

IFSHT

A Pilot Study: Exploring the musculoskeletal risk exposure associated with drying of laundry using the public housing pipe-socket system amongst women in Singapore

Lee Hong Rui

Lee Hong Rui (1), Therma Cheung (1), Yang Zixian (1), Anna Pratt (2)

(1) *Singapore General Hospital, Singapore*; (2) *Brunel University London, UK*

The homemakers are one of the largest referral populations for hand therapy in the Singapore General Hospital (SGH). In the category of musculoskeletal disorders (MSD), the homemakers comprised the second largest population of referrals for hand therapy in SGH in year 2012. One of the main roles of a hand therapist is to educate these patients on the ergonomic practices to perform housework. However, the biomechanical risk related to housework has been minimally studied. It was postulated that the biomechanics involved in the performance of laundry-drying in Singapore public-housing using the pipe-socket-system (PSS) could expose the homemakers to several upper limb MSD risk. Objective: The aim of this study is to identify the biomechanical strain involved in the nine sub-tasks involved in drying of laundry amongst the female homemakers living in Singapore public-housing using the PSS. The findings of the study could be used to formulate strategies that homemakers could use to minimise the risk of MSD occurrence and re-injury, while performing this task. Materials and Methods: Using snowball sampling approach, five female homemakers who were familiar with performing laundry-drying using the PSS were recruited. The task of laundry drying with PSS was divided into nine subtasks. The postures of the participants were analysed from video-recorded data and scored (low, medium or high risk), using the Rapid Entire Body Assessment (REBA) for each subtask. Results: This pilot study revealed very strong evidence ($p=0.001$) that the participants were exposed to medium musculoskeletal risk exposure (MRE) (REBA score: 4.3) when performing this laundry task. The sub-tasks “retrieving and returning the bamboo poles to the overhead racks” were ranked the highest in REBA score (medium risk level). The next highest in REBA score rating were sub-tasks “bringing the bamboo poles out with partially wet laundry” and “removing the dry laundry from the poles” (medium risk level). Extreme awkward postures to the shoulders and wrist, and repetitive thumb pinch and forearm rotation motions were consistently observed in the participants. The high REBA scores observed in this study could be due to two reasons: 1. the awkward postures adopted by the participants due to confined space, 2. the repetitive motions needed to complete the laundry-drying housework. Conclusion: This is the

first biomechanical study related to a laundry task using the PSS in Singapore. This study has provided useful insights on the biomechanical factors that could affect the MRE of the homemakers. Based on the findings from this study, we suggested education for these patients should include the concept of convenient reach and Chaput's principle of manual handling to reduce the biomechanical load in the task. To validate the effectiveness of the strategies suggested in this study, future research should focus on evaluating the effectiveness of the strategies to reduce MRE in laundry as suggested by the findings of the present study. Results from this pilot study estimated that a sample size of 10 participants would be required to detect the effect size with a power of 0.8 and at the 0.05 level of significance.