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Barriers and facilitators that affect public engagement with eHealth services

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Abstract

It is commonly accepted that public engagement with eHealth is beneficial. However, engagement is also variable. This article presents the findings of a review of published evaluation studies around eHealth services. A targeted search of MEDLINE, CINAHL and EMBASE returned 2622 unique abstracts. 50 articles met the inclusion criteria and were subjected to further analysis. 6 review articles were used for post hoc validation. Four main types of eHealth service or resource were identified: health information on the Internet; custom-built online health information; online support; and telehealth. 5 key themes emerged in terms of facilitators or barriers to engagement: characteristics of users; technological issues; characteristics of eHealth services; content issues; social aspects of use; and eHealth services in use. Recommendations arising from the review include: targeting efforts to engage those underserved by eHealth; maximizing exposure to eHealth across all sections of society; improving access to computers and the internet; appropriate design and delivery; ensuring content is relevant to different audiences; capitalizing on the interest in social computing; and clarifying the role of health workers in the delivery of eHealth.

Keywords:

Consumer health information, Informatics, Internet

Introduction

One commonly cited definition views eHealth as ‘an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology’ [1]. In common with this definition, other definitions also incorporate aspects of both health and technology. Health is generally represented as a process rather than an outcome, and technology is viewed as a means to augment, rather than replace, human activity. The tendency is towards optimism, with eHealth seen very much as an enabler [2]. It is a commonly held belief that public engagement with eHealth services is beneficial. The Internet facilitates widespread access to up-to-date health information [3, 4] and provides the means to obtain remote support [5, 6]. Telecare applications address an ongoing and increasing demand for care, resulting from an ageing population and a shortage of nurses and other health care workers [7]. However, public engagement with eHealth services remains variable [3]. This review of published literature seeks to formalize the reasons for this variability. This literature review forms part of a larger project ‘Including everyone in electronic health information services’. The larger project, commissioned by the National Health service in England seeks to find out what help people need to use eHealth services. The aim of this review is to identify and explore factors (barriers and facilitators) that may influence engagement by the public with those services.

Method

Literature considered in this project included national and international academic and professional (i.e. non-academic) journal articles available from the three bibliographic databases, MEDLINE, CINAHL and EMBASE. The search strategy was developed in stages:

1) An initial targeted text search of MEDLINE (via OVID) using relatively obvious terms such as ‘ehealth services’, to find ‘gold-standard’ articles from which to harvest indexing terms i.e. Medical Subject Headings (MeSH) keywords.
2) Allocation of keywords, combined with OR, into three sets:
    a. Application e.g. Internet
    b. Service e.g. Consultation
    c. Evaluation e.g. Patient Satisfaction

   These keyword sets were combined with AND.
3) Fine-tuning of categorized keywords to ensure retrieval of (at least) all exemplar articles
4) Reworking of the strategy for use with CINAHL (via EBSCOhost) and EMBASE (via the National Library for Health, now NHS Evidence).

Searches were conducted in January 2009; they were not restricted by date. Each item (title, abstract, language and type) from the initial search was reviewed independently by the two members of the project team (NRH, MJG). Items were selected according to the following criteria: an identified eHealth service; intended for use by members of the public; barriers or facilitating factors influencing use; readily and freely available online; and, published in English The following items were excluded: Commentary, book review, conference report, conference paper, conference abstract, editorial, opinion-based.

Review articles were not included in this review but were reserved for validation of the findings. Disagreements were resolved through face-to-face meetings. Agreed included items were obtained, allocated arbitrarily to the two team members and subjected to further analysis. A tailor-made data extraction tool, in the form of a table, was used to analyze articles into a number of categories, such as study design, findings, barriers and facilitators. Emergent themes that were common across different studies were identified via the completed data extraction tool and agreed at further face-to-face meeting.

Results and discussion

Four hundred and forty abstracts were returned via CINAHL, 1226 via EMBASE and 1153 via MEDLINE. After the removal of duplicates, 2622 items were considered in the initial review. Seventy articles were obtained for closer examination. Fifty of these were identified as meeting the inclusion criteria and were subjected to further analysis. The timeframe for included articles was 1999 to 2008. Six additional review articles, spanning 2001 to 2008 were reserved for post-analysis validation.

Type of eHealth service

The first set of themes to emerge from the analysis concerned the type of eHealth service featured in the articles. There were four main types:

1. Health information on the Internet (featured in 27 articles = 54%)
2. Custom-built online health information e.g. CDs, kiosks, portals (7 articles = 14%)
3. Online support e.g. coaching, mailing lists and online communities (12 articles = 24%)
4. Telehealth including remote consultation, monitoring and reporting (4 articles = 8%)

Little appears to have changed over the past several years in terms of types of eHealth service; in an early review of health information on the Internet, Cline and Haynes [3] characterized access to online health information in three ways: searching directly for information (corresponding in the current review with both ‘Health information on the Internet’ and ‘Custom-built online health information’), participating in support groups (corresponding with ‘Online support’) and consulting with health professionals (corresponding with ‘Telehealth’).

Barriers and facilitators to use

The second set of themes to emerge from this review concerned barriers and facilitators. One hundred unique themes emerged. These were distilled into twenty seven higher-level themes, from which 5 overarching themes emerged:

1. Characteristics of users
    - Age [8, 9]
    - Educational attainment [9-13]
    - Ethnicity [10, 13, 14]
    - Health status [15-17]
    - Information needs [18]
    - Literacy levels [17, 19-21]
    - Motivation [11, 12, 17, 22-24]
    - Skills and knowledge [16, 25-29]
    - Socio-economic status [10, 11, 13, 26, 29, 30]
    - Trust [9, 17, 31-35]
2. Technological aspects
    - Access to resource [23, 26, 27, 29, 36, 37]
    - Operational issues [28, 38, 39]
    - Security and privacy [36]
    - Technological Issues [18, 40]
3. Characteristics of eHealth services
    - Access to information [32]
    - Content issues [9, 19, 27, 41-45]
    - Physical distance [22, 25, 31, 38, 46-48]
4. Social aspects of use
    - Belonging [31, 38, 46, 49]
    - Interpersonal issues [38, 49]
    - Reassurance [49-51]
    - Shared experience [33, 52]
    - Shared responsibility [39, 49]
    - Social contact [31, 47]
5. eHealth services in use
    - Empowerment [17]
    - Fit with everyday life [18, 23, 25, 26, 53]
    - People as enablers [25, 51, 54]
    - Usability and usefulness [16, 18, 22, 24, 27, 33, 55]

Characteristics of users

The findings suggest that both increasing age and low socio-economic status might be negatively associated with perceptions and use of eHealth services. Non-white ethnicity also appears to be a potential barrier. A literature review by Fogel et al. [4] on online cancer support groups found that African Americans were under-represented. There appear to be higher levels of eHealth service use among people describing themselves as white and among people of higher socio-economic status. Higher levels of educational attainment and literacy appear to be associated with increased awareness and use of eHealth services. Lack of motivation, interest and engagement, both in health in general and in eHealth, appear to be barriers to use. A lack of knowledge and skills around computer or Internet use appears to be barriers to the uptake of eHealth services, as confirmed by Cline and Haynes [3]. However, exposure to these services appears to improve both the perceptions of non-users and the frequency of use. Both health status and information needs play a less predictable role in engagement. For example, poor health status provides an impetus for individuals to seek information. However, poor health status may in itself inhibit an individual’s ability and motivation to seek this type of support. Trust also appears to influence users’ perceptions of eHealth services - opinion towards ‘scientific’ sources and researchers appears to be mixed - although it doesn’t necessarily affect patterns of use. Trust was identified as a significant issue also in the literature review by Fogel et al. [4]

Technological issues

Unsurprisingly, lack of access and poor access to computers and/or the Internet are significant barriers to engagement. Simply put, those with better access (particularly at home) are more likely to engage. Cline and Haynes [3] also recognized that access is inequitable. However, having good access does not guarantee use. Perceptions of users are also dependant on operational aspects of the service along with how it handles data security and privacy, as supported by a recent literature review by Botsis and Hartvigsen on telecare for older people [7]. Interestingly, security and privacy concerns did not feature significantly in many of the articles included in the current review.

Characteristics of eHealth services

As might be expected, and as supported by Cline and Haynes [3] the content of eHealth services is an important contributing factor to engagement. Important characteristics include: quantity, relevance (including cultural relevance), comprehensibility (both technical and linguistic), reliability and impartiality, navigability, flexibility and tailoring of content. Cultural relevance was also identified as important by Fogel in a literature review on ethnicity and literacy levels and Internet use for cancer information [6].

Social aspects of use

A decreased sense of isolation is seen by many as an important benefit of eHealth services, along with autonomy and an increased sense of control. Anonymity is also valued, although the impersonal nature of online communication might in some circumstances act as a barrier. Cline and Haynes [3] also acknowledged both a 'shifting balance of informational power' and the potential benefits of anonymity. People are often seen as important adjuncts to certain eHealth services: as gatekeepers, as enablers, as trainers and as coaches. A literature review conducted by McMullan [56] on the impact of Internet use on the patient-health professional relationship suggests three ways in which health professionals may respond to their patients as active consumers of health information: 1) re-assert their role as expert, 2) collaborate in obtaining and analyzing information, 3) guide patients to reliable resources. There appears to still be a place for direct face-to-face communication. To support this, Botsis and Hartvigsen [7] found that 'patients and nurses foresee the need for real nurse home visits along with telemedicine ones'. Social computing (e.g. online discussion and support groups) is generally seen in a positive light, providing a 'safe', flexible and personal environment in which to share experiences and responsibility, foster a sense of belonging, offer empathy and support, and gain reassurance. The review by McMullan makes a similar observation [56]. Active engagement appears to reap the most benefits.

eHealth services in use

Issues affecting engagement with eHealth services arise from their implementation and use. An obvious barrier concerns ease of use. An equally obvious barrier is lack of fit with everyday life, in terms of time, cost and technical or psychological factors e.g. unfamiliarity with the resource. A lack of perceived usefulness or relevance is a significant barrier to engagement with eHealth services. Certain potential users of eHealth services believe that information will make little impact on the status quo and may actually be a burden. Other users find eHealth services empowering, reassuring and supportive.

Conclusion

There are a number of recommendations in light of the findings of this review:

- Capitalize on the continued public interest in social computing and allow users of those services to reap the benefits of online community engagement
- Clarify the role of health workers in the delivery of eHealth services e.g. endorsement, facilitation, etc.
- Continue to focus on the appropriate design and delivery of eHealth services in terms of ease of use and fit with everyday life i.e. time and cost
- Attempts to maximize exposure to eHealth services across all sections of society, in order to increase familiarity and improve perceptions of usefulness and relevance, thereby maximizing potential use
- Make efforts to ensure that the content of eHealth services meets the needs of their target audience. Content should be understandable, relevant and trustworthy to a wide variety of potential users
- Make targeted efforts to engage those who are underserved by eHealth services due to age, ethnicity, educational attainment and socioeconomic status
- Maximizing exposure to eHealth services includes improved access to computers and the Internet

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