Pregnancy and the Acceptability of Computer-Based Versus Traditional Mental Health Treatments

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Abstract

Background: Recent recommendations urge increased depression screening in pregnant and postpartum women, potentially increasing demand for treatment. Computer-based psychotherapy treatments may address some of perinatal women's unique mental health treatment needs and barriers.

Materials and Methods: We conducted a quantitative survey of pregnant women (≥ 12 weeks of gestation) on preferences regarding computer-based therapies compared with traditional therapies (psychotherapy and medication). Nonpregnant women and men served as comparison groups. Participants were provided descriptions of three computer-based therapies: video telehealth therapy (VTT), computer-assisted therapy (CAT), and self-guided online therapy (SGO). Participants were asked to select all options that they would consider for treatment as well as first choice preference. The Patient Health Questionnaire-9 (PHQ-9) assessed current depressive symptomatology, and the Mini International Neuropsychiatric Interview (MINI) assessed psychiatric history.

Results: Participants included pregnant females ($n = 111$), nonpregnant females ($n = 147$), and males ($n = 54$). Among pregnant women, 77.5% ($n = 86$) indicated that they would consider some form of computer-based therapy for mental health treatment during pregnancy; VTT was the most commonly considered, followed by CAT and SGO. When asked to select their preferred intervention, traditional talk therapy was the first choice among all three groups, controlling for treatment history and PHQ-9 score. About one-third of pregnant women chose some form of computer-based therapy as their top choice.

Conclusions: While computer-based therapies were acceptable to most pregnant women in this sample, traditional talk therapy was the preferred option. Future research should consider how to tailor computer-based therapies to the unique needs of perinatal women.

Keywords: perinatal, depression, CCBT, internet-based treatment, eHealth

Introduction

UP TO 15% OF WOMEN will suffer from depression while pregnant.¹⁻³ Mental health concerns during pregnancy have been linked to preterm birth,^{4,5} lower birth weight,^{6,7} abnormal infant neuroendocrine development,⁸ and long-term adverse impact on offspring neurodevelopment.^{9,10} Thus, the U.S. Preventive Services Task Force (USPSTF) recently recommended screening for depression specifically in pregnant and postpartum women.¹¹ With increased perinatal depression

screening will come increased demand for treatment. However, treatment options must meet the unique needs of perinatal women. Pharmacotherapy is the treatment recommendation for moderate to severe depression during pregnancy,¹² but women consistently prefer nonmedication options for perinatal mental health treatment,¹³ and often discontinue medication during pregnancy due to concern over potential harm to the fetus.¹⁴⁻¹⁶ While pregnant and postpartum women prefer nonmedication treatment such as psychotherapy, they also face unique barriers to obtaining

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such treatment, including lack of childcare, lack of time, limitations in mobility or transportation, stigma associated with depression during pregnancy, and financial concerns.^{17–21}

Computer-based treatments address some of these barriers.^{22,23} Computer-based treatments can connect therapists and patients in real time, allow stand-alone interventions, or act as adjuncts to traditional therapy models. Several computer-based treatments have been examined in the treatment of depression, anxiety disorders, and insomnia^{24–27} and range from self-guided web-based tools²⁸ to interactive modules that augment traditional cognitive-behavioral therapy (CBT) (*e.g.*, computer-assisted CBT, CCBT).^{29–32} Although, the past decade has seen significant growth in and tailoring of computer-based treatments to specific populations,^{33,34} perinatal women have not been frequently included.^{35–37} Like others,³² our previous trial of CCBT for depressed pregnant women showed a high rate of adherence to the treatment program, and 80% of participants showed symptom improvement,³¹ suggesting that computer-based treatments may be a promising option for perinatal women. Based on the reported barriers and reluctance to use medication, the ideal treatment during pregnancy would be a nonpharmacologic, short-term, easy-to-access, and effective alternative.

To examine whether computer-based psychotherapeutic interventions would be an acceptable alternative among pregnant women, we conducted a quantitative survey of pregnant women with and without a history of mental health treatment. Nonpregnant women and men with and without mental health treatment history were included as comparison groups. We hypothesized that pregnant women would prefer computer-based therapies over traditional psychotherapy in a clinician's office or medication alone given the unique barriers that pregnant women face and their general desire to avoid psychotropic medications. We similarly hypothesized that pregnant women would prefer computer-based treatments more frequently than nonpregnant women or men.

Materials and Methods

Subjects

Eligible participants were 18- to 45-year-old pregnant females, at least 12 weeks gestational age, and nonpregnant females and males of age 18–45. Participants were recruited using flyers disbursed in and around the University of Pennsylvania campus, from the Penn Center for Women's Behavioral Wellness, and *via* Penn Data Store (a data analytic center that provides patient information collected from Penn Medicine information systems). The only exclusion for study participation was if the participant was unable to correctly summarize the differences among the three types of computer-based therapies after being read descriptions of each.

Study overview

This single-site study was approved by the University of Pennsylvania Institutional Review Board. All subjects electronically signed informed consent before completion of study procedures. Participants completed surveys online using the online REDCap (Research Electronic Data Capture) tools hosted by the University of Pennsylvania. REDCap is a secure web-based application designed to support data capture for research studies.³⁸ *Via* RedCap, participants reported demo-

graphic information (including age, sex, race, ethnicity, marital status, education, and household income), medical and psychiatric history (current and past diagnoses and prescribed medications), and selected potential benefits, disadvantages, and barriers to mental health treatment (with space for free response if other was chosen). To assess acceptability and preference of three computer-based therapies as well as traditional talk therapy and medication, participants were provided descriptions of three computer-based therapies (Table 1): video telehealth therapy (VTT), a method in which the patient engages in psychotherapy sessions with the therapist over a web camera; computer-assisted therapy (CAT), a method of delivering psychotherapy, typically CBT, through a computer interface with some interaction with the therapist³¹; and self-guided online therapy (SGO), a self-selected and self-administered program in which the patient does not meet with a therapist and instead completes computer-based exercises at home at his or her own pace. To assess treatment acceptability, participants were asked to select *all* options that they would consider for treatment; pregnant women were asked to answer the question assuming that they would receive this treatment while pregnant. To assess treatment preference, participants were asked to select their *first choice* among this set of options. For both acceptability and preference, participants had the option to select none or don't know.

As depressive symptoms may impact treatment preference, participants completed the Patient Health Questionnaire-9 (PHQ-9)³⁹ to assess current depressive symptomatology. After completion of these assessments online, participants were presented with a page thanking them for their participation and prompting them to schedule a Mini International Neuropsychiatric Interview (MINI)⁴⁰ by phone. After reviewing the participant's self-report measures, a researcher trained to administer the MINI called the participant within 72 hours after submission of online surveys and completed the MINI by phone. After completion of the MINI, the participants received a \$5.00 gift card by mail as compensation for their participation.

TABLE 1. TYPES OF COMPUTER-BASED THERAPIES ASSESSED

<i>Computer-based therapy name</i>	<i>Description</i>
VTT	The patient has psychotherapy sessions with the therapist <i>via</i> a web camera using video chat technology instead of attending in-person sessions at the therapist's office.
CAT	The patient completes psychoeducational modules (typically CBT) <i>via</i> a computer interface. This is supplemented with brief in-person sessions with a therapist.
SGO	The patient selects and administers an online program without any interaction with a therapist. The patient completes computer-based exercises at home at his/her own pace.

CAT, computer-assisted therapy; CBT, cognitive-behavioral therapy; SGO, self-guided online therapy; VTT, video telehealth therapy.

Measures

The PHQ-9 was used to assess mood over the past 2 weeks. The PHQ-9 is a multipurpose instrument for screening, diagnosing, monitoring, and measuring the severity of depression. It is completed by the patient and takes less than 5 minutes to complete. The diagnostic validity of the PHQ-9 was established in studies showing PHQ scores ≥ 10 and had a sensitivity of 88% and a specificity of 88% for major depression. Scores of 5, 10, 15, and 20 represent mild, moderate, moderately severe, and severe depression.³⁹

The MINI is a short screening assessment given by a trained evaluator to establish current and past mental health concerns. When administered by family medicine residents in a primary healthcare setting, the MINI had kappa coefficients between 0.65 and 0.85, sensitivity between 0.75 and 0.92, specificity between 0.90 and 0.99, positive predictive values between 0.60 and 0.86, negative predictive values, between 0.92 and 0.99, and accuracy between 0.88 and 0.98 when compared with the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders (DSM).⁴⁰

Statistical methods

Descriptive analyses were performed to characterize the study population and to determine demographic differences between the groups. For continuous variables, analysis of variance was used to compare values among the three groups.

For categorical variables, Pearson's chi-square test was used to compare the groups. If a three-way comparison was significant, *post hoc* tests were performed. Statistical significance was set at a two-sided alpha of 0.05. Chi-square tests and multinomial logistic regression were used to assess differences in treatment acceptability and treatment preferences among men, women, and pregnant women.

Results

Demographics

Participants included pregnant females ($n=111$), nonpregnant females ($n=147$), and males ($n=54$). The groups were similar in terms of age, race, and education ($ps > 0.05$) (Table 2). A greater number of men than women were single, widowed, or divorced. Pregnant women reported higher total household income; this was likely because more pregnant women were married and thus in a dual-income household (Table 2). The three groups were similar in self-report and clinician-rated measures of depression and anxiety, including PHQ-9 score and MINI diagnoses (Table 2). More than half of the participants reported having received mental health treatment, including talk therapy ($n=181$), medication ($n=89$), and alternative treatments, including acupuncture ($n=1$), biofeedback ($n=1$), or inpatient or day programs ($n=3$) (Table 2). Significantly more men than women were treatment naïve (Table 2). Those with a treatment history had significantly higher PHQ-9 scores than those without

TABLE 2. PARTICIPANT CHARACTERISTICS BY GROUP

	Pregnant women ($n=111$)	Nonpregnant women ($n=147$)	Men ($n=54$)	p
Age, mean (SD)	30.2 (4.9)	30.8 (6.5)	28.7 (6.5)	0.10
Race, n (%)				0.26
Caucasian	82 (73.9)	110 (74.8)	36 (66.7)	
African American	16 (14.4)	17 (11.6)	5 (9.3)	
Other	13 (23.2)	20 (13.6)	13 (24.1)	
Education, n (%)				0.55
Some college or more	90 (81.1)	113 (78.5)	39 (73.6)	
Less than college	21 (18.9)	31 (21.5)	14 (26.4)	
Marital status, n (%)				<0.001 *(a)
Single, divorced, widowed	22 (19.8)	75 (51.0)	35 (64.8)	
Married	89 (80.2)	72 (49.0)	19 (35.2)	
Income, n (%)				0.003 *(b)
<\$51,000	26 (47.3)	48 (33.6)	25 (47.2)	
\$51–100,000	23 (20.9)	43 (30.1)	11 (20.8)	
\$101–200,000	40 (36.4)	28 (19.6)	10 (18.9)	
>\$200,000	14 (12.7)	8 (5.6)	2 (3.8)	
Prefer not to answer	7 (6.4)	16 (11.2)	5 (9.4)	
Hours of computer use daily, mean (SD)	6.1 (3.1)	6.63 (5.1)	7.79 (6.0)	0.10
History of treatment, n (%)	69 (62.2)	99 (67.3)	22 (40.7)	0.002 *(c)
PHQ-9, mean (SD)	3.7 (4.3)	4.3 (4.2)	4.1 (5.3)	0.54
MINI diagnoses, n (%)				
Major depression	4 (3.6)	11 (7.5)	4 (7.4)	0.40
Anxiety	10 (9)	30 (20.4)	10 (18.5)	0.04
Agoraphobia/social anxiety	4 (3.6)	12 (8.2)	2 (3.7)	0.23

p Values represent a three-way comparison between pregnant women, nonpregnant women, and men.

* $p < 0.05$. *Post hoc* comparisons revealed significant differences between pregnant and nonpregnant women in (a) marital status ($p < 0.001$) and (b) household income ($p = 0.002$) and between men and women in (c) history of mental health treatment ($p = 0.03$).

Values in bold indicate statistical significance.

MINI, Mini International Neuropsychiatric Interview; PHQ-9, Patient Health Questionnaire-9; SD, standard deviation.

a treatment history ($F(278)=6.2$, $p=0.003$); those with medication treatment had significantly higher PHQ-9 scores than those with no treatment or talk therapy ($F(2)=26.0$, $p<0.001$). As treatment history may influence treatment preference, these variables were included in logistic regression models that assessed treatment preferences. For further analyses, those who reported receiving mental health treatment were categorized as having received talk therapy, medication (even if other treatments were reported), or no treatment. Those who had received alternative treatments were excluded from analyses.

Treatment options: barriers and acceptability

Barriers to treatment. Among pregnant participants, the major perceived barriers to traditional mental health treatment during pregnancy included work schedule, treatment affordability, and lack of childcare (Table 3). Only lack of insurance was reported as a barrier by nonpregnant women significantly more frequently than pregnant women ($p=0.04$).

Acceptability of treatments. Participants were presented with five types of therapies (traditional psychotherapy, medication, CAT, SGO, and VTT) and asked to select *all* treatment options that they would consider if they needed mental healthcare. Pregnant women indicated that they would con-

sider each specific computer-based therapy at similar rates to nonpregnant women and men: VTT was most commonly considered by pregnant women at 58.6% ($n=65$), followed by CAT at 55.9% ($n=62$) and SGO at 27.9% ($n=31$) (Table 4). A significantly lower percentage of pregnant women (16.2%, $n=18$) indicated that they would consider medication compared with nonpregnant women (57.8%, $n=85$) ($p<0.001$). Men considered CAT significantly more often than women overall ($p=0.03$) (Table 4). When all forms of computer-based therapy (CAT, VTT, and SGO) were combined, 77.5% ($n=86$) of pregnant women indicated that they would consider some form of computer-based therapy for mental health treatment during pregnancy; this was similar to nonpregnant women (83.7%, $n=123$) and men (85.5%, $n=46$) ($X^2(2)=2.15$, $p=0.342$).

Treatment benefits. Participants selected from a list of potential perceived benefits to computer-based therapy (Table 3); the most common responses included ability to access computer-based therapy material anytime, less time at the therapist's office, and feeling more comfortable or honest reporting emotions to a computer. Endorsement of these potential benefits did not differ between groups ($p>0.05$). Only 12% of participants believed that computer-based therapy would be more confidential and secure compared

TABLE 3. ATTITUDES TOWARD COMPUTER-BASED THERAPIES BY GROUP, N (%)

	Pregnant women	Nonpregnant women	Men	p
Perceived benefits of computer-based therapy, n (%)				
Ability to access computerized material anytime	93 (83.8)	123 (83.7)	46 (85.2)	0.97
Shorter time at the therapist's office	55 (49.5)	73 (49.7)	30 (55.6)	0.73
Feeling more comfortable or honest reporting emotions to a computer	32 (28.8)	53 (36.1)	20 (37.0)	0.40
Enjoyable to use computer	11 (9.9)	21 (14.3)	8 (14.8)	0.52
More confidential and secure compared with traditional talk therapy	9 (8.1)	18 (12.2)	10 (18.5)	0.15
Perceived disadvantages of computer-based therapy, n (%)				
Lack of warmth or emotion on computer	87 (78.4)	123 (83.7)	44 (81.5)	0.56
Not as helpful as or as able to tailor treatment as traditional therapist	76 (68.5)	102 (69.4)	38 (70.4)	0.97
Confidentiality of personal information, privacy concerns	41 (36.9)	66 (44.9)	14 (25.9)	0.04*
Lack of confidence in own ability to use a computer	2 (1.8)	4 (2.7)	4 (7.4)	0.14
Perceived barriers to traditional psychotherapy treatment among women, n (%)				
Work schedule	58 (52.3)	69 (46.9)		0.24
Not able to afford treatment	34 (30.6)	59 (40.1)		0.07
Lack of childcare	23 (20.7)	40 (27.2)		0.15
Hope to feel better without treatment	35 (31.5)	34 (23.1)		0.09
Lack of insurance	15 (13.5)	34 (23.1)		0.04*
Lack of transportation	11 (9.9)	18 (12.2)		0.35
Do not believe the treatment will be helpful	7 (6.3)	9 (6.1)		0.58
Little family/partner support	4 (3.6)	9 (6.1)		0.27
Lack of trust in mental health system	3 (2.7)	6 (4.1)		0.41
Technology preference, n (%)				0.05*
Desktop or laptop computer	73 (65.8)	95 (65.1)	46 (85.2)	
Tablet	23 (20.7)	29 (19.9)	7 (13.0)	
Smartphone	15 (13.5)	22 (15.1)	1 (1.9)	

p Values represent a three-way comparison between pregnant women, nonpregnant women, and men.

* $p<0.05$. *Post hoc* comparisons revealed significant differences between women and men for technology preference ($p=0.008$) and privacy concerns ($p=0.035$).

Values in bold indicate statistical significance.

TABLE 4. ACCEPTABILITY OF TREATMENTS BY GROUP, *N* (%)

	Pregnant women	Nonpregnant women	Men	<i>p</i>
Traditional therapies, <i>n</i> (%)				
Talk therapy	100 (90.1)	136 (92.5)	46 (85.2)	0.29
Medication	18 (16.2)	85 (57.8)	35 (64.8)	<0.001* ^(a)
Computer-based therapies, <i>n</i> (%)				
VTT	65 (58.6)	82 (55.8)	32 (59.3)	0.86
CAT	62 (55.9)	99 (67.3)	41 (75.9)	0.03* ^(b)
SGO	31 (27.9)	49 (33.3)	13 (24.1)	0.39
Don't know, none	3 (2.7)	3 (2.0)	0 (0)	0.49

Participants were asked to choose all treatment types that they would find acceptable; pregnant women were asked to choose treatment types that they would consider while pregnant. Values in bold indicate statistical significance.

* $p < 0.05$. *Post hoc* comparisons revealed (a) significant differences between pregnant and nonpregnant women in acceptability of medication ($p < 0.001$) and (b) a trend-level difference between males and females in acceptability of computer-assisted therapy ($p = 0.06$).

with traditional talk therapy. Concerns included feeling that computer-based therapy would not be as helpful or as customizable as traditional therapy, as well as confidentiality of personal information or privacy concerns. Most participants across the three groups chose a desktop or laptop as their first choice for accessing computer-based therapy. Tablets were second choice, and smartphones were third choice in all groups (Table 3).

First choice treatment preferences

When all treatment options were presented and participants were asked to select their *single most preferred intervention*, traditional talk therapy was the first choice treatment among all three groups (Table 5). Among pregnant women whose preferred choice was a computer-based therapy, top choices were CAT (16.2%, $n = 18$), VTT (9%, $n = 10$), and SGO (5.4%, $n = 6$), which was similar to nonpregnant women and men (Table 5). Chi-square analyses revealed that treatment preference did not vary by education level, household income, employment status, marital status, or means of transportation (p 's > 0.05). Treatment preference varied by treatment history ($X^2(18) = 38.91$, $p = 0.003$) and having a current PHQ-9 score of 10 or above ($X^2(6) = 13.88$, $p = 0.03$). Thus, treatment history and PHQ-9 scores were included in regression models. Using talk therapy as a reference category, multinomial logistic regression analysis revealed that computer-based therapies were favored over talk therapy by individuals with no treatment history ($p = 0.002$) or a history

of medication ($p = 0.09$) ($F(15) = 48.22$, $p < 0.001$). This preference was not influenced by pregnancy status or sex. As expected, pregnant women were less likely than the other groups to favor medication over talk therapy ($p = 0.008$). Those with a history of medication were more likely to prefer medication over talk therapy, regardless of group ($p = 0.017$).

Participants were then asked to select their top choice among the three types of computer-based therapies. Controlling for PHQ-9 score and treatment history, multinomial logistic regression revealed that nonpregnant women preferred VTT over CAT ($p = 0.018$). Participants with a high PHQ score, regardless of group, preferred SGO over CAT ($p = 0.02$). Treatment history had no significant effect on treatment preference among the computer-based therapies.

Other factors influencing treatment preferences

Gestational age. We considered that during pregnancy, gestational age may influence treatment choice. Among pregnant women in this sample, *post hoc* logistic regressions revealed that there was no relationship between gestational age and preference for therapies that required regular in-person contact with a provider (traditional therapy and CAT) versus those that did not (medication, VTT, and SGO) ($p = 0.53$). When examining by trimester, the top treatment choice of all options was talk therapy across all trimesters ($p = 0.85$).

Anxiety diagnoses. Anxiety diagnoses were more common among women in this sample (Table 2). This included a current or past MINI diagnosis of generalized anxiety

TABLE 5. TREATMENT PREFERENCE BY GROUP, *N* (%)

	Pregnant women	Nonpregnant women	Men	<i>p</i>
Treatment modality, <i>n</i> (%)				0.08
Talk therapy	73 (65.8)	95 (65.1)	34 (63.0)	
CAT	18 (16.2)	19 (13.0)	7 (13.0)	
VTT	10 (9.0)	12 (8.2)	3 (5.6)	
SGO	6 (5.4)	6 (4.1)	0	
Medication	1 (0.9)	11 (7.5)	9 (16.7)	
None	1 (0.9)	0	0	
Don't know	2 (1.8)	3 (2.1)	1 (1.8)	

Participants were asked to choose the treatment they would most prefer given all options; pregnant women were asked to choose treatment type that they would most prefer while pregnant. Follow-up regression analyses were performed to assess group differences after controlling for PHQ score and treatment history. Values in bold indicate statistical significance.

disorder, panic disorder, obsessive-compulsive disorder, or post-traumatic stress disorder. Participants with an anxiety disorder more commonly selected computer-based therapies and medication and were less likely to prefer talk therapy, compared with those without anxiety, in a chi-square analysis ($p = 0.02$).

Discussion

This study assessed preferences for mental health treatment among pregnant women, compared with nonpregnant women and men, given recent recommendations to increase mental health screening and treatment among pregnant women. We compared traditional therapies (talk therapy and medication) with newer computer-based therapies (VTT, CAT, and SGO).

Computer-based therapies were a highly acceptable form of treatment. Among pregnant women, 77.5% indicated that they would consider computer-based therapy for mental health treatment during pregnancy, and 30.6% ($n = 34$) preferred computer-based therapy to all other forms of treatment. Among pregnant women, VTT had the highest level of acceptability among the three computer-based therapy options. VTT does not require travel to a clinician's office, which may explain why pregnant women favored it over CAT, which in this study was defined as requiring brief in-person sessions with a therapist. Indeed, work schedule and lack of childcare were among pregnant women's greatest barriers to seeking treatment; by removing travel to a therapist's office, VTT may allow more flexibility around work schedules and childcare. It should be noted that CAT can be adapted to omit in-person sessions with a therapist, instead utilizing, for example, telephone contact with a therapist. While not defined this way in this study, it is possible that replacing brief in-person sessions in CAT with video or telephone sessions could make it more appealing to pregnant women facing treatment barriers such as work schedules or childcare.

While participants indicated that they would consider computer-based treatments, the preferred treatment option among pregnant women, as well as nonpregnant women and men, was traditional psychotherapy. This is consistent with recent findings that face-to-face psychotherapy was preferred to computer-based treatments, regardless of age, sex, or education level.⁴¹ In a primary care sample, 94.3% of patients indicated interest in receiving face-to-face care in the clinic, and only 47.1% expressed interest in internet intervention.⁴² Given documented limitations in access to therapists trained in evidenced-based treatments in many areas of the United States,^{43,44} further research should be done to explore what might make computer-based treatment more appealing to patients. Inability to form a therapeutic relationship with a computer, as opposed to the human connection one experiences in face-to-face psychotherapy, is a major shortcoming of computer-based therapies.⁴⁵ In this sample, lack of warmth and the computer not being as helpful as a live therapist were some concerns regarding computer-based treatments.

Regarding pregnancy's impact on treatment preference, one might predict that the further along in pregnancy a woman is, with increased frequency of prenatal visits and/or limited mobility, the more she might prefer home-based computer-based therapy to minimize travel to a therapist's office. However, gestational age did not influence treatment preference in this

sample. Pregnancy status did influence treatment preference regarding medication—as expected, pregnant women were less likely to favor medication, likely due to concerns about the effect of pharmacotherapy on the fetus.¹⁴

Treatment history influenced treatment preference among the traditional therapies, but not for computer-based therapies. Among individuals with no treatment history or a history of medication use, computer-based therapies were significantly preferred over talk therapy regardless of sex or pregnancy status. This suggests that treatment-naïve patients may be more open to computer-based therapies than those with an established treatment history. Computer-based treatments may also be appealing to individuals who have utilized psychiatric medication in the past and are interested in exploring psychotherapy.

While PHQ-9 scores in this sample were relatively low, individuals who had greater depressive symptomatology were more likely to prefer SGO from among the computer-based therapies. Of the three computer-based therapies, SGO requires no interaction with a psychotherapist, may vary in quality, and has the least amount of empirical support in terms of treatment effectiveness.⁴⁶ This is concerning as work by Mohr et al. suggests a high dropout rate (80%–90%) in SGO, making it a poor treatment option for patients with severe symptoms and high need for mental health treatment.⁴⁷ It is possible that the more structured and interactive format of CAT, which combines aspects of traditional talk therapy with computer-based components, would provide better retention than SGO.

These findings have implications for use of technology in mental health treatment, particularly among pregnant women. Computer-based therapies may be most appealing to pregnant women who do not want to take medication or face barriers such as scheduling demands, access to transportation, or childcare.^{48,49} A large number of participants cited the ability to access therapy at any time as being an important consideration for them. Less time spent at the therapist's office was also cited as an advantage of computer-based therapies.

Strengths, limitations, and future directions

This study's strengths included assessing specific types of computer-based therapies, as opposed to focusing on computer-based therapy in general. It also used the clinician-administered MINI to diagnose anxiety and mood disorders, as opposed to relying on self-report measures alone. As treatment history appeared to influence treatment preferences, one limitation was that we did not collect detailed information on participants' past treatments, for example, type of psychotherapy, number of sessions of psychotherapy, or response to medications. Previous experience with treatment, whether it was positive or negative, can clearly have a large impact on an individual's choice of treatment and should be assessed in detail in future studies. This sample was largely Caucasian, college-educated, and used computers frequently. Future studies should assess acceptability of computer-based therapies in more diverse samples as access to or experience with technology could be limited by income or education level.

Conclusions

With recent recommendations to increase mental health screening and treatment in the perinatal population, this research provides important information on what treatment

options may be appealing to women during pregnancy. The prenatal period is critically important in the development and long-term health of the offspring, and untreated maternal depression can have deleterious effects.¹⁰ While identifying depression among pregnant women is important, taking the next step to ameliorate depressive symptoms during pregnancy is imperative. Computer-based therapies have the potential to circumvent a number of barriers that may keep women from seeking mental health treatment during pregnancy, providing an efficient and cost-effective⁵⁰ way to deploy mental health intervention during the perinatal period. CBT, the treatment recommended by the USPSTF 2016 guidelines, is particularly amenable to computer adaptation⁴⁵; it is generally time limited and includes psychoeducation on core principles⁵¹ that are translatable to a computerized format.²⁹ Future studies should examine how to make computer-based treatments tailored to and more appealing to pregnant and postpartum women.

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Author Disclosure Statement

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