

A Portal to Promote Healthy Living within Families

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Abstract. Our research aims at helping families work together to achieve a healthier lifestyle, increasing their awareness of what they currently do, and thus, could do differently. In particular, we are looking at encouraging reflections and discussions within the family, investigating the usefulness and effectiveness of various types of motivational strategies. This paper presents a collaborative platform for families. Our aim was to explore if we could facilitate health discussions, about lifestyle in particular, and encourage supportive behaviour within the family. We discuss some of the results we obtained when conducting a pilot study with families.

Keywords: Lifestyle, Family Support, Health Reflection.

1 Introduction

In the past two decades, a large body of medical research has been dedicated to the communication of health information. While investigating the best way to deliver health messages and engage people in healthy behaviour, it became clear very quickly that a *one size fits all* approach would have a limited impact. As a result, researchers turned to psychological models and behavioural theories as a basis for tailoring health behaviour change information to individuals. The need to mass-produce tailored health education material promoted the development of computer-based generation systems capable of producing a variety of messages tailored to a particular patient's medical record or disease characteristics (e.g., [7], [2] and [9] for a literature review). Over the years, tailoring has been characterised as a “promising approach” with the potential to reach a wide population.

In recent years, the focus has shifted from producing computer-tailored materials to providing more “*interactive computerized interventions where participants actually use the technology (such as websites and handheld computers)*” ([10], p.337). There has been a growing interest in developing web-based interventions (e.g., [6]) where people can plan and record their daily/weekly dietary and physical activities and where they typically can access peer-support through bulletin boards and chat rooms/lists. While some studies have been successful in demonstrating a positive effect on behaviour change (e.g., [4]), these cases remain isolated. Many web-based interventions still suffer from poor usage levels (e.g., [3] and [10]). Similarly, pervasive and ubiquitous technologies and mobile phone-based health and wellbeing applications in particular

(e.g., [5] and [8]) have become increasingly popular. While these applications are usually well received by users, they do not necessarily demonstrate significant long term behaviour changes. It can still be difficult for individuals to change their behaviour, especially when they are the only one needing to do so in their immediate environment.

Most of this effort however has focused on individuals, with little work involving families, and even less technology built to facilitate and support health discussions within families. Research on social integration and social support (for a review see [11]) has shown that people's natural social context, which includes family members, friends, colleagues and communities at large, can influence people's behaviour, and, in particular, their health and well-being, through the nature and the amount of social support provided. We therefore chose to involve the whole family and look at different ways to make them work together towards a healthier lifestyle. Our work focuses in particular on encouraging reflections and discussions within a family context. To do so, we are investigating the usefulness and effectiveness of various types of motivational strategies through the use of tailoring and user modelling techniques. In this paper, we present the platform we built, the *Family Portal to promote Healthy Living*, and the tools and activities that were provided to encourage family members to discuss, reflect and work together towards a common goal—that of adopting a healthier lifestyle.

2 Family Healthy Living Portal

To explore ways of engaging families and determine what would be most effective in promoting sustainable family healthy living, we gathered an initial set of requirements to guide the development of our first family portal prototype.

2.1 Initial Requirements

We gathered the initial requirements about the family portal through an online survey [1]. The aim was to collect information about the needs of overweight people, and what they would find useful for them and their family. The survey was designed around five particular research issues: 1) What is the perceived usefulness of a personalised health portal for individual and families? 2) How would both individual and families prefer to engage with such a portal? 3) Who would they consider including in this space (e.g., relatives, friends, doctor)? 4) What personal information would they be willing to provide? and 5) What information and services would they like to receive?

From the survey, we learned that individuals and their families would be happy to use such a portal on a weekly basis. They would like this portal to be a place for the family to share (i.e., the family space), while also providing privacy to individuals (i.e., individual space). They would prefer this space to be restricted to their family (no friends or relatives allowed). We also learnt that people would prefer most of the services to be delivered to themselves and their family. Finally, we found that people would be willing to disclose personal information to get content tailored to them. While some results were clearly supported by a large majority of participants, others showed diverse opinions and attitudes advocating the need for tailoring tools that can

address the needs and preferences of individuals and families. Before developing sophisticated tools to tailor the information, we set out to build the base platform to see if we could encourage reflections and discussions about healthy living.

2.2 A Collaborative Platform

The aim for our first prototype of the *family portal to promote healthy living* was primarily to encourage individuals and families to reflect, discuss and work together towards a healthier lifestyle. The portal was designed around four sections, described clockwise with respect to Fig. 1:

The screenshot shows the 'Family Healthy Living Website' interface. At the top left is the CSIRO logo. Below it is a navigation menu with 'Help', 'Terms of use', 'Questionnaire', and 'Logout'. The main content area is divided into four sections:

- Messages:** Contains several posts from users like Annmachie, SYS, and Darcy, dated between March 15 and 20, 2009. Topics include questionnaires, lifestyle changes, and family time.
- Lifestyle ideas:** Features a 'Select an entry' dropdown menu and a post by Laurant titled 'My lifestyle as it is now', which describes a daily routine and breakfast habits.
- Health Section:** Includes buttons for 'Index' and 'Back', and lists various tools such as 'Healthy Eating Tools', 'Healthy Lifestyle Tools', and 'Tools for Teenagers'.
- Diary:** Shows a 'Displayed Date' of Mar 20, 2009, and includes 'Readings I found interesting' and 'Tips and Strategies I found useful' from other users.

Fig. 1. Family Portal to Promote Healthy Living

- **A message board:** this enables both family members and the system to post messages (to be read by all family members). The system uses the message board to send reminders and tailored recommendations. All messages are presented in chronological order, as they are posted.

- **A lifestyle ideas tool:** each family member can use this tool to record their current lifestyle and how they could improve it.
- **A health section:** it provides resources about healthy lifestyle and wellbeing. It includes, for example, links to external health websites, quizzes and fact sheets. In the current prototype, everybody had access to the same set of resources, but members were sent some recommended pages based on their visit patterns.
- **A diary tool:** this tool can be used by families to capture their thoughts and experience in their journey of moving towards a healthier lifestyle. These can also potentially be shared amongst family members.

Both the lifestyle ideas and the diary tools were designed to help family members reflect on their behaviour and create opportunities for the family to talk about living more healthily. To initiate the reflection process, we organised an activity for families, asking them to look at their current lifestyle and to provide ideas to change it. For each suggestion, they had to specify what they currently do (“My lifestyle as it is now”), what they could change (“what could I change or do differently”), and why these changes would be beneficial (“Why these changes would result in a healthier lifestyle”). People provided their entries in an unrestricted manner (i.e., free text). As we wanted to emphasise healthy living rather than weight management, suggestions were not restricted to diet. Families could, for example, think of ways to become more active, limit alcohol and cigarette consumption or avoid sleep deprivation. Family members were encouraged to reflect on their own behaviour and that of their own family (through the lifestyle ideas tool), but we did not ask them to change in anyway their behaviour (e.g., follow a diet or increase their amount of exercise). Figure 2 provides an example of a lifestyle idea. The data entry is coming from our study.

The screenshot shows a web interface titled "Lifestyle ideas". At the top, it lists names: "Colours: Sue Steve Rebecca Deanne". Below this is a navigation bar with "Select an entry:" and a list of numbers: 45, 46, 47, 48, 49. The number 47 is underlined, indicating the current entry. Below the navigation bar, the entry is titled "»Entry by Steve: 20 Mar 2009, 20:53". The entry content is as follows:

My lifestyle as it is now:
with different activities happening in our family, meal times don't always coincide

What could I change or do differently:
would like to ensure that meals, especially breakfast and dinner, are spent together as a family

Why these changes would result in a healthier lifestyle:
this would help with developing a good relationship amongst our family as we can talk about our coming day and also what we did in the day. This would lead to a much happier and healthier family, as we can support each other with what is going on in our lives.

Fig. 2. Lifestyle entry by Steve, a 47 year old father

The electronic diary allowed families to record their experience. It was also a tool for them to share their thoughts within the family and hopefully generate health discussions. People entered free text, assigning it to one of the eight pre-existing categories in a drop-down menu. The categories were presented with the following prompts: *What I would consider giving a go*; *What I tried successfully*; *Changes that I made*; *Readings I found interesting*; *Tips and Strategies I found useful*; *What I found challenging*; *What did not work for me*, and *What would have helped me*. These categories were chosen to guide the reflection process, including intentions to change, perceived barriers, obstacles encountered and success stories. Examples of diary entries are provided in Figure 3.

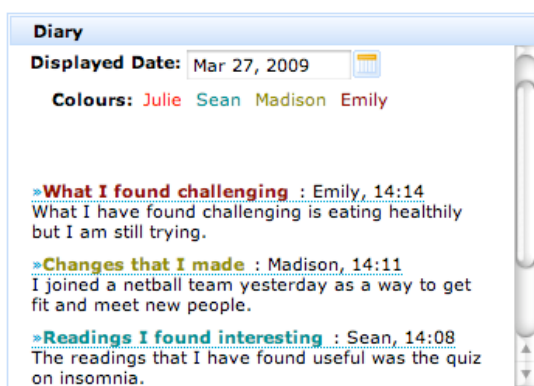


Fig. 3. Diary entries by Emily and Madison—12 and 13 year old respectively, and Sean, a 42 year old father

To facilitate the reflection process, the portal offered health resources, in three sections: 1) a section providing factsheets on food and healthy living, tips for healthy families and strategies to achieve a lifestyle change, 2) a section providing a series of quizzes on healthy eating and living and body image, and 3) a section providing links to authoritative agencies in health promotion (e.g., Nutrition Australia—a non profit community based organisation, Heart Foundation, Diabetes Australia). The content was provided mainly by the Better Health Channel website (<http://www.betterhealth.vic.gov.au/>) and by the CSIRO Human Nutrition group.

3 Family Experience

We conducted a pilot study in March 2009 with families of 4 (i.e., 2 adults and 2 children aged 12 to 17 year old). The aim was to examine whether such environment would be useful for families and, in particular, if the tools provided would be conducive to foster reflection and/or create opportunities for family discussions.

Among the 143 families recruited, 86 families only (corresponding to 215 individuals) visited the portal at least once. When analysing the data, we further removed 37 families who had logged once or twice without doing anything, leaving us with 43

families (i.e., 156 individuals). During the two week period of the study, all interactions with the portal were recorded, together with the time spent on the portal. At the end of the two weeks, families were asked to complete a questionnaire. It allowed us to collect information about the families' experience and helped us understand how family members worked together. Family members who participated until the end were offered a voucher as a token of appreciation. This incentive was not tied to their level of contribution.

3.1 Portal Usage During the Study

A total of 708 logs were recorded over the period of the study. The logs reported are based on the 43 families who participated until the end of the study. Most of the families visited the portal on average 5 to 6 times. Some of them went to the portal almost every day, sometimes several times per day. When logging in, participants could choose to submit suggestions, record their experience in the diary, consult the health information or browse the information entered by other family members. There were no restrictions on what people could write. We did not, however, find many duplications of entries or evidence of "gaming the system" (e.g., entering nonsense text just to enter something).

Lifestyle suggestions were recorded through the lifestyle ideas tool. Within two weeks, families submitted a total of 1455 lifestyle ideas. One third of the entries were suggested by mothers; the rest of the suggestions were equally distributed amongst the remaining family members. We did not build any activity around the diary tool, but we were interested to see if it would be a useful tool for the family, who would use it and what type of memories people would be willing to record. Although not everybody used the diary tool, people who used it found it a useful tool to reflect on their health. 20 families (i.e., 53 individuals) out of the 43 participating families used the diary tool to record their experience. A total of 329 diary entries were posted over the two week period. Of the eight pre-defined categories people could choose, the most used ones were: 1) intention to change "What I would consider giving a go" (34%); 2) successful changes "What I tried successfully" (20%); 3) implementation of change "Changes that I made" (13%); and 4) difficulties and obstacles "What I found challenging" (12%). It was interesting to see that, although the use of the diary tool was not mandatory for the task (unlike the lifestyle ideas tool), half of the participating families chose to exploit it. In addition, the entries reflected that people had the intention to change, that they indeed tried successfully some of their own suggestions to change, and some of them had made a lifestyle change.

3.2 A Learning Process

The analysis of the questionnaire at the end of the study (answered by 144 participants out of the 156 who took part in the study) suggests that families learnt during this process.

"I had a lot of fun doing this and learnt a lot about myself and healthy living."
(comment by 13 year old boy)

Overall, 80% of the participants reported learning something. In most cases, they learnt about ways to improve their lifestyle (83%) or about healthy living in general

(61%). Some families learnt about how to work together as a family towards a healthy lifestyle (48%). We noticed that some of the suggestions were concerned with the wellbeing of the family as a whole, emphasising aspects such as nurturing relationship between family members (e.g., father and son relationship) or spending more time together.

3.3 Encouraging Reflections

By encouraging family members to work together, we were hoping that this would generate some discussions within the family as to what could be changed. This proved to be the case: 71.5% of participants reported discussing the task with someone, in particular with someone in their family (69%), and discussing it together as a family (65%). Specific suggestions (70%), task difficulty (61%) and progress of the family (42%) were often discussed within the family. These discussions generated also personal reflections about one's lifestyle, as illustrated by the comments we received:

"I think this was worth it for my family, not just myself. I know my 14yr old son was not very forthcoming or original with his entries, but it did get him to think about and acknowledge the exercise and dietary shortfalls in his lifestyle." (a 46 year old mother)

3.4 From Reflection to Action

Our primary goal was to promote reflection and health discussions within families, not behavioural change. We found, however, that overall, 77% of our participants reported having tried a few (sometimes many) of their ideas. While a majority of entries were only statements of intention, some entries suggested more than just intentions, indicating that decisions had been made and actions implemented.

"It was really good to do it. It has helped me get started on a fitness programme that I probably would have kept putting off. I know I need to lose weight and get fit, but I just hadn't had the incentive to do it." (a 15 years old boy)

4 Conclusion

We are designing technology to assist families in adopting a healthy lifestyle, exploring techniques from CSCW and User Modelling. We designed a prototype for a family portal promoting healthy living, with an emphasis on fostering reflection and discussions. The comments and results we obtained from a two-week study with families of four (two parents, two children) are encouraging. Interestingly, we found that promoting reflections (as opposed to actions) was sometimes enough to induce an intrinsic motivation to change. Our study was limited in scope. We hope to be able to conduct a longer study in the future, also investigating whether opening this family space to health professionals (e.g., a GP, a dietician, etc.) would be useful for families and welcomed by practitioners, and whether creating a community of families would further help.

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