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THE IMPACT OF CREDIBLE AND NON-CREDIBLE TREATMENT INFORMATION ON DEPRESSION TREATMENT PREFERENCES IN COLLEGE STUDENTS

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THE IMPACT OF CREDIBLE AND NON-CREDIBLE TREATMENT

INFORMATION ON DEPRESSION TREATMENT PREFERENCES IN COLLEGE

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Abstract

Previous research has demonstrated the importance of considering client treatment preference when providing treatment for depression. However, little research has focused on the impact of treatment information on client preference. This study investigated differences in treatment preference between potential clients that read credible treatment information and those that read non-credible treatment information. The study was conducted via an online survey that was administered to undergraduate students. Eighty participants were randomly assigned to either read credible treatment information or non-credible treatment information and treatment preferences was assessed via a free response item before and after information regarding treatments was given. Overall, participants listed mostly credible treatments (49.9%) and viewed the credible reading as significantly more credible than the non-credible reading. However, regardless of exposure to credible and non-credible information, a relatively equal and small percentage of both groups changed their preference to include the treatment in the reading. These findings could lead to a better understanding of the influence of information on preference and have implications for allowing clinicians to better inform clients of possible treatments to help align treatment preference with the best evidence-based treatment.

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Treatment Preferences in College Students

Depression is one of the most commonly occurring psychological disorders in the United States with 17.3 million adults (7.3%) experiencing a major depressive episode in the past year according to the DSM-5 criteria (National Institute for Mental Health, 2017). Individuals suffering from depression experience a wide variety of symptoms and the expression of symptoms is heterogenous; however, two core symptoms individuals with depression struggle with is depressed mood and a loss of interest in nearly all activities (Kennedy, 2008). The World Health Organization (2020) places depression as a leading cause of disability worldwide and a major contributor to the global disease burden. There is a broad array of literature targeted at defining the cause of depression, with research suggesting depression is a complex disorder with many factors contributing from genetics (Levinson, 2006) to stress (Hammen, 2005). Moreover, the burden of depression stretches further than the individual. The economic toll of depression in the United States was approximately 43.7 billion dollars in 1990 and has increased ever since (Berto et al., 2000). Given the commonness and wide-spread impact of the disorder it is an ideal context to explore client treatment preferences.

Role of Treatment Preference in Depression Treatment

Mental health care providers take into consideration multiple factors when determining the best treatments for clients, including the best available research evidence, clinical expertise, and client values and preference. This strategy, known as evidence-

based practice (EBP), is a staple in the field of psychology (APA Presidential Task Force on Evidence-Based Practice, 2006) and medicine more broadly (Guyatt, 1992).

First and foremost, the EBP Model states that therapists should use treatments that are backed in research (treatments that have shown effectiveness). There are many researched "gold standard treatments" for depression, like Cognitive Behavioral Therapy (CBT), Behavioral Activation (BA), Interpersonal Therapy (IPT), and Antidepressants, to name a few (APA Presidential Task Force on Evidence-Based Practice, 2006). CBT is a form of psychotherapy aimed at identifying and modifying maladaptive thought processes and behavior through cognitive restructuring and behavioral techniques (Beck, 1979). BA is an intervention that aims to increase the client's engagement in valued life activities through guided goal setting (Jacobson et al., 2006). IPT is a type of short-form psychotherapy aimed at increasing social support and improving interpersonal relationships (Weissman et al., 2007). Lastly, while controversy remains regarding the therapeutic mechanism of action, antidepressants have broad evidence of efficacy in treating depression, (Al-Damluji, 2004). Despite the well-established evidence base for these intervention, there are a large number of alternative treatments for depression that have not be subject to rigorous scientific evaluation, some of which may be potentially harmful (e.g., rebirthing; see Lilienfeld, 2007).One of the major challenges for the public is that such treatments are often presented in a manner that appears scientific, and there is a paucity of research evaluating the publics' ability to determine credible and non-credible information regarding depression treatments.

Second, the evidence-based practice model also highlights the importance of clinician expertise. The APA Presidential Task Force on Evidence-Based Practice (2006)

defines the development of expertise as clinical and scientific training, theoretic understating, experience and knowledge of research. The APA goes further to describe components of what is considered "expertise" in practice such as: assessment, clinical decision making, diagnostic judgment, treatment implementation, and monitoring of patient progress to name a few. Clinical expertise is primarily developed through clinical training programs, ongoing supervision and consultation, and continuing education courses (APA, 2006).

Lastly, the EBP model highlights the importance of client values and preference. The APA Presidential Task Force on Evidence-Based Practice (2006) cites Norcross (2002) stating that psychological treatments are most likely to be effective when clinicians are responsive to the patient's specific problems, context, personality, and preferences. When it comes to depression, the impact of considering client preference is crucial, as considering client preference is associated with better treatment initiation, adherence, and outcomes (Dwight-Johnson et al. 2000; Swift & Callahan, 2009). In one study (Dwight-Johnson et al. 2000), participants expressed stronger preferences for psychotherapy (67%) than antidepressant medication treatment. Individual preference strength was significantly correlated with treatment initiation. Further, preference strength was associated with a higher treatment adherence rate. This suggests that if client treatment preference is congruent with treatment received, clients may be more likely to begin therapy and continue therapy. Moreover, patients who take an active part in decision making may have improved clinical outcomes and satisfaction (Brody, et al., 1989).

Consistent with the Dwight-Johnson et al. study (2000), previous research has shown that, overall, clients with Major Depressive Disorder (MDD) have a preference for psychotherapy over antidepressants (Raue et al., 2009). This study included 60 subjects meeting DSM-IV criteria for major depression. Participants were asked "Based on your experience and how you feel right now, which of the following treatments would be your first choice, second, and third choice?" at the beginning of the study then randomly assigned to a congruent or incongruent group. Participants received either 20 weeks of antidepressant treatment, or 12 weekly sessions of psychotherapy. Participants in this study demonstrated higher preferences (70%) for psychotherapy than antidepressant medication. The strength of clients' preference was significantly associated with treatment initiation (beginning treatment) and adherence rate (staying in treatment). Higher adherence and initiation were found in participants in preference congruent groups. The congruent group in this study had 100% initiation of treatment, the incongruent group had 74% initiation of treatment. This shows that clients, when given a treatment that does align with their preference, are more likely to initiate treatment.

Another study examined depression treatment preference in geriatric clients ($N =$ 120, M age = 71; Hanson & Scogin, 2008). This study found that in older populations medications were only preferred when psychotherapy was included in the treatment package (i.e., combined psychopharmacology and psychotherapy) and was only favored alone when the perception of the depression being treated was severe. Further, congruence of treatment preference and treatment received impacted the therapeutic alliance between clinician and client (Iacoviello et al., 2007). In particular, patients preferring and receiving psychotherapy reported significant increases in therapeutic

alliance. The therapeutic alliance is the collaborative and emotional bond between therapist and patient (Martin, et al., 2000). Patients assigned an incongruent treatment, such as preferring psychotherapy but receiving medication (or placebo), reported significant decreases in the therapeutic alliance. This study included participants (N=75) with a primary diagnosis of MDD. Patients receiving preference congruent treatment showed more rapid improvement in depression symptoms (Lin et al., 2005). In addition to these findings, Moradveisi et al., (2014), found that patients, ($N = 100$, $M = 31$) from Sanandaj, Iran, with a strong preference for psychotherapy (Behavioral Activation in particular) who were given antidepressants had higher drop-out rates (30% vs. 10%).

All the studies mentioned show the positive impact of preference-congruent treatment on the course and effectiveness of depression treatment. The personal and economic burden of depression is great, so quick and effective treatments are needed. The impact of preference on therapy is large and evidence shows a number of benefits received preference congruent treatment is provided including, higher treatment initiation, greater treatment adherence, a stronger therapeutic relationship, more rapid symptom improvement, and improved clinical outcomes.

Predictors of Client Preference for Depression Treatments

Higher levels of depression symptom severity are associated with a preference for medications over psychotherapy (Dwight-Johnson et al., 2000). In this study, the participants were randomly assigned to either psychotherapy, antidepressants, or placebos. Overall, 80% of participants preferred psychotherapy; however, individual with a higher severity of depressions symptoms preferred medication treatment.

In addition to the published literature, an exploratory study (Hayden & Bordieri, 2017) also supports these findings. Participants were Murray State University students (N=122) enrolled in university required general psychology classes. Of the participants in the study, 43.2% reported having received mental health treatment previously. Participants with higher symptom severity according to the Depression, Anxiety, and Stress Scale (DASS-21), depression subscale preferred medications over psychotherapy (r = -0.22). Yet, overall, participants preferred psychotherapy (66%). Participants were then given information on common depression treatments (psychotherapy, antidepressants, and electroconvulsive therapy) from the National Institute for Mental Health's website and asked their treatment preference again. Initially, Medication treatment (32%) was preferred over ECT (1%), yet after information was given, medication treatment (11%) was the least preferable of all three options. This study illustrates that preference can change when participants are given information; however, very little research to date has investigated the impact of the quality of information on changes in client treatment preference without a force-choice.

The Role of the Internet in Client Preference

With the advent of the internet, clients are playing a more active role in their treatment. According to Pew Research Center (2019), 59% of US adults had looked online for health information in that past year. Of those who looked up health information 35% tried to diagnose themselves online. Further, 53% of people who looked up health information online talked to their health care provider about what they had found. Research suggests that most clients get their mental health information from sources online (McMullan, 2006). McMullan's review of the literature found that while

individuals did go to the internet for internet information, it was not considered a
replacement for doctors by the individuals. Since this was not a replacement for
information given by doctors, it was suggested that health care providers go a step further
and discuss the internet information with their client.

Many clinicians and health care providers fear their clients are misinformed by
information they find online. However, research focused on students ($N = 157$) in school
in the US and the UK found that a majority of students between 11-19 years of age were
competent at finding reliable sources and believed that, for more serious ailments (i.e.,
not cosmetic concerns), a health-care professional should be consulted (Gray et al.,
2005). The perceived credibility of an author or source online influences the perceived
credibility of the information along with the reader's evaluation of the information
provided (Eastin, 2001; Freeman & Spyridakis, 2004).

Alternatively, other research has suggested that something as frivolous as visual
design play a significant role in peoples' perception of credibility (Robins, Holmes, &
Stansbury, 2010). In this study, participants ($N=34$) view a selection of 31 screenshots of
websites that contained health information chosen from Google. Participants then rated
the screenshots on visual design and credibility on a 1-4 Likert scale. Only two of the
websites that were rated visually higher and subsequently more credible were in the top
12 ranked credible websites ranked by the psychologists for their information. This small
study presents alarming findings that contradicts past research suggesting that individuals
are proficient at identifying credible treatment information. Given the controversy over
client's' ability to discern credible and non-credible information, coupled with the

multitude of areas clients look to establish credibility, more research in this area should be conducted.

The Influence of Credibility on Online Health Information

Even if consumers believe a source containing health care information is not credible, does that change how that healthcare is perceived? Some research suggests that the answer is no. Bates et al. (2006) found that source quality had little or no effect on consumers' perceptions of the quality of information provided. Another study (Benotsch et al., 2004) found that overall, participants suffering from a physical illness (HIV/AIDS) had reported trusting online health information more than any other source of information, with the only exception being their physicians. This suggests that individuals may have a misplaced trust in the internet, specifically regarding health information, where anyone has the right to post/publish anything they want for the public to see and consume. Further, this study discusses how patient consumers show lower evaluative skills than expert consumers (physicians, psychologists, etc.) This shows that individuals may have misplaced trust in online health information as well as struggle to discriminate between credible and non-credible health information online.

With regard to mental health specific information, Jorm et al. (2003) looked at giving clients with depression evidence-based information about their treatment options. In the study, half the participants received a control brochure while the others received more detailed, evidence-based treatment information. In this study, the participants who received higher quality treatment information changed their preference toward the higher quality information and changed their actions with regards of seeking out treatment to more evidence-based treatments (requesting certain evidence-based treatments and

seeking out mental health professionals). The participants further perceived the higher quality information as more credible.

Past research has also looked at the influence of perceived credibility on treatment preference. Rokke et al. (1990) found that when given information regarding difference evidence-based treatments for depression, clients still perceive some treatments as more credible than others. In this study, clients perceived medication treatment as the most scientific and logical depression treatment with CBT and IPT still being rated as credible. However, other treatments such as psychodynamic therapies, were viewed as non-credible. This perceived credibility did impact what therapies the clients preferred. It has also been shown (Kazdin & Krouse, 1983) that wording has a crucial effect on treatment information and can change how beneficial clients will perceive the treatment to be. Words such as "new and improved" and "backed in scientific research" influenced participants' perceived credibility of treatment options regardless of how true those claims were. This shows that even how a website describes the treatment can influence an individual's perception of how beneficial and credible the treatment is.

Present Study

This study aims to explore the differences in treatment preferences between individuals given credible and non-credible treatment information. Past research in this areas has typically examined preference for treatments using a forced-choice task between evidence based treatments (i.e., psychotherapy or antidepressants; Dwight-Johnson et al., 2000; Hanson & Scogin, 2008; Hayden & Bordieri, 2017; Iacoviello et al., 2007; Lin et al., 2005; Moradveisi et al., 2014; Raue et al., 2009). However, forced choice does not reflect real-world decision making (Cassels & Birch, 2014), especially

when options beyond evidence-based approaches are quite popular (Eisenberg et al.,

1993). The present study also seeks to investigate the baseline depression treatment

knowledge of the population. By doing so, this study seeks to fill a gap in the literature

by allowing open-choice preferences for college students to assess their preferred

treatment for depression in a more ecologically valid manner. By focusing more on an

open-response method, the study better reflects the decision clients are faced with making

in the real world. In addition to these primary aims, this study will also explore the

relationship between depression symptom severity and treatment preference, as previous

studies suggest there may be a link between higher symptom severity and preference

towards credible medication-based treatments (Dwight-Johnson et al., 2000).

Research Question1: Do college students prefer credible or non-credible

treatments when given the opportunity to provide their open-ended preferences for

depression treatment?

Most past research has evaluated the effect of information on treatment preference

without first examining participant's baseline preferences (Dwight-Johnson et al., 2000;

Hanson & Scogin, 2008; Hayden & Bordieri, 2017; Iacoviello et al., 2007; Lin et al.,

2005; Moradveisi et al., 2014; Raue et al., 2009). This study will extend the literature by

exploring participants preferences prior to receiving specific treatment information.

Previous research suggests that college students have existing opinions regarding mental

health treatments (Reavley et al., 2011), and this analysis will allow an examination of

baseline treatment preferences.

Research Question 2: It there a relationship between depression symptom

severity and initial preference towards credible or non-credible treatments?

Given past research has shown a relationship between symptom severity and preference towards medication, it is hypothesized that participants with greater depression symptom severity will show a preference towards credible treatments (Dwight-Johnson et al., 2000).

Research Question 3: Does reading credible or non-credible information lead to differences in treatment preferences?

Past research has shown that participants exposed to credible treatment information will display a greater post-information preference towards credible treatments relative to participants exposed to non-credible treatment information, who will display a greater post-information preference towards non-credible treatments (Jorm et al.,2003; Rokke et al., 1990). It is hypothesized that participants exposed to credible information with be more likely to provide credible treatment preferences.

Method

Participants

Participants were students enrolled in psychology courses at a rural Midwestern University. The students were recruited through SONA-Systems, an online data management system maintained by the psychology department. It was anticipated that a representative sample of students enrolled at the institution would be obtained due to the class being a general studies elective. The American College Health Association National College Health Assessment (ACHA-NCHA II; 2019) found that anxiety and depression are among the biggest reported factors negatively affecting academic performance with approximately 1 in 5 (20.2%) students reporting suffering from depression. For this reason, college students were deemed an appropriate population for this study, as many of them have or were in a position where their preferences towards treatments may guide their approach to treating depressive symptoms.

A total of 106 participants began the survey; however, 12 participants did not complete the survey and 14 participants completed the survey multiple times. After incomplete and duplicate entries were removed (i.e., only the first completed survey response was included in the dataset per participant), 80 participants were retained for study analyses. Of the 80 participants, there were 63 females (80%), 12 males (15%), 2 Non-Binary (2%), and 2 participants who preferred not to say (3%). Participant ages ranged from 18 to 26 years ($M = 19.1$, $SD = 1.24$). Additionally, there were 53 freshmen (67%), 18 sophomores (23%), four juniors (5%), and two seniors (3%). Only five

participants (6%) reported being psychology majors. Of the 80 participants, 34 (44%), reported a history of mental health treatment. Of the 34 participants with a history of mental health treatment, 16 participants (46%) received both medication and psychotherapy, 15 participants (43%) received psychotherapy only, three participants (8%) received medication only, and one participant reported receiving a different treatment (i.e., CDB oil; 3%).

Materials and Procedure

  Depression symptom severity. Participants were assessed for probable psychopathology, specifically depressive symptoms, to explore its impact on treatment preference. In particular, the Center for Epidemiologic Studies Depression Scale Revised (Eaton, et al., 2004) was used to measure past week depressive symptom severity.

  The CESD-R (Appendix A) is a measure that asks about symptoms of depression and depression severity using the DSM-5 criteria for depression. The items are summed with individuals scoring between 0-60. It involves 20 items on a 5-point scale: 0 (Not at all or less than 1 day), 1 (1-2 Days), 2 (3-4 Days), 3 (5-7 Days), 4 (Nearly Every day for Two Weeks). The scoring combined "5-7 Days" and "Nearly Every day for Two Weeks" into the same scoring value for analysis to allow score compatibility with previous versions of the measure. Van Dam and Earleywine (2011) found the internal consistency to be high in a community sample (Cronbach's α= 0.92). Specifically, the internal consistency in undergraduate samples (Carleton et al., 2013) has been also found to be high (Cronbach's α = 0.91). In the present study, the internal consistency was found to be high as well (Cronbach's α = 0.94). The CESD-R is designed to measure depression symptoms in clinical population and therefore should discriminate strongly between

patient and general population individuals. Test-retest reliability at 3 and 12 months was found to be poor to acceptable ($r = .45-.70$; Radloff, 1977). Given the narrow time window of the measure (i.e., past seven days), and episodic nature of major depressive episode symptoms, the marginal test-retest reliability is likely a property of the nature of the disorder and not an indicator of poor psychometric properties.

Perceived credibility. The Credibility Scale (Appendix D) is a seven-item measure that assesses perceived credibility of an intervention (Addis & Carpenter, 1999). This scale has been previously used to evaluate the credibility of depression treatments provided to clients (Rokke et al., 1990). Addis and Carpenter (1999) found the internal consistency to be high in a sample evaluating depression treatment credibility (Cronbach's $\alpha = 0.82$). The items are ranked on a seven-point Likert scale ranging from "not at all" to "extremely" with higher scores indicating greater perceived credibility. In addition, this scale has been used for other disorders such as Posttraumatic Stress Disorder (PSTD) to evaluate perceived credibility of those treatment options as well; also found to have a high internal consistency as well (Cronbach's $\alpha = 0.90$; Rokke et al., 1990). The present study also found the internal consistency to be high in both conditions (CBT condition, Cronbach's $\alpha= 0.95$; Essential oils condition, Cronbach's $\alpha = 0.90$).

Treatment preference. Participants were asked about which treatment option they would prefer if they were experiencing depressive symptoms in an open-ended format. In particular, they were asked, "Imagine that you are experiencing symptoms of major depressive disorder, including depressed mood, and loss of interest in activities. If you had a choice of professional treatments to help you with these symptoms, what would you choose? Please be as specific as possible." The participants were given a

blank text box to input their preference of choice of treatment or choice of as many

treatments as they desired. A textual analysis was completed, and frequencies of common

responses were tabulated. The choices were coded into four categories: credible

treatments, non-credible treatments, a combination of credible and non-credible

information, and not enough information to be determined. Responses were also coded

into specific or general, depending on whether the response contained a specific

treatment or a broader treatment option. Further, frequency of respondent preferences that

include CBT or essential oils were tabulated as these treatments were specifically

mentioned in treatment information provided to participants later in the study. The

operational definition used in this study for credible psychological treatments consisted

of treatments listed on the division 12 website (APA Presidential Task Force on

Evidence-Based Practice, 2006). The operational definition for credible medication

treatments used in this study were medication listed as appropriate for depression

treatment by the Prescriber's Digital Reference (PDR; Prescriber's Digital Reference,

2020) More general responses that did not include specific treatments were coded based

on additional criteria developed during coder training (see appendix E). Raters in this

study met for a training session regarding criteria for the 4 categories using a coding

sheet including examples for what types of responses get categorized where. Further,

both raters in this study were 2nd year graduate students in clinical psychology with

knowledge about appropriate depression treatments. Each rater assessed the credibility of

participant reported initial and post information treatment preferences independently.

Interrater reliability was calculated using Cohen's Kappa. Obtained Kappa values greater

that .61 (substantial agreement) were deemed acceptable, while values lower than .61

were considered as non-acceptable and would be analyzed with significant caution. Cohen's κ revealed good agreement for treatment credibility of initial treatment preference ($\kappa = .80$, $p < .001$) and post-information treatment preference ($\kappa = .88$, $p < .001$). When coding specific and general treatment responses, Cohen's κ also revealed good agreement for initial treatment preference ($\kappa = .85$, $p < .001$) and post-information treatment preference ($\kappa = .88$, $p < .001$). Lastly, specific mentions of CBT and Essential Oils were coded. At the initial preference, no responses included CBT or Essential Oils so a Cohen's κ was not calculated. Perfect agreement of CBT and Essential oil responses was obtained for post-information responses ($\kappa = 1.0$, $p < .001$)

Treatment Information. Participants were randomly assigned to either a credible or non-credible information condition using a random number generator embedded in the survey program.

Credible. Participants randomly assigned to the credible information condition read information (see Appendix B for full text) regarding a specific treatment (CBT) from the National Alliance on Mental Illness (NAMI; National Alliance on Mental Illness, 2020). NAMI is a mental health organization working to raise awareness and provide support and education. The reading discusses common gold-standard treatments for depression (National Alliance on Mental Illness, 2020). The survey stated, "The following reading contains information about a depression treatment. Please read the information carefully and answer the question that follows." The reading was 137 words after unnecessary information was removed to control for length. Unnecessary information consisted of filler words (so, and, but, however, …) and further information regarding other treatments not included in the scope of this study. Due to the

aforementioned research indicating the impact of visual design on credibility (Robins, et al., 2010), the treatment information was presented in a text-only format with the source of the information (i.e., National Alliance on Mental Illness) presented in plain text.

Non-credible. Participants randomly assigned to non-credible information condition read information regarding a specific treatment (Essential Oils) from Healthline (2020; see Appendix C for full text). This article describes ways to cure your depression at home using essential oils. While essential oils have been found to have insufficient evidence to show effectiveness in the treatment of depression (Yim et al., 2009), the treatment article provides vague descriptions of studies that appear to make scientific claims supporting essential oils. The survey stated, "The following reading contains information about a depression treatment. Please read the information carefully and answer the question that follows. Please be as specific as possible." The article was 134 words in length. Unnecessary information consisted of further information regarding other treatments not included in the scope of this study. The online sources were presented in a text-only format with the source of the information (i.e., Healthline) presented in plain text.

Demographics. Participants were asked to provide demographic information (see Appendix D for full text). Due to priming concerns regarding specific treatments, demographics were placed at the end of the survey to avoid influencing baseline treatment preferences. Questions included gender, race/ethnicity, age, year in school, history of exposure to pharmacological, psychological, or alternative treatments, and parental level of education.

Procedure. After reading the consent page and giving informed consent, participants were asked to complete the CESD-R. Participants were then asked their initial treatment preference using an open-choice response procedure. Afterwards, they were randomly assigned to either credible information or non-credible information. Finally, post preference was assessed using an identical open-choice response procedure. Participants then filled out a series of demographic questions and read the debriefing page, which concluded the survey. Students in this study received class credit for participating.

Analytic Strategy

Analyses were conducted in IBM SPSS version 25 and the alpha levels were set at $\alpha = .05$ for all study analyses.

Research Question 1. The frequencies of initial preference codes were presented as a table (i.e. percentage of participant responses coded as credible treatments, non-credible treatments, a combination of credible and non-credible information, and not enough information to be determined). Differences between initial preferences in the two groups (credible and non-credible information) were compared using a chi-square test of independence. A power analysis conducted on The Australia and New Zealand Melanoma Trials Group Statistical Decision Tree (ANZMTG, 2020), assuming a power of .8, a medium effect size (w = .3), an alpha = .05, and df = 3, revealed that 122 participants were needed to adequately power this analysis. The obtained sample size of 80 participants indicates that this analysis was underpowered.

Research Question 2. To analyze the relationship between depression severity and initial treatment preference an ANOVA was used. This analysis evaluated initial

treatment classification (IV; i.e., credible, non-credible, a combination of credible and non-credible) as a predictor of depression severity (DV). A power analysis run on G*Power 3.1.9.2 assuming a power of .8, a large effect size ($f = .4$), an alpha = .05, and four groups revealed a sample size of 76 was needed to adequately power this analysis. The obtain sample size of 80 was appropriate to adequately power this analysis. Statistically significant omnibus effects were followed by a Tukey's HSD post hoc analysis.

     Research Question 3. An independent samples t-test was conducted to compared differenced in perceived credibility (Credibility Scale) of the two groups (credible vs. non-credible information). To analyze differences between post-information treatment preference across the two groups, proportions of participants classifications (i.e., credible, non-credible, a combination of credible and non-credible, or unable to determine) were compared using a chi-square test of independence. This consists of using a 2 x 4 contingency table comparing participants' treatment preference post-information between the credible and non-credible information conditions. A power analysis run on the ANZMTG Statistical Decision Tree (ANZMTG, 2020) assuming a power of .8, a medium effect size (w = .3), an alpha = .05, and df = 3 revealed that 122 participants are needed to adequately power this analysis. The obtained sample size of 80 participants indicates that this analysis was underpowered. A chi-square test of independence was also planned to evaluate whether the proportion of participants specifically mentioning CBT and essential oils differed between the groups. A power analysis run on the ANZMTG Statistical Decision Tree (ANZMTG, 2020) assuming a power of .8, a medium effect size (w = .3), an alpha = .05, and df = 1 revealed that 88 participants were

needed to adequately power this analysis. The obtained sample size of 80 participants

indicates that this analysis was slightly underpowered.

Results

Research question 1. Baseline depression treatment preference among participants is presented in Table 1. Responses were coded into four groups: credible, non-credible, a combination of credible and non-credible, and not enough information to determined. Credible responses followed the criteria listed in appendix E and some examples of responses are: "I would go to a psychologist," "I would take medication," or "I think I would work with a mental health professional." Non-credible responses were responses that did not meet credible criteria but had enough information to determine the participant's course of action (see appendix E). Some examples of non-credible responses included: "I do not like doctors, so I will treat myself" or "I will turn to the people I am closest with." Responses that met criteria for both credible and non-credible treatments were categorized as a combination and an example of responses received are: "I would go to a counselor to find the root of my problem, then treat it myself" and "I would like Christian counseling coupled with changing my diet and adding supplements." Lastly, responses that were "not enough information to be determined" included statements such as, "Therapy," "I would go to a professional," and "I would seek treatments for my symptoms."

Table 1. *Frequencies of Participants' Initial Treatment Responses*

	Condition		
	Overall	Credible ($n = 34$)	Non-Credible ($n = 45$)
Credible	39 (49.4%)	16 (47.1%)	23 (51.1%)
Non-Credible	8 (10.1%)	4 (11.8%)	4 (8.9%)
Combination	5 (6.3%)	3 (8.8%)	2 (4.4%)
Not Enough Information	27 (34.2%)	11 (32.4%)	16 (35.6%)

A chi-square test of independence was planned to evaluate difference in initial treatment preference by condition; however, due to multiple cells with expected counts less than five, a Freeman-Halton extension of the Fisher exact probability test was conducted (Freeman and Halton, 1951). Results indicated that categorization of initial preferences did not different significantly between the two groups ($p = 0.852$).

Research Question 2. A one-way ANOVA was conducted to compare the effect of initial treatment preference classification on depression severity. There was a not a significant effect, $F (3, 71) = .988$, $p = .404$, indicating that depression severity scores on the CESD-R did not vary as a function of initial treatment preference classification.

Research Question 3. An independent samples t-test was conducted to analyze the relationship between the type of treatment information given and how credible the information was perceived (see Table 2). As expected, participants in the credible

condition (i.e. CBT) perceived the treatment to be significantly more credible than participants who were exposed to non-credible treatment information (i.e., essential oils).

Table 2. *T-Test Comparing Group Assignment and Perceived Credibility*

Credibility Scale Score	n	M	SD	t
Credible Group (CBT)	34	32.47	10.2	4.31***
Non-Credible Group (Essential Oils)	45	23.20	8.9	

Note: *$p < .05$; **$p < .01$; ***$p < .001$
Note[1]: Higher credibility scores indicated higher perceived credibility

Frequencies of participants' post-information treatment preferences are presented in Table 3. As with research question 1, a chi-square analysis of independence could not be conducted due to several cells containing expected counts of less than five. A Freeman-Halton extension of the Fisher exact probability test was used instead. Results indicated that categorization of post-information preferences did not differ significantly between the two groups ($p = 0.947$). The number of participants included in Table 3 were less than those included in the conditions due to how the data was cleaned. Participants who completed the first treatment preference question and the two scales (CESDR and Credibility Scale) were kept even if they did not complete the second treatment preference question. Only one participant did not complete the second treatment preferences question.

Table 3. *Frequencies of Participants' Post-Information Treatment Preferences*

	Condition	
	Credible (*n* = 33)	Non-Credible (*n* = 45)
Credible	16 (47.1%)	23 (51.1%)
Non-Credible	3 (8.8%)	4 (8.9%)
Combination	2 (5.9%)	2 (4.4%)
Not Enough Information	12 (35.3%)	16 (35.6%)

Five participants (6.25% overall percentage of sample), all of whom were in the credible condition, specifically mentioned Cognitive Behavioral Therapy (CBT) as a preferred treatment in their post-information response. Similarly, eight participants (10% overall percentage of sample), all of whom were in the non-credible condition, specifically mentioned Essential Oils as a preferred treatment in their post-information response. Due to a large number of cells with expected counts less than five, a Fisher's exact test was used instead of the planned chi-square test of independence. There was a significant difference in specific treatments mentioned ($p < .001$), with only participants in the credible condition listing CBT and only participants in the non-credible condition listing essential oils as a preferred treatment. Notably, the frequency of these responses was relatively equal and infrequent in both conditions [CBT = 5 (14.7%), Essential Oils = 8 (17.8%)].

Discussion

This study found that, overall, most college students provided credible treatment responses when asked to provide free choice responses. This is notable, as this is one of the first studies to explore free choice preference among college students. Further, this finding lends increased validity to previous force-choice studies that operated under the previously untested assumption that participants would choose credible treatments (Dwight-Johnson et al., 2000; Hanson & Scogin, 2008; Hayden & Bordieri, 2017; Iacoviello et al., 2007; Lin et al., 2005; Moradveisi et al., 2014; Raue et al., 2009). However, this finding is tempered by the general lack of specificity in participants' treatment responses. Only 2 (2.5%) participants gave a specific credible response for their initial preference (both responses included names of antidepressants; Wellbutrin and Sertraline), suggesting that most college students are not aware of specific evidence-based treatments for depression. Despite most college students not being aware of evidence-based treatments, it is important to remember that one in five college students meet criteria for Major Depressive Disorder, which makes this implication serious.

The applied implication of this finding suggests that mental health professionals need to do a better job of raising awareness of evidence-based, credible treatments. Most participants were unable to provide specific credible treatments offered by mental health professionals. Due to the success of direct-to-consumer advertising of mental health medications such as antidepressants, Gaudiano and Ellenberg (2014) suggest that

psychotherapy needs to consider the same marketing approach. Further, Gaudino and Ellenburg (2014) also suggest broadening the platforms psychotherapy is available on (e.g. Telehealth and Text Therapy; Tutty, et al., 2010) to increase access for younger generations.

One limitation to this finding may have been the large proportion of responses that met criteria for "not enough information to be determined" (35.3%). Most responses that met criteria for "not enough information to be determined" trended towards credible responses, such as "therapy" and "professional treatment" but were too vague to meet criteria for credible responses. A future direction of this study may include focus groups and qualitative research to help further explore participants' thoughts and guide responses towards more specific treatment options that could be coded using a revised coding scheme (Beattie et al., 2009).

Depression severity did not predict initial treatment preference, which does not support the proposed hypothesis (Research Question 2). This may be due to the high depression average in the sample. The study average met criteria for depression (20.2 CESD-R) with the CESD-R depression cut-off score being 16 (55%; Van Dam & Earleywine, 2011). This is higher than the expected rate of college students with depression (ACHA-NCHA II, 2019). Despite the elevated average score, only 22.5% of participants scored above 30 on the CESD-R (22.5%), which is an indicator of probable Major Depressive Disorder. When focusing in more on the higher scoring participants in this study (22.5%), the participants more accurately reflected the expected prevalence of depression in college students (20%; ACHA-NCHA II). This may have impacted the ability to identify a pattern in severity and initial treatment preferences among those

likely experiencing a major depressive episode, as this subsample was too small to sufficiently power a follow-up analysis looking specifically at this group. Future research should be conducted to explore differences in the credibility of treatment preferences in a clinical sample (i.e., among those who meet criteria for a major depressive episode). Returning to the present study, the high average level of depression scores in the sample generally enhanced the validity of this study, as it suggests that depression treatment preferences were relevant to many, if not most, participants in the sample. In further considering this null finding, it is important to note that previous research exploring medication vs. therapy treatment preference (Dwight-Johnson et al., 2000; Hanson & Scogin, 2008; Hayden & Bordieri, 2017; Iacoviello et al., 2007; Lin et al., 2005; Moradveisi et al., 2014; Raue et al., 2009) may not have been an adequate basis for the current study's prediction of preference towards credible vs. non credible treatments in general. This is due to previous research comparing between credible treatments, such as medication or psychotherapy, and not comparing between credible and non-credible treatments.

A significant difference in credibility scores between the two groups, credible and non-credible, indicated that participants were able to distinguish credible and non-credible treatment information. This validates previous research that suggests younger people are competent at discerning credible and non-credible information online (Gray et al., 2005). However, despite the non-credible reading being perceived as less credible, the proportion of participants selecting non-credible treatment remained consistent. Further, despite reading about treatment, most participants did not change their preference and adhered to their original treatment preference indicated at the initial time.

This finding calls into question previous research that indicates that credible health care information influences participants to change preferences to more credible treatments (Jorm et al., 2003). The lack of switch in preference could be due to the short length of provided treatment information or the free-response nature of this study.

A small subset of participants (n = 14; 17.5%) did switch their preference towards the socially desirable option, and future studies should look at the role of social desirability in health care decisions (Abreu & Gabarain, 2000). Also, given that social desirability played a role in both conditions despite differences in credibility of information, future studies are needed to identify the boundaries of credibility on demand characteristics. For example, are there treatments that are considered so non-credible that participants would not consider them (e.g. miracle mineral solution; FDA, 2019)? However, when looking at participants that conformed in the non-credible condition, most participants indicated that they would only take essential oils for depression under professional recommendation or in conjunction with a credible treatment. These participants had a "it can't hurt to try them" mentality. This is evidenced by responses such as "I would also try natural treatments like essential oils because it doesn't hurt to just try it" and "I would possibly try the essential oils thing to see if it actually worked." Yet, previous research has shown that non-credible treatments can be harmful in many cases and that the "it can't hurt to try" may be a dangerous mindset to have (Lilienfeld, 2007). Future research is needed to develop and refine trainings and awareness campaigns designed to educate consumers about the danger of pseudoscience (Kaufman & Kaufman, 2019). Focus studies have been used to develop a better understanding of beliefs held by individuals with specific health concerns such as HIV/AIDS (Irwin et al.,

1991) and the method could be structured similarly. The group discussion were led by a moderator and the groups in the future study could be led by a fellow college student.

Additional Limitations and Future Directions. The coding system used in this study was a strength (all Kappa values >.80) and could be used in similar projects in the future. The coding procedure in this study may also be tweaked to include more response from the "not enough information to be determined" to the "credible" responses category. Some limitations to this study are low sample size, the COVID-19 outbreak and subsequent quarantine, as well as the polarization of health-care decisions in the media. The sample size of the study was inadequate to power some of the analyses and the results should be considered with caution as the sample contained 80 participants but a power analysis indicated between 88 and 122 participants were necessary for the planned analyses. One possible reason for the low-sample size in the study could have been COVID-19 and the university closure that occurred three weeks into data collection (Murray State University, 2020) as the study operated within the semester term only. Further, additional opportunities besides research participation to receive class credit were offered due to the campus closure. Due to the pandemic also closing summer classes, data collection was terminated with the end of the semester. In addition, the first participation contact was completed 3/13/2020 and a state of emergency was declared for in Kentucky on 3/6/2020 and COVID-19 was already given significant media coverage. Approximately 66% of the participants collected for this study were obtained after the campus closure on 3/23/2020. Further, the increased awareness of political divide in the country regarding health-care decisions in the media could have influenced these

participants making healthcare decisions in the study and could have led to a possible

cohort effect that could have influenced results (Pew Research Center, 2020).

Future directions for this research would be introducing a free search condition

where participants take ten minutes to find their own information about depression

treatments and provide their treatment preference after. This will also help to identify

where college students are searching and how search patterns influence treatment

preference. This would allow researcher to obtain a baseline treatment preference, like

this study, but increase the ecological validity further than the present study. Another

future direction would be to provide a list of treatment options and have participants

check off any of the treatments they would prefer or be willing to engage in to guide

responses and get fewer responses in the "not enough information to be determined"

category. Further, manipulation of the source of information, such as manipulating

professional appearance, could be useful in further exploring treatment preference effects

(Bohner, Moskowitz, & Chaiken, 1995). The Elaboration Likelihood Model (ELM),

proposed by Petty and Cacioppo (1986), proposes several factors that influence

individuals to either take a central route of processing when making a decision (i.e., focus

on the central message being conveyed by the reader or website, source quality, etc.) or

take the peripheral route of processing (i.e., be influenced by factors not central to the

decision, such as the physical appearance of the speaker, length, website design, etc.).

Previous research has looked at the role of the ELM on healthcare decisions and found

that central route processing and peripheral route processing both can change an

individual's health-care decisions (Cao et al., 2017). It is important for future research to

identify factors that lead to central route processing in healthcare decisions. Moreover,

due to the rise in political party involvement in health-care concerns as previously stated, an interesting study would be looking at the role of political party in depression treatment preferences and willingness to seek treatment. Some research has found that the ELM and political party affiliation play a role in the perception of political events on social media (Wu et al., 2011).

Another future direction of this study is exploring whether health care providers offer credible treatment preferences in general. This study found that college students, in general, want to talk to a mental health-care provider or medical doctor regarding treatments for depression. This implication relies heavily on the idea that healthcare providers and mental healthcare providers will offer credible treatments. Few studies have gathered a baseline of suggested depression treatments offered by varying healthcare providers. This would be incredibly informative and beneficial to the health care community to get a full picture of the mental healthcare decisions faced by individuals and clients today. One study looked at the role mental health stigma played in individual's experiences (Flood-Grady & Koenig Kellas, 2019). In this study, individuals told stories they heard from their family on mental health and illness. This study found that stories told by families have a profound impact and can either normalize mental illness or stigmatize it. A similar study can be conducted asking participants where they have been told people go for help or what experiences they have had or heard with mental health care providers. This would help better understand what factors inform mental healthcare decisions.

Conclusion. This study suggests that college students overall prefer credible treatments for depression, can differentiate between credible and non-credible

information, and may not be easily swayed by information, instead wanting to hear it from a professional. This is hopeful and indicates that raising awareness of evidence-based treatment, especially if that information is given by a doctor or mental health professional, may be very successful in influencing client treatment preferences.

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Appendix A (Credible Treatment Information)

<u>Cognitive Behavioral Therapy (CBT)</u>

Cognitive behavioral therapy (CBT) focuses on exploring relationships among a person's thoughts, feelings and behaviors. During CBT a therapist will actively work with a person to uncover unhealthy patterns of thought and how they may be causing self-destructive behaviors and beliefs. Several studies of CBT have shown it to be an effective treatment for a wide variety of mental illnesses, including depression and anxiety disorders. Individuals who undergo CBT show changes in brain activity, suggesting that this therapy improves your brain functioning as well.

Cognitive behavioral therapy has a considerable amount of scientific data supporting its use and many mental health care professionals have training in CBT, making it both effective and accessible. The person and therapist can work together to develop constructive ways of thinking that will produce healthier behaviors and beliefs.

Source: National Alliance for Mental Illness (https://nami.org/)

Appendix B (Non-Credible Treatment Information)

<u>Essential Oils</u>

Wild ginger

According to a 2014 animal study, wild ginger may have antidepressant qualities. Researchers found that stress-challenged mice that inhaled wild ginger oil experienced less stress. They also exhibited less depression-like behaviors. It's thought that the oil may activate the serotonergic system, which is a system of brain transmitters associated with depression. This may slow the release of stress hormones.

Bergamot

The citrus scent of bergamot oil is known for being both uplifting and calming. According to a 2013 study, bergamot oil aromatherapy significantly reduced anxiety in patients awaiting outpatient surgery. Although depression and anxiety are different disorders, they often happen at the same time. Anxiety is also a possible complication of depression. It's unclear how bergamot eases apprehension. It may help reduce the release of stress hormones during stressful situations.

Source: Healthline (http://www.healthline.com/)

Appendix C (Credibility Scale)

Appendix D: Credibility Scale (Addis & Carpenter, 1999)
7-point scale 1 (not at all) to 7 (extremely)

Please consider the book above considering the questions.
Modified to fit parameters of the study

7-point scale from 1 (not at all) to 7 (extremely):

1. How logical does this therapy seem to you?
2. How scientific does this therapy seem to you?
3. How complete does this therapy seem to you?
4. In other words, do you think this therapy covers all the types of people who become depressed?
5. To what extent would this therapy help an individual in other areas of his or her life?
6. How likely would you be to go into this therapy if you were depressed?
7. How effective do you think this therapy would be for most people?
8. If a close friend or relative were depressed, would you recommend this therapy to them?

Appendix D (Demographics)

Age: _____

How do you describe yourself? (check one)

 Male   Female   Non-Binary/Third-Gender

Prefer to Self-Describe_____

Prefer Not To Answer

Year in college (circle one): Freshman   Sophomore   Junior   Senior

Ethnicity/Race (circle one):

Are you of Hispanic, Latino, or Spanish origin?

-Yes
-No
-I prefer not to answer

Which categories describe you? Select all that apply

-American Indian or Alaska Native
-Asian
-Black or African American
-Native Hawaiian/Other Pacific Islander
-White
-Other _____

Have you ever received treatment from a mental health provider? Y/N _____

    If so, which type of treatment did you receive?
       Medication treatment
       Psychological treatment
       Alternative Treatment (Ketamine, CBD, essential oils…) (please describe):_____

    If you have ever received or are currently receiving medication treatment, how

helpful was/is the treatment, on a scale from 1 (not helpful at all) to 7 (very helpful)? _____

If you have ever received or are currently receiving psychological treatment, how helpful was/is the treatment, on a scale from 1 (not helpful at all) to 7 (very helpful)? _____

If you have ever received or are currently receiving alternative treatment, how helpful was/is the treatment, on a scale from 1 (not helpful at all) to 7 (very helpful)? _____

Has anyone close to you (family or friend) ever experienced a mental illness?

-Yes   - No

What is the highest level of education that your most educated parent has attained?

High school   Some college   Bachelor's Degree   Postgraduate School

Are you majoring in Psychology?

-Yes   - No

Where do you typically get your healthcare information?

_____

Appendix E (Coding Sheet)

Coding Sheet Examples
Credibility Coding Task
Coding 1-4: 1 = Credible   2 = Non-Credible   3 = Combination of both   4 = Not Enough Info
Credible Treatments = 1
Any reference to a mental health professional or mental health medication. Any treatment on the APA Division 12 website or medication on the Physicians' Desk Reference (PDR) website.
-Specific Therapy: "CBT, Interpersonal Skills Training, Mindfulness…" = 1
-Specific Medication: "Effexor, Wellbutrin, Celexa…" = 1
- "Talk therapy" = 1
- "Medication" = 1
- "Talk to a mental health professional, therapist, counselor" = 1
Non-Credible Treatments = 2
Any reference to a treatment that is not research backed in research and on the APA Division 12 website.
- "Taking a walk" = 2
- "Socializing with my friends more" = 2
- "I would like to treat myself first" = 2
Combination Treatments = 3
Any reference to treatments that meet criteria for 1 and 2, a Credible and Non-Credible Treatment.
- "I would use talk therapy but also essential oils." = 3
- "I would use Bergamot and CBT"
Not Enough Information TBD = 4
Any treatment reference that is too vague to be categorized.
- "Therapy" = 4
- "I would seek out treatment" = 4
- "I would go to a professional" (no mention of mental health professional)

# General Treatments v. Specific Treatments Coding Task
General = 1 Specific = 2
General Treatments = 1
A response that includes a general treatment whether credible or not.
- "Talk Therapy"
- "Medication"
Specific Treatments = 2
A response that mentions a specific treatment whether credible or not.
- "CBT, IPT, Mindfulness, ACT, …"
- "Dolphin Therapy, Equine Therapy, …"
- "CBD Oil"
- "Essential Oils"

CBT and Essential Oils Specific Coding Task

CBT = 1 Essential Oils = 2

CBT = 1

A response that includes the treatment CBT.

- "CBT"

-"Cognitive Behavior Therapy"

Essential Oils = 2

A response that included the treatment Essential Oils.

- " Essential Oils"

-"Bergamot"

-"Wild Ginger"

Appendix F (IRB Approval Letter)

MURRAY STATE
UNIVERSITY

Institutional Review Board

328 Wells Hall
Murray, KY 42071-3318
270-809-2916● msu.irb@murraystate.edu

TO: Michael Bordieri, Psychology

FROM: Jonathan Baskin, IRB Coordinator

DATE: 3/9/2020

RE: Human Subjects Protocol I.D. – IRB # 20-173

The IRB has completed its review of your student's Level 1 protocol entitled *Depression Treatment Preferences 2*. After review and consideration, the IRB has determined that the research, as described in the protocol form, will be conducted in compliance with Murray State University guidelines for the protection of human participants.

The forms and materials that have been approved for use in this research study are attached to the email containing this letter. These are the forms and materials that must be presented to the subjects. Use of any process or forms other than those approved by the IRB will be considered misconduct in research as stated in the MSU IRB Procedures and Guidelines section 20.3.

Your stated data collection period is from 3/9/2020 to 3/8/2021.

If data collection extends beyond this period, please submit an Amendment to an Approved Protocol form detailing the new data collection period and the reason for the change.

This Level 1 approval is valid until 3/8/2021.

If data collection and analysis extends beyond this date, the research project must be reviewed as a continuation project by the IRB prior to the end of the approval period, 3/8/2021. You must reapply for IRB approval by submitting a Project Update and Closure form (available at murraystate.edu/irb). You must allow ample time for IRB processing and decision prior to your expiration date, or your research must stop until such time that IRB approval is received. If the research project is completed by the end of the approval period, then a Project Update and Closure form must be submitted for IRB review so that your protocol may be closed. It is your responsibility to submit the appropriate paperwork in a timely manner.

The protocol is approved. You may begin data collection now.

Opportunity
afforded

murraystate.edu