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What Are Women Being Exposed to? A Review of the Quality, Content and Ownership of Websites on Premenstrual Dysphoric Disorder

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A B S T R A C T

Background: An increasing number of people are now turning to the Internet for health information. Internet use is especially likely in women with the clinical condition premenstrual dysphoric disorder (PMDD), which affects approximately 8% of premenopausal women. However, to date, there has not been a review of the quality of these online resources on PMDD. The aim of the present study was to address this gap by reviewing websites containing PMDD information.
Methods: A search was conducted on three commonly used search engines (Google, Yahoo, and Bing). The first 50 results were extracted and compared across each search engine results to determine unique resources. After removing inaccessible links, a total of 69 unique websites were reviewed to evaluate their general quality, condition-specific content quality, and ownership.
Results: The websites varied widely in terms of their quality and ownership. Most returned websites were from web providers, U.S. health care providers, and media companies. General quality (e.g., design) was modest; yet, condition-specific content quality was far poorer.
Conclusions: Women are being exposed to a varying degree of quality information about PMDD. Health professionals and website owners of this information should consider this and encourage better online resources to help this patient group. The paper presents the five highest scoring websites that may be used by those with a vested interest in PMDD, such as health professionals or women with PMDD.

In modern society, menstruation can occur between 400 and 500 times during a woman's reproductive years, and for up to 80% of women, some physical or emotional effect will be experienced during the premenstrual phase of her menstrual cycle (Hylan, Sundrell, & Judge, 1999). These premenstrual symptoms can occur up to 2 weeks before menses (i.e., the luteal phase of the menstrual cycle) and then cease when menses begins. These symptoms can have a significant impact on women's lives leading many to seek treatment of some form (Hylan et al., 1999). For a sub-cohort of these women, however, extremely severe premenstrual symptoms are experienced. It is estimated that between 3% and 8% of women have a clinical condition known as premenstrual dysphoric disorder (PMDD; Halbreich, Borenstein, Pearlstein, & Khan, 2003), which can have severe negative effects on their lives.

PMDD was originally referred to as the late luteal phase dysphoric disorder in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM) III-R (American Psychiatric Association, 1987) before changing to PMDD in the DSM-IV (American Psychiatric Association, 1994). In the most recent edition (DSM-V, 2013), for women to be diagnosed with PMDD they are required to experience 5 of 11 specific premenstrual symptoms cyclically (i.e., symptoms disappear when menstruation begins) and these symptoms must interfere with their work, school, usual activities, or relationships with

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others. Specific symptoms include noticeable lability (e.g., moods swings), irritability or anger, anxiety and tension, depressed mood, feeling overwhelmed or out of control, difficulty in concentrating, decreased interest in usual activities, a change in appetite, sleeping patterns (e.g., insomnia or hypersomnia), and physical symptoms (e.g., headaches, breast tenderness, bloating), and must include the first four of these symptoms listed. Importantly, symptoms must not be related to any other disorder or underlying medical condition, or other medications or drug use. They must occur in most menstrual cycles over the last year and be recorded for at least 2 months to confirm the diagnosis.

The exact cause of PMDD is unknown, but various types of treatment have been used or suggested to alleviate symptoms. A comprehensive review of the literature examining the evidence for PMDD treatments reveals varying efficacies but highlights the need for more research (Rapkin & Lewis, 2013). The review examines treatments including pharmacological, non-pharmacological, and other alternative self-help and therapeutic approaches. Of these, pharmacologic treatments have received the most attention in recent years including serotonergic agents such as selective serotonin reuptake inhibitors (SSRIs), serotonin–norepinephrine reuptake inhibitors, atypical serotonergic antidepressants and serotonergic tricyclics. SSRIs are the most documented and have shown to be the most effective of these psychotropic treatments, easing symptoms in up to 60% to 80% of patients (e.g., Dimmock, Wyatt, Jones, & O'Brien, 2000; Shah et al., 2008). They are approved by the U.S. Food and Drug Administration as a treatment for PMDD and moreover, research shows that they can be taken continuously or intermittently (e.g., during the luteal phase or symptom onset) with similar results (Freeman, Sondheimer, Sammel, Ferdousi, & Lin, 2005; Ravindran, Woods, Steiner, & Ravindran, 2007; Shah, et al., 2008).

Another line of pharmacological treatments is hormonal therapies, which aim primarily to suppress ovulation. Oral contraceptives (OCs) containing drosperinone have shown the most efficacy in symptom alleviation across several randomised control trials and meta-analyses. According to Rapkin and Lewis (2013), other OCs following the standard dosing of 21 days on–7 days off have not been shown to be as effective for treating PMDD compared with continuous daily use (despite their wide use for treating symptoms of premenstrual syndrome (PMS); Rapkin & Winer, 2008). Other hormonal options include high-dose transdermal estrogen, Danazol (a synthetic partial androgen antagonist/agonist and gonadotropin inhibitor), and gonadotropin-releasing hormone agonists that also reduce or stop ovulation. These have shown some improvements for symptoms in women with PMS but not necessarily those who are dysphoric (e.g., Freeman, Sondheimer, & Rickels, 1997). Numerous negative side effects, including endometriosis, hirsutism, acne, and hypoestrogensim, have been reported with use of gonadotropin-releasing hormone, meaning these options are less appealing (Rapkin & Lewis, 2013). As a last resort, women can have a surgical menopause involving the removal of bilateral ovaries with or without a hysterectomy. Again, side effects may result including osteoporosis, cardiac disease, and endometrial hyperplasia unless other hormones are replaced (Mitwally, Gotleib, & Casper, 2002), which consequently may reintroduce PMS symptoms (Rapkin & Lewis, 2013). The review concluded OCs containing drosperinone are currently regarded as the most effective hormonal treatment and noted as another U.S. Food and Drug Administration approved treatment PMDD.

Other nonpharmacological and alternative treatment options have also been explored, but to a lesser degree. They are typically tested on women with PMS and also advocated as treatments for PMDD despite a lack of systematic evaluation on women with the condition. Self-help approaches include exercise (Daley, 2009), dietary modifications, and use of supplements in the luteal phase of the menstrual cycle. Possible dietary modifications include reducing consumption of alcohol, caffeine, and sugar (Cunningham, Yonkers, O'Brien, & Eriksson, 2009; Rossignol & Bonnlander, 1990) and increasing complex carbohydrate intake (Sayegh et al., 1995). Supplements may include vitamin B_6 (e.g., Wyatt, Dimmock, Jones, Shaughn O'Brien, 1999) and calcium (e.g., Thys-Jacobs, Starkey, Bernstein, & Tian, 1998), of which the latter has been acknowledged as showing some promise as a nonpharmacological potential treatment for PMDD (Rapkin & Lewis, 2013). Herbal remedies including hypericum perforatum (St John's wort) and *Agnus castus* (chastebury) have also been suggested with some promise from small empirical studies, particularly for the latter (Atmaca, Kumru, & Tezcan, 2003; Schellenberg, 2001). Bright light therapy is also showing signs as another potential alternative treatment of PMDD with some evidence of symptoms reduction from light dosing in the morning and/or evening in women with PMDD (Parry et al., 1989; Lam et al., 1999). Finally, the psychological treatment intervention of cognitive–behavioral therapy is another non-pharmacological treatment that has some empirical evidence of its effectiveness on PMDD symptoms comparable with that of SSRIs (Hunter et al., 2002), whereas other relaxation-type practices, such as acupuncture and reflexology, for example, again are sometimes suggested as treatment but lack empirical evidence for PMDD.

Women can often seek medical help for premenstrual problems for several years before receiving a diagnosis of PMDD. In other cases, they can receive a misdiagnosis, for example, of bipolar or borderline personality disorder (Studd, 2012; Yamauchi, Tanaka, Mukai, & Kato, 2008). An initial suggestion of a premenstrual problem can often originate from another nonmedical source, leading women to feel that their physicians were inadequately informed in relation to the diagnosis and treatment of premenstrual issues (Kraemer & Kraemer, 1998). Given this perception, it is perhaps not surprising that women are turning to the Internet for health information and advice. In fact, this is part of a common trend towards using online resources for health.

It is estimated that 59% of U.S. adults have looked online for health information in the past year (Pew Research Center's Internet and American Life Project, 2013) with a growing number searching online for health information before seeking professional medical advice (Dutton & Blank, 2011). However, the overall quality of health information online is known to be variable (Eysenbach & Köhler, 2002). Researchers have noted issues with the general quality of the website (e.g., currency of information, readability, and download time; Croft & Peterson, 2002; Eysenbach & Köhler, 2002) as well as with the specific health content provided (e.g., incomplete information; Reed & Anderson, 2002). Although a number of specific studies have examined the content and quality of women's health information online, such as menopause, (Pérez-López, 2004;Reed & Anderson, 2002), postmenopausal osteoporosis (Pérez-López & Pérez Roncero, 2006), cervical cancer treatments (Selman, Prakash, & Kahn, 2006), and postnatal mental health (Moore & Ayres, 2011), to the best of our knowledge there has not been a review of PMDD information websites.

Recent evidence suggests that women with PMDD may be more likely than other women to use the Internet excessively. Ko