What factors are relevant to define the functional sitting position in an activity chair?  
Preliminary results.

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INTRODUCTION

According to the International Standard Organization (ISO), an assistive technology is defined as a product designed to prevent impairments, activity limitations or participation restrictions [1]. Furthermore, assistive technologies promote the ability to live independently and participate in daily activities [2]. In the future, there will be a larger proportion of older people who live longer, which means that an increased use of assistive technologies will be expected [3,4]. Activity chairs are an example of an assistive technology designed for people with altered balance, mobility, power, and endurance [5]. Activity chairs, such as the VELA chair, serve to compensate for loss of function and support the citizen in carrying out daily activities at home as for example cooking, cleaning, and doing laundry while seated [5]. Active but controlled sitting is believed to activate muscles and supporting structures and therefore prevent static loads acting on joints, ligaments, and tendons [6]. Furthermore, an alternating sitting position significantly enhances muscular activity, which can be additionally beneficial for the activity chair’s target group [6].

Since activity chairs are used to support performing activities of daily living while seated, it is important that they support a functional sitting position. It is however, difficult to find research-based literature that helps to define "the functional sitting position". Therefore, the objective of this study is to identify in the literature factors that can contribute to develop a definition of the functional sitting position with special focus on the relation between the person and the chair, while performing activities.

METHODS

A literature search was performed in PubMed and Cinahl using search terms like for instance: functional sitting position, chair, office chair, ergonomic, movement, stability, balance, activity, and performing tasks. The search terms were systematically combined. The inclusion criterion was that the articles where published in peer-reviewed scientific journals from 1990 to 2019. No methodological restrictions were applied.

The identified publications were screened first based on the title and abstract and then, based on the full paper. Duplicates were removed and the final sample was synthesized to reveal what factors are relevant to consider for developing a definition of the concept of functional sitting position.

RESULTS

According to the literature search and synthesis, the following three factors were found relevant for developing a definition of functional sitting position:

a. Body position

Forward inclination is important for a functional sitting position because it promotes improved upper extremity function [7, 8, 9], trunk extension [10], and improved postural efficiency [11, 12, 13] and permits engagement in functional tasks [14]. Furthermore, forward tilted seating (seating surface inclined 15°) is, in terms of postural activity, a more efficient position for postural efficiency compared to horizontal (0°) and backwards tilted (seating surface reclined 15°) sitting positions [11]. The most efficient posture is that with the least postural muscle activity in postural adjustments [11].

b. Mobility

Chairs with multiple degrees of freedom provide enhanced spinal mobility, which may be beneficial for the general wellbeing and does it possible to preform different movement and activities [15]. Spinal mobility
includes twisting, which helps to perform functions in the lateral and posterior space by increasing the area of reach [16].

The functional sitting position requires control in various sitting positions, and multiple movements of the spine and pelvis are needed to maintain the various sitting positions [17].

c. Balance

Sitting balance is assumed to be essential for obtaining independence in other vital functions such as reaching, sit-to-stand, and sitting down [18-20]. Balance is therefore relevant to consider in particular with regards to reaching tasks that might challenge the users’ postural stability.

DISCUSSION AND CONCLUSION

According to the results, three factors were identified in the literature as contributing to the development of the concept of functional sitting position. Collectively, they address body position, mobility, and balance. However, the literature that was included in the synthesis is rather old and sparse. This indicates that there is a need to work further in developing the concept of functional sitting position.

REFERENCES


