How much do farmers move?

A study by TEAGASC, UCD and WIT found that farmers may be significantly underestimating their levels of daily physical activity.

Physical activity (PA) is hugely important for famers' cardiovascular and mental health. Measuring PA accurately is a prerequisite to knowing if public health guidelines are being met. This study aimed to explore farmers' PA levels using two different methods (a standardised questionnaire survey and accelerometers), and to compare the results with a view to informing larger-scale farmer health research.

Measuring activity

Fifteen male farmers were recruited at farmer events, and written consent was obtained. Ethical approval was granted by Waterford Institute of Technology (WIT) Research Ethics committee (12/HSES/07). Participants completed the International Physical Activity Questionnaire – Short Form (IPAQ – SF), which has been shown to have good validity and retest reliability for self-reported PA levels. The farmers also wore an ActivPAL professional uniaxial accelerometer (53 x 35 x 7mm and weighing 20g) on the thigh, from waking until bedtime for seven consecutive days, while continuing normal farming activities.

The IPAQ and ActivPAL data were entered onto the Statistical Package for the Social Sciences (SPSS version 20.0). The IPAQ data were analysed according to IPAQ guidelines with the minutes of walking, moderate and vigorous intensity exercise converted to MET minutes (Metabolic Equivalent of Task, where intensity of PA is compared to energy cost of sitting quietly, which equals 1MET). Descriptive statistics were used for initial analysis of the IPAQ and ActivPAL data.

MET data were compared (comparison of group means) using paired t-tests, with Spearman's correlation test used to explore the relationship between the subjective and objective data.

Results

Participants were aged between 39 and 69 years, with a mean age of 48 years (SD 8.0). Most were full-time farmers with various farm types (intensive dairy, dairy and sheep, suckler cattle, and dry stock cattle) and a farm size ranging from 21ha to 81ha.

The body mass index (BMI) of the farmers ranged from 22.9 to 30.7 with a mean of 26.7 (SD 2.3), which is classified as overweight. According to the ActivPAL data, farmers achieved a range of 8,047 to 19,768 steps per day (median 14,163) (completing more than 10,000 steps per day is the general recommendation for health). Farmers spent approximately two-

thirds of the day sitting/sleeping/lying (mean 16 hours; SD 1.9), with a mean of 4.2 hours (SD 1.0) standing and 2.9 hours (SD 0.9) stepping per day. ActivPAL-calculated MET hours per week (mean 253.5; SD 12) were found to be significantly higher than IPAQ – SF MET hours (mean 125; SD 103) (t-test $p<0.001$). A non-significant poor correlation was found between the two measures (Spearman rho – 0.182; $p=0.593$).

Discussion

Given the discrepancy between IPAQ and ActivPAL data, all participants here were, in fact, underestimating their PA levels. This is in contrast with recent findings, including a systematic review, where overestimation of PA using IPAQ was identified as the issue (Lee *et al.*, 2011; Shook *et al.*, 2016). Being so physically active may render it difficult to accurately report PA on the IPAQ, with Maddison *et al.* (2007) reporting a systematic bias towards underestimation of PA-related energy expenditure at higher levels of physical activity.

Additionally, when self-reporting, participants may not have regarded certain regular farm activities as actual physical activity, or may underestimate familiar routes covered as part of their regular working day.

Therefore, an alternative measure of PA may be required for highly active populations, or indeed an occupation-specific instrument that also takes occupation-specific tasks into consideration.

In terms of farmers' cardiovascular and overall health, dietary behaviours that lead to farmers becoming overweight, stress associated with higher work intensities, the intensity of PA undertaken and participation levels in leisure time, sport and exercise also warrant exploration.

Conclusion

This active cohort of farmers largely underestimated their PA on self-report (IPAQ – SF) when compared with their objectively measured PA on the ActivPAL. An alternative to the commonly utilised IPAQ – SF measure of PA should therefore be considered for future research into farmer physical activity levels. This study has demonstrated the feasibility of conducting accelerometry studies with farmers, with advances in wearable technology and reduced device costs to facilitate this research approach.

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