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Original article

Assessment of the quality and content of website health information about herbal remedies for menopausal symptoms

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Abstract

Objective: To assess quality, readability and coverage of website information about herbal remedies for menopausal symptoms.

Study design: A purposive sample of commercial and non-commercial websites was assessed for quality (DISCERN), readability (SMOG) and information coverage.

Main outcome measures: Non-parametric and parametric tests were used to explain variability of these factors across types of websites and to assess associations between website quality and information coverage.

Results: 39 sites were assessed. Median quality and information coverage scores were 44/80 and 11/30 respectively. The median readability score was 18.7, similar to UK broadsheets. Commercial websites scored significantly lower on quality ($p=0.014$), but there were no statistical differences for information coverage or readability. There was a significant positive correlation between information quality and coverage scores irrespective of website provider ($r=0.69$, $p<0.001$, $n=39$).

Conclusion: Overall website quality and information coverage is poor and the required reading level high.

1. Introduction

The internet is increasingly used as a source of health information [1]. Searches for health information are the third most popular online activity [2] and 52% of European adults have searched online for health information [3]. It allows inexpensive, wide dissemination, enabling people to access information when needed [4]. The internet allows anonymity, useful for some topics [5], but can also be interactive and facilitate 'communities' of people with similar health conditions [6]. These qualities should make it an ideal tool for women who want to access information about herbal products to alleviate menopausal symptoms.

The website provider can influence health information quality, with commercial websites having poorer quality information about herbal remedies [7] and the menopause [8]. Although the quality of online information has been evaluated for a range of conditions [9,10] there have been no studies into the quality and content of websites on herbal remedies for menopausal symptoms. The objectives of this study were to assess the quality and coverage of website information; to compare

commercial and non-commercial providers; and assess how well the information fits with what women want.

2. Methods

2.1 Design

The study used a cross-sectional survey to include commercial and non-commercial sites (i.e. both government-originated and charity-originated sites).

2.2 Search strategy

A purposive sample of websites was generated by including sites and search terms recommended by women participants and health service providers in an earlier study [11]. Appendix A provides details of these search terms and websites. The Search terms were employed to conduct a series of searches using Google; the most frequently used search engine in the UK [12] and the sample was taken from the first results page, mimicking typical browsing [13].

Inclusion criteria were websites with information about herbal remedies as a treatment option for menopausal symptoms; whose key purpose was providing treatment information and from any country of origin which used the English language. Websites were excluded if they only provided information about menopausal symptoms and not treatment; sold products and contained no additional information; provided information solely about one product; acted exclusively as a portal to other sites; required registration or membership to access information; only published research papers and books; were solely news or blog sites; were no longer active; or were sponsored sites, as they tend to be ignored [14].

Sampling was undertaken on 21st January 2013. Figure 1 illustrates how the final sample of 39 websites was obtained.

2.3 Measures

Three measures were used: the DISCERN tool for quality [15], criteria [11] for information coverage and the SMOG readability tool. [16]

DISCERN assesses the quality of written information on health-related treatment choices [17]. It comprises a 16 item questionnaire, each rated 1 to 5 [18]. DISCERN is a validated tool [15], has adequate internal consistency (Alpha = 0.777) and satisfactory inter-rater reliability [19].

The tool for measuring information coverage was based on information needs identified in an earlier study involving 4 focus groups with menopausal women [11], Table 1 provides details of their identified needs with examples of information searched for and how this informed items in information coverage tool. The resultant tool comprises 6 questions, each rated 1 to 5 (see Appendix B).

Insert Table 1 Information needs informing coverage assessment tool

SMOG [16] was used to assess the complexity of text using two indicators: polysyllabic words and sentence length. It is the most frequently used readability test [20], sampling up to 30 sentences

(approximately 300 words) from a document. A SMOG score of 11-12 equates to Level 1 in the UK National Adult Literacy Standards [21], the level at which 43% of UK adults can read [22].

2.4 *Data collection*

Websites were scored by one researcher (JS). The SMOG tool was applied to three text samples from three key content areas for each website and the average score calculated. SMOG readability scores were calculated using the National Institute of Adult Continuing Education calculator (NIACE).

2.5 *Data Analysis*

The DISCERN, information coverage and SMOG scores were compared for three website provider types (government, non-profit organisation and commercial) using the Kruskal-Wallis statistic. Pearson's product moment correlation coefficients assessed the relationship between DISCERN and information coverage scores for each website type. The medians, quartiles and outliers were plotted according to website provider types for each question in the DISCERN and information coverage tools, to identify high and low scoring websites for each item. SPSS v19 [23] was used for the analysis.

3. **Results**

3.1 *Distribution of types of website provider*

Most websites returned from searches were for commercial providers; 15 government, 13 non-profit and 106 commercial sites were eligible for inclusion, see Figure 2.

3.2 *Ranking of individual websites*

Median scores for all websites (n=39) were 44/80 for quality (DISCERN), 11/30 for coverage and 18.7 for readability (SMOG), a similar level to UK broadsheet newspapers (see Table 2).

3.3 *Information quality by type of website provider*

A Kruskal-Wallis test revealed no difference between website provider types in SMOG scores ($\chi^2 = 2.255$, $df=2$, $p=0.324$) or information coverage ($\chi^2 = 1.018$, $df=2$, $p=0.601$). Scores were different for the DISCERN tool, although they did not reach statistical significance ($\chi^2 = 5.854$, $df=2$, $p=0.054$). A Mann Whitney U test comparing the government and non-profit websites on DISCERN revealed no significant difference ($p=0.797$), therefore the two groups were combined to a single non-commercial provider group. A Mann Whitney U test comparing non-commercial and commercial providers revealed a statistically significant difference between the two provider types on DISCERN (median scores 36 and 53, $p=0.014$), such that commercial website providers scored lower.

There was a significant positive correlation between the DISCERN scores and information coverage scores for all website providers ($r=0.69$, $p<0.001$, $n=39$). When correlations were calculated according to provider type, there were positive correlations for the non-profit and commercial sites ($r=0.902$, $p<0.001$, $n=9$, and $r=0.684$, $p<0.001$, $n=25$) respectively. There was a large correlation for the government websites ($r=0.842$). This was not statistically significant ($p=0.073$), although there were only 5 websites of this type.

3.4 *Analysis of websites for information quality*

Section 1 of the tool (questions 1-8) assessed website reliability. Only four (of 39) websites received the maximum score of 5 for the aims being clear: three were commercial sites (patient.co.uk, menopause matters, natural health practice) and one non-commercial (healthtalkonline). Sites were scored lower for relevance if there was little or no information about herbal remedies. For questions 4 and 5, 29 (74%) and 27 (69%) of websites received a score of 3 or below, indicating only partial or no information about sources of information used and date of production. Commercial sites had the lowest median score for question 6, which checked that information was balanced and unbiased. This tended to be due to the promotion of particular products or treatment approaches.

Section 2 of the tool (questions 9 to 15) assessed information quality on treatment choices. Question 9 assessed whether there was an explanation for how treatments worked and scored relatively low overall. There was information about the indications for treatments but limited information about the mode of action. Government sites received the lowest mean score for question 12, which asked whether there was information about what happened if no treatment was used, although this question was difficult to score as the menopause is a symptomatic stage of life rather than a disease. In order to score the top mark of 5, websites needed to include information about the range of symptoms associated with the menopause, prevalence of symptoms and how long symptoms might last with no treatment.

3.5 *Analysis of websites for information coverage*

Table 4 provides a summary of the median scores and interquartile ranges (IQR) for individual items for the specific information tool according to the type of website provider.

Median scores were low for both types of website provider but scores were highly variable both within each group and for specific items of information. No one website scored highly for every question.

Table 1 Information needs informing coverage assessment tool

| Identified need | Examples of information searched for | Item in information coverage assessment tool |
|--|---|---|
| Information about options for treating symptoms with herbal products | Range of possible herbal products to use, alternatives to HRT, alternatives to soya | Is there information about the range of herbal products available as treatment options for menopausal symptoms? |
| Information about specific products | Dose, ingredients, effectiveness, how long before product will work, contra-indications, interactions, side effects | Is there information about specific herbal products? |
| Information about combining herbal products | Do products complement each other; how to combine products for optimum effect | Is there information about combining herbal products? |
| Information about real life experiences | Recommendations from other women; experiences of other women | Is there access to information about real life experiences and personal recommendations? |
| Information about dealing with adverse reactions | Where to report and how to deal with adverse reactions | Is there information about how to deal with any side effects or adverse reactions with herbal remedies? |

Table 2 Top 10 ranking websites by measure of quality, content and readability

| Rank | DISCERN tool (quality) | Total score | Information coverage | Total score | SMOG (readability) | Total score |
|-------------------------------|---|--------------------|---|--------------------|---|--------------------|
| 1 | healthtalkonline.org | 67 | menopausematters.co.uk | 19 | livestrong.com | 16.4 |
| 2 | patient.co.uk | 63 | medicinenet.com | 18 | mayoclinic.com | 16.47 |
| 3 | mayoclinic.com | 61 | umm.edu | 17 | menopausesupport.org.uk | 16.87 |
| 4 | medicinenet.com | 60 | avogel.co.uk ; project-aware.org; mayoclinic.com | 16 | avogel.co.uk | 17.1 |
| 5 | umm.edu | 58 | mhra.gov.uk ; healthtalkonline.org | 15 | Cancer researchuk.org | 17.13 |
| 6 | nccam.nih.gov menopausematters.co. uk | 57 | nccam.nih.gov livestrong.com | 14 | yorkshiremenopause.co.uk | 17.47 |
| 7 | webmd.boots.com mhra.gov.uk menopausesupport.org. uk | 55 | menopausesupport.org.uk ; home remediesweb; saga.co.uk | 13 | breastcancer.org | 17.5 |
| 8 | cancerresearchuk.org | 54 | cancerresearchuk.org;rcog.org.uk; healthhowstuffworks.com; nhs.uk Patient.co.uk;webmdboots.com peoplespharmacy.com | 12 | saga.co.uk | 17.57 |
| 9 | project.aware.org; rcog.org.uk. | 53 | breastcancer.org; hollandandbarrett.com; naturalhealthpractice.com; simplysupplements.net | 11 | peoplespharmacy.com | 17.7 |
| 10 | livestrong.com | 52 | cnchealth.com; marilynplenville.com | 10 | naturalhealthpractice.com | 17.73 |
| Total by provider type | Government=2 Non-profit=5 Commercial=7 | | Government=3 Non-profit=5 Commercial=15 | | Government=0 Non-profit= 5 Commercial=5 | |

Table 3 DISCERN tool: median (and IQR) scores for individual questions

| Question; max score for each question=5 | Non-commercial | Commercial | Reliability of website |
|---|----------------|------------|-----------------------------------|
| 1. Are the aims clear? | 4(1) | 3(2) | |
| 2. Does it achieve its aims? | 4(2) | 3(2) | |
| 3. Is it relevant? | 4(2) | 2(1) | |
| 4. Is it clear what sources of information were used to compile the publication? | 3(2) | 2(2) | |
| 5. Is it clear when the information used or reported in the publication was produced? | 2.5(3) | 2(2) | |
| 6. Is it balanced and unbiased? | 4(1) | 2(2) | |
| 7. Does it provide details of additional sources of support and information? | 3(1) | 2(2) | |
| 8. Does it refer to areas of uncertainty? | 4(1) | 2(3) | |
| 9. Does it describe how each treatment works? | 3(2) | 2(2) | Quality of information on choices |
| 10. Does it describe the benefit of each treatment? | 3(1) | 3(1) | |
| 11. Does it describe the risks of each treatment? | 4(2) | 2(2) | |
| 12. Does it describe what would happen if no treatment is used? | 3(2) | 3(3) | |
| 13. Does it describe how the treatment choices affect overall quality of life? | 2(3) | 2(2) | |
| 14. Is it clear that there may be more than one possible treatment choice? | 4(1) | 3(2) | |
| 15. Does it provide support for shared decision making? | 3(1) | 1(1) | Overall rating |
| 16. Overall quality of the publication | 3(1) | 1(2) | |

Table 4 Information coverage tool: median (and IQR) scores for individual questions

| Question; max score for each question=5 | Non-commercial | Commercial |
|--|----------------|------------|
| 1. Is there information about the range of herbal remedies/products available? | 3(1) | 3(2) |
| 2. Is there information about specific herbal remedies/products? | 2(1) | 2(1) |
| 3. Is the information about combining herbal products? | 1(0) | 1(1) |
| 4. Is there access to information about real life experiences and personal recommendations? | 1(2) | 1(1) |
| 5. Is there information about how to deal with any side effects or adverse reactions to herbal remedies? | 1.5(1) | 1(1) |
| 6. Overall rating | 2(1) | 1(1) |

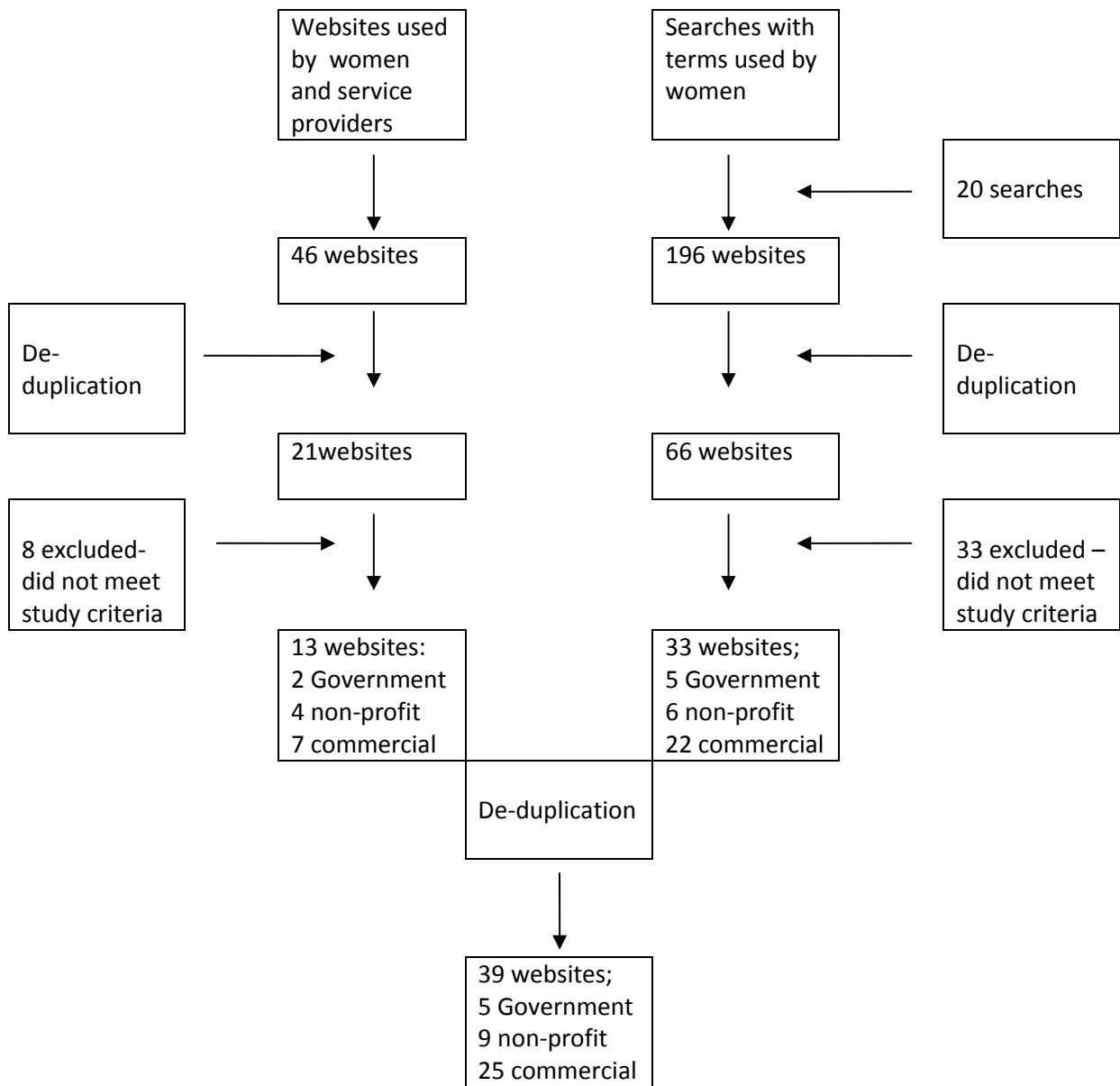


Figure 1 Flow diagram for obtaining website sample

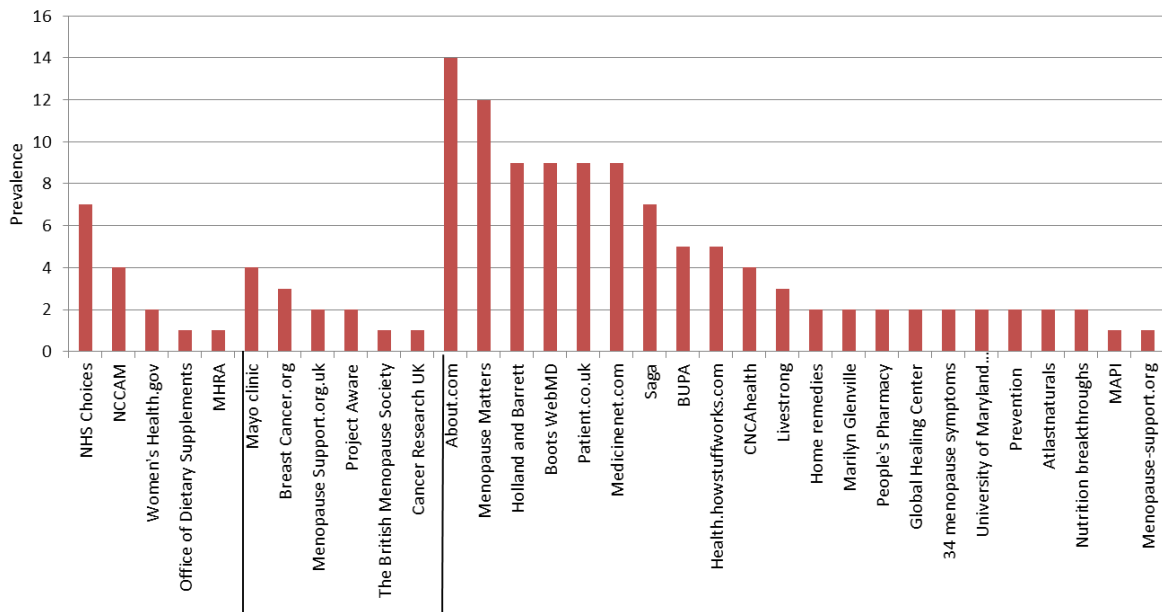


Figure 2 Frequency with which sampled websites appeared in the internet searches

4 Discussion

The majority of websites returned, originated from commercial providers. The overall quality of commercial sites was significantly lower than non-commercial sites, a similar finding to other studies of the quality of online menopause information more generally [8, 24].

The aims of sites were often not immediately apparent, and the declaration of information sources and publication dates were also poor, giving users little opportunity to verify information provided, as reported about other health information online [24-26]. The website scores indicated room for improvement in both general quality and, in particular, information coverage.

The association between website quality and information coverage matches other findings [8] in which the most informative sites about the menopause also tended to be the highest quality.

Seven websites were rated in the top 10 for both quality and coverage of information: menopausematters.co.uk, medicinenet.com, umm.edu, mayoclinic.com, healthtalkonline.org, mhra.gov.uk and nccam.nih.gov. However, no site scored consistently highly across all items on the tools for quality and coverage of information.

The SMOG score was relatively high for all website providers, indicating the use of complex language. The lowest SMOG score for any website was 16.4. By comparison the average SMOG scores for newspaper editorials are: the Sun < 14, the Daily Express < 16, and the Telegraph and The Guardian > 17 [21], indicating that the websites were of UK broadsheet level.

The high website readability levels could impact on their accessibility. Evaluation of other types of health-related websites has also identified the need to reduce the reading level of information [4, 24, 25, and 27], although Promislow et al. [25] suggested that lower levels are difficult to achieve with medical information. The concern is that difficult content may cause consumers to instead

resort to internet forums where information may be limited to personal experiences and anecdote [28].

The study evaluated websites used by women and service providers, supplemented by 20 separate searches which employed terms actually used by women looking for herbal remedies to treat their symptoms. The study also took account of women's actual information needs by assessing information coverage using a tool developed from information gained during focus groups with menopausal women.

The DISCERN tool has been validated [18] and appears to be a better indicator of website quality than Health On the Net (HON) [29]. However other website quality indicators were not checked and website scoring does involve a degree of subjectivity. This subjectivity was countered by two researchers (JS and PK) independently assessing a sample of 5 websites and discussing differences in allocated scores to reach consensus.

Limitations of the design were that the sample resulted from searches conducted on one computer on a single day and the sample was also limited to the top 10 of the searches. The study also did not look at website navigation, therefore even though a website might score highly for quality or information coverage, women might not be able to find the information they required.

Women might need to access more than one website to find good quality information which meets their specific needs and which presents this information in an understandable and accessible way. The complexity of the text in all the sampled websites might act as a barrier to communication. The coverage of information about herbal remedies was generally poor. In part this may be due to the lack of scientific evidence to support their use. However, the current state of knowledge could be discussed on a website and there could be more information provided about how to report side effects and adverse reactions. The MHRA website provided a particularly good example of this type of information. Another poorly covered area was information about real life experiences with herbal remedies, a preference expressed by focus group participants [11]. The healthtalkonline website provided a good example of how this type of information could be provided.

The study has highlighted the potential role that service providers can play in 'prescribing websites'. Although evidence of co-production with end users was not investigated in this study, it would be beneficial to involve women in the design or evaluation of websites being developed to provide this type of information.

Commercial websites are the most commonly-retrieved providers of internet information about herbal remedies for menopausal symptoms. They are also more likely to provide lower quality information than non-commercial sites and have greatest within-site variability. Information coverage about herbal remedies was poor across all provider types. However, website quality and information coverage were positively associated and it was possible to identify a number of websites which provided reasonable information coverage and also achieved good overall quality.

Conflict of interest

None declared.

Funding

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Ethical approval

Website evaluation does not require ethical approval.

Contributors

JS contributed to the conception and design of the study, acquisition of data, analysis and interpretation of data and drafting the article. FA contributed to the conception and design of the study, interpretation of data and revision of the article. LD contributed to the conception and design of the study, analysis and interpretation of data and revision of the article. PM contributed to the conception and design of the study, interpretation of data and drafting the article. PK contributed to the conception and design of the study, acquisition of data, analysis and interpretation of data and revision of the article. All authors approved the final version for submission.

Provenance and peer review

This article has undergone peer review.

Appendix A

Search terms volunteered by women:

- Herbs for menopause
- Herbal remedies for menopause
- Herbal treatment
- Herbal remedies menopause
- Menopause herbal remedies + symptom
- Menopause herbal remedies
- Menopause herbal + year
- Menopause herbal treatments or herbal relief or Natural menopause symptom relief
- Alternative treatment for menopause
- Herbal treatment for menopause

Websites volunteered by women:

- Holland and Barrett's
- NHS Choices
- Simply Supplements
- Solace space

Websites volunteered by Healthcare professionals:

- BBC
- BootsWebMD
- British Menopause Society
- Chemist and Druggist
- Clinical Knowledge summaries
- Daisy website
- Healthtalkonline
- Holland and Barrett's
- Menopause Matters
- MHRA
- NHS Choices
- NHS Direct
- NPA website
- Patient.co.uk
- Royal College of Gynaecology
- Sainsbury's
- Yorkshire Menopause Group

Appendix B

Tool to evaluate websites for coverage of information identified by women in focus groups

| | | | | |
|--|---|-----------|---|-----|
| 1. Is there information about the range of herbal products available as treatment options for menopausal symptoms? | | | | |
| No | | Partially | | Yes |
| 1 | 2 | 3 | 4 | 5 |
| Notes to support score: | | | | |

| | | | | |
|---|---|-----------|---|-----|
| 2. Is there information about specific herbal products? | | | | |
| No | | Partially | | Yes |
| 1 | 2 | 3 | 4 | 5 |
| Hint: information about indications, ingredients contained in products, dosage, how long before a beneficial effect can be expected, side effects, interactions, contra-indications | | | | |
| Notes to support score: | | | | |

| | | | | |
|---|---|-----------|---|-----|
| 3. Is there information about combining herbal products? | | | | |
| No | | Partially | | Yes |
| 1 | 2 | 3 | 4 | 5 |
| Hint: which herbal ingredients complement each other, interactions with other herbal products | | | | |
| Notes to support score: | | | | |

| | | | | |
|---|---|-----------|---|-----|
| 4. Is there access to information about real life experiences and personal recommendations? | | | | |
| No | | Partially | | Yes |
| 1 | 2 | 3 | 4 | 5 |
| Notes to support score: | | | | |

| | | | | |
|--|---|-----------|---|-----|
| 5. Is there information about how to deal with any side effects or adverse reactions with herbal remedies? | | | | |
| No | | Partially | | Yes |
| 1 | 2 | 3 | 4 | 5 |
| Notes to support score: | | | | |

| | | | | |
|-------------------------|---|----------|---|------|
| 6. Overall rating | | | | |
| Low | | Moderate | | High |
| 1 | 2 | 3 | 4 | 5 |
| Notes to support score: | | | | |

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