

Fitness Gadgets as a Form of Preventative Healthcare

Making an Active Lifestyle Appealing to the Sedentary and those with Manageable Health Issues

Tag Words: Fitness gadgets, fitness trackers, fitbit, garmin, jawbone, preventative health care, exercise, active lifestyle, heart rate monitor, sleep tracker, hydration, monitoring nutrition, personal activity intelligence, obesity, diabetes, health insurance, depression, calorie counting, Alzheimer's disease, heart disease

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Summary: Fitness gadgets can be useful tools in influencing individuals who live unhealthy or sedentary lifestyles to become more active and engaged with their health. Gadgets not only motivate the already motivated to make further progress in their fitness accomplishments, but also provide a mechanism for the unmotivated and individuals with health diseases to manage risk factors. Many of these gadgets have similar functions, such as counting calories, step counting, heart rate monitoring, water consumption tracking, food planning, and sleep tracking. Fitness trackers are not just a fad, but should be perceived as a lifelong necessity to manage and improve health. Health insurance companies should embrace the fitness gadget revolution as an approach to preventative health care and as a means to lower health care costs.

Video Link: <https://youtu.be/MMJ9AV4OMbs>

The Issue: We Need to Play A More Active Role in Managing Personal Health

It is well known that an active lifestyle has many physiological benefits, but many people do not realize that it is also an accessible form of preventative healthcare. Consistent physical activity can enhance an individual's fitness, energy, mood, physique, and overall well-being. Simultaneously, it also reduces the risk for chronic illnesses including heart disease, diabetes, depression, hypertension, dehydration, sleep apnea, and obesity. Fitness gadgets enable individuals to monitor their activity, heart rate, water intake, sleep quality, and nutrition. This greatly enhances the individual's awareness of their own health thus allowing them to initiate premeditative action to save their lives before any diseases develop or worsen.

Heart Rate (SA)

Heart rate detection is one of the main features present in many fitness gadgets on the market because it can be used as a predictor for heart problems. In order to be used as an effective predictor to save lives, the heart rate monitor must be accurate. Most of these gadgets acquire heart rate readings by monitoring the pulse on the wrist as noted in the article All About Heart Rate. The data is then stored and accessible to the user at any time. If the individual were to notice an abnormality, the accuracy of the reading would come into question when bringing up the concern to a doctor. Compared to an EKG, the accuracy of these gadgets was found to be almost identical to medical equipment that made a reading every "three seconds" while the

gadget makes one “every five” (1). This key feature makes it a reliable and convenient tool that can be used as a preventative measure for an individual's wellness.

Knowing the different meanings of heart rate monitoring makes it easier to interpret the data and identify abnormalities. Resting heart rate means that the individual is at rest not performing any physical activity. A standard resting heart rate is between sixty to one hundred beats per minute. Someone who consistently engages in vigorous physical activity has a lower resting heart rate that can drop to forty beats per minute, which often indicates that they have a more “efficient heart function” (2). Factors such as smoking, hypertension, and age can make the “normal resting heart” higher.

Elevated heart rates have a direct correlation with heart disease in those without a family history of heart disease. A four percent increased risk of heart failure has been reported for every one beat per minute added to the resting heart rate (3). This study included individuals with different diseases and high heart rates. When the heart has difficulty pumping, the body’s natural reaction is to increase cardiac output or the beats per minute. Because each beat sends less blood out to the organs, signals are sent out more frequently making the heart beat faster. As a result, people with a history of heart problems demonstrated an increase of five beats per minute which increased their risk of death by eight percent, heart failure by sixteen percent, and a heart attack by seven percent (3).

The majority of these gadgets’ design is a comfortable band that can be worn around the wrist throughout the night. The user will be able to detect any abnormalities from the previous night’s data and possibly be able to prevent a cardiac arrest. This is especially important considering the fact that heart attacks tend to be “five to six times more common” throughout the hours of “one” and “five A.M” (4). An irregularity, such as the heart rate dropping “below 40 beats per minute” is a sign of “Bradycardia” (5). This condition is defined in The American Heart Association as, the heart beating at a very low rate that could end in cardiac arrest. With the aid of a fitness gadget, the user will also be able to prevent seizures by looking at heart rate during REM sleep. A normal REM sleep cycle starts after ninety minutes of falling asleep and lasts for ten minutes, with an increase of cardiovascular activity, blood pressure, and heart rate (6). If a person does not get sufficient REM sleep, they are more prone to getting seizures as stated in the article The Brain Basics. An individual can prevent this by looking at their sleeping patterns and their heart rate monitoring from the night before.

Having a heart rate monitor accessible at the touch of a button enables anyone to be alert and conscious of his or her “heart performance”, since they are able to check their heart rate in the comfort of their own home instead of having to “go to a doctor’s office or hospital” to do so (1). This accommodation is a great advantage for those who need it the most, such as the elderly or those with heart conditions. Moreover, heart rate is a feature that benefits everyone trying to achieve an advantageous physical activity; it is not only for the already committed. For example, in order to reassure that one is achieving a worthy workout, one needs to reach the “target zone” which reassures the quality of the workout and prevents the possibility of an injury as well (7). As described in Mayo Clinic, one can calculate the target zone by simply subtracting the ones’ age from 220 and multiplying by 0.70 to obtain the lower end or multiplying by 0.85 to calculate the higher end of the heart rate target zone. Knowing their heart rate monitor is accurate,

especially while working out, benefits the person's health substantially. If individuals were to follow an appropriate (intensity and quality) exercise regimen, there would be an impressive "30% to 40% reduction in cardiovascular events" (8).

Sleep (KC)

One of the Fitbit's major selling points was the use of a sleep tracker. Essentially, sleep trackers measure how many hours and minutes the individual slept, and tells them how restless their sleep was (9). Sleep is more important than you think. If someone does not get enough sleep one night, they may think they will just be tired the next day, but sleep affects much more than next day drowsiness. Harvard University reported that, consistent lack of sleep could lead to serious mood disorders like depression, anxiety, and mental distress. The studies done at Harvard University Medical School showed that there is a link between diabetes, obesity, and hypertension with lack of sleep. Studies also show that sleeping less than five hours a day increases the risk of death by fifteen percent (10).

Researchers found that one night of insufficient sleep can result in a higher blood pressure level the next day, for people who have existing hypertension. This correlation may be the reason for poor sleep contributing to cardiovascular disease and stroke. "One study found that sleeping too little (less than six hours) or too much (more than nine hours) increased the risk of coronary heart disease in women" (10).

Sleep is also a crucial for the human immune system. At night our immune systems work to fight off illness because our bodies are inactive. If someone were to get an infection they would be more likely to successfully fight it off if they get a good amount of sleep (10). Lack of sleep is also linked to the development of Alzheimer's disease, "a progressive brain disorder that slowly destroys memory and thinking skills, and eventually the ability to carry out the simplest tasks" (11). When people sleep, there is a fluid in the brain called cerebrospinal fluid that clears out toxins that may have built up in the brain throughout the day. The channels that the fluid flows through expands during sleep. If a person is not getting an efficient amount of sleep then they risk the build up of the toxic protein beta-amyloid. This is known for its appearance in the brains of Alzheimer's patients (12). CSF fluid only flows in abundance when the mind is in an unconscious state.

As stated previously, REM sleep is very important for the human body. Rapid eye movement (REM) sleep is the final stage, after stages 1-4, each stage brings the individual into a deeper state of sleep. In a study in rats, it was found that the rats' life spans were extremely shortened when they were not able to get REM sleep (11). Fitness trackers do not detect REM sleep in its users, but one can determine the amount of sleep they got and determine their amount of restlessness throughout the night.

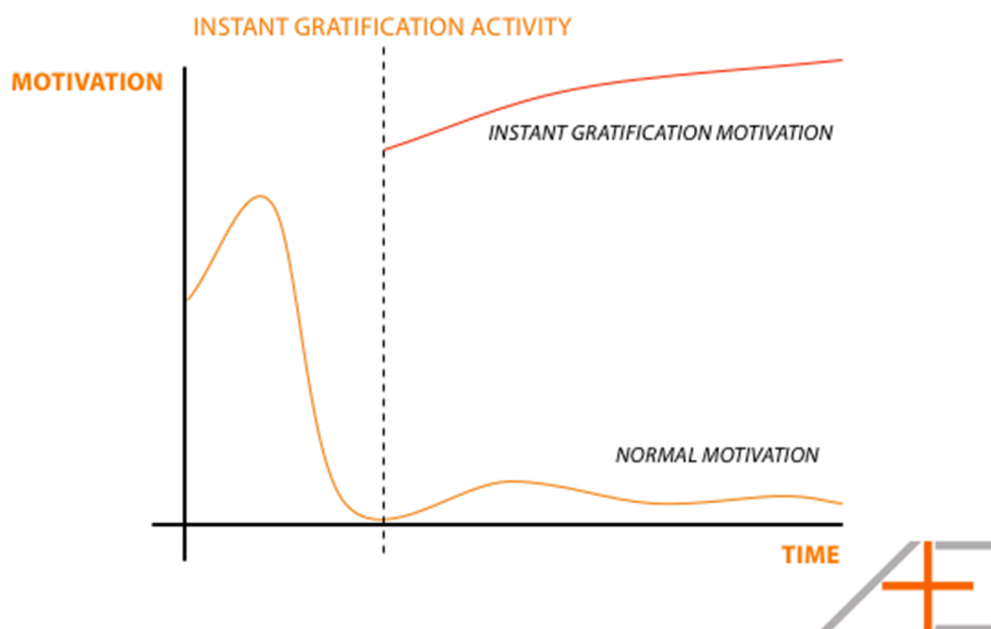
Sleep trackers use a simple equation to calculate sleep efficiency, "100 x time asleep/(time asleep + time restless + time awoken during sleep)" (13) These devices use auto detection technology based on the user's movement to detect sleep. If the device confirms that its user is not moving for a longer time, it will begin to record the sleep. The downside to this technology is that if you are awake and not moving it may falsely record sleep. There are devices that can measure sleep on the wrist or the waist. Companies suggest their sleep tracker users to wear the

wrist device because the waist device runs the risk of falling off during sleep. Since people need 7-8 hours of sleep per night these gadgets allow the individual to set a daily goal as well as a graph their sleep over time (13).

Psychology Behind Fitness Trackers (SA)

“One in ten adults in the United States owns a fitness band” as mentioned in the article “Fitness Trackers and Smartwatches Attract Totally Different Groups”. The fitness gadget revolution has increased over time giving the customer the option to choose what gadget they prefer to use. It can be said that unconscious psychology is what attracts individuals towards fitness trackers. For instance, everything in society revolves around social media, which provides “instant gratification” whenever the user seeks for it. For example, when a person makes a post on their social media account and there are likes and comments in return, the person gets the automatic fulfillment that makes them feel good (14).

Many if not all the companies have included the ability for their gadgets to connect in some way to social media, giving them the option to share their latest workout. When individuals do so, they “reinforce, motivate and reward by turning exercise into a game” (15). This means that the user can challenge himself or herself consciously or unconsciously to keep working harder and improving. In other words it makes people more motivated because they are instantly rewarded for their efforts. The graph below gives a clear representation on how instant gratification gives the person an impressive linear boost compared to the normal motivation without any gratification (16).



Another aspect worth looking at is self-regulation, which Psychology Today describes as the capability to work on long-term interests such as progressive workout routines. By getting a gadget an individual can engage in self-regulation. Most gadgets are not cheap and spending money can be a motivator for the individual to keep using it on a daily basis, with such frequent repetition the use of the gadget can become a habit. In an interview a Fitbit Wellness instructor mentioned that her company’s investigation revealed that, “you’re likely to get about 40 percent

more active just by putting one on” (17).

People will tend to keep using these gadgets due to the positive reinforcement they provide. When one exercises there is an instant mood enhancer, which can translate to long-term effect and help ease depression. This was demonstrated in an experiment where people with depression were placed into three different groups; one group was given a placebo, another group was given antidepressant medication while the final group was submitted to an exercise regimen (18). As a result, exercise and the antidepressant demonstrated lower scores of depression after four months. After a year, the exercise was found to be more effective than the antidepressants. This was thought to be due to the sense of accomplishment that a depressed individual will get by practicing a meaningful activity or the person’s brain can adapt to the stress and be less likely to have a detrimental effect like depression (18).

It is also important to point out that people who are suffering from diabetes tend to suffer from depression and vice versa. A “number of studies show people with both disorders are at greater risk for mortality than people with either disorder alone”. In an experiment, patients with both diabetes and depression were given an exercise routine or cognitive-behavioral therapy for twelve weeks. As a result, the patients who underwent an exercise routine showed improvements in both disorders (18). This demonstrates that people who are suffering from depression could potentially improve their condition by getting a fitness tracker.

Water Intake (KC)

Water is essential to the human body. Mobile apps and some gadgets can actually calculate your water intake. The iDrated app allows you to determine your optimal daily intake and allows you to input every bit of water you drink throughout the day until you reach your goal. The apple watch and Fitbit both allow you to set a water goal. Water is used for “digestion, absorption, circulation, creation of saliva, transportation of nutrients, and maintenance of body temperature” (13). People need to be conscious about how much water they put in their bodies daily.

Depending on how active the individual is and how much they weigh, the average person needs about two liters of water a day; that number may fluctuate a little more or less. The users of the gadgets input how much water they drink throughout the day measured in liters or fluid ounces, based on personal preference. To make it user friendly, these devices allow people to put in the amount of water they drank throughout the day. If the gadget notices that an amount has not been recorded in hours, it will send a friendly reminder to drink some water. The iDrated app also allows its users to see their history of daily water intake using a medal system. If the person reaches the goal, they get a gold medal, if they almost make it they receive silver and then bronze. The system can be an incentive to get people to drink more water because they want to earn that medal.

The American Heart Association recommends that individuals with diabetes or heart disease should drink more water than someone who does not have these conditions. If a person is not suffering from these conditions, they still need water for other health reasons. The kidneys depend on water and use it to excrete cellular waste in the form of urine, and also hold on to some water for later filtration. When someone does not take in enough water they can seriously damage their kidneys. If you drink too little, you increase your risk of getting kidney stones, solids that form within the kidney. Kidney stones can vary in size and cause severe pain when

they are passing. Water can be used to prevent all four types of kidney stones. If urine is diluted it is more difficult for stones to form (19). Along with waste removal, water helps keep things moving through the digestive tract; inadequate water intake can lead to constipation because “the colon pulls water from the stool”(20).

One may recall from high school biology the picture of the shriveled up dehydrated cell. This occurs in the muscles when the body does not have a balance between electrolytes (salt) and water and can lead to fatigue. It can be anywhere from mild to severe needing medical attention. Lack of water can also affect the look and feel of the skin. A person’s skin may feel dry and have wrinkles if they do not get enough water and become dehydrated (21). When water is ingested it goes to all of the other organs inside the body until it reaches the largest organ, skin. Because skin is an organ, it has cells that need water; when these cells lack sufficient water supply it is shown on the surface. Though this may seem like a superficial benefit, it is very important because when the skin becomes dry and flaky, it may become itchy and irritated, and cause severe discomfort. Hydrated skin has more resilience and can protect better from other environmental factors (22).

Monitoring Nutrition (SS)

Most fitness gadgets today also have a diet tracker in the form of calorie counters and insulin trackers. For those who are overweight, losing weight and burning more calories than taken in, lowers the chance of weight gain. Tracking your nutrition is imperative in losing weight because the foods you eat directly affect your metabolism and mood which can affect how active you are in a day or how much energy you have. A study in 2008 found that those who tracked their eating habits lost twice as much weight than the control group that did not track their food intake (23). This study also found that the more frequently the individual recorded their nutrient intake, the more drastic their weight loss, ultimately concluding that monitoring nutrition is imperative to effective weight loss.

Most fitness trackers have a modern version of a food diary through associated apps where you can log the foods you have eaten, and how many calories are in them. They also manage the calories you burn with the ones you have eaten and plan to eat, allowing you to eat more or less based on your level of exertion for the day. These apps help you plan, track, and analyze your diet to accommodate your nutrient needs. The individual can correlate their calorie intake with their goals or compare it to the recommended calorie intake for their demographic. The U.S. Department of Agriculture recommends “1,600 to 2,000 calories for the sedentary, 1,800 to 2,200 for the moderately active, and 2,000 to 2,400 calories per day for those who are active” (24).

Over 35% of American adults are obese, which increases the risk of developing diseases such as diabetes, stroke, cancer, heart conditions, and more. Those who suffer from obesity tend to spend more on medical bills than those of a healthier weight. With the obesity epidemic in the United States, the need for effective weight loss interventions for patients is higher than ever. However, most systems are costly, resource intensive, and require counseling. Fitness gadgets and apps offer an alternative to these intensive weight loss programs (25). Fitness trackers monitor your calorie consumption by calculating the basal metabolic rate (BMR), which according to Fitbit specialists “is the rate at which you burn calories at rest just to maintain vital body functions like

breathing, heartbeat, and brain activity.” It considers more than half the calories burned in a day depending on factors including gender, age, height, and weight. The estimated calories burned are then recorded by the tracker, taking into account the BMR and any manually logged activities. It resets at midnight and begins counting immediately after even while your sleep (26). Some devices also synchronize with diabetes tracking apps for insulin doses to integrate all your data in one graph (27).

MyFitnessPal is one of the most popular and in demand apps in the market for weight loss, with over 50 million registered users. According to professionals at the UCLA primary care clinics, “MFP incorporates elements of social cognitive theory, including self-monitoring, goal setting, and feedback.” Calorie and food trackers also generally encourage healthy eating by making you more aware of the foods you eat and motivating yourself to satisfy your daily nutritional needs (27).

Movement (KC)

Fitness trackers have different features to track movement. One of the first types of trackers was the step counter. It is a little device you clip onto your pants, or today, wear on your wrist to track how much one walks (28). This goal of 10,000 steps has been fairly difficult for the average American to achieve, especially with a nine to five job. Now, some fitness gadgets are tracking people’s Personal Activity Intelligence (PAI) by using a scoring system. The goal here is to just make sure every day the individual reaches the score of 100. This score is based on the individual’s overall activity, combining steps walked as well as any other activity, like bike riding or weightlifting. The score system gives more credit for strenuous activity (29). This can really motivate people to do more high intensity exercise, instead of just walking, which can get better results.

Many people want the satisfaction of seeing that score of 100 therefore they will work hard to do it. This can even get people to try things they would not have normally done. “The PAI app removed the obstacle of figuring out the “right” amount of exercise, so going for a run didn’t feel pointless—and I didn’t overdo it. Our fitness metrics ought to be as unique as our bodies. PAI may be the one I have no excuse to ignore.” (29) This device uses information regarding its user’s heart rate to project a score.

This increased activity is great for lowering the risks of obesity and helping people lose weight, as well as maintaining their weight to prevent obesity. In turn, this can prevent a multitude of weight related diseases. People need more physical activity than just walking. Even though walking is good for the body, it is not intense enough to get the results that would actually cause change (30). Weight loss has to be specified for the individual based on their lifestyle and health concerns, not everyone can walk 10,000 steps and lose a significant amount of weight. Obesity is a serious problem but can also lead to other problems too, like hypertension, elevated levels of cholesterol and heart disease. This revolutionary way of tracking fitness using Personal Activity Intelligence makes counting steps a thing of the past. This technology in particular is offered in the device, MIO global, while other devices track activity by using calories burned, active minutes, steps and heart rate. This PAI technology might be something companies may use in their devices to make it a universal system of activity measurement (27).

Insurance Reward Systems (SS)

Fitness trackers are expected to become more common over the next decade as more high tech sensors are installed to detect more illnesses (31). More employers also continue to adopt corporate wellness programs and monitor their data to provide rewards based on activity levels and with health insurance costs rising. Selling their gadgets to employers has become the most profitable and thriving aspect of business for Fitbit. Majority of the \$2.6 trillion healthcare bill is primarily affected by consumer behavior (32). The health industries advisor at PwC said “If you think of the wearable devices as a way to value improvement of BMI, who knows maybe one day — it’s scary to think — but maybe on a real time basis, the healthier you get the lower your premiums go.”

One insurance expert even said, “If used effectively, wearables have the potential to improve the impact of wellness programs by encouraging healthier behavior or simply by increasing team cohesion – for example, by letting colleagues compete with each other for the number of steps they take per day.” The same results were seen with the company, Appirio, when they gave a Fitbit to each of their employees, and negotiated a deal with their insurance provider ultimately reducing healthcare costs by five percent, or \$280,000 (33). In 2013, BP allowed the company to track 14,000 employees’ steps with FitBit Zip. If they made it to one million steps, they got a lower insurance premium.

Other free apps on the market use fitness data from gadgets to rate user activity from 1 to 110 to provide insurance companies with an idea of the user's health risk (34). Companies that provide insurance benefits for their employees are the first to incorporate the gadget trend into their work lifestyle to improve overall employee health. Some companies, like Autodesk, buy Fitbit trackers in bulk and sell them at little to no cost to their staff. A global benefits director, saw a trend between device distribution and decreased problematic health conditions such as hypertension and said “When we look at national averages of healthcare increases, we find that we are a little below those increases.”

Future Fitness Technology (SS)

The future of fitness trackers aims to incorporate and connect the entire body and tackle blood glucose monitoring. Some are using sensors to determine chemical imbalances. New research shows sensors that detect chemicals in the body’s sweat that may be used to assess medical conditions, drug abuse, or help optimize athletic performance (34). The Profusa company showed a wearable biointegrated sensor called Lumee, to allow people to check their body chemistry for extended periods of time. This provides data on the body’s chemical makeup and detect changes as the individual proceeds with their daily activity to help monitor health (35). These methods are also being used to slowly replace the painful task of finger pricking to draw blood for regular testing. The sensor monitors glucose levels every minute in interstitial fluid through a thin filament inserted under the skin and kept in place with a bandage. This may be worn for 14 days and the user may measure glucose by passing a scanner over the sensor discreetly and conveniently.

Community Action: Connecting Fitness Device Distributors With Health Insurance Companies

We sent letters to insurance companies asking them to offer discounts on fitness and wellness

gadgets for policyholders. We also contacted individual fitness device distributors by phone to persuade them to work with insurance companies. Our plan was to have these companies offer a price reduction on fitness gadgets for those who buy a fitness tracker through their insurance. It will serve as form of preventative healthcare because the insurance company is making an investment in their buyers' health and better health through active lifestyles will lower the risk of disease and future costs for treatments, ultimately saving insurance companies money as well. The companies we contacted included Allstate, Aflac, Blue Cross Blue Shield, United Healthcare, Garmin, Fitbit, Jawbone, and John Hancock.

After many phone calls and emails, we found that most insurance companies did not have any involvement in the fitness tracker industry, but were open to corporate inquiries regarding collaboration. Currently, Fitbit does not have any association with insurance companies. Employers and organizations can get them in bulk for a discounted price for their employees to promote healthy living or to create team challenges and reach specific goals. According to a Fitbit representative we contacted, the Fitbit team mostly gets inquiries from corporate programs about these bulk product discounts and do not have any other connections with major corporations.

Garmin did not wish to disclose any information on discounts offered to specific industries, but did offer a lower price for buying in bulk. They did validate that they had links with fitness companies but could not disclose any information on which companies or at what cost they sold their products. Representatives from Jawbone also said their product is an open product and is willing to allow insurance companies to use their product for their policyholders, since doctors can use the information to better their understanding of their patient's behavior throughout the day. Aflac does not have any current discount for any types of fitness trackers, but they do offer supplemental health policies for employers. The representative we spoke to on the phone did not know of policies or arrangements that may be in the works with insurance companies. Other companies we contacted, including Blue Cross Blue Shield, Allstate, and United Healthcare did not respond.

John Hancock investments said they offered a discount on the Fitbit when the individual signed up for their life insurance policy. They said they also tracked the individual's level of activity based on a point system where they offered a figurative gold, silver, platinum, and bronze medal, for varying levels of active living and doctor visits. They also offered a discount based on this point system value. Additionally, John Hancock's insurance benefits offered a free Fitbit to any individuals who bought their life insurance policy. Their point system also offered to keep members motivated by giving a discount of up to 15% to their customers. John Hancock offers "savings on annual life insurance premiums, as well as discounts and rewards from leading retailers to encourage policyholders to take small steps to improve their health." The representative we spoke to from the insurance company said that the new devices were created in collaboration with Vitality, the global trendsetter in combining health benefits with life insurance products. The more points members obtain on their Vitality Status, the greater their potential in savings and rewards. According to their product factsheet, "policyholders can earn travel, shopping, and entertainment-related rewards and discounts, including half-price Hyatt hotel nights, 20-50% off major brand cruise packages, and gift cards from leading retailers like Whole Foods, REI, iTunes, Starbucks, Fandango, and more."

The growing industry of mobile health estimates over 40,000 health related apps to comprise a \$718 million industry (19). With healthcare costs on the rise, living an active lifestyle to prevent diseases is more imperative than ever. Some of the most prevalent diseases have many preventative risk factors that can be monitored with the use of fitness trackers. With the use of these gadgets the risk of obesity, heart disease, Alzheimer's, hypertension, high cholesterol, and dehydration just to name a few, can be decreased in our country and all over the world. There are a multitude of gadgets and apps on the market like the Fitbit, Apple watch, Garmin watch, Jawbone, MyFitnessPal, polar heart rate monitor and others whose features include monitoring heart rate, movement, water intake, calories, sleep, and more. With the use of these gadget trackers, insurance companies can offer discounts to patients taking an initiative to improve their health (31).

Insurance Letter

To whom it may concern,

The purpose of this e-mail is to propose an optional incentive to customers to become more physically active with the use of fitness gadgets, provided at a discounted price from their insurance providers to serve as a form of preventative healthcare. This will be beneficial for both parties because it has been proven that those who are physically active are healthier. As students at Rutgers University, we have researched the physical, mental, and psychological benefits of living active lifestyle. Our findings have motivated us to reach out to you to implement small changes that can create a great impact to better the state of health our society lives in. By offering discounted fitness gadgets through insurance companies, more customers will be motivated to buy these gadgets and become more active, ergo healthier.

With healthcare costs on the rise, living an active lifestyle to prevent diseases is more imperative than ever. Some of the most prevalent diseases have many preventative risk factors that can be monitored with the use of fitness trackers. With the use of these gadgets, the risk of obesity, heart disease, Alzheimer's, hypertension, high cholesterol, and dehydration can be decreased. There are a multitude of gadgets and apps on the market like the Fitbit, Apple watch, Garmin watch, Jawbone, MyFitnessPal, and polar heart rate monitor. These devices have features including monitoring heart rate, movement, water intake, calories, and sleep. With the use of these gadget trackers, insurance companies can offer discounts to patients taking an initiative to improve their health. Today, only one in ten Americans owns a fitness gadget. These trackers are expected to become more common over the next decade as more high tech sensors are installed to detect more illnesses. For example the heart rate monitor, according to our research, is almost as accurate as an EKG, offering reliable data for the user. An accurate heart rate reading can give the user an idea of their target zone for more effective workouts.

As stated earlier these features can be used by consumers to predict and identify possible risk factors. For example, there is an increased risk of having a heart attack while sleeping. This can be noted by looking at your heart rate monitor or sleep pattern and bringing it to the attention of your doctor who will take preventative measures if a problem is identified. Most fitness trackers have a modern version of a food diary where you can log the foods you have eaten, and how many calories are in them. These apps help plan, track, and analyze diet to accommodate

nutritional needs so the individual can correlate their calorie intake with their goals or compare it to the recommended calorie intake for their demographic. Calorie and food trackers also generally encourage healthy eating by making you more aware of what you eat and motivating you to eat more nutritious foods. Recording your daily water intake helps the individual reach a goal while also staying hydrated. Sleep tracking is also important so you can see how many hours you sleep a day and the activeness of your sleep. People need REM sleep to survive. Sufficient sleep also helps prevent many diseases including Alzheimer's. Exercise is crucial as well; seeing your physical activity laid out in front of you on an app can also motivate you to keep moving and fight obesity and other diseases that are brought on by being overweight. This can help fight future costs on disease care for both the consumer and the insurance provider.

The literature overwhelmingly demonstrates that physical activity benefits mental and motivational health. Social media and sharing your progress is another feature these gadgets provide, which contributes to the motivational aspect through instant gratification to maintain an active lifestyle. This will create an attachment to the habitual use of the gadget and create a beneficial outcome for both sides. Insurance companies can continuously offer discounts for the latest gadgets as new features develop. The future of fitness trackers aims to incorporate and connect the entire body and tackle blood glucose monitoring. Some are using sensors to determine chemical imbalances. New research shows sensors that detect chemicals in the body's sweat that may be used to assess medical conditions, drug abuse, or help optimize athletic performance.

Overall, this will serve as form of preventative healthcare because the insurance company is making an investment in their buyers' health. Some companies, like Autodesk, buy Fitbit trackers in bulk and sell them at little to no cost to their staff. A global benefits director, saw a trend between device distribution and decreased problematic health conditions such as hypertension and said "When we look at national averages of healthcare increases, we find that we are a little below those increases." Better health through active lifestyles will lower the risk of disease and future costs for treatments, ultimately saving insurance companies money by providing a reduced cost for fitness gadgets. We ask you to please consider this proposal and help the future health of our society.

Thank you in advance,

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