C. HUANG, C-L. CHEN. Design and evaluation of the armrest of an assistive sofa for older adults. Gerontechnology 2018;17(Suppl):163s; https://doi.org/10.4017/gt.2018.17.s.158.00 **Purpose** The sofa may be one of the most popular pieces of furniture in our living rooms, however, most older adults are reluctant to sit on sofas due to their deteriorated musculoskeletal system. The reason is that the seat height of the sofa is too low for them to sit down or stand up without a struggle. We proposed an assistive sofa in which its seat is lifted up and down by a motor to help older adults sit down and get up easily. In a test, more than 90% of the respondents were satisfied with this design. However, it was observed that many respondents were holding their umbrellas (it is quite common as a substitute for cane in Taiwan among older adults) while doing the test. Janssen et al. argued that the armrest is one of the determinate factors to help people standing up from a chair[1]. Therefore, we added a pair of armrests beside the seat to provide a good grip for users to hold on. This study aims to evaluate effects of the armrest in helping older adults get up and sit down on the assistive sofa. **Method** A new design was prototyped (*Figure 1*). Armrests were connected on the side-end of the seat and moved up and down along the seat. A usability test was carried out[2]. Thirty older adults, aged 65-85 (males n=15, females n=15) from an elderly daycare center in Taipei City were recruited for the test. Respondents were asked to get up and sit down on the prototype with and without holding armrests respectively (*Figure 2*). Two "Wii Fit" balance boards were used to detected changes of the respondents' foot pressures. The peak pressure was captured by a laptop computer in the moment when the respondent's buttocks left or touched the seat pad for analysis. **Results & Discussion** As a result, 25 effective samples were collected, including 11 males and 14 females, with an average age of 74.8 years old (*SD*=7.02), average height of 155.3cm (*SD*=8.56), and an average weight of 57.5kg (*SD*=12.36). *Table 1* shows that there was no significant difference identified between sitting down without holding the armrest (SNH) and holding armrest (SWH). However, there was a significant difference identified between getting up without holding the armrest (RNH) and holding the armrest (RWH). This means that the armrest is helpful for shifting a certain portion of their body weight for older adults while maintaining their balance, especially when getting up from a sofa. Although the effect was not significant in the sit-down situation, its balance effect remains to be explored. We concluded that the adding of the armrest has positive effects on releasing the burden for users when they get up from the assistive sofa and keeps them in good balance.

References

1. Janssen WG, Bussmann HB, Stam HJ. Determinants of the sit-to-stand movement: a review. Physical Therapy 2002;82:866-879
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Table 1. Peak foot pressure of the respondents in sit-down and rise-up (n=25)

	SNH	SWH	RNH	RWH
Mean (kg)	59.43	59.30	59.86	56.79
SD	15.79	15.57	17.50	17.46
P(T<=t)		0.4551		0.0003

Figure 1. Prototype

Figure 2. Usability test