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Theories and applications of Gymnastics
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Abstract of the study in English

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The impact of some biomechanical determinants on landing performance in men's artistic gymnastics

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Landing in gymnastics is one of the most important parts that determine the final arrangement of gymnasts in different competitions. So, in this study we aim to identify some biomechanical variables which before the landing phase and its effect on the landing performance level. The research sample was a male gymnast under 12 years stage performing landing from a dismount of a double back somersault tucked on the horizontal bar, that because of the deficiencies in the landing performance for this stage. The two dimensions analyzing was applied by recording the attempts with a Nikon d5500 digital camera with a 60fps speed and 1080p resolution, a tripod, a computer, Nikon M.E view NX 2 software for editing the videos, and motion track analysis software for analyzing the attempts. The attempts were recorded in the Egyptian Republic Championship for the stage under 12 years season 2016/2017. Then the attempts were ranked by the level of the landing performance score (stick landing – landing with small errors – landing with medium errors – landing with large errors). For choosing a sample of each level a group of 3 gymnastics judges had determined the deductions for each gymnast during the stage of the dismount and the stage of landing each separately for ranking it depending on the level of landing performance in each attempt. The researcher analyzed the attempts by using the motion track analysis software for determining the values of the biomechanical variables. The most important conclusions were - the greater the horizontal distance between the gymnast's body and the bar, the more deductions in the landing phase. The takeoff angle and shape of the gymnast's body after leaving the bar has a big role in determining the vertical distance from the landing surface during the performance of the dismount. The sufficient vertical distance between the gymnast's body and the landing surface provides the opportunity for early preparation and landing without errors. Preparation for landing from an appropriate distance reduces the chances of making mistakes when landing. And the most important recommendations were - Concentration while leaving the bar on both the takeoff angle and perfect body tucked shape in the recommended position that the International Federation notice to ensure the maximum possible height that helps gymnast's performance of the dismount in sufficient time and with ability to prepare for the landing phase properly. The gymnast's body must be reached a vertical distance of not less than 3.18 meters from the landing surface to ensure a safe and good landing without error. The distance that the gymnast have to start extending his body and preparing for landing should be determined, and should not be less than 1.69 meters. Training the position of the arms during the landing to be forward and upward when landing and then forward and down in the balance and stability phase. Allotment a part of the training for the motion absorption from different heights because of its great role in the stability of the gymnast.