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Online health information on obesity in pregnancy: a systematic review

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ABSTRACT

Objective: To assess the quality of health information available online for healthcare users on obesity in pregnancy and evaluate the role of the internet as an effective medium to advocate a healthy lifestyle in pregnancy.

Study design: We used the poly-search engine Polymeta and complimented the results with Google searches (till July 2015) to identify relevant websites. All open access websites in English providing advice on the risks and management of obesity in pregnancy. Two independent reviewers assessed the quality of information provided in each of the included websites for credibility, accuracy, readability, content quality and technology. We compared websites 'quality according to their target population, health topic and source of funding'.

Results: Fifty-three websites were included. A third of websites were focused on obesity in pregnancy and two thirds targeted healthcare users. The median value for the overall credibility was 5/9, 7/12 for accuracy, 57.6/100 for readability, 45/80 for content quality and 75/100 for technology. Obesity specific websites provided lower credibility compared to general health websites ($p = 0.008$). Websites targeting health users were easier to read ($p = 0.001$). Non-governmental funded websites demonstrated higher content quality ($p = 0.005$). Websites that are obesity focused, targeting health users and funded by non-governmental bodies demonstrated higher composite quality scores ($p = 0.048$).

Conclusions: Online information on obesity in pregnancy is varied. Governmental bodies in particular need to invest more efforts to improve the quality of online health information.

Introduction

The epidemic of obesity continues to be a major health challenge worldwide [1], particularly in women of childbearing age [2]. About one in five women in this age group are obese with increased prevalence in high-income countries such as the USA (34%) and the UK (25%) [3]. Pregnant women with obesity have an increased risk of complications such as gestational diabetes, pre-eclampsia, stillbirth and cesarean section [2]. Early adoption of dietary and lifestyle interventions have the potential to reduce these risks in pregnancy [4,5]. The chief Medical Officer of England has emphasised the importance of encouraging women of childbearing age to adopt a healthier lifestyle to combat obesity before pregnancy [6].

Effective, cheap, innovative and widely adopted interventions are needed to improve women's health. The Internet is now one of the most consulted sources by women for health information in developed countries. The quality of health information provided online for healthcare users, in general, is inconsistent [7]. Poor quality information, particularly those targeting women, can adversely influence mother's behaviour leading to worse health outcomes [8].

The quality of health information available online on risks and management of obesity in pregnancy is not known. We systematically evaluated the quality of online information on the topic of obesity in pregnancy.

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Materials and methods

We conducted this study using a prospective protocol (PROSPERO Registration: CRD42015020192) and reported the findings in accordance with the PRISMA statement [9].

Identification of websites

We developed a comprehensive list of search terms identified through Google searches to capture websites providing information on obesity in pregnancy. A full list of search terms and the search strategy is provided in Appendix (1) in Supplementary material. The selection and inclusion process were conducted in two stages. Two independent reviewers used these search terms in different combinations in the poly-search engine Polymeta (https://polymeta.com/) which searched the following search engines simultaneously: Google, Ask, Yahoo, Bing and Blekko. We undertook complimentary searches with Google search engine using the different portals of English speaking countries such as google.co.uk; google.com; google.ca; google.com.au; and google.co.nz. We screened the first 10 pages of every search results for relevant websites and removed duplicates. We included only websites in English. Websites were excluded if they were not open access or required a password to access the content. Websites solely replicating scientific articles were excluded.

Quality assessment

Two independent reviewers (CP and HL) assessed the quality of the included websites for their quality of information and technology. We grouped websites according to their target population (healthcare users vs general population), health topic (obesity specific vs general health) and source of funding (governmental, commercial and non-governmental (NGO)). Websites hosted by public health organisations such as the National Health Service (NHS) were classed as governmental. Websites or blogs started or maintained by patients and health charities were classed as NGOs.

Information quality

We assessed the quality of information provided on the website for its credibility, accuracy, readability and content. We scored the inspired credibility based on the information source, content relevance, currency, utility, editorial review process, hierarchy of evidence, statement of the original source, availability of a disclaimer (including details on ownership, sponsorship, funding and advertising), omissions and a mechanism for feedback. A score of 0 or 1 was given for each item if absent or present respectively [10].

The accuracy of provided information was evaluated by comparing it against peer reviewed published guidelines [11,12] on pre-conception counselling, antenatal maternal risks, fetal risks, prenatal diagnosis, intrapartum complications and the role of diet and physical activity in pregnancy. Each of these items was given a score of 0, 1 or 2 if not reported, briefly reported or reported in sufficient detail respectively.

We assessed the readability of websites using an online readability calculator (readability-score.com), which used the Flesch Reading Ease test. The readability scores ranged from 0 to 100, with higher scores demonstrating easier readability [13]. The information content quality was evaluated using The DISCREN tool [14]. A score between 1 and 5 (1 if completely not mentioned and 5 if mentioned in sufficient detail) was given to each of the 16 items in the DISCREN tool, such as sources of bias, an adequate description of the benefits and risks of reported treatments, and the advocacy of shared decision making with patients.

Technological quality

We used the Nibbler software to study the overall technological quality of the included websites (nibbler.silktide.com). Each website was assessed for its accessibility (such as ease of locating information on the website, URL format, and page titles), the rated user experience (such as the content value, format, mobile availability, internal links, etc.), the marketing (links to social media, popularity, meta tags, freshness, etc.) and the quality of informatics used (such as quality of images, headings, titles, printability, etc.). Each criterion is given a score from 0 to 100, with higher scores indicating higher quality. The software also generated an overall technology score out of 100.

Data analysis

The inter-rater reliability of agreement between the two assessors' was evaluated using intra-class correlation coefficient (ICC). A score less than 0.2 indicates poor agreement, 0.6–0.8 good, and greater than 0.8 is very good agreement [15]. We obtained the final scores by calculating the mean individual scores of the two reviewers. We reported the mean and the standard deviation for parametric data and the median and the range for non-parametric data. We standardised the scores obtained for each domain to a mean of 0 and a standard deviation of 1.

A composite quality score was calculated for each included website by averaging the standardised scores of credibility, accuracy, readability, content quality and technology quality. We used the Kolmogorov–Smirnov test and Kruskal–Wallis one way ANOVA test to compare the different quality scores between websites according to their target users, health topic and source of funding. We used the Student-T test and the oneway ANOVA test to compare the composite quality mean score between the above groups of websites. We performed a post-hoc multiple comparison test for statistically significant between-group results using Least Significant Difference tests (LSD). Linear regression modelling was done to test the association between the composite quality score and the funding source when accommodating for the websites target user and the topic of focus.

Results

Characteristics of websites

We identified 1169 potentially relevant websites. Initial assessment excluded 652 websites and 517 were fully checked. Of these 53 met our inclusion criteria. Fig. 1 illustrates the selection and inclusion process.

A third of websites focused on obesity in pregnancy as health topic (17/53, 32%) and two-thirds targeted women and healthcare users (37/53, 70%). About half of the websites were American (27/53, 51%) followed by British websites (17/53, 32%). Only seven websites provided a free access discussion forum to exchange health-related information (7/53, 13%). Over a third of the websites had listed authors (21/53, 40%) and 57% provided a privacy statement (30/53). We identified 12 commercial, 18 governmental and 23 NGO funded websites. Table 1 summarises the characteristics of included websites.

Quality of websites

Reliability testing revealed an excellent agreement between the scores of the two reviewers with an ICC of 0.92. The median value