Virtual reality could improve your balance, study finds

March 19 2019

Credit: CC0 Public Domain

Vision changes can entail major problems in everyday life. To a high degree, vision affects our ability to keep our balance, and balance affects our ability to move around.

"People with long-term dizziness sometimes rely a lot on their vision and do not use the very quick and effective balance system provided by sensory information from joints and muscles. This can intensify feelings of dizziness, which is very unpleasant. The new study shows a possible treatment method for these conditions," says Eva Ekvall Hansson, researcher and associate professor of physiotherapy at Lund University.

Twenty healthy women and men took part in the study, in which they watched a Virtual Reality (VR) simulation of a roller-coaster ride while standing on a platform which registered their postural stability. The researchers investigated how the participants' balance system was affected when visual information was disrupted by the experience of being in a VR environment which gave them a strong sensation of being in movement.

The study shows that the human balance system can very quickly cease to rely on vision and use other senses instead, such as sensory information from the feet, joints and muscles to increase postural stability. Differences also emerged in how men and women are affected by watching a VR video. More women had difficulty maintaining their balance in a VR environment and they generally needed more practice before they learnt to use their other senses to increase postural stability.

"VR can thus be an effective tool in rehabilitation, to train the patient's ability to rely on senses other than vision to keep their balance. However, some women may need additional practice to achieve the same effect as men in the rehabilitation of certain types of injuries related to vision," says Måns Magnusson, professor of otorhinolaryngology research at Lund University and consultant physician at Skåne university hospital.

"We know that older people, to a greater extent than young people, use vision to maintain postural stability. The lessons from this study will therefore be an important incentive to introduce new training methods

for the older, for example using VR technology to prevent falls," concludes Ekvall Hansson.

More information: Per-Anders Fransson et al, Postural instability in an immersive Virtual Reality adapts with repetition and includes directional and gender specific effects, *Scientific Reports* (2019). DOI: 10.1038/s41598-019-39104-6

Provided by Lund University