

## Ergonomic evaluation of grater

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■ **ABSTRACT** : The use of modern gadgets and appliances in recent years has apparently simplified the methods of performing household activities. It has on other hand brought in several ergonomic issues towards the health and safe working performance of the users. As there are very few ergonomical studies on kitchen tools, the present study was conducted to evaluate identified models of graters through case analysis. Four models of graters were identified based on the household and market survey and the ergonomic evaluation was carried out on a multiparametric approach. The quantitative and qualitative evaluation of the identified models of the graters revealed that more energy and time was spent while using grater 1 compared to other graters. Grater 2 was found to be user compatible in view of user's comfort, safety and efficiency.

■ **KEY WORDS** : Awaren

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**F**ood preparation, a part of cooking activity involves the use of kitchen tools *i.e.* knives, peelers, tongs, graters, beaters and many more. Different models of these tools are available in the market which may be ergonomically compatible or incompatible and the women may not give much thought in making wise choices with regard to the design of the tool in terms of comfort and usability. Graters are one of the important and frequently used kitchen tools. These should be chosen not only with the view of how well they will grate food but also how easily they can be cleaned. The designer should take conscious advantage of unique human capabilities while designing tools. Reduced injuries, fatigue and mental stress are sufficient reasons in themselves for applying ergonomics, independent of any associated cost savings. Hence, the present study was taken up to evaluate the design features of different identified models of graters available in the market.

The study was conducted in the twin cities of Hyderabad and Secunderabad of Andhra Pradesh. Four models of the graters were identified from the household and market survey. A subsample of ten respondents was taken as a sample for case analysis after standardizing the procedure. The experiments were conducted in their respective homes in twin cities of Hyderabad and Secunderabad. The ergonomic

evaluation was carried out on a multiparametric approach considering the two major aspects of subject and object through quantitative and qualitative evaluation. Four types of commodities which are commonly grated and comprises of hard and soft food categories were selected for the study *i.e.*, dry coconut, fresh coconut, carrot and cucumber. Two hundred and fifty grams of each commodity, which is sufficient for a meal of medium sized family was taken. Each experiment was carried out in three replications.

The profile of the identified models of the graters (Fig. 1) in terms of their dimensions was studied which is depicted in Table 1 under object aspect. The quantitative evaluation was conducted under subject aspect. The anthropometric and physiological aspects of the users were studied under quantitative evaluation.

### **Anthropometry :**

The user's anthropometry is one of the vital issue to be considered while evaluating grater. The biomechanical aspects considered were Grip strength and wrist angle.

In the present study the grip strength of both right and left hands were taken. The results indicated that there was highly significant reduction in grip strength from neutral posture with 90° elbow flexion in case of grater 1 compared to