

Assessment of resting, activity and total energy expenditure in free-living Thai elderly: A pilot study

Introduction: Obesity and non-communicable diseases (NCDs) are increasingly prevalent among Thai older adults. Establishing guidelines for healthy diet and lifestyle to address this problem, require a basis on dietary energy recommendation that suits body conditions and local context. To derive the dietary reference values for energy, the data gap on energy expenditure in relation to various physical activity levels must be filled. Therefore, this study aims to measure resting/activity and total energy expenditure through the use of stable isotope technique and to determine associations between these values and body composition indices among free-living Thai older adults.

Methods: The study was an observational, cross-sectional design, enrolling 35 free-living and relatively healthy elderly who are able to perform their daily activities (aged 62 to 83 years, 16 men and 19 women). The total energy expenditure (TEE) was measured using doubly labeled water technique. The Resting energy expenditure (REE) was measured by respiratory gas analysis, and the activity energy expenditure (AEE) was derived from the difference between TEE and REE, assuming the thermic response to feeding contributes 10% of TEE. Physical activity level (PAL) is the ratio of TEE to REE. Body composition estimates were determined using dual energy x-ray absorptiometry (DEXA).

Results: Measured TEE and REE were significantly higher in males comparing to females (Figure 1A). REE accounted for the largest component of TEE (57.6 % for men and 53.8 % for women, followed with AEE (36.2 % for men and 33.6 % for women). Multiple regression analysis showed that FFM could explain 70.5 % and 30.9 % of the individual variation in REE and TEE, respectively. TEE varies greatly within volunteers due to variation in physical activities, in which PAL ranged from 1.2 to 2.6 in men and 1.1-2.3 in women (Figure 1B). A trend decrease in PAL with age was observed only in females, this finding needs to be confirmed with larger sample size. There was no correlation of AEE with FFM or % body fat.

Conclusion: In this group of free-living older adults, total energy expenditure is majorly influenced by different levels of physical activity. Therefore, emphasis should be placed on determination of activity energy expenditure as part of the basis to derive dietary energy recommendation.

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