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Development of an application for mobile devices to evaluate the balance and risk of falls of the elderly

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Abstract: Aging is defined as a natural and physiological process that progressively accompanies the life cycle. As well as psychosocial complications, physical losses also occur, resulting in slow reasoning, depression, functional disability, loss of strength, inactivity and physical degeneration. The application of the functional tests is intended to aid clinical evaluation by providing data on the patient's mobility capacity and revealing possible balance deficits. The use of smartphones in health is growing as it provides professionals with more agility and flexibility in their work, from the time of data collection to the use of applications that assist with patient evaluation. The sensors embedded in these devices are increasingly being used in the evaluation of balance and gait. One of these sensors is the accelerometer, which has the potential to aid clinical procedures, offering quantitative data for assessment and balance and gait training.

Objective: to develop an application for mobile devices to evaluate the balance and risk of falls of the elderly.

Method: A cross-sectional study with a sample composed of 54 elderly individuals with an average age of 71 years submitted to three balance and risk of falls evaluation tests, was performed. The Timed Up and Go (TUG) and Performance Oriented Mobility Assessment (POMA) tests were employed.

Results: The results were closely correlated, identifying three groups of volunteers: low, medium and high risk of falls. When these values were compared with the analyzes performed by the application, some of the variations in the results generated by the application were not related to the classic tests, as the software could discriminate between individuals with a high and low risk of falls.

Conclusion: The developed application was able to verify the oscillations present in the maintenance of static balance of the elderly and could differentiate the results into two groups of high and low risk of falls.

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