Stress Management 2.0 – A Holistic Approach to Self-management Online

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ABSTRACT

The last years have put stress management on the agenda of healthcare. Intense lifestyles with job and domestic demands let people experience high levels of stress and to react strongly to different stressors. Long-term sickness and absence from work can be a consequence of too high stress exposure during a long period of time. This negative trend can be counteracted if we allow a combination of actions to support people who experience stressful lives. Different online programs are available for people with stress symptoms. However, there is a lack of conceptual understanding and a holistic approach to learning online for this group of people. In this article, we present a holistic and integrated approach to stress management 2.0 that considers several areas: stress management, self-management, informatics and continuous learning through communication and feedback. The approach is based on findings from previous research studies of web based solutions for learning new lifestyles, stress management and results from clinical trials. At the end of the article, we present some design principles to be used for developing systems in accordance with stress management 2.0 from a holistic view.

Keywords: Self-management, Stress management, Web based, Learning, Communication, Holistic.

1. INTRODUCTION

The use of the Internet and new technological possibilities continuously change the way we look upon healthcare, interventions and self-help activities. Different intervention programs and counseling activities are offered to people who suffer from problems related to their lifestyles. By changing unhealthy lifestyles, people can reduce the risk of getting severe illnesses. Heart conditions, diabetes, asthma and cancer are examples of health conditions that have shown to be associated with lifestyle. Preventive healthcare and early interventions are therefore recognized as important in order to help groups of people from becoming patients of the healthcare system and from being forced to sick leaves and long-term sickness absence.

One important target group for interventions consists of those who are exposed to high stress levels. They have an increased risk for deterioration in physical and mental health often leading to sick leave and high consumption of healthcare [1]-[2]. Stressors related to occupational work such as a frustrating work situation or work-family imbalance are major causes of psychological and physiological strain and mental disorders [3]-[4]. Also overcommitment at work could entail increased risk to experience work issues as stressful [5]-[6]. Overcommitted co-workers suffer from inappropriate perceptions of demands and of their own coping resources. Often perceptual distortion prevents them from accurately assessing cost–gain relations and to set limits [5].

To be able to achieve long-term changes, intervention and support activities need to be continuous. Ongoing social support has been recognized as a crucial factor for developing a lifestyle change that lasts [7]-[8]. It is in this context that e-health platforms play a difference, since they can offer continuous interaction and information sharing between healthcare professionals and people with lifestyle issues, and also within the community of people who share the same kinds of lifestyle issues. Other reasons for using web based healthcare interventions have been stated in a systematic review of research studies: reduction of cost and increased convenience for users, reduction of healthcare costs, overcoming isolation of users, the need for timely information, stigma
The use of the Internet to search for health information and to communicate around health issues with others has increased during the last years [10]. Online self-help exists in many different health areas, from severe physical illnesses such as diabetes (see [11], e.g.) and mental disorders such as depression (see [12], e.g.), to different lifestyles that are considered to cause health risks to people (see [13]-[15], e.g.). Among e-health platforms on lifestyle issues you find those targeting stress and stress management.

In this new world of increasing online health services, there is a need to discuss different ways of designing the online systems for communication and learning individually and in groups. The Internet technology and its use have gone through major changes over the years. The dominant feature for many years was information search and retrieval. The present trend is to move to more interactive applications allowing people to share information and knowledge and to communicate in groups. To integrate applications, information and people in a flexible way are characteristics of web 2.0. To let users not only be consumers but also producers and contribute to content is another important feature [16]. Through blogs, wikis, video sharing, social networking and content tagging services, people contribute together [16]-[17]. By using the term “collective intelligence” is another way of referring to the web 2.0 [18].

The use of self-management intervention systems on the Internet today is characterized by information management, interactivity and communication. However, the use of the different online health services for information and communication with experts and peers has not yet reached the level of integration and holistic thinking. This gap needs to be addressed in order for people to get an online platform that is well aligned with their needs of support and learning. How to combine the different online technology features and services is what this article will discuss. The focus of attention is web 2.0 for self-management among people with stress symptoms. The goal is to present a holistic approach to designing intervention systems for stress management and to introduce appropriate design principles that consider integration, flexibility and adaptation.

The sections of the article are organized as follows. We will start by introducing basic characteristics of stress and stress management. After that, we discuss self-management online in general and stress management online in particular. Next, we address web communication for learning purposes among people with lifestyle concerns. From our understanding of these presented themes, we suggest design principles for a holistic approach to stress management 2.0.

2. STRESS MANAGEMENT

Stress management consists of different interrelated areas: stress as a concept, individuals and their differences and how to manage stress. In this section, we will approach these areas.

The Concept of Stress

“Stress” could either be a cause or act as a stressor on the human body and mind, or an effect, a stress response, of an event or thought in an individual [19]. Stress has physiological as well as psychological components, and is about how we perceive demands and our ability to cope with them.

Not all stress reactions are negative and a certain amount of stress is necessary for survival. For example is birth one of the most stressful experiences in life. The high level of hormones released during birth is involved in the stress response, and prepares the newborn child for adaptation to the challenges of life outside the womb. The biological responses to this stress make the newborn more alert which promotes the bonding process and the survival.

While a certain amount of stress is necessary for survival, prolonged and chronic stress for example in occupational life, can affect health adversely [20]. Stress is experienced negatively when there is an imbalance between the individual’s perceived demands and the ability to respond to these demands. In modern life the psychosocial stressors are the most common. To let a thought or an event be appraised as a stressor, there has to be a perceived mismatch between the demands and the individual’s resources to cope with it [6].

Responses to Stressors

Hans Selye was one of the first researchers within the area of stress. In the early 70-ties he described the effect of “nonspecific” chronic stressors on the body [21]. He concluded that the stress response can result from a variety of different stressors and focused on the internal aspects of stress, the stress response. He found that an individual who is subjected to prolonged (=chronic) stress goes through three phases: Alarm Reaction, Stage of Resistance and Exhaustion which was concluded as the Stress response or the General Adaptation Syndrome (GAS). The alarm phase is where the fight or flight response is activated which make the organism’s ability to fight and resist the stressor to increase. In the next phase, the resistance phase, the body starts to adapt to the chronic stressor. In the exhaustion phase the body’s resources are depleted.

The Biopsychosocial Model of Stress, presented by Engel in 1977 states that biological, psychological and social factors are linked regarding the progress of promoting health or causing disease [22]. According to this model the mind and the body are well connected and
interdependent. This means that biological, psychological and social issues operate together to affect the health status. This model is somewhat more comprehensive and could be considered a development of Selye’s original model. The stress response is elicited by many different psychosocial stimuli which can threaten the homeostasis (=the ability to maintain internal equilibrium by adjusting its physiological processes) in individuals.

Stress research has since a long time been oriented toward studies involving the physiological response (=the body's reaction) to stress and the cognitive processes that influence the perception of stress. However, the social perspective of the stress response has established that people with similar life conditions are not necessarily affected in the same way, which indicate that stress is caused, at least in part, by a person's mind or way of thinking.

Self-management Techniques

Regarding individual interventions in the area of dysfunction due to negative stress exposure, progressive muscle relaxation was originally designed by Jacobson to guide people through successive tensing and relaxation of the body muscle groups from toe to head to achieve overall body relaxation [23]. This process is easy to learn and teach, safe, non-threatening and non-competitive. Since then it has been concluded that the effectiveness of the interventions varied according to the health-outcome measure used [24]. Cognitive-behavioural skills were more effective for psychological outcomes, whereas muscle relaxation techniques were more effective for physiological outcomes. Using a combination of techniques; muscle relaxation and cognitive-behavioural skills seemed to be more effective across outcome measures than using a single technique [24]-[25]. Deep, diaphragmatic breathing is known to counteract the fight or flight response symptoms that are often associated with anxiety and negative reactions on stress exposure [26]-[27]. Also meditation can be used to counteract stressful situations, as it is a technique to develop concentration and awareness to produce a calming effect. Here diaphragmatic breathing is central to any meditation practice [26]-[28]. It has been found that there could be a lowering of blood pressure during deep breathing [29], which is interesting to consider in stress management.

3. SELF-MANAGEMENT ONLINE

In this section, we will outline some research results from studies on self-management online. Firstly, we present examples related to stress management online and secondly we will complement with some other self-management areas in order to broaden the coverage of different types of applications.

Stress Management Online

In a Swedish study on the effects of a web based intervention program for stress management, the results indicated that the web based program had better impact on the participants than was the case for the control group [30]. The target group consisted of 303 employees from four IT companies and two media companies. The participants were divided evenly and randomly into two groups: one intervention group and one reference group. The difference between the groups was that the intervention group had web chat possibilities and interactive self-help exercises. Examples of exercises were techniques for relaxation, time management and cognitive training. The exercises were in different modes; as plain text, pdf files and flash animation. The support that the two groups had in common was popular scientific information on stress and health, a diary that the participants used to improve their self-knowledge and how their health and well-being were affected by different events. Both groups also had a monitoring tool for the researchers to do statistical follow-ups on the groups. Indicators of changes in stress level were both physiological markers and psychological ratings of health, recovery and general well-being. The results were studied after 6 months to measure short-term effects. The levels of cortisol were found to be lower in the intervention group than in the reference group. Also self-rated eating habits, memory, physical activity, self-esteem and work joy were improved. However, data were also gathered and analyzed after 12 months [31]. The results from this long-term study showed that both the intervention and the reference group improved ratings of self-related health (SRH) but that no statistically significant difference between the two groups was shown.

No counseling feature was implemented in the web based intervention system. Also, neither studies of online conversations through the chat function nor other quantitative and qualitative studies of patterns of communication were included in the study. In general, communication support for managing stressful situations was not addressed.

Other studies of intervention programs online focus instead of designing and evaluating web based counseling functions. One example is the study that compared the effectiveness of a computer-based worksite stress-management program with an identical intervention program that was delivered through a traditional face-to-face group format [32]. The results show that both groups responded well to the relaxation exercises. However, reduction of perceived stress was less in the computer-based group.

Other Examples of Self-management Online

There are also other areas where self-management online applications have been used. In a study of diabetes self-management online, the intervention was divided into
three treatment components: basic information, tailored self-management and peer support [11]. Among the tailored self-management, the participants had access to a professional coach who guided them in diets. Regarding peer support, the participants exchanged diabetes-related information, coping strategies and emotional support in an online community that was monitored by professionals. The result after 10 months was that the usage had dropped gradually. When measuring dietary, biological and psychosocial outcomes, the results were regarded moderately successful, possibly caused by the participants’ lack of intensity and consistency in usage of the online intervention components.

Andersson found in a randomized trial of treatment of depression that those who had online therapy and participated in an online discussion group had more reduction of depressive symptoms [12]. The control group had only participated in an online discussion group.

4. LIFESTYLE LEARNING THROUGH WEB COMMUNICATION

Lifestyle problems implicate a lot of different concerns. They are also manifested differently depending on certain personal contexts. Through web based communication with peers, upcoming lifestyle concerns can be discussed as soon as they appear. Web based health communities on lifestyle issues are used on a daily basis by people with different health concerns. The communities help people share experiences, mental support and advice on how to cope with different health conditions [33]-[34]. To balance emotional support and factual knowledge is important for the social aspects of an online community [35].

The web communication with peers can help people get new insights and to develop new behaviors. A prerequisite is to let different views be represented in the conversations [36]. In this context, to have opposing ideas is something useful for the learning situation of a community [37]. This can also be described as the need of having both strong tie relations and weak tie relations, presented by Haythornthwaite [38]. Characteristics of strong ties are frequent communication, access to similar information, shared values and approaches, social and emotional support together with openness and self-disclosure. Weak ties, on the other hand, are characterized by less frequent communication between strangers or not so close friends or colleagues. While strong tie relations are important to enhance social support among the participants, weak ties are needed in order to let the community experience new inputs in terms of different ideas and approaches.

In studies of web based health communities on lifestyle concerns, the frequency of conversations that included deviating opinions and new perspectives were shown to be relatively few [39]. At the same time, the peers that expressed deviating ideas managed to do so in a friendly and empathetic way. This has led to the understanding that this type of conversations could be used more frequently without jeopardizing community bonds.

Regarding the conversational topics that are raised in web based communities on lifestyle problems, different types of questions and statements are used to initiate the conversations. The most frequent type of issue identified in lifestyle community studies is the fact query [13], [39]. The frequency of conversations on setbacks, obstacles and motivation were altogether the same as the frequency of questions on facts when communities on overweight and smoking were investigated. At the same time, when web community participants were asked about what they would like to increase, they wanted more of conversations on motivation [40].

The web based communities on lifestyle problems for peers have also shown to have complementary contents when compared to the systems in which the health experts answer questions from the public. Advice and information given in the two systems are of different characteristics, offering the people with lifestyle problems diverse and complementary approaches to their problems [41]. While answers from health experts contain detailed descriptions of requested subjects, community conversations emphasize personal experiences and more practical oriented advice [41]. This leads us to believe that a combination of different communication channels, with different actors, would offer the users a better understanding of his or her problem. The different and complementing knowledge of the actors is an advantage.

5. STRESS MANAGEMENT 2.0 FROM A HOLISTIC VIEW

In order for a web based intervention system to appeal to a diversity of people with different stressors and stress-related symptoms, the system needs to be flexible and responsive.

Design Principles
The following are suggested design principles for future self-management systems on stress management.

Social and Learning Activities: One important characteristic of well-functioning web communities is their ability to foster social and empathical communication [34]-[35]. At the same time, they need to support learning about stress and stress management activities. The two – social and learning activities – need therefore to be used in combination. Assigned health moderators can encourage the users to express different ideas, for example.

Integration of Knowledge and Actors: The intervention system must enable different actors to
contribute with their different types of knowledge and experiences. If letting the diversity meet in communities instead of being kept separated, new understanding can be produced. To have direct communication with others who are in the same situation and also with health professionals can create a turning point for managing a stressful situation.

**Extended Relations:** New topics and new ideas can easily be introduced if different health experts are invited to the online conversations. Also people who have managed to recover from difficult and stressful life situations can contribute with their insights. Thereby the platform will include both strong and weak tie relations, i.e., the kind of relations that Haythornthwaite related to [38].

**Learning Conversations on Stress:** In order for the users to become aware of their own learning processes, questions and conversations on practical situations, experienced and foreseen difficulties as well as motivational issues need to be addressed [13], [39].

**Tagged Conversational Topics and Acts:** In order for the users to navigate easier among the conversations, the posted topics and answers could be tagged according to their contents and response types. This could also help the users to become more aware of their own learning processes.

**Variety Management in Stressful Situations:** To get advice on how to approach a certain stressful situation can be of help to people who use the system. Also, advice on how to filter environmental signals and experienced demands can be of useful help. Considering individual differences, personal problem scenarios can be used as a starting point for interventions. Through “first-aid” and “ready-to-hand” support, the users can increase their variety in stressful situations.

**System Diversity and Variety:** There are individual differences due to diversity of personal stressors and reactions, and also different phases [21]. This needs to be handled by the system. Different system areas can enable people with different needs to navigate between relevant stressful situations and conversations. The different areas can have specially designed exercises and conversational topics related to certain situations and stress symptoms. This can also include different "user personas", i.e., individual preferences that are created based on patterns of usage.

**Continuous Learning:** In order for people to change unhealthy behaviors and patterns of thinking, continuous interventions are needed. The change process takes time. Mechanisms for continuous support in everyday life situations are therefore important.

**Viable Platform:** The platform should include learning from the users. Through repeated conversational topics and requests from the users, the involved health professionals can get feedback on what goes on in the users’ life and adopt and change the system in accordance with this. For example, exercises can be adjusted as to better suit current stress symptoms of the users.

**Multimedia for Virtual and Real Life Integration:** Communication between health professionals and the users can be supported by multimedia applications. Breathing exercises would probably benefit from being demonstrated through online video clips. Other physical exercises and instructions could also be exploited. These exercises could be performed by the users at any convenient time, such as during a lunch break or before a situation that normally causes stress reactions. Also desktop video conference applications could support the personal dialogues, making them richer.

**Embedded Feedback Mechanisms:** The platform should include stress measurements such as physiological markers and self-reports in questionnaires. This would help measure progress in learning. Results from these tests could also be useful for identifying needs that the online intervention system should be able to meet.

6. **CONCLUDING REMARKS**

Stress management gives people the opportunity to increase their self-regulation and to continuously seek for equilibrium. However, self-management systems online still need to be further investigated and developed in order to support sustainable improvements.

The approach in this article is based on findings from previous research studies of web based solutions for learning new lifestyles, stress management and results from clinical trials.

The research field of self-management online needs to apply ideas of web 2.0 in combination with medical evaluation methods of stress levels. New design principles with social and learning communication allowing diversity and embedded feedback mechanisms are suggested in this article. Self-management online also needs to detect progress, identification of problems, obstacles and setbacks, and motivational issues in learning and web communities. The presented system is based on a-synchronous textual communication allowing larger groups to interact together. Involved health professionals are also suggested to include multimedia applications and to use video conference for synchronic support.

Our approach named Stress Management 2.0 suggests a new paradigm with interdisciplinary methods from medical informatics, medicine and social sciences to be used simultaneously in research and evaluation.
7. REFERENCES


