Body by smartphone

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"Studies have shown it's very useful to track diet and physical behaviors," says Jennifer Sacheck. "Tracking allows you to see how you're progressing." Credit: Blair Kelly

We love our smartphones. Since they marched out of the corporate world and into the hands of consumers about 10 years ago, we've relied more and more on our iPhone and Android devices to organize our schedules, our social lives, our finances and now, even our bodies.

Americans are increasingly downloading health and fitness apps

designed to help them get in shape, lose weight or manage a variety of health issues. Because our phones are always with us, these apps promise to make it easier to start the long-term lifestyle changes that promote good health, such as getting more exercise and eating more balanced diets. And now that 91 percent of Americans own a mobile device, health and fitness apps are available to traditionally underserved communities, too. But can these little bits of software really make the difference in the seemingly intractable problem of getting people to eat better and exercise more?

"Thirty-one million pounds and counting." That's how much weight people using one of the more popular weight-loss apps, called Lose It!, have lost since its debut in 2008, noted Charles Teague, CEO of Lose It!'s parent company, when he spoke as a panelist at a Friedman School seminar on mobile fitness technology in February (find it at iTunes).

Lose It! is like a lot of weight-loss programs, such as the venerable Weight Watchers, in that you need to keep track of what you eat each day and try to meet certain nutrition and calorie goals. "This approach has been around 20 to 30 years; it's not like we have some breakthrough," says Teague. Indeed, many if not most fitness apps, including Calorie Counter, MyFitnessPal and countless others, follow a similar formula.

"Studies have shown it's very useful to track diet and physical behaviors," says Jennifer Sacheck, N01, an associate professor at the Friedman School and co-author of a recent diet book that advocates small and steady lifestyle changes. "Tracking allows you to see how you're progressing. You're more likely to make changes when you get that positive feedback."

The advantage of an app, Teague says, comes from the smartphone itself. Because we never put our phones down, dieters are more likely to

keep a running tally of what they eat throughout the day rather than trying to think back every night and recall what they ate. An app is likely to produce more accurate food records. But more important, Teague says, mobile apps for diets can engage users at the moment of decision, rather than after the fact, when it's too late.

"We can say, while you're standing in line at Starbucks, can you really afford that caramel macchiato? Or should you maybe get a black coffee if you want to stay within your calorie budget today?" asks Teague.

Lose It! and its competitors boast a host of other features meant to make dieting less of a chore. App users can set reminders to track calories after each meal or to get some exercise during the work day. The premium version of Lose It! lets users plan meals ahead of time, track micronutrients and interact with other health-monitoring devices, including wireless scales and blood pressure cuffs. But the crucial elements of Lose It!—the food diary, the exercise log, the ability to connect with friends via social media—come with the basic, free version of the app.

"That can't be overstated," says Teague. "That massively increases access. Our user adoption spans across all kinds of socioeconomic classes and demographics. Computers might limit access. Cell phones really don't."

Recent research into how people use their mobile devices backs up those claims. As of January 2014, nearly 60 percent of American adults owned smartphones, according to the Pew Research Center. Pew figures from 2012 showed that 20 percent of smartphone owners had downloaded at least one health and fitness app. African-Americans and Hispanics—two groups that disproportionately lack access to health-care services—were more likely than whites to own smartphones and use their mobile devices to look for health or medical information online.

Dubious Data?

But what kind of information are they finding there? Diet-logging apps such as Lose It! might be based on well-established nutrition science, but they are among tens of thousands of other health and fitness apps available. It's hard to pin down a precise figure, in part because the category is not well defined.

Some apps are meant for consumer use, some as reference for health-care providers, but business analysts' estimates range from 40,000 to 97,000 such apps for iPhone and Android smartphones. (It's not surprising, then, that the iPhone's next operating system will include a dedicated app, called Health, to help people aggregate the data from their various wellness apps.) Yet apart from user rating systems, they aren't being vetted by experts for their efficacy, safety or basis in nutrition or fitness science.

One 99-cent app has a BMI calculator that anyone can find for free online. Another offers so-called "brain wave recordings" at a whopping $9.99 that claim to help the brain feel "motivated and satisfied without the need to eat." South Beach, paleo, blood type, fast metabolism, low glycemic, juice and all kinds of "detox" diets are well represented.

Last fall, the Food and Drug Administration published guidelines for developers of medical apps that blur the line between software and medical devices. That includes the accessories that turn smartphones into heart monitors or convert the phones' cameras into otoscopes parents can use to peer into a child's potentially infected ears. But the agency specified it won't be regulating apps intended for general patient education or generic aids. That's likely the category many diet and exercise apps would fall into.

So how can consumers know which ones to choose? Few scientists have

had a chance to take a hard look at the crowded field of apps that has sprung up in just the last three or four years.

In a study published in the journal *Translational Behavioral Medicine* in 2011, public health researchers conducted what they considered the first survey of 204 weight-loss apps available in Apple's App Store in 2009. Scientists from George Washington University and Duke University Medical Center created a list of 13 "evidence-informed" weight-loss strategies endorsed by the federal government, including keeping food records, getting more exercise, and eating more fruits and vegetables. The team found the vast majority of apps available at the time incorporated three or fewer of the 13 strategies.

That was five years ago—eons ago in Internet time—but in a more recent study published last fall, also in *Translational Behavioral Medicine*, public health researchers from the University of South Carolina found that not much has changed.

Of the 57 apps they assessed—this time targeting pediatric obesity—the team found that fewer than half included any evidence-based recommendations at all. Among those that that did, many suggested healthier eating and getting more exercise, but failed to recommend starting the day with a good breakfast or cutting back on time in front of the television—two proven ways to accomplish both goals.

That's "likely because they are not areas of behavior change that app developers have thought of," the authors wrote, concluding that "app developers and public health practitioners should work collaboratively to integrate evidence-based practices and expert recommendations."

Instant Feedback

That's just what Kris Widican, N06, Emily Stone, N08, and Caroline

Carney, N11, all graduates of the Nutrition Communication program at the Friedman School, do in their roles at Good Measures, the Boston-based company behind the nutrition app of the same name, which is "designed with the input and the oversight of registered dietitians," says Widican, a registered dietician (R.D.) and Good Measures' director of clinical content development.

People who sign up for the program—which is offered as a wellness benefit through employers or insurance policies—use the Good Measures app in concert with a registered dietitian specially trained in behavior change. Members work with the R.D. to determine their nutritional goals and health concerns, which they can then enter into the app.

Every time users log meals or snacks, the program provides them with a score, called the Good Measures Index or GMI, which lets them know how well they are meeting the nutritional parameters they set.

That instant feedback helps people make healthier choices throughout the day. The program will also offer meal and snack suggestions that will nudge people closer toward reaching their own goals, whether they want to lose weight, lower cholesterol or keep sodium levels in check.

The Tufts-trained nutritionists "were instrumental in helping our team understand the relative importance of different nutrients, such as fiber, saturated fat and sodium," says Carney, director of program development. "That in turn makes a difference in the meals that the system then suggests."

The program builds what Widican calls a "virtual pantry" of meals as it begins to learn each user's tastes and preferences from their food logs. That is, if an individual logs heavy pasta dinners several times a month, Good Measures might suggest a dish with a small portion of whole grain

pasta topped with several servings of vegetables and lean protein.

"That's really attractive," says Carney, an R.D. "People want to make changes, but they want to make slow changes. They don't want to throw everything out of the fridge and stock it with chia seeds and goji berries."

Right now, the team is working with experts at the Joslin Diabetes Center in Boston to tailor the program for individuals with diabetes. That way, the same food—say, a serving of watermelon—would provide a different GMI for a user with diabetes versus one without the disease.

"We can tailor feedback to a particular person's clinical needs right down to the nutrient," says Widican. "And that's really interesting, because we may also be able to measure the effects of different diets on relevant biomarkers and health outcomes."

Lose It!'s 18 million registered users already have entered reams of data about what they eat, how they exercise and how that translates on the scale. The company, Teague says, is still figuring out how to turn all that information into new insights about weight management.

Tipping Point

Putting too much emphasis on an app's diet and exercise tracking abilities may overlook the smartphones' real advantage: connectivity.

"How do we get people to engage the program?" Teague asks. "How do we get them to stick with it? Mobile plus social is very interesting."

Lose It!, like many of its competitors, allows its users to form groups with other users, whether they know them in real life or not. These apps also can link to Facebook pages or Twitter accounts so people can crow

about their accomplishments to their existing social networks. "I can get positive feedback almost immediately," says Teague. "That's very strong reinforcement."

Sacheck, the Friedman School professor, will be using social networking in her work to get school kids to exercise more. She's found that one way to encourage kids to walk or run more is to set up an online competition between schools. "The social aspect is a big thing," she says. "It has to be cool to engage in a healthy lifestyle."

Anecdotally, Sacheck has seen it on her own Facebook page. She sees friends log miles run, 10K times beaten, Tough Mudder obstacle courses completed—and then "the 'Great Jobs!' roll in from everywhere," she says. "We all respond to that sort of positive reinforcement."

Sacheck would also like to see the day when an app or fitness monitor not only tells a user what they've done, but suggests why and how they could do a little more. She'd like to see a diet-tracker notice that someone isn't consuming dairy and then offer a web link to alternative sources of vitamin D. She'd also like to see a calorie counter congratulate people on their activity levels, and then suggest engaging in some higher-intensity workouts.

"The technology today is at the tipping point. Initially, it helps people's awareness. But I think the novelty can wear off if there's not going to be more to it," Sacheck says.

And, of course, as useful as linking to the Internet would be for dieters and exercisers, it could be that smartphones' most useful trick is why Alexander Graham Bell invented phones in the first place—letting us talk to each other. Some apps are already moving in that direction.

Good Measures' subscribers have the chance to interact in real time with

dietitians and nutritionists who have access to users' dietary logs. The arrangement allows people to use Good Measures' technology to make all the changes they can on their own, and then take advantage of an expert's help to make some of the bigger ones.

"We have people we work with who come to us already having learned insights from the app," says Good Measures' Stone. "It's amazing how it forwards the conversation. Then their counseling session can be more focused on deeper behavior change needs."

Maybe Good Measures' model provides a glimpse into the future of health and fitness apps or apps in general for that matter. Their usefulness might lie less in compiling and providing information than in creating powerful connections among people.

"For any meaningful and sustained behavior change, you need not just the expertise of a registered dietitian, but of someone who cares and is supporting you along the way," Widican says. "That human component is essential."

Apps for a Healthy Planet

SEASONS (What Is It Production Ltd., $1.99). Helps eaters follow the natural growing seasons of fruits and vegetables in their region. They can also search a database of fruits, vegetables, herbs and nuts for descriptions, information on seasonality and photos.

SEAFOOD WATCH (Monterey Bay Aquarium, free). Offers recommendations and information about sustainable farming or fishing practices for sushi and seafood. It can be used at restaurants and markets to make ocean-friendly seafood choices.

WHAT'S ON MY FOOD? (Pesticide Action Network, free). Identify

chemicals found on foods commonly sold at the grocery store. Search the database to find out which pesticides are the most dangerous and to take a crash course on pesticides for amateurs.

LOCAVORE (Hevva Corp., free). Helps consumers find out what local foods are in season and locate the closest farmers markets that provide them. The app has tons of information on individual producers in a user's area and provides seasonal recipes to best use fresh, local ingredients.

FIND FRUIT (Neighborhood Fruit, 99 cents). For fruit that's as fresh as possible, forgo the supermarket and use the Find Fruit app to locate fruit trees growing in public spaces. Users can also search fruit trees in their area according to seasonality, type and proximity.

HARVESTMARK TRACEABILITY (YottaMark Inc., free). Allows users to trace their fresh food back to the farm it came from by scanning any fruit or vegetable bearing the HarvestMark logo and pulling up the item's information on the app. It also offers instant updates on any food recalls affecting HarvestMark produce.

FOOD COMMUNITY (Nommunity.com, free). Consumers can search and discover local vegan, vegetarian, kosher, gluten-free, locally grown and organic restaurants. They can also connect and collaborate with a community of people with the same dietary preferences.

URBAN FARMING ASSISTANT STARTER (iHuerting, free). For those planning on growing their own vegetables, the app sets reminders for when to water, fertilize and care for plants. It also helps identify organic solutions to pests, diseases and other gardening issues.

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