

Wellness Self-Management in Older Populations

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ABSTRACT

This position paper describes ongoing work in the design and evaluation of a self-care application for older adults to support general wellness. We report on findings from a 5-month field study with 7 participants, which provided rich insights and a greater understanding into older adults' attitudes and behaviours in relation to wellbeing self-management. We highlight case studies of two participants - one of whom embraced the application and continued to use it beyond the trial period, and one who dropped out of the trial early, indicating some reasons behind both.

Author Keywords

Older adults; wellness; self-care; health promotion

INTRODUCTION

Globally, human populations are ageing [6] and there is a significant cost element to the health care of older adults. Supporting older people where they live and in an environment that will adapt to their needs as they age by reducing hospital visits is a pressing need and represents a critical challenge to the health care system of the future.

Related to this, there is an increasing realization that health care for older adults needs to move beyond its current focus on disease management to a more holistic and preventative approach. Much of the literature around self-care technologies for older adults focuses on management of chronic illnesses, but ignores associated issues such as effects on mood, social wellbeing, sleep etc. [5, 9]. There is also little research on what might motivate older adults to look after their general wellness. While one might expect there to be higher levels of intrinsic motivation to self-care for chronic disease management, challenges exist around how to motivate older adults to look after general wellness, as part of a more preventative approach. Additional questions that need to be addressed include whether older adults are interested in technology-supported self-care; whether they want to view their own data, and whether educational advice is of benefit to them.

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This paper reports on findings from a 5-month deployment of the application. Some results from this deployment were presented elsewhere [4]. However, this paper provides additional insights and reflections and in particular compares case studies of two participants – one of whom embraced the application and continued to use it beyond the trial period, and one who dropped out of the trial early.

THE YOURWELLNESS APPLICATION

YourWellness is an application that has been designed and developed to support older adults in self-reporting on their wellbeing and provide feedback to promote positive wellbeing management. While incidences of chronic illness are high in older adults, and while monitoring of physiological symptoms is important, what is often ignored are the associated health issues, such as effects on mood, social interactions, physical activity or sleep. YourWellness aims to provide a holistic approach to self-care.

YourWellness users can self-report on up to 6 aspects of wellbeing including, for example, sleep, mood, social interactions and nutrition. For each area of wellness, (1) a series of questions can be asked of the person and (2) a library of multimedia educational content exists that can be pushed to the user daily, in real-time. Figure 1 shows the main elements of the app. A feedback 'wheel' provides a quick-glance overview of wellbeing. The wheel is divided into segments, representing the parameters of wellness that are being monitored and uses the traffic light metaphor as a high level indicator of wellbeing status – green for good, orange for not so good etc. Clicking on a segment brings the user to a graph of their data. A personalised educational message is also delivered daily. YourWellness has been iteratively refined based on feedback from older adults [3].

Field Study

We deployed YourWellness to 7 older adults (5M, 2F), aged 65-77 and conducted an evaluation after 5 months of usage. These participants had not been involved in the design process. The purpose of this study was to examine long-term adherence to self-reporting in an older population, to gauge opinions on whether the application

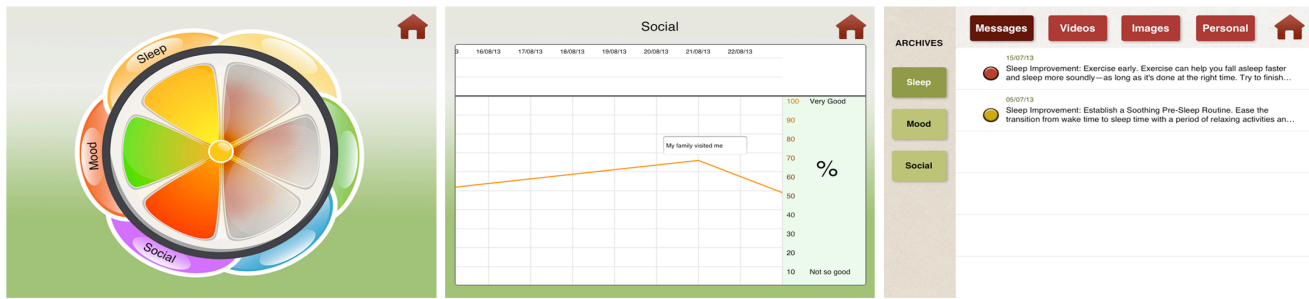


Figure 1. The YourWellness Application (a) Overview feedback wheel (b) Graph data for self-reported social interactions (c) Educational advice messages

increased awareness of one’s wellbeing, whether it encouraged people to alter their behaviour in some way and whether people found the application, particularly the feedback provided, useful and usable. We informed participants that they would receive a set of questions daily, but that they should answer them whenever they wanted to or could. We also said the initial trial period was 2 months, but there would be an opportunity to continue using the application, if the participant chose to. We were interested in measuring ‘real-world’ adherence to self-reporting and usage, rather than forced usage. After 5 months, interviews were conducted with all participants, and participants filled out two questionnaires – the System Usability Scale (SUS) [1] and the Intrinsic Motivation Inventory (IMI) [2]. Further details on the application and the study are outlined in [4]. In this paper we outline some of the main findings from this study and provide additional insights beyond [4], in particular highlighting and contrasting the experiences of two participants, one of who’s usage of the application led to a clinical diagnosis.

FINDINGS

In this section we discuss two case studies and provide an overall summary of our findings from the deployment of YourWellness. Figure 2 shows the daily percentage adherence of participants throughout the trial. Our case studies discuss *Brenda, who dropped out of the trial before the end of the 2-month study period and *John who continued to use the application beyond the 5-month trial.

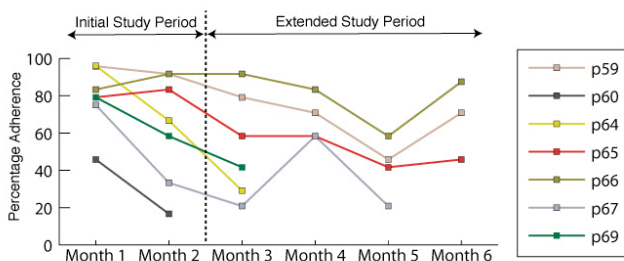


Figure 2. Daily adherence data for the trial period including data for John (p59) and Brenda (p60)

Case Studies

John’s Experience

John is a 67-year old man who took part in our trial. Like the other participants, John was interviewed about his experience 5 months after first deployment of the application. However, 4 months after the exit interview, John phoned the lead researcher of the project. John had continued to use the application on his iPad following the end of the formal study. After about 8 months of usage, John noticed that his graphs were “a little bit all over the place”, meaning that one week he might be reporting good wellbeing, the next week reporting poor wellbeing. John said that reflecting on his data made him realize that something wasn’t quite right. So John went to see his doctor and was eventually diagnosed with cancer.

	Success (*John p59)	Failure (*Brenda p60)
Age	67	69
Length of usage	> 8 months	< 2 months
Daily adherence	80.7%	31.5%
Usability score	90/100	75/100
IMI – Interest / Enjoyment	4.7/7	5/7
IMI – Perceived Competence	6.8/7	6/7
IMI – Pressure / Tension	1/1	1/1
IMI – Value / Usefulness	6.25/7	6.75/7
Understanding of design elements	Very good	Poor
Integration in to daily life	Very good	Poor

Table 1. Comparison of data for 2 participants

At this point, John agreed to take part in a follow-up interview with the researcher. He said that reflecting on the graphs on the YourWellness application had heightened his

awareness that something wasn't quite right with his health. In his previous exit interview, John had talked about understanding what caused dips in his graphs: *"So one time I got a dip in sleep and I know why it was. I had to go to the airport at 5.30 in the morning to pick up my daughter. So I couldn't sleep that night in case I slept it out."* When he got to the point where he didn't understand the dips, he began to ask himself questions. He said it prompted him to visit his doctor.

In terms of John's experience of using the application throughout the trial, other factors that contributed his continued usage of it included its easy integration into his life as well as his understanding of the concept and design of the application. In terms of integration, John adapted usage to suit his own needs. John found answering the questions and viewing the graphs to be more useful than reading the messages. This may be partially due to the repetitive nature of the messages on which John commented: *"They're useful, and they're common sense. But when you get the same types of ones over again, you're not going to read them."* However, John also noted that the questions were also repetitive, yet he continued to answer them as he found the graphs his answers generated to be useful. The type of device also had an impact. John spoke about how the iPad was *"always on the coffee table. We'd (John and his wife) always have been people where the computer is in a separate room. I couldn't get over how much we both used it (the iPad)."*

In terms of design and usability, John found the application easy to use, scoring 90 out of 100 on the SUS. John was one of only 2 participants who understood the use of the traffic light metaphor to indicate current wellbeing status. While he rated the application low on the interest/enjoyment scale of the IMI, he rated it high for value/usefulness.

Brenda's Experience

In contrast to John, Brenda - a 69-year old woman who participated in the trial - dropped out of the trial early and furthermore, her adherence to self-reporting during the 2 months that she took part, was very low. Looking at Table 1, there are little differences between Brenda and John's IMI scores, but the usability scores differ somewhat. Furthermore, during Brenda's exit interview it became apparent that she didn't understand many of the design elements, such as the use of traffic light colours to depict wellness state, despite this having been explained when the application was first deployed. She commented: *"Would they (the traffic light colours) relate to your personality? Usually nice bright colours are associated with lively people."*

The main reason Brenda reported for dropping out of the trial was that the application, in particular the questions being asked, weren't currently relevant to her life. Some of the social wellbeing questions asked about satisfaction with

interactions with neighbours. However, Brenda lived in a rural location and reported that she would rarely see her neighbours. Thus, she was unsure of how to answer this question, which on occasion caused frustration.

Brenda also thought that the purpose of the application was more medical than preventative wellness. She spoke about how she didn't need such a medical application as she was currently healthy: *"I think it could be useful at a certain stage. But not for me at the moment. That's not to say I wouldn't need it in twelve months"*. Brenda also felt that *"a medical check every 12 months or two years is enough."* She didn't see the benefit of it for someone who wasn't ill. A further question raised by Brenda concerned the trustworthiness of the wellness advice messages delivered through the application.

Summary of Other Findings

Further insights gained from the trial, as outlined in [4] are included in Table 2.

All 7 participants reported an interest in self-managing their wellness, but aspects that are important to them personally. There must be a gained benefit.
6 of the 7 participants said self-reporting encouraged reflection and therefore increased awareness of wellbeing. These participants viewed this as a positive thing. Research by Li supports this: he found that maintaining a diary alongside sensorised data collection of activity levels made participants more aware of their physical activity levels [17, Chapter 3].
Long-term adherence is likely going to be achieved by keeping the application personal and 'fresh' – i.e. ensuring questions and feedback are not repetitive, are engaging and introducing something new each day, such as an interesting quote, joke or trivia question. All participants commented on the repetitive nature of the application. 5 of the 7 participants rated interest/enjoyment of the application as average (only 2 rated it as high).
4 of the 7 participants made reference to 'clinically' worded questions causing confusion or having potential to stir up negative emotions.
Designing feedback that is easily interpretable is important. In the case of YourWellness, line graphs were easily understood and the preferred method of feedback for 5 of the 7 participants. Graphs allowed participants to 'dig deeper' into their wellbeing trends and to reflect on anomalies in their data.
Supporting the provision of context, through user annotations for example, is important to facilitate reflection on past events that might have caused a change in reported wellbeing. This was highlighted by 3 participants. The importance of context in supporting interpretation of anomalies in behaviour has been highlighted in previous studies [7].

Table 2. Additional Findings

DISCUSSION

Considering John and Brenda's experiences, and taking into account our other findings, we outline in this section some

important things to consider when designing wellness self-care applications for older adults.

Re-thinking 'Adherence' for Preventative Wellness

At the outset of the trial, measuring adherence was one of our primary goals, as we wanted to learn how we might motivate future usage. The starkest contrast depicted in Table 1 is that of the vastly different adherence levels for Brenda and John, and reasons for this are outlined in the previous sections. However, it is also worth asking what defines 'adherence' to usage of such an application? There is little existing research to provide guidance on how often preventative applications should be used to ensure benefits to the person. Should participants report on their mood daily? Is once a week enough? How often should they view their feedback?

With current clinical practice, such questions around quality of life, satisfaction etc. are only asked at a clinical visit, which is often triggered by a health event. For example, a person has a fall, attends a GP or clinic, and a series of questionnaires will be completed. At this time, the clinician may also provide some advice on self-care, for example how to prevent a fall. However, in between such events, no wellness information is captured and no new education is being delivered to support self-care.

We argue that any additional information reported in between is useful, as it prompts reflection. Furthermore 'dipping in and out' is natural and ensures easier integration into one's life. This type of usage is often seen with many quantified-self technologies, such as Fitbit or Nike+, where usage patterns naturally change over time, particularly if the user has a busy period at work or is ill, for example. Therefore, it may not be necessary that wellness applications are used daily, or even weekly, but that they are used as much or as little as the person wishes. However, more research is required to determine how designers might motivate older adults to use self-care technologies that focus on prevention rather than management.

Personalised Wellness

Very closely related to the discussion on adherence, is motivation. In terms of managing chronic illnesses, motivating adherence is important and much design research for self-care technologies focuses on how best to motivate and encourage behaviour change [9, 10]. In such cases, there is an immediate benefit in self-care – you become more aware of your condition and how to manage it and you can ultimately prevent a health event from occurring. But how can we encourage a more holistic approach to self-care, making it appeal not only to those who have a condition to manage? How do we educate potential users that continuous as opposed to episodic monitoring is beneficial? As indicated by Brenda's exit interview, she didn't see the benefit of the application beyond what was provided by her yearly medical checks.

However, she indicated if she could monitor her diet and nutrition, that this would be more appealing. Furthermore, John's experience provides a strong case of how things can change over a relatively short time period and why usage of such an application is important. Therefore, users of wellness applications should be able to tailor or personalize the application and its content to suit their needs.

CONCLUSION

Our findings have potential to contribute to a greater understanding of older adults' attitudes and behaviours in relation to wellbeing self-management that can facilitate the creation of new, personalized health and wellbeing interventions for this population. In future trials, we will evaluate health/wellness benefits through standard clinical questionnaires administered pre- and post- trial in addition to examining motivation and sustained behaviour change over time to determine guidelines around how to motivate preventative wellness management.

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