

# Comparison in the Effect of Linear Polarized Near-infrared Light Irradiation and Light Exercise on Shoulder Joint Flexibility

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## Abstract

**OBJECTIVE:** This study aimed at comparing the effect of linear polarized near-infrared light irradiation (PL irradiation) and bicycle exercise with 50%HRreserve on the flexibility of the shoulder joint. **DESIGN:** Placebo-controlled trial.

**SETTING:** Twenty-four healthy young adults (10 males: mean $\pm$ -SD, age 20.9 $\pm$ -3.1 y, height 171.0 $\pm$ -3.9 cm, body mass 63.4 $\pm$ -3.5 kg and 14 females: age 21.2 $\pm$ -1.7 y, height 162.0 $\pm$ -7.8 cm, body mass 56.2 $\pm$ -7.2 kg). **INTERVENTIONS:** PL-irradiation (100%, 1800 mW), placebo-irradiation (10%,180 mW), and light exercise (50%HRreserve) for 10 minutes. **OUTCOME**

**MEASUREMENTS AND RESULTS:** The shoulder joint angles were measured twice-before and after each intervention. We measured the angles when the right shoulder joint extended forward and flexed backward maximally without support, and analyzed these shoulder joints and range of motion. Trial-to-trial reliability (intraclass correlations) of each joint angle was very high, over 0.98. All joint angles showed significant changes, and values in post-PL-irradiation and postlight exercise were significantly greater than that in postplacebo-irradiation. Shoulder forward flexion and backward extension angles had significantly greater change rates in PL-irradiation and light exercise than placebo-irradiation, and their range of motion angle was in the order of PL-irradiation, light exercise, and placebo-irradiation.

**CONCLUSIONS:** It is suggested that PL-irradiation produces almost the same effect on shoulder joint range of motion as light exercise.