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Social Networks for Quantified Self

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Glossary

Connected health	Health care through the use of technology
mHealth	Mobile health
Mobile fitness	Mobile fitness applications used from a smartphone or website apps

Definition

Over three quarters of US health care spending goes to the care of people with chronic conditions, including heart disease, diabetes, and asthma, while in 2004, nearly half of the Americans were diagnosed with one or more chronic conditions, a number expected to increase dramatically as the baby boomer generation rapidly approaches their retirement age (Accenture 2009). The new reality, dubbed “Connected Health,” incorporates a broad range of health and fitness applications that are always on, always active, and always aware (Accenture 2009).

Since many aspects of health promotion professionals involve interdependent actors, social networks are of increasing interest to health

services researchers (O’Malley and Marsden 2008). The creation of a social network map of a person’s social network can help visualize and thus better understand the strengths of the social ties of the network (Christakis and Fowler 2009).

Technology Will Transform the Future of Chronic Care

In a 1995 editorial in the *American Journal of Public Health*, former US Surgeon General C. Everett Koop stated, “Cutting-edge technology, especially in communication and information transfer, will enable the greatest advances yet in public health. Eventually, we will have access to health information 24 hours a day, 7 days a week, encouraging personal wellness and prevention, and leading to better informed decisions about health care” (Koop 1995). Technologies like miniaturized health sensors, broadband networks, and mobile devices are enhancing and creating new health-care capabilities such as remote monitoring and online care (Accenture 2009).

In 2009, management and technology consultant Accenture released a report on how technology will transform the future of chronic care. Cited in the report is the anticipated crisis in care that will be further challenged as the baby boomer generation begins to retire.

According to the US Census Bureau, the world’s population of people age 65 and older is projected to triple by mid-century, from

516 million in 2009 to 1.53 billion in 2050. This growing trend places a tremendous economic burden on governments, private employers and individual consumers alike. It also puts strain on the capacity of skilled care professionals and nursing homes (Accenture 2009).

In addition to the inexpensive cost of computers and Internet connectivity, the report identifies three technological advancements that are paramount to the future of chronic care:

- Seamless capture and sharing of patient information in real-world settings
- Improvements in ways to combine and interpret data about an individual's health and wellness so that appropriate interventions can be made before an acute situation occurs
- Innovative tools including user modeling, advanced visualization, decision support, and collaboration

Health and Social Networking

One aspect of "Connected Health" is via the power of a person's social network. Research suggests that people interact with their social network with regard to their health. Christakis and Fowler (2009) concluded that "... a person with more friends and social contacts generally has better health than a person with fewer friends, and a person at the center of a network is more susceptible to both the benefits and risks of social connection than those at the periphery of a network." This would suggest that a person is not only affected by their location in a social network but also influenced by the behaviors of those who are "close" to them in the network. Perceived social support and physical activity are directly associated with a person's perceived health status (Almeida 2008).

As technology continues to impact humanity, the understanding of one's social network may be one key to better health. The basic element of a person's social network is simple: a social network starts with a central person (called an ego) and other people (called nodes) that are interconnected by links (called ties). As the

numbers of nodes and links increase, the number of possible connections grows exponentially – known as the network effect (Christakis and Fowler 2009).

Christakis and Fowler (2009) suggest that "people are inter-connected and so their health is inter-connected. Inter-personal health effects in social networks provide a new foundation for public health." As online connections between people become ever more interweaved with offline real-world interests, social networking methods are moving towards simulating real-life social interactions, including physical activity, health, and disease management: rather than randomly approaching each other, people meet through things they have in common (Breslin and Decker 2007).

Technology and Health Behavior Modification

By using Mobile Health technology (mHealth), health providers can practice a more "personalized medicine" and potentially reach more individuals with effective health-related advice and information at a very low cost (Strecher 2007). Griffiths et al. (2006) suggest a number of reasons for delivering web-based health, wellness, and fitness interventions including reduced delivery costs, convenience to users, timeliness, reduction of stigma, and reduction of time-based isolation barriers.

Technologies can play three roles with regard to behavior modification: as tools, as media, and as social actors.

- As a tool, interactive technologies can be persuasive by making target behavior easier, leading people through a process, or performing calculations/measurements that motivate.
- As a medium, interactive technologies can be persuasive by allowing people to explore cause-and-effect relationships, providing people with experiences that motivate, or helping people to rehearse a behavior.
- As a social actor, interactive technologies can be persuasive by rewarding people with

positive feedback, modeling a target behavior or attitude, and providing a social network of support (Fogg 2002).

Within the health-care field, interactive technologies can be effectively deployed to take on multiple roles at the same time. For example, a simple persuasive tool can measure calories while at the same time giving a reward upon attainment of a personal goal. This type of self-monitoring is a key ingredient in successful behavioral modification. In addition, if several people are connected through the Internet, then social support can be leveraged, which has been shown to impact motivation and behavior change (Chatterjee and Price 2009).

The Quantified Self

The idea of measuring things relative to a business or personal goal is common in today's society. The same measurement tools can be used within the self-tracking of a person's health and fitness. Commonly known as the Quantified Self movement, this is eclectic mix of early adopters, fitness fanatics, technology evangelists, personal development junkies, hackers, and patients suffering from a wide range of health challenges (The Quantified Self – Counting Every Moment 2012). Some measure their hourly mood swings, while others the stages of their nightly sleep habits. Some track every meal, snack, or drink, while others share on Twitter and Facebook their workout routine complete with heart rate, time, distance, calories burned, and musical preferences.

Ongoing research aims to classify and understand why a person shares their workouts within their social network via Twitter and the associated benefits. While there are various personal devices that monitor/track a person's exercise characteristics (e.g., Body Media, Fitbit, MapMyFitness, and

Nike+), the effectiveness of online sharing via social networks of one's physical activity is limited in scientific research. Studies have indicated that "lack of motivation" is a key factor in why a person does not exercise.

One factor to address is the relationship between participant and provider (i.e., personal trainer) and/or participant and social network, including their influence. People join gyms not only for health and fitness but also for the social atmosphere. To fully understand the power of combining social networking and exercise adherence, the physical barrier of the four walls of an exercise facility is removed, and technology is used that enables a measurable improvement towards one's fitness goals.

Conclusion

With the move towards making machine-understandable data available for computers, allowing exercise data to become accessible/exchangeable between trusted peers is quite important. However, one's historical exercise records are often locked in to proprietary systems. By publishing selected aspects of these profiles using semantic terms, it will become easier for people to search for and discover relevant exercise regimes.

Early prevention and healthy lifestyles may be the least expensive and best ways to combat the growing prevalence of avoidable diseases associated with a lack of physical activity including obesity (Almeida 2008). If people who lead sedentary lives would adopt a more active lifestyle, there would be enormous benefit to the public's health and to individual well-being. An active lifestyle does not require a regimented, vigorous exercise program. Instead, small changes that increase daily physical activity will enable individuals to reduce their risk of chronic disease and may contribute to enhanced quality of life (Pate et al. 1995).

Cross-References

- ▶ [Actionable Information in Social Networks, Diffusion of](#)
- ▶ [Data Mining](#)
- ▶ [Twitter Microblog Sentiment Analysis](#)

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