The Application of Intelligent Keywords to Patient Adherence Management System

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ABSTRACT

Health behavior change is the key challenge for healthcare intervention adherence management. For each treatment planning, patient adherence can be managed, audited, and improved by the Patient Adherence Management System applying Intelligent Keyword (PAMSIK) featuring the use of intelligent keywords, which has been design to navigate users to the target in-time knowledge and also leverage the collective power – peer learning to encourage patients. Three major components of PAMSIK are: an autonomous, intelligent, friendly User Behavior Collector to identify patient’s personal adherence problems, a Patient Similarity Analyzer to dynamically cluster peers, and a Cure Service Dispatcher to recommend suitable cures and thus deliver prompt services and in-time contents to users.

Keywords: Clustering, Cure, Intelligent Keyword, Keyword-Bubble, Management System, Patient Adherence, Patient Similarity, Peer Learning, Prompt Services, User Behaviors

INTRODUCTION

Background – Chronic Diseases, Patient Adherence & Peer Learning (in Marketing Views)

Quoted from US CDC web site, “Chronic diseases – such as heart disease, stroke, cancer, diabetes, and arthritis – are among the most common, costly, and preventable of all health problems in the U.S.” Statistical data have shown that not only chronic diseases are leading causes of death and disability, but also a great amount of percentage of medical insurance expenses are due to chronic diseases. It is increasingly important that we can effectively help these patients or soon-to-be to do some prevention as we know most chronic diseases can be prevented if a little change can be done before the disease outburst. It is also beneficent to our society social and economic wise as well.

As much as most people agree that health is one of the most important components in their life. However, recent research indicated that patterns of behavior change following diagnosis indicated that the vast majority of individuals diagnosed with a new chronic condition did

DOI: 10.4018/ijehmc.2013100107
not adopt healthier behaviors (Newsom et al., 2012). For example, smoking cessation among those with heart disease was the largest observed change, but only 40% of smokers quit. Furthermore, the longitudinal study concluded that no average long-term improvement in health behaviors such as exercise had been reported based on the latent growth curve analyses up to 14 years after diagnosis. People tend to be passive to change their life style to follow healthcare practitioner’s instructions unless they are actually sick.

Adherence is about ignoring or not following through with medical or healthcare decision (Vermeire et al., 2001). Adherence represents the idea of share-decision making between the clinician and the patient that has been appreciated more in the past decade than patient compliance. People are normally not willing to sacrifice their pleasure time to trade who-knows-what-could-happen security. However, when it does happen, people regret their carelessness about their health. Reasons for patient non-adherence are complex. Both internal and external factors were reported to influence a patient’s decision making and behavior change. Some internal factors considered to be important in advocating health-relevant behaviors are: (1) knowledge about risk factors and risk reduction, (2) attitudes, beliefs and core values, (3) social and life adaptation skills, (4) psychological disposition, e.g. self-efficacy, and (5) physiology. Some external factors are: (1) social support, (2) media, e.g. public service announcements, (3) socio-cultural, economic and political factors, (4) biologic, (5) health care system, (6) environmental stressors, and (7) societal laws and regulations (Shumaker, 2009). These findings are consistent with the Health Belief Model (Janz & Becker, 1984). It proposes that patients act on treatment recommendations when they believe that the benefits of treatment outweigh treatment barriers. Health information is the key to strengthen a patient believe in health behavior change. Smith (2011) reported that significant differences exist by health status in source of health information. People with fair to poor health were more likely than those with good to excellent health to obtain health information from TV (25.4% vs. 20.4%) and their health care provider (72.5% vs. 68.3%); whereas those with good to excellent health are more likely than those with fair to poor health to get information from the Internet(36.7% vs. 30.3%). Those who have good to excellent health are significantly more likely than those with fair to poor health to trust information from the Internet and their health care provider (67.4% vs. 61.8%).

Another observation is that patient himself, by alone, is normally a bad manager to manage their own health conditions. A review study 25 randomized clinical trials that assessed the effect of peer-based interventions on health-related behaviors in adults published in 2010 concluded that peer-based interventions facilitated important changes in health-related behaviors, including physical activity, smoking, and condom use, with a small- to medium-sized effect (Webel et al., 2010). Therefore, peer learning could be considered as the key to make the said management system successful. Thank to the blooming internet social websites, i.e. Facebook and Twitter, everyone in the world nowadays is all equipped with unbounded people network resources. We can surely take advantage on these resources to form an effective use of peer learning mechanism. Figure 1 illustrates all of the main interested parties and data for a patient who has adherence problem in the physical world and in the cyber world as well.

**Problem Statements – How to Turn Knowledge into Action by the Power of Peer Learning**

In this research, a Patient Adherence Management System applying Intelligent Keyword (PCMSIK) was proposed to assist users to enhance their adherence behavior by leveraging peer power. It is necessary to first dig out what are the causes of adherence problems and why. How ICT can do to the help would be the next question to ask. Adherence problems vary from person to person. In this paper, we proposed that adherence problem can be interpreted into the actualities that people just cannot follow rigid professional knowledge closely enough
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