Clinician's Commentary on Daligadu et al.[1]

In this digital age, people are constantly exposed to new technologies, wearable devices, and apps for self-improvement. The market for these devices continues to expand as mobile health and personal health technologies gain popularity among consumers and clinicians.[7] In 2018, worldwide sales of wearable health care devices are estimated to total US$26.43 billion.[8]

Wearable activity trackers have been tested in a variety of populations, including those with post-acute coronary syndrome, heart failure, and coronary heart disease in a cardiac rehabilitation setting.[2–4] However, a paucity of research remains on the use and validity of these devices in the acute care setting and immediately after discharge. Cardiac surgery patients are referred to outpatient cardiac rehabilitation programmes on discharge as a standard of care.[5,6] These programmes commence 6 weeks after surgery, leaving patients to continue their activity progression independently at home, based on a scheduled walking programme and activity progression guide provided at discharge.

Daligadu and colleagues[1] tackled this void, examining the validity of the Fitbit Flex activity monitor for step count and distance walked in post–cardiac surgery patients. Although the Fitbit Flex demonstrated a lack of agreement between output and measures of manual step count and distance walked in metres,[1] suggesting that it would be an invalid outcome measure in the acute care setting, the Fitbit Flex did demonstrate moderate associations with steps walked in slow- and fast-walking groups as well as strong associations with distance walked in faster walkers.[1] These results suggest that the device had the potential to be used as a motivational tool and gross measure of physical activity, combined with the self-monitoring (rating of perceived exertion, time, and distance walked) already used in practice.

Alharbi and colleagues[3] demonstrated that the Fitbit Flex had a substantially higher validity than self-report in assessing active minutes of physical activity in a cardiac rehabilitation population. Yates and colleagues[4] also demonstrated the disparity between objective and self-reported measures of physical activity in patients who had heart failure and undergone coronary artery bypass graft surgery; both groups overestimated their physical activity. These findings highlight the importance of multimodal measurement.

Wearable activity trackers offer the promise of assisting patients who are working to improve their physical activity habits,[9] and a growing body of research has suggested that the devices are becoming increasingly accepted.[7,11] It is also important, however, for physical therapists to educate their patients about their limitations. Commercially available activity trackers use algorithms to convert accelerometer data to measures of physical activity, but these algorithms may not account for differences in performance measurement, such as gait abnormalities, functional limitations, different body morphologies, and use of assistive devices.[7]

Phillips and colleagues[10] demonstrated that the Fitbit did not detect steps in 25% of older adults using assistive devices; this finding suggests that the device may not be appropriate for tracking activity in adults with lower gait speeds and using assistive devices. Using objective activity trackers as the sole measure of activity risks overcompensating for underestimates of activity; it also risks patients experiencing exhaustion or injury. Overestimations may encourage patients to reduce their activity or their adherence to activity prescriptions.[7] Observational studies have shown an increased risk of recurrent cardiac events, most often in the first year.[14] Numerous studies have shown the significant benefit of regular physical activity, which can reduce cardiovascular risk by 30%–40% in active compared with sedentary individuals.[12,13]

The more physical therapists can do as health care providers to educate, motivate, and empower their patients to participate in appropriate amounts of physical activity, the more recurrent events they may be able to prevent. Future studies examining the accuracy of evolving technologies in activity trackers and apps in the acute, post-discharge or home, and outpatient settings will help clinicians and patients identify appropriate devices that they can combine with self-monitoring to improve physical activity across the continuum of care.

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