Implementation of an online tailored physical activity intervention for adults in Belgium

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SUMMARY

It has been argued that the Internet is a promising channel for distribution of health promoting programs, because of its advantage to reach a wide variety of people at once, at any time and location. However, little research is done to study how we could prompt people to use these online health promoting programs. Therefore the main objective of the present study was to assess if a face-to-face contact stimulates adults to visit a recently developed tailored physical activity website to promote more physical activity in the general Belgian population. The second objective was to test the website under real-life conditions in a small sample. Therefore, 200 flyers, with a call for evaluating the new tailored physical activity website, were distributed to hospital visitors in two different ways. One group of visitors were personally approached by a research assistant and handed over a flyer. Another 100 visitors could simply take a flyer home, without initial personal contact. After two months, telephone interviews were done to make a qualitative evaluation of the website. The results showed that obviously more participants with an initial face-to-face contact (46\%) registered on the website in comparison with the participants without personal contact (6\%). The used strategy reaches participants of both sexes as well as regular and irregular Internet users. Secondly, the telephone interviews indicated that the website was accepted well, without major problems. We could conclude that distributing flyers combined with a short face-to-face contact, increased the number of visitors compared with distributed flyers without contact and that the tailored physical activity website could be used in real-life situations to promote an active lifestyle in Belgium. However, a controlled study with a larger sample size should be done to test the effectiveness of the tailored intervention in increasing physical activity.

Key words: implementation strategies; internet; physical activity; tailored intervention

INTRODUCTION

In 2000 the Internet was called a promising channel for distribution of health promoting programs, because of its advantage to reach a wide variety of people at once, at any time and location (Fotheringham et al., 2000). Five years later, Internet use has expanded tremendously and usage is still increasing due to a drop in the cost of Internet connections and improved high speed access. Today there are more than one billion Internet users worldwide. The biggest penetration rate is found in North America (68.6\%), followed by Oceania (52.6\%) and Europe (36.1\%) (Miniwatts International, 2006). At the moment the increase of Internet users is the largest in underserved populations like the elderly, lower educated persons and women; and consequently the gaps among age, educational attainment and gender are narrowing (Insites Consulting, 2005).

Currently, many adults use the Internet to receive health-related information or advice for changing health-related behaviour. The reported numbers of adult Internet users in the US who ever searched the Internet for health information...
vary between 35 and 80% (Baker et al., 2003; Fox, 2005; Harris Interactive, 2005). In an Australian study 35% of the participants preferred to receive advice for increasing their physical activity level by Internet and e-mail instead of other indirect strategies like book (14%), video (12%), postal mail (8%) or telephone (5%) (Marshall et al., 2005).

As a consequence, researchers started to develop and evaluate online health advice on various topics such as smoking (Feil et al., 2003; Lenert et al., 2003), diet (Oenema et al., 2001; Irvine et al., 2004) and physical activity (Marshall et al., 2003; Napolitano et al., 2003). It has been proposed that qualitative behavioural change websites should be theory-based (Doshi et al., 2003) and that the efficacy could be enhanced by adding tailored advice, i.e. personal feedback on the participants’ risk behaviour and ways to change it (Kirsch and Lewis, 2004). However, very little is known on how to stimulate adults to visit health-behaviour-change websites.

In Switzerland, a single print advertisement for an online physical activity intervention resulted in absolute number of 947 visitors after a 2 week period, but corresponded only with a participation rate of 0.3% (Martin-Diener and Thüring, 2002). The same research group also compared print advertisements with diverse recruitment strategies as e-mails and Internet banners and buttons (Thüring et al., 2003). The e-mail calls produced the highest number of participants, with a response rate of 36.8%. Further, the print advertisements proved to be more cost-effective than the Internet banners. In another study (Feil et al., 2003) absolute numbers of recruited participants by search engines and user groups were higher in comparison with non-Internet recruitment methods (newspaper, radio interview or distributed brochures). However, no response rates could be calculated for these strategies. No research is done to evaluate other strategies that could enhance the participation rate of health promoting Internet interventions, for example face-to-face contact.

Therefore, the first objective of the present study was to assess if personal contact could enhance the number of visits to our newly developed tailored physical activity website and determine the reasons for not visiting the website. Next, the second objective was to test the physical activity website under real-life conditions, in the general population.

METHODS

Participants

Participants were recruited from visitors of a university hospital. The inclusion criteria were (1) between 20 and 55 years of age (2) no history of cardiovascular disease and (3) having Internet access.

Group 1 consisted of 100 visitors (50 women, 50 men) who were personally approached by a research assistant and asked to test a newly developed website aiming to promote physical activity in adults. People were asked to visit the website in a two month period, after which a research assistant would contact them by phone to interview them about their website experiences. They were told that the aim of the study was to improve the physical activity website. Individuals who wanted to participate received a flyer with a standard message and a unique flyer number. A researcher assistant noted their name and telephone number, so that they could be contacted afterwards.

Another 100 flyers were dispersed in various highly visible hospital locations, passed by many visitors. Group 2 consisted of these visitors who had taken voluntary a flyer with them, without personal contact.

Procedure

Both participants from Groups 1 and 2 could visit the site during a 2 month period, using the information on their flyer. Each flyer contained a standard message about the aim and time period of the study; how to navigate to the website; and a unique flyer number that was needed during registration. The flyer also mentioned that participants could receive a free tailored physical activity advice at the time they visited the website. More detailed information about the study and the registration procedure was mentioned on the introduction page of the website. During registration an electronic informed consent was filled in and a confidential username and password was created. After login, participants had access to the entire website (see Figure 1).

The main section of the website was an interactive tailored computer program that generated individualised physical activity advice after participants completed an assessment, containing questions on demographics, physical activity
(Craig et al., 2003) and psychosocial determinants. The advice contained information about participants' level of physical activity compared to American College of Sports Medicine (ACSM) recommendations (Pate et al., 1995) and was tailored to participants' stage of change (Prochaska, 1994), both by content and the way in which participants were approached, and
constructs of Theory of Planned Behaviour (Ajzen, 1985) by giving participants personal advice about intentions, attitudes, self-efficacy, social support, knowledge, benefits and barriers of physical activity. Participants could follow hyperlinks in their advice that lead to other specific website sections beside the tailored advice (Table 1), were added to assist people in becoming more physically active.

Table 1: Description of specific website sections

<table>
<thead>
<tr>
<th>Website section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal setting</td>
<td>Print-out form to fill in short, medium and long term goals and achieved goals; supplemented with an online example</td>
</tr>
<tr>
<td>Weekly plan</td>
<td>Online form to fill in the planned physical activities for one week, with tips and suggestions and an example; This was included to transform physical activity intentions into concrete acts (implementation intentions) (Gollwitzer, 1999)</td>
</tr>
<tr>
<td>Stretching program</td>
<td>Eight stretching exercises for beginners. Illustrated with photographs</td>
</tr>
<tr>
<td>Strength program</td>
<td>Ten easy strengthening exercises for beginners (without equipment), illustrated with photographs and supplemented with a self-monitoring form</td>
</tr>
<tr>
<td>Start-to-run program</td>
<td>Exercise program for beginners: from 0 to 30 min running in 3 months</td>
</tr>
<tr>
<td>Site plan</td>
<td>See Figure 1, with hyperlinks directly to the specific website section</td>
</tr>
<tr>
<td>Links</td>
<td>Hyperlinks to other relevant websites concerning physical activity in general and more specific the most practiced activities in Belgium: cycling and walking</td>
</tr>
<tr>
<td>Forum</td>
<td>Forum to get in contact with other website visitors and exchange information and experiences</td>
</tr>
<tr>
<td>Contact us</td>
<td>Contact information with e-mail address in case of help or more information needed</td>
</tr>
</tbody>
</table>

Usability testing

During the website development, usability testing (US Department of Health & Human Services, 2005) was done with six volunteer participants (all between 25 and 52 years old, 3/6 female, 4/6 low educated). Five usability problems were detected and solved. Most of the changes executed, made it easier for the user to navigate through the entire website: For example, hyperlinks were made more visible and the print version of the tailored advice was made to open in a smaller (new) browser window, in order that closing the page does not take the participants out of the website.

Measurements

The registration procedure, including the use of a unique flyer number, objectively assessed the number of participants in both groups that actually visited the website.

Interviews by phone

The telephone interviews were executed by the same researcher and contained a maximum of four parts. First, all participants in Group 1 were asked whether they had visited the website and completed registration. Non-visitors were asked about the reason for non-visiting.

Next, questions about the online questionnaire and the tailored advice followed for all registered participants in both groups: What problems did they experience? Could they remember the content of the advice and the current physical activity recommendations? Did they print, read and/or discuss the tailored advice? Did they make behavioural changes after reading the advice?

In the third part, participants were asked whether they had navigated to other sections of the website before or after receiving the tailored advice. If so, all the specific website sections were evaluated on frequency of visiting, on level of usage, on usefulness and on problems or difficulties they experienced.
indistinctness. Further the participants were asked to evaluate the entire website on features such as colour, structure, navigation speed, hyperlinks, etc. The last part of the interview contained questions about computer, e-mail and Internet access and usage. This was needed to study whether regular computer or Internet users could visit the site more easily compared with irregular users.

Statistical analyses
All data analyses were performed using SPSS 11.0. Descriptive analyses using means, standard deviations and distributions were used to describe participants’ characteristics, website use and qualitative website evaluation.

χ²-tests were used to detect relations between categorical variables. Statistical significance was set at a level of 0.05.

RESULTS
Website registration
After two months, 46 of the 100 participants in Group 1 registered on the site and 41 received their tailored physical activity advice and could be contacted by phone (see Figure 2).

Non-registrations
Figure 2 shows that 54 of the 100 persons in Group 1 did not register on the website; 49 of them were contacted by phone. Telephone interviews revealed that 42 persons of the 49 had indeed not visited the website, however 7 participants did navigate to the welcome-page (Figure 1), but could not \( (n = 4) \) or were not willing to fulfil registration \( (n = 3) \). The most important reasons for not visiting the site were ‘lack of time’ \( (n = 20/42) \), followed by ‘forgotten’ \( (n = 17/42) \). Most of the people who simply forgot to navigate to the site \( (n = 17) \), would have preferred a reminder e-mail \( (n = 10) \), instead of a reminder telephone call \( (n = 4) \) or both e-mail and telephone call \( (n = 3) \).

Participant characteristics
Characteristics of the participants are summarized in Table 2. Almost as many men as women received their tailored advice. Average age was 38 years and they were highly educated and employed, and 40% did not meet the physical activity recommendation for adults. Most of the participants had Internet access both at home and at work, and a third of the participants used the Internet as an information source daily.

An equal number of irregular as regular (at least once a week) Internet users visited the
There was also no association found between frequency of Internet use and problems experienced during website visit ($\chi^2 = 1.075, df = 1, P > 0.05$).

Tailored physical activity advice evaluation

From the five persons in Group 1 who fulfilled registration but received no tailored physical activity advice, three participants scored positive on one of the screening questions [based on PAR-Q (Thomas et al., 1992) and the SCORE system (De Backer et al., 2003)] and were recommended to consult their general practitioner; and the other two participants did not answer the questionnaire completely, which was necessary to receive a tailored advice.

In total, 47 individuals (Groups 1 + 2) received a tailored physical activity advice, and 43 of them could be reached by phone. All the participants ($n = 43$) except one, filled in the questionnaire without interruption. The reported mean time to complete the questionnaire was 15 min ($\pm 12.1$ min), which was acceptable for most of the participants ($n = 40/43$). Almost all individuals could remember their physical activity level mentioned in the advice, but only six persons could recall the mentioned ACSM physical activity recommendations for adults. Only one of them had heard about the physical activity recommendation before participating in the study.

More than half ($n = 25/43$) of the participants saved their tailored advice by printing it out ($n = 23$) or by saving it on PC ($n = 2$); 16 participants (37%) read their advice a second time and 24 individuals (56%) discussed it with others. Most of the volunteers ($n = 32/43$ or 74%) found the tailored advice stimulating, however only 10 persons (23%) did make behavioural changes immediately, while another 10 participants indicated they intended to make some changes. All participants who made behavioural changes ($n = 10$) mentioned they were interested in receiving a second tailored advice and were curious about the change in their physical activity score.

Website evaluation

The other parts of the website (supplementary to the tailored advice) were visited by 11 individuals out of 43 (22%). In general the website was evaluated positively (good structure, colour use, writing style, working links and navigating speed) and everybody should recommend the website to others.

As given in Table 3, participants visited different sections of the website, dependent on their interests. The most visited section was the start-to-run program that was experienced as (very) helpful by everyone and actually executed by one person.
DISCUSSION

The first finding of this study is that an initial face-to-face contact, even with a stranger, encouraged individuals to visit a physical activity website. A total of 46 of the 100 participants, who were personally approached and handed over a flyer, registered on our physical activity website in comparison with only 6% of the participants who had simply taken a flyer home, without initial contact. Secondly, the telephone interviews indicated that the website was accepted well and no major problems were experienced.

Low response rates are a common problem in the recruitment of participants for Internet-based health promoting research (Im and Chee, 2004). A few studies have compared different strategies to motivate potential participants to visit their health-behaviour-changing website. The measured response rates varied between 0.3% for print advertisements (Martin-Diener and Thüring, 2002) and 36.8% for e-mails-messages (Thüring et al., 2003). In the study by Feil et al. (2003) the success of strategies such as Internet engines or Internet banners on absolute numbers of visitors was highlighted, however no calculation of response rates were possible. Therefore, the high number of website visitors caused by a short face-to-face contact in the present study is promising. Moreover, the hospital visitors were approached by an unknown person and we could hypothesise that the response rate should by even higher if the flyer was handed over by a familiar person, for example a family doctor. Another advantage of implementing the recruitment in already existed networks, for example general practice, is the decrease in additional costs of a face-to-face contact.

Further, it should also be mentioned that the most common reason for not visiting the study-website, was forgetfulness. The non-visitors indicated that a reminder e-mail could help them to remember it. Therefore, it should be recommended to combine the first strategy of an initial face-to-face contact with reminder e-mails.

Few problems were experienced using the website. Almost all participants (90%) who registered on the site received their tailored advice. This is much more than the 33% visitors who finished the physical activity module in the study of Martin-Diener and Thüring (2002). Further, participants in the present study completed the assessment questionnaire in about 15 min, which was twice as fast as the completion time of the CD-ROM version. Most of the participants found the tailored advice stimulating and 23% of them reported immediate behavioural changes. All of the latter were interested to receive a second tailored advice to see how their PA score had been increased.

It was clear that the tailored advice was the key element of the website, only 11 out of the 47 participants navigated to another section of

<table>
<thead>
<tr>
<th>Visited? (n)</th>
<th>Strength-program</th>
<th>Stretching-program</th>
<th>Start-to-run program</th>
<th>Weekly plan</th>
<th>Goal-setting</th>
<th>Links</th>
<th>Forum</th>
<th>Site plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 X</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>&gt;1 X</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<thead>
<tr>
<th>Used? (n)</th>
<th>Strength-program</th>
<th>Stretching-program</th>
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<th>Weekly plan</th>
<th>Goal-setting</th>
<th>Links</th>
<th>Forum</th>
<th>Site plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printed</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saved</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
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<tr>
<td>Executed</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Followed hyperlinks</td>
<td></td>
<td>4</td>
<td>2</td>
<td></td>
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<tr>
<th>Evaluation? (n)</th>
<th>Strength-program</th>
<th>Stretching-program</th>
<th>Start-to-run program</th>
<th>Weekly plan</th>
<th>Goal-setting</th>
<th>Links</th>
<th>Forum</th>
<th>Site plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very helpful</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Helpful</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Not helpful</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Not at all helpful</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

Table 3: Evaluation of specific website sections by participants who visited at least one website section beside the tailored advice (Groups 1 + 2)
the website. However, these 11 persons evaluated the visited website sections positively.

Another important finding of the telephone interviews was the poor knowledge about the physical activity guidelines for adults and the fact that reading it once was not enough to remember it. In Belgium, only few national physical activity campaigns have been done and almost all were aimed to increase sports participation (Vandelanotte, 2004). Therefore, large-scale repetitive interventions to increase the knowledge about current physical activity recommendations seem necessary in Belgium.

The results showed that our recruitment strategies prompted both regular as well as irregular Internet users to our website. This was similar with the results of Feil et al. (2000), who found no relation between Internet use and participating in an Internet-based diabetes self-support program. We could also attract an equal number of men and women to our website, which corresponds with the finding that online exercise and fitness information is a popular health topic for both sexes (Fox, 2005).

Limitations of this study
A first limitation of this study is the small sample size. Nevertheless, the sample was diverse with an equal number of men and women and both regular, as well as, irregular Internet users. Second, with the exception of the numbers of flyers and registrations, all measurements were self-reported data. It would be of interest to know how many people in Group 2 saw and read the flyers, but did not take the flyer away. Objective data of website visit (when and how long each visit lasted) could also have been informative. A third limitation is that no more than two recruitment strategies were compared.

CONCLUSION
We could conclude that the used strategy of distributing flyers combined with short face-to-face contact, could increase the number of visitors of a tailored physical activity website compared with distributed flyers without contact and that this strategy reached both men and women as well as regular and irregular Internet users. The second strategy, distributing flyers without personal contact, resulted in very few website visits and therefore appears to be an ineffective strategy on its own for prompting people to visit a health-related website. Further, the tailored physical activity website could be used under real-life situations and was evaluated well.

Future research should study how such a face-to-face contact could be implemented in already existing contacts and what the effect is of additional reminder e-mails to prompt adults to visit a health-behavioural change website. Finally, the effectiveness of the website in increasing physical activity in the general population should be investigated.

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