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Elderly: health services and human resources requirements in Portugal

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ABSTRACT

Introduction: Portugal with the demographic aging process increased the number of elderly people. The economic global crisis printed restrictions in the National Health Service, with centralisation at the local level, distancing health services and human resources from the elderly population. This scenario gains more serious proportions because the current elderly population lives principally alone or accompanied by another elderly; has a low level of education; is economically disadvantaged; lives with chronic pathology installed. In this context, local health services and human resources are essential [1,2]. Accordingly, we put the guiding question: What adjustments should be made in health services and human resources as the Portuguese population ages, specifically at the level of primary health care, rehabilitation units, continued care and palliative units?

Materials and methods: We questioned a panel of 44 experts made up of Ministers; Secretaries of State; public bodies with health functions; Orders and Associations of health professionals; Hospital Technical Commissions; public health agencies; Academics; Specialists. We used the Delphi method. The elaboration of the questionnaire went through a phase of construction and a phase of validation using a similar panel of experts. The final questionnaire is composed of 55 questions about several dimensions related to the binomial elderly/health and specifically about the dimensions: proximity; urban and rural regions; health services response as primary health care, rehabilitation units, continued care and palliative units. The questionnaire was submitted to one round because a consistent consensus was reached [1].

Results: The panel answered that: the number of elderlies is an important factor to consider on health system political decisions making process; there is a need to adapt the health professions specialties; the existing services and human resources do not respond to the needs, because current services do not fit the characteristics of the current elderly; the biggest adequacy problems are located at the interior and rural level but the urban areas are also not well; the proximity of health services and primary health care are essential for the promotion and maintenance of the health and quality of life of the elderly; the units of continuous care, palliative care, and rehabilitation care, do not respond to the needs and should be multiplied in the national territory; deliberate the importance of institutions' creation that provides home health care throughout the country, to keep the elderly in their homes and close to their families and their environment; the investment in health should be focussed to the human resources and towards primary health care followed by rehabilitation care, continued and palliative care [1]

Discussion and conclusions: The health services and human resources at the level of primary health care, rehabilitation care, continued and palliative care, should multiply in the national territory to increase proximity to the elderly. Specifically, primary care and rehabilitation units, with the necessary human resources, physiotherapists are implicit, to achieve excellence in elderly health and quality of life [1].

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Acknowledgments

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Estimating anatomically plausible segment orientations using a kinect one sensor

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ABSTRACT

Introduction: Marker-based motion tracking systems are the golden standard for human motion analysis, however such systems are expensive, non-portable and require long time subject preparation. The Kinect One sensor, being inexpensive, portable and markerless, appears as a reliable and valid alternative to the marker-based systems in several situations [1–3]. This sensor acquires depth image data and colour camera data that are processed by a tracking algorithm to estimate the three-dimensional position of twenty-five anatomical joints in real-time [4]. Nevertheless, the internal orientations of each anatomical segment are poorly estimated. The main objective of this work is to study the effectiveness of vector orthogonalization methods to estimate the relative internal orientations of the anatomical body segments using the skeletal data acquired by a Kinect One sensor.

Materials and methods: Twenty-eight young healthy adults (25 ± 9 yrs old, 170 ± 9 cm height, 61 ± 9 kg weight, 13 women) performed 5 repetitions of ten different elementary movements: shoulder flexion/hyperextension, shoulder abduction/adduction, shoulder transversal abduction/adduction, shoulder medial/lateral rotation, elbow flexion, forearm pronation/supination, hip flexion/hyperextension, hip abduction/adduction, knee flexion and hip medial/lateral rotation. On each repetition, the subject initiated the movement in an adapted pose of the anatomical reference position and once finished returned to the initial position. Data was collected, simultaneously, using a marker-based system (Qualysis — 100 Hz) and a markerless system (Kinect One — 30 Hz). All participants signed consent forms.The biomechanical model used was composed by eleven anatomical segments: the head, the chest, the abdomen and both arms, forearms, thighs and legs. Six different vector orthogonalization methods (Householder, Eberly, Square Plate, Spherical and Projection Matrix) were used to estimate the relative orientations of the anatomical body segments from Kinect One sensor model [5]. Pearson's correlation coefficient was used to compare the anatomical body segments orientations of all model segments obtained with both systems.

Results: The results obtained show that the six techniques implemented present a moderate to high correlation ($0.58 - 0.93$) between segments longitudinal axis of rotation while for the remaining axes (anterior-posterior and medial-lateral) they show a moderate to negligible correlation (–0.37 to 0.46). Additionally, the performance of each technique varies according the selected movement. For example, the Householder technique presents different correlation values when applied to the following movements, hip flexion (0.84), hip abduction (–0.05), knee flexion (0.78), shoulder flexion (0.36), elbow flexion (0.80) present relevant differences.

Discussion and conclusions: Although vector orthogonalization techniques are capable to estimate plausible orientations, the results given the same movement shows significant differences, suggesting that not all vector orthogonalization techniques are appropriate for all movements. Therefore, it is necessary to careful select the best technique for each movement in order to obtain valid results. Finally, it is possible to conclude that Kinect One shows good results for some kinematic variables, nevertheless, it needs to improve the precision on the estimation of the joints' position and all body segments' orientation in order to obtain results similar to marker-based systems.

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Functional capacity and health status in patient with chronic obstructive pulmonary disease

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