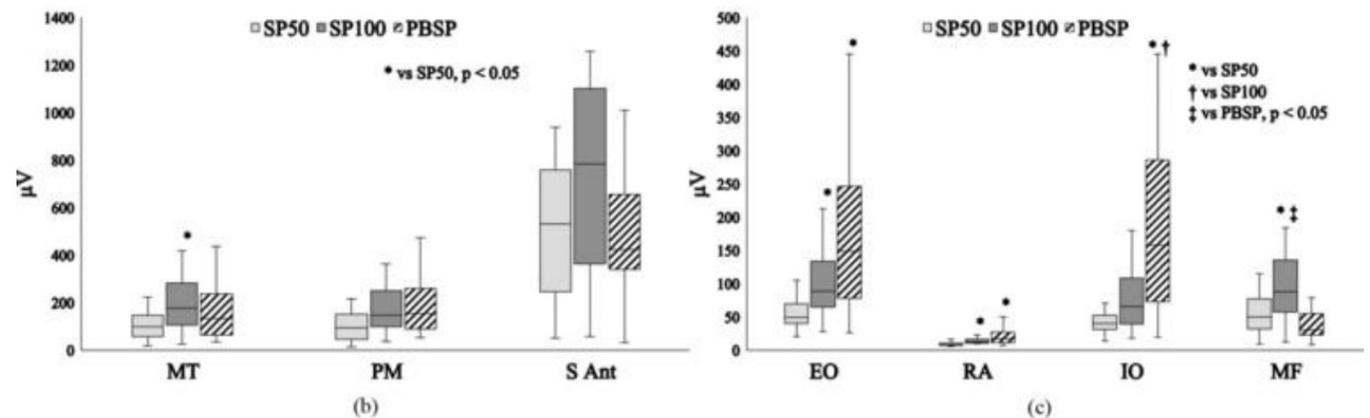
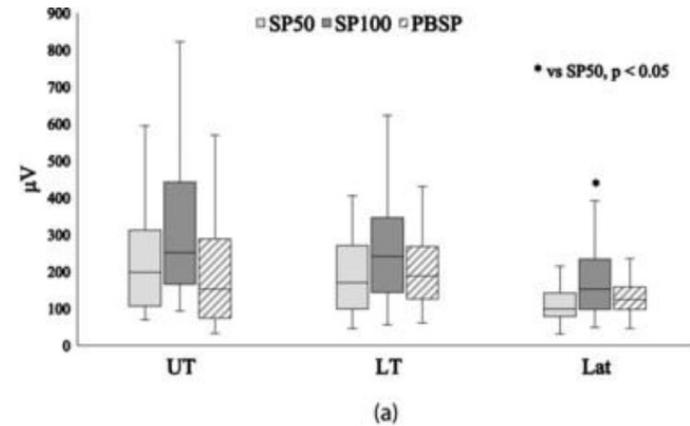
Paper balloon method

Upper trapezius (UT), lower trapezius (LT), latissimus dorsi (Lat), medial head of the triceps brachii (MT), clavicular part of the pectoralis major (PM), serratus anterior (S Ant), external oblique (EO), rectus abdominis (RA), internal oblique (IO) and multifidus (MF) muscles

SP50= 50% 1 RM

SP100= 100% 1 RM

PBSP = Paper balloon Method



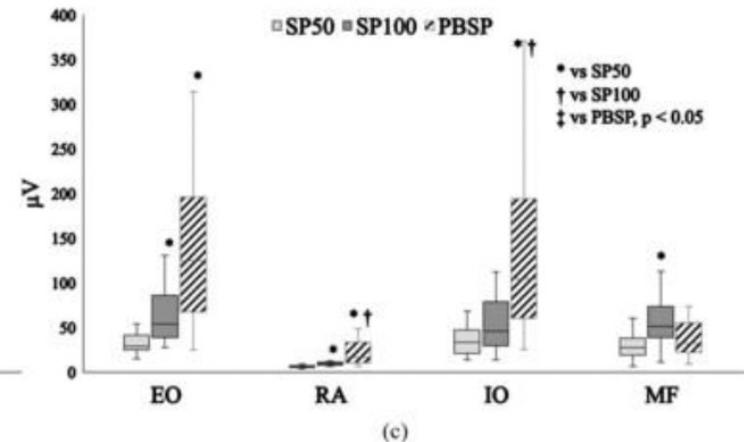
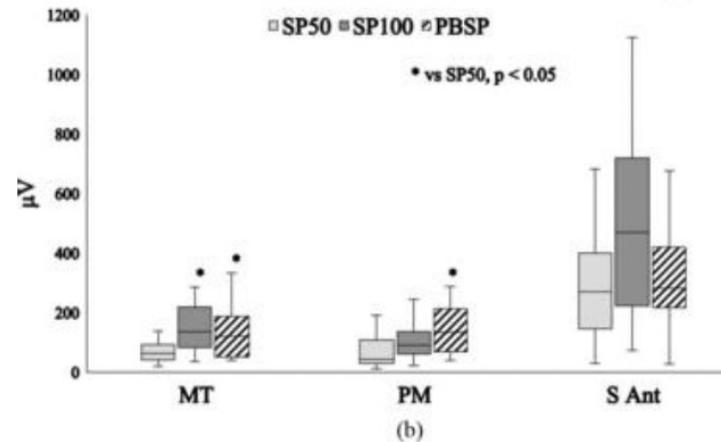
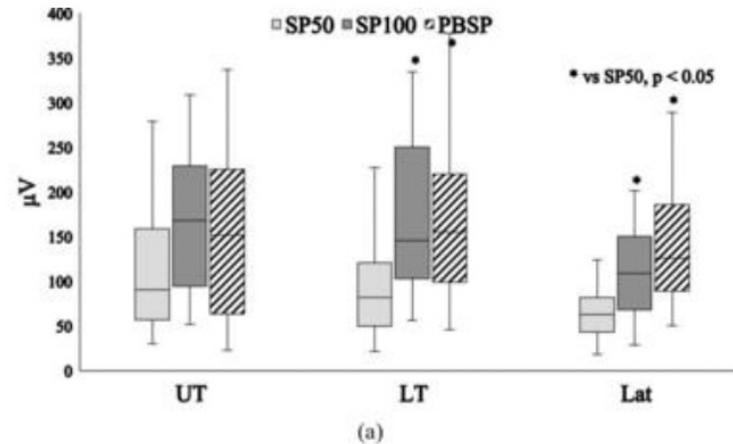
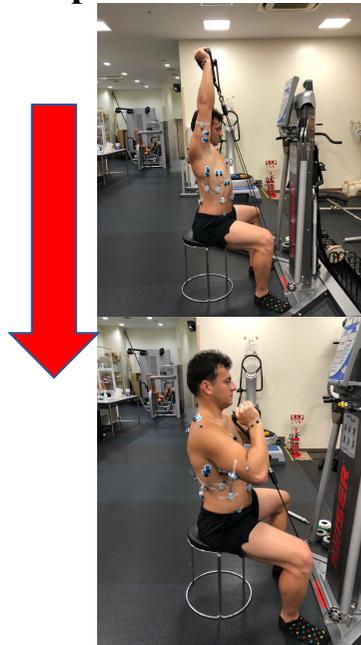
Paper balloon method were significantly activated in upward shoulder press, 3 out of 10 muscles with 50% 1 RM, 1 out of 10 muscles with 100% 1 RM.

Upper trapezius (UT), lower trapezius (LT), latissimus dorsi (Lat), medial head of the triceps brachii (MT), clavicular part of the pectoralis major (PM), serratus anterior (S Ant), external oblique (EO), rectus abdominis (RA), internal oblique (IO) and multifidus (MF) muscles

SP50= 50% 1 RM

SP100= 100% 1 RM

PBSP = Paper balloon Method



Paper balloon method were significantly activated in downward shoulder press, 7 out of 10 muscles with 50% 1 RM, 2 out of 10 muscles with 100% 1 RM.