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Mini Review

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The Effect of Fitness, Sports and Lifestyle Factors on All Causes Mortality and Insurance Premiums

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Abstract

Physical activity, sports and modifying lifestyle factors reduce all causes mortality in a dose-response way and should be prescribed as a medicine. Insurance companies are looking for possibilities and opportunities in this new market. Luring clients with apps, trackers and smart watches is only a small part of their efforts. Giant mergers, alliances and AI learning will dominate the landscape of healthcare and insurance in the near future. If this benefits patients have to be seen.

Introduction

High levels of physical activity (PA) reduce the risk of mortality among older adults [1-12]. There is growing support that exercise is medicine, since it is a crucial modifiable factor for preventing early mortality [8]. Strong evidence exists that shows a dose-response relationship to the volume of PA and mortality, with PA levels up to 3 times higher than the recommended value of 30 minutes walking a day, yielding the most favorable all-causes mortality rates [13-16]. So, PA, fitness and sports can be prescribed by physicians in different doses [7,8]. Are there similarities with prescribing of regular medicines?

Global fitness market is worth approximately \$ 81,2 billion with 186.850 clubs and over 151 million members worldwide. This doesn't include all of the related industries within fitness, such as equipment, trackers or supplements [17]. With Johnson & Johnson only at an estimated value of \$ 354 billion, this may seem small but is nevertheless substantial [18].

If you are ill, insurance will cover most of your doctor's costs, medicines and hospital stay, depending on your deductible's. But how about if you want to invest in PA, fitness, sports and organic or biologic nutrition? Insurance and big healthcare companies are looking for possibilities in this new market. Some of these initiatives and their pros and cons will be discussed in this mini-review...

Initiatives

Premium Discounts

Discounts seems to be mainly a Dutch health insurance affair. In the Netherlands health insurance is organized collectively and based on the solidarity principle. This means health insurance is obligated by law for every person. Profits of insurance companies are limited and in line with mandatory financial buffers. Therefore, it is possible monthly premiums range from €100-€150/month, depending on the package, with deductible's ranging €400-€800/year. Within the limits of the Dutch law insurance companies have little freedom of movement regarding discount premiums. Insurance is based on claims experience implying the company pays when there is a claim. So for restitution you have to be ill or accumulated medical expenses.

Coverage of prevention of lifestyle diseases is just coming up. Costs of quit smoking programs and dieticians for obesity are covered after referring by a GP. Discounts are generally of the magnitude of about 10% if you follow these programs. However, technology developments are fast and apps, smart watches and trackers are also incorporated in Dutch healthcare now, rewarding people for "moves" in fitness programs by ancillary gifts or an extra small discount, following global trends [19].

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Fitness Apps, Trackers and Wearables

With the ever increasing availability of mobile apps, consumer wearables and smart medical devices more and more individuals are self-tracking and managing their personal health data. A recent Canadian National Survey by Pare et al. interviewed a sample of 4109 Canadian adults, one of the largest ever [20]. Their findings revealed that 66,2% (2702/4109) regularly self-tracked one or more aspects of their health. About 1 in 4 respondents (1041/4109; 24,7%) currently owns a wearable or smart medical device, and 57,2% (580/1014) use their devices on a regular basis for self-tracking purposes. Digital self-trackers are typically young or mature adults, healthy, employed, university educated, with an annual family income over \$80,000 CAD. The most popular reported device is the fitness tracker or smartwatch that can capture a range of parameters [20].

Currently, mobile apps and trackers are mainly used to monitor physical activity (856/1669; 51,3%), nutrition (545/1669; 32,6%), sleep patterns (428/1669; 28,9%) and to a much lesser extent, cardiovascular biomarkers (215/1669; 12,8%), medication intake (126/1669; 7,5) and glucose level (79/1669; 4,7%). Most users of connected care technologies (481/580; 83%) are highly satisfied and 88,2% (511/580) intend to continue their apps and devices in the future. A majority said smart digital advices have allowed them to maintain or improve their health condition (398/580; 68,5%) and to be better informed about their health in general (387/580; 66%). About 33,8% of the sample as composed of people who do not monitor their health or well-being on a regular basis [20]. These are interesting figures and some data are in sharp contrast with real-world data obtained from long-time functioning programs.

In the Netherlands, Menzis, an insurer with 2,5 million customers has such a program already for 5 years. Policy holders can earn points by cycling or walking. For that reason, they have to link the Menzis app SamenGezond ('TogetherHealthy') to a fitness app as Run keeper or Strava. Each kilometer is worth 25 points. When enough points are saved, people can visit the Menzis webshop to cash their points, or they can choose for a small premium discount. (19). Of 750,000 Menzis customers who signed up in 2012 only 225,000 save points. Just 25,000 linked their apps to the Menzis app. The others were saving by posting healthy moments on facebook or FB selfies. Other Dutch insurance companies as CZ, Zilveren Kruis, and Friesland are offering similar programs. If these clients are really healthier as reflected by GP consultations or hospital admissions has not been reported by the insurers, considering these data as confidential trade secrets [19].

The American wellness specialist Vitality offers since last year a package deal including an Apple watch if their customers achieve the goals of their training programs [21]. Insurer Oscar Health offers healthy people discounts at Amazon's web supers, if they achieve the step by step program goals of the insurer [22]. Rumors suggest Apple and Aetna, one of the biggest U.S. insurers, are discussing alliances, introducing an Apple device with step counter, heart rate monitor and fitness monitor. Rumors are denied by Apple and Aetna so far [23].

Does It Work?

After the first enthusiasm most fitness tracker users are tired of listening and moving on tracker instructions. This is a

phenomenon shared with new fitness club members. One in three uses its tracker not anymore after 6 months [19,24,25]. One of 10 Americans has a step counter but half of them are not using it [19]. British students, aged 13-14 years, used a Fitbit Charge for 8 weeks. After 4 weeks most of them dropped it because they did not like their fellows scoring better [19,26]. Stanford researchers showed wrist watches are pretty good in counting heart beats but awfully bad in counting calories burned [27]. Fitbit Surge was one of the best with a margin of error of 27% while Pulse On scored an error margin of 92,6% [27].

As the Canadian survey shows there is little spirit for cardiopulmonary tracking and glucose sensing. Apple's new smart watch only offers a 1 lead ECG, distinguishing only sinus rhythm from atrial fibrillation. AliveCor announced to respond soon with a 6-lead ECG watch [28]. A normal ECG has 12 leads. Developments in the sensor technology of diabetes monitoring are still slow, but far from perfect, despite decades of research [29].

What Is the Life-Span of Apps and Trackers Start-Ups?

Jawbone founded in 1999 and one of the pioneers collapsed in 2017. TomTom announced also in 2017 leaving the production of sport watches. Market leader Fitbit sees sharp drops in wearable sales revenues [19,30]. This directs us to the concerns about the privacy of the delivered data, when these start ups' go bankruptcy. The answer is easy. When they vanish, their apps and trackers disappear too and all your jogging, walking and cycling data are swimming in the water. Thus cyber security and hacking of devices are not the only problems in securing data privacy...

What Will Come After the First Shake-Out?

The answer is already there. As mentioned before Amazon is already active in different parts of the healthcare industry over the past 2 years, but its recently announced alliance with JPMorgan Chase and Berkshire Hathaway demonstrated that Amazon's ambitions go much further than simply selling healthcare products [31]. From an online bookstore to an online everything stores, leading in cloud computing, B2B platforms and a provider of n home services, Amazon continues to grow on its original business plan.

It will afford Amazon to reap huge financial benefits from lowering high costs of healthcare in the U.S. The expectation is that the alliance will focus on durable medical equipment and supplies, mail order and retail pharmacy, pharmacy benefit management, telemedicine or in-home healthcare and last but not least A1 powered diagnostics and continuous care [31].

All these activities will generate an enormous amount of customer's online data. Such a development could lead to a total irrelevance of trackers and healthcare apps used mainly by a small portion of highly educated people. These new giants consider this world of online data as company trade secrets. They are still interested in all causes mortality as a tool for calculating insurance risks but they don't need the WHO ICD 10 IRIS system anymore [32]. It is an illusion they will publish their results. They will have insurance under their thumb. If this benefits patients, as they promise, has to be seen.

Conclusion

It is obvious that physical activity, sports and fitness is a medicine

and reduces all causes mortality in a dose dependent way. As a result, fitness industry is booming and healthcare insurers lure clients with smartwatches, apps, trackers and discounts on premiums or ancillary gadgets in their gift webshops. The health information gathered is handled as secret trade information. The shake-out of the first start up pioneers in apps, trackers and smart devices has already begun. When they collapse, all your jogging, walking and cycling data are swimming in the water. So, data privacy means more than hacking data and cybersecurity.

Mergers of insurance giants as Aetna and Cvs (and maybe Apple) and alliances between Amazon, J.P. Morgan and Berkshire Hathaway will dominate the near U.S. healthcare and insurance landscape. These giants are still interested in all causes mortality as a risk tool for calculating premiums. They are not interested in publishing their gathered information. Insurance will be under their thumb. If this is beneficial for patients, as they suggest, has to be seen.

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