研究業績　英文表記

和文	
表題	異なるストレッチング強度を用いたストレッチングが関節可動域や大腿四頭筋スティフネスを及ぼす影響の検討
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英文	
Title	The comparison of different stretching intensities on the range of motion and muscle stiffness of the quadriceps muscles
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Abstract	Muscle strain is one of the most frequent sports injuries, having the rectus femoris (RF) muscle as the reported preferred site of quadriceps muscle strain. The decrease muscle stiffness could be an effective RF muscle strain prevention. In recent studies, a high-intensity static stretching intervention decreased passive stiffness, though no study has investigated on the effect of the different static stretching intervention intensities on quadriceps muscle stiffness. The purpose of this study was to investigate the three different quadriceps muscle stiffness intensities (120 vs. 100 vs. 80%). Eighteen healthy, sedentary male volunteers participated in the study and randomly performed three intensities. The static stretching intervention was performed in knee flexion with 30° hip extension. Three 60-second stretching intervention with a 30-second interval were performed at each stretching intensity. We measured knee flexion range of motion and shear elastic modulus of the RF muscle used by ultrasonic shear-wave elastography before and after the static stretching intervention. Our results showed that the knee flexion range of motion was increased after 100% ($p < 0.01$) and 120% intensities ($p < 0.01$) static stretching intervention, not in 80% intensity ($p = 0.853$). In addition, our results showed that the shear elastic modulus of the RF muscle was decreased only after 100% intensity static stretching intervention ($p < 0.01$), not after 80% ($p = 0.365$), and 120% intensities ($p = 0.743$). To prevent the quadriceps muscle strain, especially the RF muscle, 100%, not 120% (high) and 80% (low), intensity stretching could be beneficial in sports setting application.
keyword	high-intensity stretching; shear elastic modulus; static stretching; stretch tolerance; visual analog scale

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