

HEAD TO HEAD



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Can healthy people benefit from health apps?

Some apps have the potential to encourage healthier habits and are accessible to most people, writes **Itifat Husain**, but **Des Spence** notes the lack of any evidence of effectiveness and the potential for encouraging unnecessary anxiety

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Yes—Itifat Husain

A health app is a piece of smartphone software that purports to offer the user some health benefit. Many of these apps are aimed at people with diagnoses; for example, they teach the correct use of an asthma inhaler or collect blood pressure results by syncing wirelessly with a blood pressure monitor. But many are aimed at people with no diagnosis: for example, apps that allow users to track their calorie intake and exercise, or even their sleep patterns.

Apps have health benefits

Discussions on weight loss and increasing fitness take time in primary care, and ample evidence has shown that patients retain little of the education doctors provide at clinic visits.¹ Instead, primary caregivers can recommend health apps to deliver education and behaviour change techniques. We have already known for a few years that adherence to Lose It, a popular app based weight loss plan, works just as well as or even better than paper based or website based weight loss plans.² This makes intuitive sense because people tend to carry their smartphones with them everywhere they go, and it's much easier to track weight loss and calories in one place on your phone than on pieces of paper.

Also, we have known for several years that mobile based weight loss programmes work well. Two recent randomised trials showed that mobile strategies that make use of apps on personal digital assistants (PDAs) increased compliance and led to better patient outcomes than traditional programmes. In one study the participants in the mobile group lost a mean 3.9 kg more than the standard group at each post baseline time point measured (95% confidence interval 2.2 to 5.5 kg).^{3,4} And apps for smartphones may work even better than PDA based apps because of their deeper integration with a patient's lifestyle: while PDAs are restricted to Wi-Fi availability and cannot make phone calls, smartphones can do all of this and more, enabling a more intimate and frequent experience in comparison with a PDA.

Data on apps specific to smartphones are few because of the novelty of these devices to researchers—although they are not novel to the public. The trials of PDA apps for weight loss were published in 2013, well after the heyday of the PDA at least a decade before.

Researchers have tested popular fitness devices such as Fitbit and Jawbone. These are wearable devices that count users' steps and overall physical activity using motion sensors built into the devices and that sync to apps on smartphones. Several studies have confirmed their accuracy.⁵ There is no current evidence that these fitness devices improve outcomes or exercise compliance; likewise, there is no evidence that they cause harm.

Five years ago health apps were available to and used only by affluent people who owned smartphones. Today, nearly two thirds of adults in the United States have smartphones, and research from the Pew Research Center shows that poorer adults are more likely than richer adults to access the internet and email from their phones.^{2,6}

Smartphones and apps are now within most people's reach, with the potential to make a broad impact on health. And age is no barrier: in fact, most owners of fitness devices such as Fitbit and Jawbone are over 35.⁷

Health apps and devices can empower patients with diagnoses, improving satisfaction and compliance, so perhaps they can also help healthy people who want to stay that way.

There's no evidence of harm

Currently, no evidence indicates that the use of health apps to promote physical activity or dietary change leads to harm, although such absence of evidence isn't necessarily evidence of absence. And we've seen an explosion of apps and devices that measure other variables such as heart rate variability, skin temperature, sweat production, and a host of other metrics.

But just because mobile technology allows us to track these metrics better doesn't mean that we should.⁸ Many such apps are untested or unvalidated, or they make claims incompatible

with best medical advice. For example, paediatric societies do not recommend mobile baby monitors to protect healthy children from sudden infant death syndrome, yet the industry markets and sells such apps.

We can't rely on Apple or Google to regulate the apps in their stores and to guide consumers away from those that have no basis in evidence or may be dangerous. With tens of thousands of health apps on the market, the US Food and Drug Administration published final guidelines in February stating that it would regulate only those apps that turn smartphones into medical devices or accessories to medical devices.⁹ The FDA will not regulate apps that, if they malfunction, do not pose a health threat to users. This includes apps that process data, that allow people to track their health metrics, or that allow patients to self manage a condition without offering advice on treatment. This leaves thousands of health related apps without any regulation.

Conclusion

The naysayers will argue that healthy people shouldn't use health apps because there's little evidence of benefit or that they may lead to unnecessary anxiety, meaning more work for primary caregivers. But apps have been around for more than 10 years, on PDAs, and have been shown to improve outcomes and health.

Health apps on smartphones are here to stay, and some at least have great potential to reduce morbidity and mortality by encouraging healthy behaviour. They can help people to correlate personal decisions with health outcomes, and they can help doctors to hold patients accountable for their behaviour. And their low cost and availability means that they have the potential to benefit broad demographics.

If we wait for scientific studies to prove the benefit of apps, we're going to get left behind—not only by our patients who are already using them but also by the industry dictating which tools people should use.

Apple and Google won't keep harmful apps out of the App Store, and the FDA clearly doesn't have the bandwidth to keep up with the thousands of health apps out there. If we choose to be passive about explaining the metrics that matter to us and why, there is potential for great harm. So yes, healthy people may well benefit from using some health apps, such as those that encourage more physical activity and better diet, but doctors need to be proactive about telling the public which metrics matter and which apps they should buy.

No—Des Spence

Medical technologies abound: retinal implants, cochlear implants, robotic limbs, and even the prospect of an implantable pancreas. Google is developing a contact lens sensor that continuously monitors blood sugar concentrations.¹⁰ These modern miracles lack enough superlatives to describe them.

But another technological wave is rising: medical apps for smartphones and tablets. These supposedly promote mental health, aid sleep, cause weight loss, control food allergy, aid self diagnosis, manage pain, and help in every other conceivable medical condition. Indeed, some are endorsed by the NHS.¹¹

Mostly harmless (and likely useless)

These tens of thousands of health apps are perhaps mostly harmless (and likely useless). More recently, though, these apps are morphing into something different. When used alongside wearable gizmos, apps offer continuous physical monitoring of

things such as fetal heartbeat in pregnancy,¹² blood pressure, heart rate, and even pulse oximetry.¹³ Tomorrow is today, and these wearable devices and apps will soon be ubiquitous. Is this a medical revolution of disease monitoring and early diagnosis?

Let's consider who will use these new devices. Today, simple wealth has been usurped; health and fitness have become the new social currency, spawning a "worried well" generation. Health "bling" is everywhere: all things Lycra, T shirts from exotic charity half marathons, the chatter of personal trainers and training programmes, and bikes that cost more than cars. Even food is no longer to be enjoyed: it has become a pharmacopoeia of blended pulses, green leaves, and nuts. Now, in many ways this is a great improvement on the drinking, smoking, corned beef eating generation that came before. But our technologically advanced society is avoidant, fearful, insecure, and worried about anything and everything. We have an unhealthy health obsessed generation who will seize on these new health apps and devices.

Most medical research and diagnoses are based on isolated readings taken in medical clinics in symptomatic, older, high risk individuals, by doctors who can interpret results—not by young, asymptomatic, middle class neurotics continuously monitoring their vital signs while they sleep. So what will users of these apps discover? How common brief arrhythmias are in the normal population? How often our blood pressure might be high? How widely normal oxygen saturations can vary? The variation in the heart rate of an intrauterine baby? What happens if these gizmos malfunction or are placed in the wrong position? How will it change our management? Who can interpret the results? What if parents want to start monitoring their children? Where's the evidence that these things will improve diagnosis?

Diagnostic uncertainty ignites extreme anxiety

The truth is that these apps and devices are untested and unscientific, and they will open the door of uncertainty. Make no mistake: diagnostic uncertainty ignites extreme anxiety in people.¹⁴ We must reflect on what we might lose here, rather than what we might gain. Will apps simply empower patients to overdiagnosis and anxiety?

And who actually benefits from this health totalitarianism and meddling medical micromanagement? Corporate medicine and the drug industry, that's who, whose joint commercial imperative is to make us all health neurotics. Witness the unintelligent polypharmacy, bogus screening, and exponential growth of invented non-diseases. Regrettably, the guardians—our doctors—either are too financially conflicted or have no insight to the harm we are doing. So, current technology is already abused and overused by doctors for profit: computed tomography, magnetic resonance imaging, blood tests, and so on. The result is medical harm and overdiagnosis.¹⁵ We should be sceptical of embracing more medical technology.

The body as a simple machine

Also, society increasingly considers the body as a simple machine: take the advice, take the pills, go for check-ups; and now, presumably, constantly monitor ourselves with these new apps. Do all of this, and we won't get cancer, dementia, heart disease, and the rest. Endorsing the unspoken yet widely held view of illness—that there are the deserving sick (with diabetes, lung cancer, heart disease, or chronic obstructive pulmonary disease, for example) and the undeserving sick (with breast cancer, leukaemia, and so on)—is reductionist and simplistic: death and disease is a lottery outside our control. So when the "undeserving" sick get sick, they feel cheated. These new

technologies will serve only to fuel this anger and resentment further.

The US Food and Drug Administration and the UK Medicines and Healthcare Products Regulatory Agency have elected to go for light touch regulation on new apps and devices.^{16 17} A Wild West approach to development is playing out and will use the advertising classic—fear—to sell product. War, pestilence, and famine are all out to grass; technology, medicine, and overdiagnosis are the new riders of the Apocalypse. Humanity is wasting its time on monitoring life rather than getting on and living it. Wearable technology and medical apps? No thanks; I'll take my chances.

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