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Smart shirt with textile strain sensors as experimental method for ballerina shoulder girdle motion control

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Smart textile products are widely used in different fields of engineering and everyday life now. For example, smart garments find wide range of healthcare applications, including health monitoring and rehabilitation. In sports and biomedical applications, smart sensors and smart sensor garments had been used for sports performance improvement of an individual and recovery and the correction of movements and ergonomics. One of the main parts of smart garment is the sensing system which can include one or several sensing elements for posture and joint motion control. Ballet is a type of performance dance which requires a series of movements in which the person moves in space and time to the rhythm of music. Ballet is a high-performance dance that requires an advanced level of technical skills, movement precision and aesthetic, advanced motion coordination. Ballet dancers are described as athletes because they can perform complex, physically demanding routines and are subjected to long periods of coaching. The aim for this single subject experimental (ABA) design study was to capture and monitor shoulder girdle motion during training sessions for ballerina Scheherezade and her tales, Sun variation theme out of laboratory environment for ballerina with type I or Inferior scapular dysfunction (Kibler classification). External visual feature is the right-side prominence of the inferior angle because of anterior tilting of the scapula in the sagittal plane and excessive shoulder elevation during shoulder flexion and abduction above shoulder level, compare with left side. As monitor tool have been used smart shirt with textile strain sensors (made in Rigas Technical University, patent number: LV 14920), which captures motion in real time and gives visual feedback on electronic data processing device screen. Smart shirt has been used in addition to conventional physiotherapy to reduce right side shoulder girdle elevation during advanced motion as ballet performance. Results showed that smart shirt can be useful and convenient in addition to conventional physiotherapy for ballerina shoulder girdle motion control.

Biography

Guna Semjonova has completed her BSc from Riga Stradins University, Latvia. Presently, she is pursuing Master's degree in Health Sciences (Physiotherapy) in Riga Stradins University, Faculty of Rehabilitation. She is Member of Performing Arts Medicine Association and Latvia Physiotherapy Association and has four-year work experience as Physiotherapist in field of traumatology and orthopedics.

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