The devil is in the detail: determining the content of an internet intervention for older adults with asthma

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Abstract

Introduction: The Internet can support people to self-manage their asthma, while overcoming barriers frequently found in primary care. A user-centred design process was utilised to explore the types of asthma information older adults perceived to be beneficial in helping them manage their asthma and the website features they felt were desirable for an asthma education website. Methods: A survey package was mailed to 9,000 adults aged 55 years and over, whose contact details had been obtained from the Australian Electoral Commission. Four focus groups were also conducted covering: asthma management; asthma Internet information; and website features. The Technology Acceptance Model was used as a framework to structure results. Results: Survey respondents indicated that they wanted information about identifying and avoiding asthma triggers, dealing with asthma attacks and the latest information on asthma management. Whilst focus group participants stated that asthma blogs, Internet forums and control assessment quizzes would not be useful to them. However the use of videos was seen as beneficial. Internet forums were the only feature discussed where older adults expressed concerns with their ability to use them effectively. Discussion: While older adults indicated a desire for basic asthma information the individual nature of asthma needs to be taken into consideration when creating website content. Both survey respondents and focus groups participants showed little interest in the use of blogs or forums on asthma. These results have implications for professionals providing self-management education to older adults with asthma and other chronic diseases.

Keywords

devil, content, detail, determining, internet, asthma, adults, older, intervention

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Abstract

Introduction: The Internet can potentially support people in self-managing their asthma, while overcoming barriers frequently found in primary care. A user-centred design process was utilised to explore the types of asthma information older adults perceived to be beneficial in helping them manage their asthma and the types of technology that could be used on an asthma education website.

Methods: A survey package was mailed to 9,000 adults aged 55 years and over, whose contact details had been obtained from the Australian Electoral Commission. The response rate was maximised using a tailored design method, with a reminder sent approximately three weeks later, followed by a second survey package.

Four focus groups were conducted using a discussion guide which covered: asthma management; asthma Internet information; and web site features. The Technology Acceptance Model was used as a framework to structure results.

Results: Survey respondents indicated that information about identifying and avoiding asthma triggers, dealing with asthma attacks and the latest information on asthma management would be of most benefit. Whilst focus group participants stated that blogs, Internet forums and asthma control assessment quizzes on an asthma website would not be useful to them, although the incorporation of videos was viewed as beneficial. Internet forums were the only interactive technology discussed where older adults expressed concerns with their ability to use them effectively.

Discussion:

Older adults with asthma are interested in information on identifying and avoiding asthma triggers, dealing with asthma attacks and changes in asthma management information. However, the individual nature of asthma needs to be taken into consideration when creating website content. Both survey respondents and focus groups participants showed little interest in the use of blogs and forums to enhance an asthma education website. These results have implications for professionals providing self-management education to older adults with asthma and other chronic diseases.

Key words

Middle aged

Elderly

Asthma

Web 2.0

Introduction

Asthma

Although asthma is often considered a childhood illness, most asthma deaths in Australia occur in older adults[1]. While asthma, like other chronic diseases, cannot be cured, it can be effectively self-managed, leading to improved quality of life[2,3]. Active self-management is important in older adults as this age-group face unique challenges in managing their asthma, primarily, due to the increased co-occurrence of asthma with other chronic diseases. A review of Australian studies showed that 80% of patients aged over 65 years had three or more chronic conditions[4] – highlighting levels of multi-morbidity. The occurrence of other diseases in conjunction with asthma complicates disease management, as patients' symptoms are often overlapping and they frequently have multiple medications. Further, the occurrence of asthma with other chronic diseases increases the likelihood of adverse drug reactions due to polypharmacy[5]. These issues are compounded by short face-to-face consultations patients have with their primary care physicians, which inhibits the provision of adequate self-management education[6–8]. The time pressures faced by primary care physicians will increase with the ageing of the population, prompting researchers to suggest that alternate methods of service delivery need to be investigated in order to provide quality healthcare[7]. While these pressures will be felt by all patients, they will acutely affect older adults due to the increased likelihood of them having multiple issues that need to be addressed during each consultation with their primary care physician.

The Internet offers a platform to provide health information which overcomes the problem of short physician visits and enables patients to receive the support they need. The Internet, allows the provision of current healthcare information, which can be viewed at a time and place convenient to the patient[9]. This is important as it facilitates easy access to information

and allows the information to be revisited when the patient wants to learn more or their disease symptoms change. Further, there are no geographical constraints[9] – an important factor in a country as vast as Australia, where many people do not live near large towns or cities. From a developers' perspective, such applications are relatively cheap to run once the initial development costs have been met[10], and can easily be updated and edited. Additionally, their appeal can be enhanced by the incorporation of interactive components, such as video clips, quizzes, Internet forums and blogs[11]. Internet interventions targeting chronic diseases have been shown to significantly increase patients' disease knowledge, health behaviours, health outcomes and subsequently increase their empowerment [12–15]. Previous research has identified the need to investigate the efficiency and effectiveness of the Internet as a way of providing self-management support to older adults[16]. As far as can be discerned, online asthma self-management education has never solely targeted older adults; despite such interventions holding greatest potential for this population segment as they shoulder the burden of asthma mortality and morbidity.

One of the biggest drawbacks to providing older adults with online self-management education is the presumption that they have limited computer skills. This can be partially overcome by the use of the research based guidelines that provide guidance on how to make websites accessible to older adults[17–19]. These guidelines tend to focus on the appearance and organisation of information, offering recommendations on size of font, navigation structures and amount of information presented. However, guidelines on the incorporation of interactive content, such as blogs, Internet forums and video sharing, on sites targeting at older adults is scant, despite knowledge that interactive content increases user participation, resulting in a richer user experience[20].

This paper describes formative research undertaken to inform the design of an asthma self-management education website, for adults aged 55 years and over, with asthma. A user centred design process was utilised which involved users early in the design process. This approach was adopted as it aims to understand the end-users (older adults, with asthma), as opposed to using simple demographics to describe the target population[21]. The aim was to explore the types of asthma information older adults want, as well as ways of presenting such information on an asthma website, with particular reference to the perceived usefulness of online communities created through blogs and Internet forums. A paper-based survey was used to determine the types of information that were of interest to the audience. Focus groups were subsequently conducted to investigate older adults' opinions on the benefits of the use of current web technologies in learning about asthma. Approval for this study was granted through the University's Human Research Ethics Committee

Methods

Survey development

A paper based survey was developed to investigate the health beliefs, behaviours and attitudes of older Australians towards asthma. The survey included sections on participants': demographics, general health, opinion on asthma and asthma management. The survey was reviewed by experts in the field of asthma to ensure face validity. Cognitive interviews in the form of think-alouds[22] were subsequently conducted with a convenience sample of 13 older adults, both with and without an asthma diagnosis. Participants were visited in their homes by one of two researchers and were asked to talk through the survey, voicing their thoughts. Interviews were recorded and the researchers took notes. As a result of this process a number of changes were made to the survey, most notably in the way the survey was bound. This changed from a staple in the left corner to booklet format, in order to reduce respondents overlooking the questions on the back of the pages.

The survey was subsequently piloted with a second convenience sample of older adults (n=115). These were approached through community groups or while they were travelling on public transport. Again, there was a mixture of respondents, both with and without an asthma diagnosis. Further refinements were made to some of the scales within the survey in order to minimise missing data.

The refined survey was 79 items in length and printed in 14-point font to account for the decrease in visual acuity that many older adults experience[23]. All respondents were asked to complete the first part of the survey, whilst only those respondents with an asthma diagnosis were asked to complete the second, asthma specific section. The asthma specific questions sought to elicit information on respondents' health service use, their self-management

practices, and the asthma topics they felt they needed to learn more about in order to best control their asthma (rated as: of no benefit; of some benefit; of great benefit). The list of 29 asthma topics (Figure 1) was derived from an audit of information available though current national asthma websites, such as National Asthma Council Australia (http://www.nationalasthma.org.au/), Asthma UK (http://www.asthma.org.uk/) and Asthma Society of Canada (http://www.asthma.ca/).

<<FIGURE 1>>

Survey distribution

In October 2010, a survey package was mailed out to 9,000 adults aged 55 years and over, whose contact details had been obtained from the Australian Electoral Commission. The package contained a copy of the survey, a letter explaining the research and a reply paid envelope. Reminder postcards were sent out approximately three weeks later when the initial response rate began to slow. The surveys were coded in order to reduce contact with people who had returned their survey. A second copy of the survey package was sent out four weeks after the postcard. This amended version of Dillman's tailored design method was used in order to maximise the response rate[24]. Surveys received after January 31, 2011 are not included in the analyses presented in this paper. The survey data were entered into SPSS v. 17 by three researchers. Five percent of responses were re-entered to check for accuracy, giving an error rate of 0.175%.

Focus Groups

Focus groups were conducted between November 2010 and April 2011 and continued until data saturation was reached. A total of four groups were conducted (N = 26; group 1 = 5; group 2 = 9; group 3 = 9; group 4 = 3). Focus groups were chosen as they were able to provide in-depth information and a greater breadth of understanding around the asthma information needs of older adults with an asthma diagnosis[25].

Focus Groups Recruitment

Participants in focus groups 1 and 2 were recruited through flyers placed on community noticeboards. Due to the limited response received, participants for focus groups 3 and 4 were recruited via emails sent to people registered with Asthma Foundation New South Wales; a non-profit organisation that provides asthma information, education, training and advocacy to the community. Where possible, up to eight people were scheduled to attend each group with the aim that at least six would attend. In all cases, participants were required to be aged 55 years or over and to have a diagnosis of asthma.

Focus Group Sessions

The first two focus groups were held in a library in regional New South Wales (NSW), Australia, and the remaining two were held in the offices of Asthma Foundation NSW, located in Sydney, NSW. In both locations, one focus group was held during the day and the second after business hours to accommodate participants in full-time employment.

Each session lasted approximately two hours, including the administration processes. On arrival participants were asked to read the Participant Information Sheet and provide

informed consent. A short survey was subsequently completed by the participants in order to obtain demographic data.

Each session was facilitated by the first author utilising a standardised discussion guide. The guide covered three topics: asthma management; asthma Internet information; and web site features. Each focus group was split into two sessions. The first session covered the first two topics and ran for approximately 45 minutes, before a short refreshment break. The second session ran for approximately 30 minutes. The focus groups were structured in this way to allow the participants to concentrate on the topic matter being discussed, without running out of energy[25].

The sessions were audio-recorded and notes were made on a white board, which were either printed out or photographed. At the conclusion of each focus group participants were given a gift voucher to acknowledge their time and contribution.

The recordings from the focus groups were transcribed and de-identified. NVivo 8 was used to code responses by question. A second independent reviewer reviewed the thematic analyses prior to the final interpretation. The key results were divided into information on 'website behaviour' and 'website features'. Responses to the topic 'website features' were further coded under themes derived from the Technology Acceptance Model (TAM).

Technology Acceptance Model (TAM)

The TAM was developed by Davis to explain how users accept and use technology and is an extension of Ajzen and Fishbein's Theory of Reasoned Action[26,27]. TAM suggests that perceived usefulness and perceived ease of use are two important variables in determining

whether information technology will be accepted or rejected. Perceived usefulness refers to the increased use of systems believed to enhance job performance; in this instance job performance is synonymous with asthma control through self-management. However, perceived usefulness is moderated by how easy a system is to use; "perceived ease of use". It is postulated that people are more likely to persist with a hard to use system if they perceive the benefits to their performance, in this case asthma control, to be worthwhile. We used the TAM as a framework through which to interpret the results of the focus groups. This model was chosen as it is the most widely accepted model in the technology acceptance literature. However, it should be noted that while the TAM has undergone several iterations it was originally developed to explain the use of information systems in the workplace and not predict the use of specific features of a system to aid chronic disease self-management.

Results

Survey Responders

A total of 4,060 eligible surveys were returned (response rate = 46.8%). Participants with current asthma, that is a diagnosis of asthma by a health professional and symptoms or treatment for asthma in the previous 12 months, numbered 466 (11.5%). All further analyses of survey data refer to this subset of respondents. Respondents had a mean age of 67.7 years (range: 55 – 94 years), were predominantly female (68%, N=315), mostly retired (70%, N=320), typically born in Australia (86%, N=399) and just over one-third had completed tertiary studies (37.4%, N=173) (Table 1). Respondents' age at time of asthma diagnosis was almost equally split, with 49% (N=221) being diagnosed before the age of 45 years. The most frequently reported co-morbidities were arthritis (57.3%, N=266) and high blood pressure (50.9%, N=236).

Focus Group Participants

Participants in the focus groups were slightly older with a mean age of 68.4 years (range: 55 – 85 years) and were almost equally split between males (N=14, 54%) and females (N=12, 46%). The majority had completed tertiary studies (N=20, 74%), were retired (N=15, 56%) and had been born in Australia (N=20, 77%). All had been told by a health professional that they had asthma and the majority had been diagnosed before the age of 45 years (N=19, 73%). The most frequently reported co-morbidities were arthritis (N=12, 46%) and allergic rhinitis (N=9, 35%). Participants were generally confident, long-term Internet users; with 18 (69%) reporting being comfortable, quite comfortable or very comfortable with using the Internet and 21 (81%) reported having used the Internet for more than five years. Average reported weekly Internet usage was between six and nine hours.

<<TABLE 1>>

Asthma

Focus group participants were invited to provide an overview of their history with asthma. There were many recollections of childhood asthma treatments that participants had been exposed to, which differed from the current medical recommendationsprescription of inhalers, such as drinking ginger ale and being injected with adrenaline. Participants also spoke about the way asthma used to be perceived as an emotional or psychological condition and how they felt this has shifted with time to a general acceptance of asthma as a physical illness;.

> *"People don't think people with asthma are abnormal any more – when I was a child they did. We were from another planet"*

Focus group participants spoke about discovering new asthma puffers when they saw other people with asthma, often younger members of their family, use them. In every group there were lengthy discussions regarding individual asthma triggers, such as pets, geographic location and weather events. It became clear from the discussions that everybody's triggers were unique, and what caused an asthma attack for one person may ease symptoms in another.

> *"...there's so much variety in asthma and how the symptoms manifest themselves in people."*

> *"I think one of the tricks there, because we don't know where we stand in the hierarchy of asthmatics."*

Further discussions showed that not only were peoples' asthma triggers unique but each individuals' experiences of asthma were quite different and that participants were aware of these differences. Some participants spoke of struggling to see how and where their disease experience fitted on the asthma spectrum. This awareness of individual differences in the way that asthma presents suggests that one-size fits all asthma education programs might be limited in their perceived effectiveness.

Asthma Topics of Interest

Survey respondents identified the five asthma topics they felt they needed to learn more about: avoiding my asthma triggers; the latest information on asthma management; how to deal with an asthma attack; identifying my asthma triggers; and asthma and the seasons

(Table 2). Chi-square tests showed that there was no significant variation in topics of interest between those with a long-standing diagnosis of asthma and those with late-onset asthma (Table 2).

<<TABLE 2>>

Website Features

Focus group participants' statements were coded as relating to 'perceived usefulness' of the technology and/or 'perceived ease of use'. These categories were derived from the TAM. As privacy concerns were raised frequently they were coded separately in the analysis.

Focus group participants felt that the inclusion of relevant video(s) on an asthma website would be useful as they are information rich and can reinforce what the doctor has already said (Table 3). Responses to photos currently used on asthma websites targeting older adults indicated that people did not want to look at pictures of old-old people. There were also comments that the people in the photographs looked too happy.

> *"None of us want to look that old – do we? We want to look just over 55."*

> *"They don't look like there is anything wrong with them, they look so happy."*

These comments suggest that photos of younger people who look sick or in pain might be more effective in illustrating disease website targeting older adults.

Focus group participants were unanimously reluctant to read blogs written by other people with asthma; although a few participants conceded a well written asthma blog might be of interest (Table 3). It was also acknowledged that this view was likely to be different from younger people and that such information might be of use to others;.

> *"But I do think young people – they live like that – have to be out there to be known; you're asking a group of oldies who would be against it."*

These findings suggest that blogs written by people with asthma would be of little value to older adults. Comments further reinforced the idea that because asthma is a unique experience little could be learned from reading about someone else's experience with asthma.

Similarly, focus group participants were dubious about the value of sharing their own experiences with the disease through their own blog (Table 3). Like blogs, the inclusion of an asthma control quiz was seen as positive, for other people with asthma, but not for themselves (Table 3). While focus group participants were open about their use of Internet forums for other health issues, they were hesitant about the benefits of using a forum for people with asthma (Table 3). Of note, the comments relating to Internet forums were the only ones where comments were coded under both TAM domains, 'ease of use' and 'usefulness'.

Survey responders were also generally negative in their response to the inclusion of interactive components on an asthma website, with the majority rating these functionalities a "of no benefit" to them: participating in online discussion forums about asthma (76.9%,

N=297); and sharing their asthma story online (74.9%, N=290); interacting with a health professional online to discuss your asthma (64.7%, N=249). The only exception was reading other people's asthma stories (47.4%, N=193), with just over 50% perceiving some value in such information.

Focus group participants were reluctant to have another password and felt that they already had too many passwords and would struggle to remember another one; the only exception being if they perceived that the site would be highly beneficial to them (Table 3). Participants also expressed concerns about sharing personal information through the registration process which may open themselves up to the receipt of junk mail.

Focus group participants expressed a desire to be able to contact people about their asthma either through email or by phone numbers displayed prominently on websites;.

> *"I can use the Internet, but gee sometimes I hate it because you get no phone numbers, you can't speak to a person."*

The older adults felt that being able to contact a "real" person through a website was hugely beneficial as they spoke of frequently forgetting to ask questions during visits to their physician. Such a facility should be considered when providing self-management education to older adults.

<<TABLE 3>>

Website Behaviour

Focus group participants felt that they would visit an asthma education website either after they experienced breathing problems and prior to or after a visit to their doctor.

> *"If you got an attack for the first time … or if you've got breathing problems"*

> *"If I couldn't see my doctor"*

> *"The only reason I would go to any site is if I went to the doctor and he said you've got this, I would go and look at the site and see what were the side effects of the medication."*

In terms of the provision of online asthma information, these findings show that it is imperative that accurate and up-to-date asthma management information is provided online, as people are most likely to look for asthma information when they are experiencing breathing difficulties. Further, participants also spoke about searching for information after a doctor's visit, suggesting a role for health care providers in the recommendation and promotion of trustworthy sites.

Focus group participants were asked 'what would encourage you to read an asthma website on a regular basis?'. Responses indicated that participants were keen to learn about the latest advances in asthma treatment and also to help communicate information about asthma with their friends and family.

"And also to keep, you know, family and friends informed. I still think that's critical, so people around you know what's going on"

Participants also responded positively to the suggestion of email reminders as a way of encouraging people to revisit a site. These findings suggest that reminder emails highlighting the latest advances in asthma treatment or with information targeting family and friends of people with asthma would be effective in driving people to view an asthma education website.

Discussion

The major underlying theme that emerged through the focus groups related to the unique asthma experience; all of the groups acknowledged that different people were affected by their asthma in different ways and that the severity of people's asthma can vary significantly. This often resulted in participants stating that while some things would not be useful for them, they might be useful for someone else. It also incorporated the change in the way asthma has been perceived over time. This issue was salient with those participants with long-standing asthma and has been reported by other researchers conducting qualitative research with older adults with asthma[28]. Other researchers have divided older adults with asthma into two groups[29]; those who have suffered with asthma from childhood are referred to as having long-standing asthma, whilst those who develop the disease later in life are described as having late-onset asthma. This division is a useful reminder that the experiences and problems encountered by the two groups can vary widely[28], with those with long-standing asthma often having decades' worth of personal knowledge on how best to manage their asthma; although sometimes this knowledge may be dated. This theme highlights the

need to provide tailored information on an asthma education website that takes into account users' individual experiences, including their time of diagnosis.

Asthma Topics of Interest

The top five asthma topics that respondents wanted to know more about included basic self-management information such as identifying and avoiding asthma triggers and how to deal with an asthma attack. Previous research has also found that older adults want to know more non-drug aspects of asthma management and in particular their asthma triggers[30,31]. Surprisingly, we found little variation between the asthma topics of interest nominated by respondents with long-standing asthma compared to those with late onset asthma, contrary to findings of previous research[28]. It is interesting to note that length of time since asthma diagnosis did not appear to affect respondents' desire for basic information, such as identifying and avoiding triggers. However, it is possible that while the asthma topics identified were the same, the depth of information desired may vary between these two groups.

Website Features

While Internet forums and blogs are frequently touted as being able to provide a sense of community to those with chronic diseases[32], the respondents showed little interest in utilising such technology to learn more about their asthma. This finding was consistent amongst the results from both the survey and the focus groups. One of the main reasons given for the perceived lack of relevance of asthma blogs and forums was the individual nature of the disease, which has been recognised in other research[33]. These findings are contrary to other research which reported participants finding online peer support and electronic discussion groups a positive, non-judgemental source of support that facilitated information exchange and was available 24 hours a day, facilitating information exchange and providing emotional support[34]. Our results suggest that older adults see little value in participating in online communities, such as blogs and forums, to help them in the management of their asthma. It is

not clear whether these results would be replicated if the disease in question was another chronic disease other than asthma.

The results suggest that the use of videos to supplement written information would be positively received by an older audience. This is consistent with earlier work that has found inclusion of videos on websites facilitates engagement and comprehension of the content[35]. Interestingly, many older adults would prefer to view pictures of younger-old people online as compared to old-old people. This finding supports previous research which found that older adults do not see themselves as old[36]. However, they expected these people to look ill. It is likely that these findings can be extrapolated to the age of characters seen in video information and should be considered prior to the production of audio-visual materials targeting older adults.

Focus group participants generally expressed hesitation about acquiring another password, particularly if this required the sharing of personal information. Nevertheless, the majority of participants were willing to register for an online asthma education website provided they could identify benefits for themselves. The general apathy towards passwords, and the privacy concerns expressed, are consistent with other findings [34]. As such, it is suggested that if a password system is to be implemented on websites targeting older adults, the benefits of registering for access to the site are made very clear.

Website Behaviour

Respondents' in the focus groups suggested that they were most likely to visit an asthma education website either before or after visiting the doctor or after experiencing problems breathing. However, the discussions suggested that regular visits to an online education

website could be encourage~~d~~ through the presence of information on the latest advancements

in asthma treatment, asthma information to share with friends and family and also through

receiving reminder emails.

Limitations

~~The focus group results are limited in that we used a self-selected convenience sample.~~ It is

likely that both focus group participants and the people who returned completed surveys had

a greater interest in asthma than people that did not self-select. However, the results are

strengthened by the ability to compare the data on usage of website features from the survey

with that obtained from the focus groups, giving a wider understanding of the way in which

older adults want information on the management of asthma presented.

It is notable that the focus group sample was comprised mainly of confident, long-term

Internet users. It is likely that less savvy computer users would have expressed greater

concerns regarding the 'ease of use' of the various technologies discussed and be even more

reticent to engage with ~~the~~ technology. Further, it is possible that ~~the~~ participants in the focus

groups would have responded differently had they been able to interact with and explore the

websites shown, rather than simply responding to website screenshots.

It is likely that the focus group sample experienced better health than other people with

asthma, as other research has shown over 60% of people with asthma also have arthritis[4],

compared to 46% in this study. Although the majority of focus group participants reported

having had asthma since childhood, this is unlikely to have impacted on the results reported

here as these concentrate on the use of technology on an asthma website. Finally, the

occurrence of multi-morbidities in older adults makes it possible that participants had been

misdiagnosed with asthma, as a number of other chronic diseases have symptoms similar to asthma[16].

<<FIGURE 2>>

Implications and Future Developments

Figure 2 summarises the type of asthma content, presentation and site design preferred by older adults. These findings are important because no other guidelines around the asthma information older adults want could be identified. Similarly, no information on website design preferred by older adults could be identified. These results show that despite many participants having had asthma for most of their lives they were still seeking basic information about asthma. Secondly, the individual nature of asthma was identified as an important underlying theme and may be best addressed through the provision of individual asthma information, achieved by tailoring websites to meet each user's needs. Finally, the inclusion of the latest technology in website design may not always be desired by older adults e.g. blogs and forums. The findings derived from tThis formative research was used to inform ere utilised in the development and piloting of an online asthma education tool aimed at older adults, which hais been reported in detail elsewhere[37,38]. There is scope for future research to explore how best to deliver the asthma self-management health information that desired by end-users in conjunction withmeets current management recommended guidelines and provides information end-users want, without over burdening users with information.

Conclusions

~~Formative research with~~The participation of end-users~~, in this case older adults,~~ in formative research~~,~~ to guide the development of an online asthma education tool was novel. ~~in this case older adults, allowed~~The findings provide ~~us to gain~~ a better understanding of ~~their needs and preferences both in terms of~~ the asthma information ~~content~~ sought by older adults and~~and~~ preferred ways of ~~use of technologies to present~~ presenting this information ~~asthma information online~~. Due to the lack of literature in this area, t~~Older adults with asthma were found to be interested in information on identifying and avoiding their asthma triggers, dealing with asthma attacks and changes in asthma management advice. However, the creation of content for an asthma educational website needs to recognise the individual nature of the disease. The results also suggested that older adults are not interested in taking part in online asthma communities created through blogs and forums.~~ These ~~results~~findings have implications for health care professionals ~~providing~~providing self-management education ~~to older adults~~to older adults with both ~~with~~asthma and other chronic diseases.

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Figure 1: The List of Asthma Topics – Respondents were asked to rate each category as: 'of no benefit', 'of some benefit' or 'of great benefit'

1. What is asthma

2. Asthma symptoms

3. Asthma research advances

4. The latest information on asthma management

5. Tips to control my asthma

6. Doing a quiz to see how well controlled my asthma is

7. Asthma service providers in my area

8. Asthma and other disease e.g. diabetes

9. How to use my asthma medications

10. How asthma medications work

11. The side effects of asthma medications

12. Cleaning my inhaler/spacer

13. Asthma and complementary or alternative medicines

14. Asthma and exercise

15. Asthma and the seasons – pollen/bush fire etc.

16. Asthma in the home – heaters/bedding etc.

17. Products to help my asthma

18. Creating an asthma friendly garden

19. Identifying my asthma triggers

20. Avoiding my asthma triggers

21. When to see my doctor

22. When to attend the Emergency Department

23. How to deal with an asthma attack

24. Testing my knowledge of what to do in an asthma   attack

25. Reading other people's asthma stories

26. Sharing my asthma story online

27. Participating in online discussion forums about asthma

28. Participating in online (Internet) asthma education programs

29. Interacting with a health professional online –to discuss your asthma/get information and support

Figure 2: Recommendations for Content and Features for an Online Asthma Education Tool Targeting Older Adults

Content	Include	Exclude	Consider Inclusion
Avoiding my asthma triggers	✓		
Identifying my asthma triggers	✓		
Asthma and the seasons	✓		
The latest information on asthma management	✓		
How to deal with as asthma attack	✓		
Content Presentation			
Videos	✓		
Photos of 'young-old'	✓		
Asthma Control Quiz		✓	
Blogs – sharing own story		✓	
Blogs – reading someone else's story		✓	
Forums		✓	
Site Design			
Password			✓
Registration			✓
Individual Tailoring	✓		
Contact number/email provided	✓		
Email reminders	✓		

Table 1: Survey respondents' demographic characteristics

	Survey respondents with current asthma	Regional Focus Groups	Metropolitan Focus Groups
Number of participants	466	14	12
Age (years)			
55 – 64	187	5	4
65 – 74	166	7	5
75+	113	2	3
Gender			
Male	150*	6	8
Female	315*	8	4
Education			
Never went/completed primary school	33*	0	0
Some secondary school	142*	1	1
Completed secondary school	115*	2	2
Completed tertiary education	173*	11	9
Internet use			
Non-users	216*	0	0
<1 year	6*	0	0
1-2 years	17*	1	1
2 – 5 years	36*	2	1
>5 years	164*	11	10

*Does not total 466 due to missing data

Table 2: Top five asthma topics rated as being of great benefit

Topic	Total (N=466)[*]			Late onset asthma (N=230)[*]			Long standing asthma (N=221)[*]		
	Number	Valid Percent (%)	Ranking	Number	Valid Percent (%)	Ranking	Number	Valid Percent (%)	Ranking
Avoiding my asthma triggers	212	50.5	1	91	45.5	3	116	55.8	1
The latest information on asthma management	208	49.5	2	97	48.5	2	105	50.7	4
How to deal with as asthma attack	206	49.4	3	99	50.0	1	103	49.8	5
Identifying my asthma triggers	206	49.2	4	86	43.9	4	114	54.5	2
Asthma and the seasons	202	48.3	5	87	43.9	4	110	53.1	3

*Not all respondents answered every question

Table 3: Categorisation of technologies by 'usefulness' and 'ease of use'

Technology	TAM category	Other themes	Example quote
Videos	Useful		*"Moving picture is much more informative than the still..."* *"I think it's good to have that because the doctor might go through, or the pharmacist 'this is what you do' but if you're sick you don't concentrate very well. But if you take it home you can do the first step and look at it 10 times if you didn't get it."*
Blogs	Useful – for someone else		*"There are some people who would find that a good support tool."* *I sort of can't see why I'd want to because it's sort of someone's personal opinion; I had a bad night, I couldn't breathe, this happened, this happened."* *"Absolutely nothing!"* *"I'm stuck with it [asthma], there's nothing I can do, I want to associate with the non-asthma people … Because my fear is that you end up dealing with a morbid lot who end up feeling sorry for themselves."*
Authoring a blog	Useful - for someone else		*"There are some people who would find it a good support tool."* *"If I could convince someone how serious asthma is, … I might put it on a blog….If it helped someone to realise that it can kill, asthma, if you don't treat it properly...Would anybody read it?"* *"Unless you'd had a remarkable reversal from a very bad experience you'd like to let other people know about."*

Technology	TAM category	Other themes	Example quote
Forums	Ease of use Useful – for someone else	Privacy	*"I don't consider my asthma is a major problem or a major issue, but I can see it may be useful for other people."* *"I think I'd be too scared because I'm not familiar enough with the internet."* *"I have used forums but for other issues."* *"I might do it, I'm just not that into forums but if I has a pressing enough issue and I felt that I needed the support and input of other people yes, I might so it. Particularly if it's the idle of the night and I thought of something."* *"I'm not particularly keen on giving information on the internet, personal information of this sort."* *"I did it with weight watchers a few times – they have a forum and I've got relevant information from there which was very helpful to me. I haven't used this sort of forum, but maybe I would if I was seeking information, maybe I would."* *"Well if I'd been looking for singing and asthma treatment I'd be very interested and taking part in that and finding out what people normally do."*
Asthma control quiz	Useful – for someone else		*"It could be useful to people if they were thinking they were well controlled when they weren't or reassuring that yes… so it's not a useless thing to do, it's just not something I would do because I don't think I need it."*

Technology	TAM category	Other themes	Example quote
Passwords	Ease of use	Privacy	*"So long as it's not linked to any other sites and they start sending you junk mail and that sort of thing."*
			"If I thought I'd be getting valuable information from the site, it's pretty much a priority I will do that."
			"I don't know why they want it and what sort of information they're trying to track."
			"That's the problem – too many passwords."
			Logging on, you've got so many bloody code names to remember."