Do fitness trackers and smartwatches track your health accurately?

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Wearable fitness trackers have become a must-have for fitness enthusiasts as well as health-conscious people. These state-of-the-art devices claim to measure everything from your steps and distance to your heart rate, calories burned, sleep quality, and even your stress levels.

But it's time to answer an important question: Are these devices exactly what they claim to be, or are they merely trendy tech accessories? Find out the truth about your favorite fitness tracker in the following article!

Factors affecting the accuracy of health monitoring devices

There are several pros and cons to buying a fitness tracker. The accuracy of these devices should be considered.

Proprietary tracking algorithm and method

One of the main factors affecting the accuracy of fitness trackers lies in the proprietary tracking algorithms and methods used by different companies. Every brand, whether it's health-focused Apple, Samsung with its BioActive sensor, Fitbit with its various models, or any other brand, has its own algorithm that processes raw data from the sensor to provide provide health data.

These algorithms are often kept secret, making it difficult to assess their accuracy and compare them with each other.

Differences in individual physiology

Another factor to consider is variation in individual physiology. Everyone's body, fitness level, and health condition are different, which can affect how their body responds to workouts and other activities.

Because most of these wearables are designed with general population data in mind, they don't always account for these individual differences. This can lead to differences in health indicators, especially for those outside the "average" range.

How to wear a smart watch

The way you wear your smartwatch can also affect how accurate it is when it comes to tracking its stats. Most smartwatch manufacturers recommend wearing the device snugly, just above the wrist bone. However, factors like wrist size, shape and even how you move your arm can affect those stats.

If the smartwatch is worn too loosely, it may not make steady contact with your skin, resulting in inaccurate heart rate readings. For example, if you use a smartwatch while mountain biking, you can wear the watch upside down for comfort. You will still be able to navigate, but will lose all heart rate metrics.

Limitations in sensor technology

Finally, limitations in sensor technology play an important role in tracking accuracy. While sensors in wearables have come a long way, they still have their shortcomings.

Some devices may use more advanced sensors, such as the BioActive sensor found in the Samsung Galaxy Watch that can measure muscle, fat, and body water. Others may use less sophisticated technology, as is the case with some budget-friendly fitness trackers (such as the $50 Amazefit).

The type and quality of the sensor can greatly affect the accuracy of the data collected.

Investigate the accuracy of popular smartwatches

Each brand of fitness tracker offers a distinct set of capabilities, but how accurate is their tracking?

To get a clearer picture of the performance of these smartwatches, you can compare them with gold standard measurement tools such as pedometers for step counting, chest heart rate monitors, Lab metabolic test to estimate calories burned and sleep study device to monitor sleep.

Pedometer accuracy

When it comes to counting steps, a pedometer is the classic choice. They measure steps using a simple mechanical or electronic mechanism to detect movement when you walk or run. In contrast, smartwatches rely on algorithms that process data from accelerometers and gyroscopes to count steps.

While smartwatches typically provide a reasonably accurate step count, they can be affected by factors such as walking speed, arm movements, and other activities that can cause false step counts. .

A study published in the Journal of the American Medical Association measured the accuracy of pedometers in wearable devices and smartphone apps. The results show that these devices can be relied on to accurately track the number of steps you take.

Accuracy of heart rate monitor

When it comes to measuring heart rate, chest heart rate monitors are the most accurate heart rate monitors because they use electrical signals from your heart to measure beats per minute. On the other hand, smartwatches use optical heart rate sensors to measure changes in blood flow through your skin.

While smartwatches provide fairly accurate heart rate readings during steady-state workouts, they can struggle with accuracy during high-intensity or infrequent activities due to factors such as arm movement and perspiration.

The study, published by the Journal of Personal Medicine, measured the accuracy of wrist-worn devices, including those from Apple, Fitbit and Samsung. The study concluded that most wrist-worn devices were accurate in measuring heart rate during laboratory activities.

But do lab operations simulate the real world well enough? Researchers from Harvard University report that accuracy depends on activity. For example, while walking, smartwatches and wrist-worn fitness trackers tend to report a higher heart rate than the actual heart rate.

Another study published by the Journal of Cardiology of the American Medical Association reports that chest-worn heart rate monitors have a 99% correlation with electrocardiograms, making them the right choice for who want accurate tracking.

Accuracy of calories burned

Laboratory-based metabolic testing, the gold standard for estimating calories burned, measuring oxygen consumption and carbon dioxide production to calculate calories burned.

In contrast, smartwatches and fitness trackers like Fitbit estimate calories burned using algorithms that take into account variables like heart rate, age, weight, and activity level. The accuracy of these estimates can vary depending on the individual and the specific activity, making them less accurate than laboratory testing.

The study published by the European Journal of Sports Science measured devices from three manufacturers including Apple, Polar and Fitbit. The study concluded that in terms of measuring energy expenditure (i.e. calories burned), all three devices showed poor accuracy across all activities. This doesn't mean smartwatches won't be able to track this metric accurately one day, but they don't currently track calories burned accurately.

Accuracy of sleep tracking

Clinical sleep equipment, such as polysomnography, measures brain activity, eye movements, muscle activity, and heart rate to accurately monitor sleep. This level of accuracy is currently only available in clinics.

Wrist devices, on the other hand, are limited in the data they can collect from a single point on your body. For this reason, they rely on accelerometers and heart rate data to estimate sleep stages, which can be less accurate.

According to Johns Hopkins Medicine, wearables can be useful in helping you recognize your sleep habits, and they can provide something to reflect on, but there are no wearables on the market that can actually measure it. direct sleep. For direct measurement of sleep, there is no substitute for clinical equipment.

Advantages of fitness trackers and smartwatches

Smartwatches and fitness trackers have revolutionized the way you can track your health and fitness, providing valuable insights into many different aspects of your health. These devices have made significant strides in accuracy.

A meta-analysis conducted in 2022 by the Journal of Medical Internet Research confirmed that wearables can effectively measure steps and heart rate, but not calories. The accuracy of sleep tracking is also questionable.

A review of recent research published in The Lancet Digital Health indicates that the advantages of wearing a fitness tracker outweigh any potential downsides. For example, these devices appear to be effective in increasing general physical activity.