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## An evaluation of online information available for women with breast implants aged 47–73 who have been invited to attend the NHS Breast Screening Programme

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## ABSTRACT

**Introduction:** The Internet has become an innovative instrument older adults utilise to obtain health-related information. Poor quality health information may cause harm to individuals. If not accessible, or at a level comprehended by target audiences, this does not support the development of their knowledge and subsequently hinders patient's ability to make informed-decisions. Aim: evaluate quality, readability, accessibility and usability of online information for women with breast implants invited to attend the NHSBSP.

**Methods:** Eight websites were evaluated for quality and accessibility/usability using uniquely developed evaluation tools. The 'three-click' rule was used to assess usability and SMOG tool to measure readability. Quality and accessibility/usability scores were combined to give an overall score, which were then converted into percentages. A percentage categorisation system ranked the percentage scores from poor to excellent. Readability scores were represented in number of years of education required to read/understand text.

**Results:** Average quality score = 14 (66.6%). Average accessibility/usability score = 9 (56.6%). 7 websites achieved an overall score in the poor percentage category (below 75%).

Over 50% of websites had readability levels higher than the recommended level for online health information. 100% were above the UK average reading age.

**Conclusion:** Websites providing information on breast screening with implants are not easily accessible, are of poor quality and too difficult to be read by most people. The quality, readability and accessibility of each website's content should be improved to help support women make informed decisions relating-to breast-screening attendance, increase their understanding and lessen their anxiety.

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## Introduction

Breast cancer is the most prevalent cancer within the UK, with 54,800 women diagnosed in 2014.<sup>1</sup> The aim of the UK National Health Service Breast Screening Programme (NHSBSP) is to reduce mortality by detecting breast cancer in its early stages of development.<sup>2</sup>

Screening has the potential to reduce breast cancer mortality by an average of 23–40% for women aged 50–69.<sup>3</sup> This outlines the importance of invitation uptake by women invited to attend the

NHSBSP. It is therefore encouraging that uptake has increased for the first time in five years from 71.3% during 2014–2015 to 72.1% during 2015–2016.<sup>4,5</sup>

The exact number of women with implants is not known. However breast augmentation is the most performed cosmetic procedure and 1981 of 3389 who have immediate reconstruction following a mastectomy have implants inserted.<sup>6,7</sup> There is an increasing availability of cosmetic procedures and undergoing a cosmetic intervention is suggested to be increasingly popular with the general public and regarded as more "normal" and less discouraged<sup>8</sup> thus women with implants invited to the NHSBSP may be more willing to consider attending. This may result in more women seeking screening information via the Internet to increase

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their understanding and support them to make informed-decisions relating-to attendance.<sup>9,10</sup> Literature outlines the importance of the Internet improving health outcomes and promoting patient empowerment,<sup>11</sup> however the quality of information accessible via the Internet is inconsistent.<sup>12</sup>

As a result of the age extension trial,<sup>13</sup> this research attempts to mimic online search behaviours of UK women aged 47–73 seeking information on breast screening with implants and measure the value of available information online. The quality, readability, accessibility and usability of the first five ranked websites based around breast screening with breast implants found using the three most popular search engines was evaluated.

## Literature review

The literature review was split into two sections: Section 1 – use of the Internet and quality of online information; Section 2 – benefits, risks and method for screening with implants. Search results were refined using Boolean logic operators and keywords (see Table 1). Manual searches of books/journals were performed and the snowballing effect utilised.<sup>14</sup>

A focused literature review was conducted by applying inclusion and exclusion search criteria; reasons are justified in Tables 2 and 3, as chosen criteria are likely to have implications on the validity of findings.<sup>15</sup>

### The role of the internet

The Internet is an increasingly used communication tool for health information and a popular way for older adults and breast cancer patients to search for information with anonymity.<sup>17</sup> Women may seek screening information via the Internet to increase their understanding and support them to make informed decisions relating to attendance.<sup>18</sup> Literature outlines the importance of the Internet for improving health outcomes and promoting patient empowerment.<sup>19,20</sup>

Deficiencies in accurate informative information can negatively influence an individual's decision and potentially cause harm to their health.<sup>21,22</sup> With increasing numbers of patients accessing health information online to self-educate and Government

initiatives designed to promote patient empowerment and choice, it is essential women have access to clear information to support women to act autonomously safely and manage health appropriately.<sup>23–25</sup>

### Quality of information

Informed decision-making is only optimised if patients have access to quality information.<sup>26</sup> As websites are unregulated the Internet can be an unreliable source of health information.<sup>27</sup> Healthcare professionals should guide patients to quality health information to satisfy their needs and develop their understanding.<sup>28</sup> The quality of websites can be reliably and methodically evaluated using reliable and validated evaluation instruments such as DISCERN and HONcode.<sup>29</sup>

### Target audience

There is an imbalance between complexity of information on health websites and many readers understanding, especially for mid-life adults in England (aged 65+).<sup>30,31</sup> Mid-life women, in-particular breast cancer patients, are actively seeking participation in decision-making processes.<sup>32</sup> As readability is a fundamental factor in determining a website's accessibility, if not set at an appropriate reading level, health information will remain inaccessible to a proportion of women invited for screening, potentially resulting in poor health outcomes and lessened patient satisfaction.<sup>33,34</sup>

Most individuals prefer to read below their reading age.<sup>35</sup> The average reading age for the UK population is suggested to be 9 years (USA 4th Grade).<sup>36</sup> However previous research into readability levels of breast cancer websites found levels scored were consistently above the UK average reading age and the recommended readability level for online health information websites (6th–7th Grade).<sup>37,38</sup>

### Usability and accessibility

Literature suggests a large percentage (49%–68%) of women with breast cancer and those asymptomatic use the Internet as a source of information.<sup>17,18,25</sup> It could therefore be assumed women

**Table 1**  
Literature search terms.

Keywords for worldwide sources of information (Section 1)	Health Information; Health communication; Health information websites; Internet, Online; Evaluation; Quality; Harm; Impact; Readability; Patient empowerment; Patient outcomes; Health outcomes; Health literacy; Websites; Reliable; Health; Adults
Keywords for UK sources of information only (Section 2)	Breast screening; Cancer screening; Breast imaging; Implants; Breast implants; UK

**Table 2**  
Literature inclusion criteria.

	Inclusion criteria	Reason
<b>Section 1 &amp; 2</b>	Articles published since 2001	Referencing literature more than 10–15 years old can be suspect in terms of its currency in areas of research <sup>16</sup>
<b>Section 1:</b> Internet use and online health information	UK and non-UK literature:	The Internet is a readily accessible worldwide information source
<b>Section 2:</b> Benefits, risks and method for screening with implants	UK literature only:	Relevant to UK women and the NHSBSP

**Table 3**  
Literature exclusion criteria.

	Exclusion criteria	Reason
Sections 1 & 2	Articles not written primarily in English Duplicate articles	Issue of translating information Unnecessary to re-read duplicate data

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