

### Overview

Physical inactivity is responsible for 1 out of 10 premature deaths worldwide and is a risk factor for numerous chronic diseases. Although the World Health Organization recommends that adults engage in at least 150 minutes of moderate-intensity physical activity per week in order to receive the benefits of regular physical activity, only about 1 in 4 adults are this active. Researchers are developing and testing new ways to help adults be more active. It is critical to be able to reliably measure the impact of these strategies and programs with valid, reliable, and direct measures of physical activity. Two types of measures are most common – subjective and objective measures. Subjective measures, such as self-reported questionnaires, are often not accurate. It can be challenging for people to remember what they have done. Objective measures, such as wearable devices (e.g. pedometers, accelerometers) or direct observation, have been shown to be more precise. The purpose of this systematic review was to 1) evaluate the extent to which physical activity is measured objectively, and 2) describe the objective measures used, and how they were used.

### Main Questions

- To which extent is physical activity measured objectively in physical activity interventions for adults?
- Which objective measures have been used, and how has the information been reported?

### Study

A computerized search was conducted in March 2016 for peer-reviewed original research published in English after January 1, 2006. The following databases were searched: Pubmed, Cochrane Central Register, and PsychInfo. The keywords in the search included (“physical activity” OR “physical activities” OR “exercise” OR “leisure time physical activity” OR “leisure time physical activities”) AND (“intervention” OR “interventions” OR “randomized controlled trial” OR “comparative study” OR “clinical trial”). Studies were included if they were randomized controlled trials or quasi-experimental interventions focused on increasing lifestyle physical activity among adults ( $\geq 18$  years of age). Articles also needed to be published in English, peer-reviewed, and published between January 1, 2006 and March 30, 2016. The search yielded 13,718 articles, and 342 met the review criteria.

### The Bottom Line

In order to accurately test new programs and strategies for increasing physical activity, researchers need an accurate way to measure physical activity to see if the new interventions are working. Research is increasingly using objective measures, but technology needs to improve to be able to capture all forms of physical activity consistently.

### Contact

Stephenie C. Lemon, PhD | Division of Preventive and Behavioral Medicine | University of Massachusetts Medical School | [Stephenie.Lemon@umassmed.edu](mailto:Stephenie.Lemon@umassmed.edu)

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### Spotlight on Results

- Of the 342 articles that met the inclusion criteria, 239 studies used subjective measures to measure physical activity and 103 studies use objective measures.
- The proportion of studies using objective measures increased from 4.4% to 70.6% from 2006 to 2016.
- All of the studies using objective measures used wearable devices; half (50.5%) used pedometers only and 40.8% used accelerometers only.
- A majority of the 103 studies reported steps (73.8%) as their physical activity outcome metric.

### Call for Action

Researchers should continue to use objective measures to measure physical activity. More work is needed to address the challenges of comprehensive and consistent collecting, reporting, and analyzing of physical activity metrics.