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Methods for Incorporating Patient Preferences for Treatments of Depression in Community Mental Health Settings

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Abstract

We developed three methods (rating, ranking, and discrete choice) for identifying patients' preferred depression treatments based on their prioritization of specific treatment attributes (e.g., medication side effects, psychotherapy characteristics) at treatment intake. Community mental health patients with depressive symptoms participated in separate studies of predictive validity (*N*=193) and short-term (one-week) stability (*N*=40). Patients who received non-preferred initial treatments (based on the choice method) switched treatments significantly more often than those who received preferred initial treatments. Receiving a non-preferred treatment at any point (based on rating and choice methods) was a significant predictor of longer treatment duration. All three methods demonstrated good short-term stability.

Keywords

evidence-based practice; patient preferences; depressive symptoms; community mental health settings

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Ethical approval: This research was reviewed and approved by the University of Pennsylvania IRB and City of Philadelphia IRB. All procedures involving human participants were in accordance with the ethical standards of the IRB, the 1964 Declaration of Helsinki, and its later amendments.

Informed consent: Informed consent was obtained from all individual participants included in the study in accordance with HIPAA standards.

Evidence-based practice (EBP) has been described as a paradigm shift in clinical decision-making (Guyatt et al., 1992). However, the most formidable barrier to integrating EBP data into treatment-related decisions is that the results of meta-analyses are aggregated and patient-neutral, providing no method for customization on the individual patient level. This is despite the fact that the Institute of Medicine (2001) describes EBP as "… the integration of best research evidence with clinical expertise and patient values" (Sackett, 2000, p. 47), and the American Psychological Association (APA) defines EBP in psychology as "… the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences" (APA Presidential Task Force on Evidence-Based Practice, 2006). Incorporating patient preferences into treatment decisions would be another way—besides genetics—to tailor treatment to the individual, which is a major goal of healthcare in the 21st century. Improving the personalization of patient care in a community mental health center (CMHC) setting, where access to EBP is often limited, is a particular priority.

There is accumulating evidence in psychology and medicine that ignoring patient preferences leads to poorer outcomes (Intercontinental Medical Systems, 2004; Keating et al., 2002). A number of studies have directly examined the importance of patient preferences in the treatment of major depressive disorder (MDD). A review of five studies conducted in primary care settings revealed that across studies, about 55% of patients preferred psychotherapy and 30% preferred medication (van Schaik et al., 2004). More importantly, several studies have found a significant link between preferences and outcome (Chilvers et al., 2001; Clever et al., 2006; Dwight-Johnson et al., 2001; Kocher et al., 2002; Lin et al., 2005), and one study demonstrated that incorporation of patient preferences into treatment decisions strengthens the therapeutic alliance in the treatment of MDD (Iacoviello et al., 2007).

All of the aforementioned studies have assessed global preferences – that is, preference for one type of treatment over another, rather than for specific treatment attributes. However, it is highly likely that many patients are not fully aware of the range of attributes that characterize current evidence-based treatments for MDD. The preferences of some patients may be based on limited personal experience (e.g., one negative experience with medication side effects may lead a patient to conclude that all medications will have intolerable side effects). Therefore, replacing global preference assessments with attribute-based assessments may increase patients' awareness of a variety of relevant treatment features, producing a final treatment match that more closely aligns with patient preferences across a range of attributes. Attribute-based preference assessment has the potential to reveal patient priorities that would be obscured by a global preference variable, as well as to elicit more informed preferences by educating patients about treatment attributes. Moreover, if patients' attribute-based preferences are incorporated into clinician decision-making, a wider range of treatment options appropriate for each patient might be considered and implemented.

One previous study examined preferences for specific attributes of depression treatments (Wittink et al., 2010, 2013). Using a discrete choice assessment method, individuals recruited via Internet reported their preferences for treatment characteristics including medication side effects, counseling frequency, and treatment setting. Results indicated that

most respondents preferred counseling over medication and that setting and frequency of treatment were important considerations.

The current study expands upon prior research (Wittink et al., 2010, 2013; Zimmermann et al., 2013) by assessing attribute-based initial (at intake) preferences for depression treatments in several distinct ways. First, we developed and examined three different methods of assessing attribute-based preferences. Second, we assessed the preferences of patients seeking treatment for depression in community mental health settings. Third, we developed a method for evaluating the degree of similarity (i.e., distance) between individual patients' preferred treatment attributes and the attributes of the treatments they actually received. Fourth, we examined the predictive validity of each preference assessment in relation to treatment course in order to identify the best method of assessing preferences in a clinical setting. Fifth, we evaluated the short-term stability of each preference assessment method.

Method

Overview

We conducted two studies. In the first, we examined the predictive validity of three preference assessment methods, and in the second, we evaluated the short-term stability of each method. In each study, all participants were patients seeking treatment for depressive symptoms in community mental health settings. Every participant was asked to complete all three preference assessment measures prior to any treatment decisions being made. For the predictive validity study, we extracted data on actual treatment received or prescribed (in the case of medications) and duration of treatment at the clinic from patient medical charts. The degree to which a patient's preferred treatment (assessed using each of the three methods) matched the treatment he or she initially received following intake was calculated and examined as a predictor of treatment course. This research study was reviewed and approved by an Institutional Review Board (IRB). All procedures involving human participants were in accordance with the ethical standards of the IRB and with the Declaration of Helsinki and its later amendments.

Developing a List of Depression Treatment Attributes

Our goal was to construct instruments to measure initial preferences for attributes of treatments. The focus was on initial (at intake) preferences, not on preferences assessed after receiving a treatment, so that initial preferences could be incorporated into the clinical decision making regarding treatments. Such treatment attributes, such as medication side effects, of course at intake have not yet occurred for patients, if they will occur at all. Therefore the attributes are "potential" attributes for a given patient, even though the attributes in general typically characterize a given treatment.

As a first step, we generated an initial list of medication characteristics based on recent reviews and meta-analyses of the antidepressant literature, as well as information about side effects (both common and rare) included in the package inserts of all medications approved for treatment of MDD in the U.S. To this list, we added three basic attributes of

psychotherapy: (a) involves talking about details of life, (b) involves homework, and (c) involves coming to weekly treatment sessions (sessions were almost always once/week in the all participating clinics). Unlike medications, where package inserts and meta-analyses of side effects of medications are available, there is no empirical basis for selecting attributes for psychotherapy. Thus, for psychotherapy, the process to generate a limited number of attributes was informal. We asked some psychotherapists and psychotherapy researchers to tell us what the primary attributes of psychotherapy would be. There was also a need to have a very limited list of attributes (a larger list would make the assessment impractical for implementation).

Next, we modified our initial attribute list based on input from 99 patients currently in treatment for depression at a community mental health agency. These patients were asked to provide input on the wording of the attributes and suggestions for additional attributes. The respondents were primarily African American (53%) and female (59%), with a mean age of 41.4 years (SD=12.1). In terms of current treatment, 9 clients were receiving medication only at the CMHC, 37 were receiving psychotherapy only, and 52 were receiving both medication and psychotherapy. All were referred to the study by clinic staff based on knowledge that the patient was in treatment for depression at the clinic. A final list of 18 attributes (Table 1) was piloted among clinicians, research staff, and patients in order to refine its content and language.

It should be noted that, in general, the attributes of medication treatments for depression are largely negative attributes (side effects), while psychotherapy attributes more likely could be negative or positive (e.g., whether or not a patient is interested in talking about problems in their life). No attempt was made to artificially balance the lists of attributes for medication and psychotherapy on valence. This decision biased the list of attributes against medication.

Sites

Data were collected at the outpatient clinics of three nonprofit community mental health centers (CMHCs). These centers provide mental health, mental retardation, and substance abuse treatment services to patients of all ages, primarily serving publicly funded consumers. Two centers were urban and one was in a suburb adjacent to a large city. The outpatient clinic population at one urban site is composed of about 2,100 individuals (primarily adult and predominantly African American). A second suburban site is one of the largest CMHC outpatient sites in the United States, serving about 4,900 individuals per year (about half African American). A third site serves in an urban setting about 1,000 individuals in its outpatient service with 80% being adults (about half African American). Nearly all of the patients receiving outpatient services at these clinics are low-income individuals receiving some form of public assistance or other support and Medicaid for medical and behavioral health services. The majority of outpatients receive pharmacological management with about one-half also getting psychotherapy. Each outpatient clinic employs between 10 and 70 clinicians. Psychiatrists at each site provide medical coverage. We did not record if patients simultaneously received additional treatment outside of the CMHC setting, though this would be expected to be rare because concurrent mental health

treatments at separate agencies would not be covered by Medicaid and patients would not be likely to pay out of pocket for a concurrent treatment.

Participants

Participants in the predictive validity study were patients with depressive symptoms seeking treatment at one of the three participating CMHCs. Participants were recruited upon completion of an intake assessment at a CMHC and prior to initiating treatment with a psychotherapist or psychiatrist. All patients who received a score of 11 (indicating at least moderate depression) or above on the Quick Inventory of Depressive Symptomatology (QIDS; Rush et al., 2003) at intake and could read English and understand the informed consent were eligible to participate, regardless of age or comorbidities. Participation consisted of completing three brief preference assessments, as well as providing consent for the researchers to access medical charts in order to track treatments received and time spent on each treatment. Patients received the treatments naturalistically provided to them at the CMHCs.

Participants in the short-term (one-week) stability study were patients who received a diagnosis of major depressive disorder at intake at one of the participating CMHCs and were approached at intake by research staff for participation in the short-term stability study. All participants in both studies were paid $20 for participating.

Measures

Assessment of Preferences for Treatment Attributes—We constructed three methods of assessing patient preferences regarding the 18 selected attributes: two paper questionnaires (rating and ranking methods) and one computer-based discrete choice assessment (choice method). The rating method asked participants to rate each attribute according to how strongly it would affect their willingness to receive a hypothetical treatment. On a 5-point Likert scale (1 = *I don't care at all if I might get this side effect [it is worth it if the medication will help me]* and 5 = *I would never want to take a medication with this side effect, even if it is rare to get this side effect*), participants rated a series of potential side effects according to the influence each one would have on the desirability of a hypothetical medication. Similarly, on a 5-point Likert scale (1 = *This wouldn't bother me at all* and 5 = *I would never want to see a therapist if I had to do this*), participants rated the degree to which each attribute of psychotherapy would affect their willingness to receive it as a treatment.

The ranking method listed all 18 treatment attributes. Instructions to patients were: "Please rank order this list beginning with the number one thing that you would want in a treatment for depression. Write the number "1" on the line next to the thing that you would want the most from a treatment, a "2" next to the thing you would want the next most, as so on up to "18"."

The computerized discrete choice assessment (choice method) was based on maximum difference scaling, also known as "best-worst scaling" (Finn & Louviere, 1992; Flynn, Louviere, Peters, & Coast, 2008; Louviere, Flynn, & Marley, 2015; Marley & Louviere,

2005; Marley, Flynn, & Louviere, 2008), and was implemented using the MaxDiff software marketed by Sawtooth Software, Inc (Orem, UT). Examples of implementation of the MaxDiff method are available on the Sawtooth Software, Inc. website (see:http://www.sawtoothsoftware.com/products/maxdiff-software/93-support/sales-support/238-maxdiff-method). Best-worst scaling methodology originated in marketing research settings and has since been applied in several studies of health care and patient preferences (Cohen, 2009; Flynn et al., 2007). The MaxDiff software presents four attribute choices at a time and asks the respondent to designate the most and least preferred of the four. Every subsequent set of four choices is determined based on the participant's previous answers. In this study, 22 sets were used to evaluate 18 attributes. Preference scores for each attribute were estimated for each respondent using hierarchical Bayesian methodology. These preference scores were then used to rank the 18 attributes from most to least preferred.

Ratings of Evidence-Based Depression Treatments on Attributes—We used a 3-point rating scale to evaluate the extent to which each available treatment for depression was characterized by each of the 18 attributes. Three experienced clinical researchers served as judges. The judges were provided with all relevant documents that were used to generate the list of treatment attributes. For medication side effects, the primary documents were package inserts for each medication. Additional documents included meta-analyses examining rates of side effects for various psychotropic medications and placebo, review articles on specific side effects such as sexual dysfunction and effects on sleep) (Ferguson, 2001; Gartlehner et al., 2011; Gitlin, 2003; Pagel & Parnes, 2001; Montejo et al., 2001; Schweitzer, Mcguire, & Chee, 2009; Serretti & Chiesa, 2011; Watanabe et al., 2010). Judges used the following 3-point rating scale: 0 if the attribute was not characteristic of a given treatment, 1 if the attribute was somewhat characteristic of the treatment, and 2 if the attribute was highly characteristic of the treatment. In rating medication side effects, we instructed the judges to assign medications a score of 1 if a given side effect was 3–9% more likely to occur with medication use than with placebo and a score of 2 if the side effect was at least 10% more likely to occur with medication use than with placebo. If the likelihood of developing the side effect with medication use was less than 3% greater than it was with placebo, judges assigned a score of 0. We selected 10% to define highly characteristic because a 10% difference has been suggested as a useful criterion to indicate a clinically meaningful difference (Citrome & Ketter, 2013). The 3% cutoff was selected by the investigators empirically to provide spread to the 0 to 2 rating scale. However, precise drug and placebo prevalence rates were not available for all antidepressants (particularly older ones), and therefore judges ratings on medication attributes were subjective in those cases. The ratings were also subjective for the psychotherapy attributes.

The attribute "works within 3 weeks" was dropped from final analyses, because the judges' ratings showed no variability across treatments (i.e., consistent data showing differences in 3-week efficacy across treatments was not available in the literature). An intraclass correlation coefficient (ICC), which was pooled for all three judges, revealed good reliability for the 3-point ratings of the remaining 17 attributes (ICC (3,3) = .94). The average rating given to each of these 17 attributes was then computed and used in the decision matrix that derived the order of preferred treatments in subsequent analyses.

Quick Inventory of Depressive Symptoms (QIDS)—The QIDS (Rush et al., 2003) was used to assess depressive symptoms at intake. The QIDS is a 16-item self-report measure of depressive symptoms based on the criteria for an episode of MDD outlined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994). The QIDS has demonstrated good internal consistency (Cronbach's $\alpha = .86$), and total scores on the QIDS have been found to be highly correlated ($r = .81$) with scores on the 17-item Hamilton Rating Scale for Depression (HAM-D; Hamilton, 1960) in a sample of patients with chronic major depression (Rush et al., 2003). The internal consistency of the QIDS was good ($\alpha = .85$) among subjects in the current predictive validity study.

Procedures

In both the validity and stability studies, the order of administration of the three preference assessment methods was determined using a randomized block design so that each of the six possible order permutations was implemented for the same number of participants. To obtain data on the type and duration of treatment actually received, we reviewed clinical charts an average of two months after patients finished treatment at the clinic. Analyses focused on 14 treatment options, which included psychotherapy and 13 psychotropic medications that were used to treat patients who participated in our study. Of these 13 medications, 10 were antidepressants, and three were atypical antipsychotics that have U.S. Food and Drug Administration (FDA) approval as add-on agents for treatment-resistant depression.

Statistical Analyses

Multiple attribute decision making (MADM; Yoon & Hwang, 1995) was used to link each patient's attribute preferences to actual treatment attributes, allowing treatment options to be rank ordered by preference for each patient. The data for a MADM analysis are structured as a matrix. In this study, a separate matrix was constructed for each patient for each of the assessment methods. Each column of the matrix represented one of the 17 treatment attributes, and each row represented a type of treatment. The cells of the matrix contained our judges' 3-point rating indicating the degree to which each attribute was characteristic of each treatment – in other words, the performance of each treatment on each attribute. An additional vector contained the patient's preference weights obtained from the preference assessment method, which represented the relative importance of each treatment attribute as judged by the patient. The MADM analysis then integrated the ratings of each treatment's performance on each attribute with the relative importance of every attribute to the patient, resulting in a rank-ordered list of preferred treatment matches. For each patient, this process was repeated using preference weights from each of the three preference assessment methods.

There are a variety of statistical methods for implementing a MADM approach. In this study, we employed one of the more common methods, known as the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS; Yoon & Hwang, 1995). The first step in the TOPSIS approach is to standardize the data in order to address differences in measurement units. The TOPSIS model then constructs an attribute profile representing an ideal hypothetical treatment option that—if it were to exist—would achieve the patient's

desired performance on every attribute. Attributes can be weighted in this process, though for the current study we applied equal weights to attributes. Next, for each patient, the distance between each available treatment option and the ideal hypothetical treatment is calculated. This value is computed as the weighted Euclidean distance of an existing treatment option from the ideal option using the formula $D_i = \sqrt{(\Sigma\ j\ w_j\,(d_{ij} - d+_j)^2)}$ where w_j is the importance weight of attribute j, and d_{ij} is the performance of treatment i (the ideal hypothetical treatment) on attribute j, and $d+_j$ is the performance of an existing treatment option on attribute j. The TOPSIS approach also defines an anti-ideal hypothetical treatment option that would achieve the least desirable performance on all attributes. The weighted Euclidean distance between each existing treatment and the anti-ideal treatment in a multi-attribute space is also calculated. In its final step, the TOPSIS model computes a score for each existing treatment option, which consists of the distance from the anti-ideal treatment divided by the sum of the distance from the anti-ideal treatment and the distance from the ideal treatment. This score ranges from 0% (if a treatment option is identical to the anti-ideal) to 100% (if it is identical to the ideal). Using these scores, the set of available treatment options is rank ordered for each patient according to how well each treatment matches the patient's attribute-based preferences.

In other domains of research, MADM models have been used to choose optimal antibiotics (Dolan, 1989), calcium-channel blockers (Schumacher, 1991), tuberculosis prevention strategies (Dolan & Bordley, 1994), colorectal cancer screening tests (Dolan & Frisina, 2002), triptans for migraine (Goadsby et al., 2004), and antiepileptic medications (Brodie & Kwan, 2001). However, these efforts mostly relied on clinician preferences, meaning that they yielded the "best" general treatment approach as judged by clinicians, rather than an individualized, patient-preferred treatment match as emphasized in this study.

After MADM scores were calculated for each patient, we evaluated agreement among the three preference assessment methods (rating, ranking, and choice). To do this, we calculated Kendall's W, which gives the proportion of agreement for every pairing of methods such that when $W = 0$, there is no agreement (indicating that rankings are completely random), and when $W = 1$, there is complete consistency between methods. In general, a Kendall's W of .50 is interpreted as moderate agreement, and .70 as high agreement (Riche et al., 2013).

The relationship between receiving a non-preferred initial treatment (defined here as a treatment that fell in the bottom 25% of a patient's preference rankings, considered separately for each of the three assessment methods) immediately following intake and switching treatment vs. not switching treatment was assessed using logistic regression, controlling for several *a priori* covariates including age, gender, education, income, employment, and marital/cohabitation status. The relationship between receiving a non-preferred treatment (at any point) to total duration of a patient's treatment at the clinic was assessed using a Cox proportional hazards model, controlling for age, gender, education, income, employment, and marital status.

For the short-term stability study, MADM scores representing closeness to ideal treatment were calculated at time 1 and time 2 for each of the 14 treatment options according to each of the three preference assessment methods. The relation of time 1 to time 2 MADM scores

was then evaluated for each assessment method using an intraclass correlation coefficient (ICC [3,1]) that incorporated the 14 treatment options as a repeated measures factor.

Results

Baseline Demographic and Clinical Characteristics of Sample

A total of 249 patients were enrolled in the predictive validity study, with 241 providing useable preference data at intake and 193 returning for at least one treatment session at the CMHC. Since no medication or psychotherapy was provided on the day of intake, only data from these 193 patients were used to examine predictive validity.

The predictive validity sample was approximately 65% non-white, with a majority (55.4%) identifying as Black/African American. Only 11.9% were married/cohabitating at the time of assessment. The intake QIDS scores (M = 17.0, SD = 3.6) indicate that the sample as a whole displayed a moderate level of depressive symptoms. Demographic and clinical characteristics of the short-term stability sample were similar (Table 2).

Multiple Attribute Decision Making Applied to Preference Data

Among patients who provided useable preference data at intake (N=241), atypical antipsychotics (averaging across three medications in this class) ranked in the top 25% of preferred treatments for 57–61% of patients (depending on the assessment method used). There was some divergence among the three assessment methods when it came to the bottom 25% of individual preference rankings. According to both the ranking and rating methods, atypical antipsychotics fell in the bottom 25% for 5% and 6% of patients, respectively, whereas the choice method placed atypical antipsychotics in the bottom 25% for 23% of patients. SSRIs ranked in the bottom 25% of treatments for 28% of patients according to the ranking method, 49% according to the rating method, and 61% according to the choice method. SNRIs ranked in the bottom 25% for 66% of patients according to the ranking method, 68% according to the rating method, and 34% according to the choice method. However, SSRIs and SNRIs rarely ranked in the top 25% of preferred treatments: across all three assessment methods, SSRIs were among the top 25% of preferred treatments for only 0.2–7% of patients, and SNRIs for only 0–0.3%.

Agreement among Preference Assessments

The values of Kendall's W for agreement among preference assessment methods were .90 for rating and ranking methods, .70 for choice and rating methods, and .66 for choice and ranking methods. Thus, there was high agreement among methods, particularly the rating and ranking methods. The lower agreement of the choice method with the other two instruments is consistent with its divergences regarding the percent of patients for whom certain treatments ranked in the bottom 25%, as described above.

Comparing Preferred Treatment to Treatment Received

The distribution of treatments received by N=193 patients following intake is presented in Table 3 (note: patients could receive more than one treatment either at the same time or sequentially). In the present sample, 33.7% of patients received only psychotherapy, 66.3%

received at least one medication, 32.6% received more than one medication, and 48.7% received both psychotherapy and at least one medication.

Using the treatment rankings generated by the MADM scores from each of the three preference instruments, we compared each patient's treatment preferences with the set of all treatments they received during their time at the clinic. Our analysis revealed that 19.2% of patients received at some point in time a treatment designated by the rating method as non-preferred (i.e., ranked in bottom 25% of 14 treatments). Similarly, 20.2% of patients received a treatment that fell in the bottom 25% of their preferences according to the ranking method. Using the choice method, 43.5% of patients received a treatment that ranked in the bottom 25% of their preferred treatments.

Predictive Validity of Preference Assessments

We conducted predictive analyses to determine whether receiving a non-preferred initial treatment influenced the naturalistic course of depression treatment in our sample of 193 patients. We hypothesized that receiving a non-preferred treatment immediately following intake would be associated with higher rates of switching or terminating treatment prior to the second visit with a prescribing psychiatrist. However, only seven patients dropped out of treatment prior to their second psychiatrist visits. Moreover, contrary to our hypothesis, patients who initially received treatments that did *not* rank in the bottom 25% of their preferences terminated treatment more often than patients who did receive such low-ranking treatments. According to the rating and ranking methods, all seven dropouts received relatively preferred initial treatments. According to the choice method, six out of seven dropouts received a relatively preferred treatment.

Switching treatments was more common than terminating treatment. According to the choice method, among patients who received a non-preferred medication, 52.2% (35/67) switched to a new medication, whereas among patients who received a relatively preferred medication, only 26.2% (33/126) switched to a new medication. Similar trends were apparent with the other two assessment methods (rating method: 50% [11/22 patients] vs. 33% [57/171 patients]; ranking method: 47.8% [11/23 patients] vs. 33.5% [57/170 patients]). With the choice method, the logistic regression controlling for age, gender, employment, education, income, marital/cohabitation status, race, and depression severity revealed a statistically significant relationship between receiving a non-preferred initial treatment and switching medications (Table 4). The effects of receiving a non-preferred treatment as measured by the other two preference instruments did not reach statistical significance. In these analyses, none of the covariates yielded significant effects.

A second predictive analysis examined total duration of treatment at the clinic as the dependent variable. In these analyses, age, gender, and income were significant predictors in the Cox regressions for the ranking and rating methods, while age and income were significant for the model with the choice method ($ps < .05$). Receiving a non-preferred treatment at any point in time was a significant predictor of longer treatment duration (Table 5) for both the rating and choice methods (34% longer with the choice method and 38% longer with the rating method).

To rule out the possibility that any particular treatment might be driving these effects, we examined the relation of receiving a specific initial treatment to switching treatment. Binary variables coding for initial use versus nonuse of each of the 14 treatments were entered as logistic regression predictors of switch versus no switch. Initial use of each of five treatments (olanzapine, paroxetine, citalopram, escitalopram, and desvenlafaxine) was significantly ($p < .05$) associated with a greater probability of switching treatment. However, when variables representing each of these five treatments were specified on a second step in a logistic regression model after the variable coding for non-preferred vs. preferred treatment (based on the choice method), none of the specific treatment variables contributed significantly to the model.

We also examined the relation of receiving each of the 14 treatments (at any point in time) to total treatment duration. The only treatment that was significantly associated with total duration at the clinic was psychotherapy: patients who received psychotherapy stayed in treatment longer than those who did not receive psychotherapy. Therefore, a binary treatment variable coding for use of psychotherapy was used as a stratifying factor in Cox regression analyses to remove any influence on the relation of receiving a non-preferred treatment to total treatment duration. In these analyses, the same pattern of results as shown in Table 5 remained (choice method: Wald $\chi^2 = 6.7$, $p = .01$, median durations of 24.0 and 29.6 weeks for those who received a preferred and non-preferred treatment, respectively; rating method: Wald $\chi^2 = 6.9$, $p = .009$, median durations of 25.1 and 33.4 weeks, respectively; ranking method: Wald $\chi^2 = 1.5$, $p = .21$, medians of 26.1 and 30.0 weeks, respectively).

Short-Term Stability of Preference Assessments

The comparison of time 1 to time 2 MADM scores revealed a high degree of short-term (one-week) stability for preference scores generated by all three assessment methods. The ICCs (3,1) were .84 for both rating and ranking methods and .98 for the choice method.

Discussion

Our investigation of approaches to the evaluation of patient preferences in the treatment of depression revealed several novel and significant findings. First, all three methods of assessing patient preferences based on treatment attributes showed substantial variability across patients in terms of preferred and non-preferred treatment options. This variability indicates that the methods were sensitive to individual differences and highlights the potential importance of matching treatments to patient preferences. Second, comparing patient preferences at intake to actual treatments received revealed that a notable percentage of patients receive non-preferred treatments in CMHC settings. These results highlight the value of introducing new methods of preference assessment into clinical settings so that clinicians are more equipped to take patient preferences into account. The use of a brief self-report measure of attribute-based treatment preferences may be particularly effective in healthcare settings where clinicians have limited time to discuss patients' likes and dislikes in detail. Administering a measure such as the ones proposed here could help trigger educational discussions about patients' treatment priorities.

All three assessment methods were found to be highly reliable in the short term (i.e., high stability over the course of one week) for differentiating patients' preferred and non-preferred treatments based on specific treatment attributes. Moreover, our preliminary examination of validity yielded highly interesting and clinically meaningful results. Specifically, patients who received non-preferred treatments (based on the choice method) immediately after intake were significantly more likely to switch treatments than patients who initially received preferred treatments. Furthermore, patients who received non-preferred treatments at any point in time remained in treatment at the clinic for a substantially longer time than those who received no non-preferred treatments. We can speculate that when a new patient is prescribed a non-preferred treatment, the patient and/or clinician typically gives it some time to see if the disadvantages (often medication side effects) are worth the potential benefits. In most cases, the negative attributes appear to outweigh the benefits, and the patient begins a second course of treatment. Thus, receiving a non-preferred treatment is associated with longer total duration because of the higher likelihood of receiving a second treatment, as well as the need to try each treatment for an adequate amount of time before switching. Incorporating patient preferences into treatment decision-making may therefore have the potential to hasten satisfactory outcomes. In addition, receiving a preferred treatment is likely to reduce the incidence of personally troublesome adverse events endured by patients.

Of the three preference assessment methods developed in this study, we found that the choice method demonstrated several advantages. The choice method produced preference scores that successfully predicted treatment duration, and only the choice method predicted the likelihood of switching treatments. In addition, the choice method had the highest short-term test-retest reliability. Given that all medication side effects are negative, it may have been somewhat difficult to rank order such attributes from most to least valued using the ranking method. However, the ranking method did demonstrate good test-retest reliability and successfully predicted treatment duration. Further studies may help elucidate other potential advantages and disadvantages of each approach.

In addition to evaluating patient preferences regarding specific attributes of depression treatments, such as side effects and time commitment, it may be useful to measure patients' priorities regarding treatment outcomes. Zimmerman et al. (2013) found that adult patients currently or previously in treatment for depression generally placed the highest value on the ability to cope with activities of everyday living, and they also preferred being free of depression-related pain and side effects to being free of depressed mood. Another study examined patient preferences for outcomes of taking antidepressant medications and found that patients prioritized —in order of decreasing importance—improvement in depressive symptoms, cognitive function, social function, no anxiety, remission, and no relapse (Hummel et al., 2012). These studies, however, focused on overall group averages rather than individual differences in outcome priorities. There is no compelling scientific literature that points to clinically meaningful differences in outcome among existing treatments for depression. Hence, exploring ways of incorporating such factors into clinical decision-making is a task for future treatment research.

Several limitations of this research should be noted. First, it is of ultimate interest to understand whether assessment of attribute-based treatment preferences can improve treatment outcomes. Such outcomes were not examined in this study. Second, stability of the preference assessment measures over a time period longer than one week was not assessed. Long-term stability may be important to examine, given that many patients receive multiple treatments over an extended period of time. A third limitation is that the attributes for medication and psychotherapy were not parallel constructs, thereby giving psychotherapy an apparent advantage on average. Not only were more medication attributes inherently negative, but also the anchors for the rating method differed for the medication vs. psychotherapy attributes. For this reason, our focus is on individual preferences, not average preferences of the sample as a whole. Although our approach likely has greater ecological validity and clinical relevance, it hindered meaningful comparisons between psychotherapy and mediation in average preference. Related to the lack of equating on valence is a limitation that for the rating and ranking methods, attributes were not presented in random order to patients. Additional research using such methods can explore the impact of balancing psychotherapy and medication attributes on valence and presentation of attributes in random order. A fourth limitation is that we focused on a relatively small number of attributes, particularly for psychotherapy. Future research can potentially explore the usefulness of including more attributes for psychotherapy, particularly attributes that differentiate different psychotherapies. A fifth limitation is that attributes were equally weighted in the analyses that compare each patient's profile of preferences across attributes to the actual attributes of each treatment. It may be that only the most highly ranked attributes for each patient are important, rather than the whole profile of preferences for attributes. A greater impact on treatment duration or outcome might be evident if only the most impactful attributes are considered for each patient. A further assessment of each attribute, asking about importance in addition to preference, could be obtained in future studies to sort this out. Another limitation is that the use of preference assessments by clinicians has not yet been investigated. Treatment selection should be determined by a combination of patient preferences and clinical judgment, and knowledge of clinical issues – such as drug-drug interactions and the treatment of severe symptoms – may sometimes override patient preferences. In addition, some patients who have pre-existing preferences based on prior experiences with certain treatments may not be interested in exploring other potential preferences. A full assessment of patient preferences for treatment should likely include asking about experiences with previous treatments, including any current treatments, as well as other factors such as cost and insurance coverage. All of these factors, not only preferences for treatment attributes, are of importance to patients when treatment decisions are made and likely influence the course of treatment. Nevertheless, incorporating the assessment of patient preferences about treatment attributes into clinical routines may lead to increased efficiency and greater patient satisfaction.

Conclusions

The assessment of patient preferences regarding specific attributes of depression treatments may be one way of systematically addressing an overlooked element of evidence-based practice: namely, the integration of patient preferences into clinical decision-making. The

preference assessment methods presented in this study demonstrate satisfactory reliability and preliminary validity. The methods described in this study may advance the ability of researchers and clinicians to promote positive treatment outcomes in community settings by enabling the integration of patient preferences into the treatment process.

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Table 1

List of Final 18 Attributes of Treatments for Depression

Medication side effects
Treatment is associated with:
1. headaches
2. a sexual problem (such as less interest in sex, cannot have an orgasm, or poor erection for men)
3. you to feel tired during the day
4. moderate weight gain
5. nausea
6. diarrhea
7. dry mouth
8. constipation
9. blurred vision
10. effects on blood pressure (either dizziness or light-headedness when you stand up suddenly) or higher blood pressure (hypertension).
11. seizures
12. if you take a large overdose you might have medically serious cardiac side effect (irregular heart rhythm or loss of consciousness)
Psychotherapy attributes
13. meeting regularly (usually once per week) with a therapist
14. having homework assignments from my therapist that focus on my thoughts and activities
15. talking about very personal details of my life, including talking about my relationships with other people
Attributes not necessarily specific to medication or psychotherapy
16. works quickly (within 3 weeks) to help me with some of my symptoms
17. helps me with my sleep problems
18. ends after several months (I don’t have to stay with the treatment for a long or unending period of time)

Note. Eighteen treatment attributes were selected based on feedback from patients, clinicians, and research staff. Medication-related attributes were initially drafted based on review of the antidepressant literature and medication package inserts.

Table 2

Demographic and Clinical Characteristics of Samples

	Validity Sample (*N* = 193)	Stability Sample (*N* = 40)
Characteristic	***n* (%)**	***n* (%)**
Gender		
Female	142 (73.6%)	34 (85.0%)
Race		
White	69 (35.8%)	20 (50.0%)
Black/African American	107 (55.4%)	18 (45.0%)
Asian	4 (2.1%)	1 (2.5%)
American Indian/Alaska	6 (3.1%)	1 (2.5%)
Mixed	5 (2.6%)	0
Missing	2 (1.0%)	0
Ethnicity		
Hispanic	6 (3.1%)	1 (2.5%)
Non-Hispanic	187 (96.9%)	38 (95.0%)
Missing	0	1 (2.5%)
Marital Status		
Single	124 (64.2%)	19 (47.5%)
Divorced	24 (12.4%)	5 (12.5%)
Widowed	6 (3.1%)	1 (2.5%)
Married/Cohabitating	23 (11.9%)	10 (25.0%)
Separated	16 (8.3%)	5 (12.5%)
Level of Education		
Less 12 years	35 (18.1%)	8 (20.0%)
High School/GED	99 (51.3%)	13 (32.5%)
Some College or more	59 (30.6%)	19 (47.5%)
Employment Status		
Employed Full or part time	27 (14.0%)	5 (12.5%)
Homemaker	21 (10.9%)	4 (10.0%)
Unemployed	80 (41.4%)	23 (57.5%)
Disability	48 (24.9%)	8 (20.0%)
Student	8 (4.1%)	0
Missing	9 (4.7%)	0
Age (years), *M (SD)*	38.1 (11.6)	37.8 (11.4)
QIDS total score, *M (SD)*	17.0 (3.6)	17.1 (2.9)

Note. Two separate patient samples were recruited from the same three community mental health centers (CMHCs) for the predictive validity and short-term stability studies. A total of *N* = 249 patients were recruited for the predictive validity study, of which *N* = 193 attended at least one treatment session.

Table 3

Percent of Patients Receiving Each of 14 Treatments at any Point Following Intake

Treatment	Percent of Patients Receiving Each Treatment (N = 193)
1. Aripiprazole	18.1
2. Olanzapine	1.0
3. Quetiapine	10.4
4. Mirtazapine	8.8
5. Fluoxetine	8.8
6. Paroxetine	3.1
7. Citalopram	23.3
8. Escitalopram	6.7
9. Sertraline	12.4
10. Duloxetine	3.6
11. Venlafaxine	5.2
12. Desvenlafaxine	1.6
13. Bupropion	10.9
14. Psychotherapy	75.1

Note. Data is shown for the N = 193 patients who enrolled in the predictive validity study and attended at least one treatment session. Some patients received multiple treatments in succession and/or simultaneously.

Table 4

Predictive Validity: Receiving a Non-Preferred Initial Treatment in Relation to Switching versus not Switching Treatment

	B	Wald χ^2	*p*	Odds Ratio (95% CI)
Rating Method	0.84	3.00	.083	2.31 (0.90, 5.92)
Ranking Method	0.49	1.13	.29	1.63 (0.66, 4.00)
Choice Method	1.22	13.5	<.001	3.39 (1.77, 6.51)

Note. $N = 193$ patients. Non-preferred treatment is defined as any treatment in the bottom 25% of a given patient's preference rankings. Analyses adjust for age, gender, education, income, employment, marital status, race, and intake depression severity.

Table 5

Predictive Validity: Receiving a Non-Preferred Treatment in Relation to Duration of Total Time at Clinic

Preference Assessment	Duration at Clinic (*Mdn*)		Wald χ^2	Hazard Ratio (95% CI)	*p*
	NPT	PT			
Rating Method	31.7	23.0	7.8	1.70 (1,17, 2.47)	.005
Ranking Method	28.3	23.8	1.5	1.25 (0.87, 1.80)	.22
Choice Method	28.3	21.1	5.3	1.42 (1.05, 1.92)	.022

Note. N = 193 patients. Duration at clinic is measured in weeks. NPT = received non-preferred treatment; PT = received preferred treatment. Non-preferred treatment is defined as any treatment in the bottom 25% of a given patient's preference rankings; preferred treatment is defined as any treatment in the top 75% of preference rankings. Analyses adjust for age, gender, education, income, employment, marital status, race, and depression severity.