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Diagnoses, Intervention Strategies, and Rates of Functional Improvement in Integrated Behavioral Health Care Patients

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Abstract

Objective—Compared with more traditional mental health care, integrated behavioral health care (IBHC) offers greater access to services and earlier identification and intervention of behavioral and mental health difficulties. The current study examined demographic, diagnostic, and intervention factors that predict positive changes for IBHC patients.

Method—Participants were 1,150 consecutive patients (mean age = 30.10 years, 66.6% female, 60.1% Hispanic, 47.9% uninsured) seen for IBHC services at 2 primary care clinics over a 34-month period. Patients presented with depressive (23.2%), anxiety (18.6%), adjustment (11.3%), and childhood externalizing (7.6%) disorders, with 25.7% of patients receiving no diagnosis.

Results—The most commonly delivered interventions included behavioral activation (26.1%), behavioral medicine-specific consultation (14.6%), relaxation training (10.3%), and parent-management training (8.5%). There was high concordance between diagnoses and evidence-based intervention selection. We used latent growth curve modeling to explore predictors of baseline global assessment of functioning (GAF) and improvements in GAF across sessions, utilizing data from a subset of 117 patients who attended at least 3 behavioral health visits. Hispanic ethnicity and being insured predicted higher baseline GAF, while patients with an anxiety disorder had lower baseline GAF than patients with other diagnoses. Controlling for primary diagnosis, patients receiving behavioral activation or exposure therapy improved at faster rates than patients receiving other interventions. Demographic variables did not relate to rates of improvement.

Conclusion—Results suggest even brief IBHC interventions can be focused, targeting specific patient concerns with evidence-based treatment components.

Keywords

health care psychology; treatment outcomes; client treatment matching; evidence-based practice; latent growth curve modeling

Psychosocial interventions delivered via an integrated behavioral health care (IBHC) model present both opportunities and challenges (Blount, 1998; Robinson & Reiter, 2007).

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Compared with traditional mental health care, IBHC offers greater access to care and earlier identification and targeting of difficulties (Brawer et al., 2011; Pomerantz, Kearney, Wray, Post, & McCarthy, 2014). IBHC service delivery also means less time per session, fewer visits per patient, and more limited resources when serving patients with serious impairment. To date, research on IBHC suggests opportunities outweigh challenges. Recent studies support its palatability among patients and providers (e.g., Funderburk et al., 2010) and speak to its potential to improve both patient access to care (Brawer et al., 2011; Pomerantz et al., 2014) and outcomes (e.g., Miller, Petterson, Teevan Burke, Phillips, & Green, 2014; Peek, Cohen, & deGruy, 2014). Lacking, however, are studies that adequately describe intervention activities of IBHC providers and the extent to which these activities represent evidence-based practices.

In this study, we asked the following questions: (a) Which intervention strategies do IBHC providers use most often? (b) Does the choice of intervention strategy correspond systematically to patient diagnosis? and (c) Is there a relation between providers' choice of intervention strategy and patient rate of change? Much of the research on IBHC-delivered services has been conducted in settings that serve military personnel and their families (e.g., Brawer et al., 2011; Funderburk, Fielder, DeMartini, & Flynn, 2012; Funderburk et al., 2011; Pomerantz et al., 2014). The current study extends that work with data gathered in IBHC settings that serve an ethnically diverse, predominately low-income community sample.

Brief Introduction to IBHC and Outcome Research

Several authors have provided detailed descriptions of the IBHC model (e.g., Blount, 1998; Robinson & Reiter, 2007; Strosahl, 1998). IBHC consists of behavioral health consultants (BHCs) embedded in a primary care setting who collaborate with medical providers to deliver whole person care. Typically, the terms collaborative care and IBHC are used interchangeably; however, collaborative care emphasizes ongoing relationships between health care providers who are not necessarily part of the same clinic or hospital, rather than a set of providers working within the same health care organization to deliver seamless health care services to patients (Doherty, McDaniel, & Baird, 1996). In the current study, we refer to the IBHC model as a model by which BHCs consult with and support medical providers to address patient needs.

The IBHC model operates with a very different structure for visits, referrals, and follow-ups than that used in traditional or specialty mental health care settings or even in other models of collaborative care. Sessions tend to be shorter (e.g., 20–30 min), with fewer sessions overall. IBHC services are often used episodically for acute problems given the emphasis on enhancing patient functioning rather than symptom amelioration per se (Robinson & Reiter, 2007). BHCs are available to meet with referred patients on the same day as their medical appointment, often in the same examination room. Medical providers will typically introduce BHCs using a "warm-handoff" that includes a brief description of presenting concerns and the role of the BHC on the medical team. BHCs tend to use brief assessment/screening tools and adapted versions of evidence-based interventions or intervention components, in particular, strategies and techniques based on cognitive–behavioral

principles (Bridges et al., 2013; Bryan et al., 2012; Corso et al., 2012; Hunter, Goodie, Oordt, & Dobmeyer, 2009; Ray-Sannerud et al., 2012).

Systematic reviews of foundational studies, including randomized trials, support a collaborative care approach to treating depression and related disorders in primary care settings (Butler et al., 2008; Thota et al., 2012), but similar controlled trials involving IBHC have not yet been conducted (Peek et al., 2014). Preliminary findings estimate that a majority of patients—just over 70%—experience significant improvement when treated in IBHC settings (Bridges et al., 2013; Bryan et al., 2012; Corso et al., 2012). Patients with more severe initial impairment tend to improve more rapidly than patients with less severe initial impairment. Gains tend to occur as early as the second session (Bryan et al., 2012; Corso et al., 2012) and have been maintained for up to 2 years after an episode of care (Corso et al., 2012).

However, a clear relation between patient improvement and number of IBHC sessions has not emerged.

Much of the research examining IBHC outcomes has been conducted in settings serving military personnel and their families (e.g., Bryan et al., 2012; Corso et al., 2012; Gros & Haren, 2011; Ray-Sannerud et al., 2012), although recent studies indicate the model holds promise for university students (e.g., Funderburk et al., 2010) and diverse community samples (Bridges et al., 2013). Bryan, Corso, and colleagues (Bryan et al., 2012; Corso et al., 2012) viewed early supportive findings as evidence that IBHC offers a level of care on par with more traditional mental health care settings. They also speculate that patient improvement reflects a tendency for BHCs to use problem-focused, action-oriented interventions that assume limited patient contact.

Intervention Activities of IBHC Providers

Speculations aside, it is important to examine if IBHC providers are using evidence-based strategies in an effort to work competently in primary care settings (McDaniel et al., 2014). Most psychosocial interventions recommended for primary care settings are derived from behavioral or cognitive–behavioral traditions (Bluestein & Cubic, 2009; Hunter et al., 2009). Typically such interventions are empirically supported, work rapidly, and involve behavioral practice or assigned homework (Bryan et al., 2012). As currently packaged, these interventions are often too lengthy to be implemented fully in the fast-paced arena of IBHC (Pomerantz, Corson, & Detzer, 2009). BHCs often adapt or extract components from evidence-based intervention strategies to fit the pace and structure of primary care (e.g., Gomez et al., 2014).

Little is known about this process of adapting or extracting components from empirically supported interventions. Funderburk and colleagues (Funderburk, Dobmeyer, Hunter, Walsh, & Maisto, 2013; Funderburk et al., 2011) conducted studies examining what providers actually do when implementing the IBHC model. A chart review of 180 patients seen in a Veterans Affairs (VA) primary care system revealed that 61% of patients attended only one session (Funderburk et al., 2011). Depression was most frequently identified, followed by substance abuse/dependence, psychosis, and bipolar disorder. Five strategies

were used in at least 10% of sessions: patient education (23.3%), behavioral activation (20%), supportive therapy (20%), cognitive techniques (14.2%), and relaxation (11.7%). To keep pace in primary care, BHCs were commonly "implementing only one element of an empirically based treatment or shortening the implementation time" (p. 26). These practices were viewed by the authors as "not empirically based" and a cause for "significant concern" (p. 26).

Funderburk et al. (2013) conducted a related study with IBHC providers in primary care clinics run by the Veterans Health Administration (VHA) or the United States Air Force (USAF). BHCs (N = 182) provided survey information about 403 patients seen on a single day of clinical service. Depression and anxiety were the most common patient concerns, the modal length of a visit was 30 min, and the modal IBHC appointment was the patient's second visit. Specific interventions used by BHCs were not assessed, but the researchers found referrals to specialty mental health care were discussed with one third to one half of patients, actual referrals were made for one fifth to one fourth of patients, and plans for a second visit occurred with one half to two thirds of patients.

The Current Study: Three Questions and an Extension

The current study was driven by three gaps in the existing IBHC research: First, what intervention strategies are IBHC providers using and do those strategies reflect aspects of empirically supported treatments? Second, do BHCs choose intervention strategies that correspond to patients' specific concerns? Third, do intervention strategies predict patients' rate of change? We expected to find a tendency for BHCs to use empirically supported, CBT-based interventions (Bryan et al., 2012; Funderburk et al., 2011). We also expected to find a concordance between diagnosis and intervention strategy that reflected published outcome studies with specific patient populations (Chambless & Ollendick, 2001), such as using behavioral activation for patients with depression and parent-management strategies for children with disruptive behaviors. We made no prediction about the relation between BHCs' intervention strategies and patient rate of change. Our measure of patient outcomes was limited to therapist-generated Global Assessment of Functioning (GAF) scores. Research on the psychometrics of GAF scores documents both strengths and limitations (e.g., Grootenboer et al., 2012; Smith et al., 2011); however, use of GAF scores allowed us to examine whether previous findings using IBHC patient self-reports could be duplicated with a tool that took the BHC's perspective.

Our study also extends previous work by investigating IBHC in settings not restricted to military communities, which represent a unique culture (Strom et al., 2012). It is important to examine the IBHC model with diverse and underserved samples (Sanchez, Chapa, Ybarra, & Martinez, 2012). For instance, although Hispanic patients generally receive less quality mental health care (Young, Klap, Sher-bourne, & Wells, 2001), seek services less often (U.S. Department of Health and Human Services, 2001), and experience poorer outcomes (Sue, Fujino, Hu, Takeuchi, & Zane, 1991) when compared with non-Hispanic patients, Bridges and colleagues (2013) found that Hispanics experienced similar access, improvement, and satisfaction with IBHC care as non-Hispanic Whites. However, more

research is needed to determine if IBHC can meet the needs of minority and economically disadvantaged patients.

Method

Setting

The current study took place in two primary care clinics, both part of a federally qualified health center (FQHC) in a medically underserved area of northwest Arkansas (Health Resources and Services Administration [HRSA], 2014). Service fees are based on household size and income; no one is turned away, regardless of insurance status or ability to pay. During the time in which this study took place (August 2010 through June 2013), the two clinics served 34,649 patients who totaled near 190,000 visits with 46 different licensed health care providers. Clinic patients were 48.8% Hispanic, 62.8% women, 41.3% uninsured, and 49.5% children or adolescents.

Participants

Participants were 1,150 consecutive patients seen for behavioral health services by clinical psychology doctoral trainees. All had an initial behavioral health encounter during the 34-month period in which data collection took place. Demographic variables for this sample are presented in Table 1. Most patients were Hispanic (60.1%) and White (95%). Most patients were female (66.6%) and 47.9% were uninsured. Patients ranged in age from 1 to 76 years (M = 30.10, SD = 18.03). One third (31.3%) of patients were pediatric (age 17 and under). Sessions with pediatric patients typically included the primary caregiver(s) and interventions were often targeted at the families. Sessions were conducted in Spanish for 49.5% of patients, and a trained interpreter was used 17.3% of the time. All other sessions were conducted in English.

Table 2 provides information on the most common primary mental health diagnosis (or diagnostic rule-outs) patients received at the time of their initial BHC visit. Although some patients (9.6%) had more than one mental health diagnosis noted by the BHC, the primary mental health diagnosis was the focus of the behavioral health session and, therefore, seen as most relevant to the current study. Most common were depressive (23.2%), anxiety (18.6%), adjustment (11.3%), and childhood externalizing (e.g., attention-deficit/hyperactivity, oppositional defiant, conduct; 7.6%) disorders. All other diagnoses were relatively rare, occurring in less than 5% of patients. Approximately one fourth (25.7%) of behavioral health patients did not receive a mental health diagnosis; these patients were primarily seen for life stressors such as relationship problems or for health concerns such as weight management and chronic pain. We did not capture concurrent medical conditions of patients because these were not typically included in the BHC notes.

Clinicians

For this study, we used data from the patients of four IBHC clinicians. All were clinical psychology trainees enrolled in a scientist-practitioner doctoral training program with a primarily cognitive–behavioral theoretical orientation. As part of their training, all clinicians took a semester-long course in psychopathology that included training in multiaxial

diagnosis (American Psychiatric Association [APA], 2000) and at least two courses in evidence-based psychotherapy. Three of the four clinicians took an additional course in integrated behavioral health care. Clinicians had weekly, on-site supervision that included live shadowing from a licensed psychologist (the first author). Two IBHC clinicians were bilingual (one non-Hispanic White male and one non-Hispanic White female); the other two were monolingual English speakers (one non-Hispanic White male and one Hispanic female). Patients were distributed as follows: 625 saw the bilingual non-Hispanic White male across 2 full years of clerkship, 128 saw the bilingual non-Hispanic White female across 1 year of clerkship, 278 saw the monolingual Hispanic female across 2 years of clerkship, and 119 saw the monolingual non-Hispanic White male across 1 year of clerkship. The bilingual non-Hispanic White male served as the only BHC at one of the primary care sites during part of his training.

Procedures

All procedures were approved by the executive director of the FQHC and the university Institutional Review Board. As part of standard operating procedures, patients of the FQHC sign a patient consent form, updated annually, that specifies information in the patient's medical chart and notes from the patient visits may be used for research and program evaluation purposes. Patients presented to their primary care provider for a variety of reasons, including annual physical examinations, infections, pain, diabetes management, and well-child check-ups. If primary care providers identified a behavioral health issue during the patient visit, they referred patients to a BHC for a same-day, immediate appointment. Upon completion of the visit, BHCs would schedule follow-up sessions as necessary. The average number of visits was 1.50 (*SD* = 0.96, range = 1–8 visits). Each visit lasted ~15 to 30 min.

A session typically began with a functional analysis of the referral reason identified by the primary care provider. Often, brief assessments such as the Mini International Neuropsychiatric Interview (Sheehan et al., 1998) or the Patient Health Questionnaire-9 (Kroenke, Spitzer, & Williams, 2001) were administered to identify potential diagnoses and measure symptom severity. Interventions were problem-focused and generally comprised evidence-based, brief cognitive–behavioral approaches such as psychoeducation, relaxation training, sleep hygiene, behavioral activation, exposure therapy, and parent management training (PMT). Follow-up appointments were spaced ~2 to 4 weeks apart, depending on the severity of presenting concerns and the purpose of the appointment (e.g., to reassess symptomatology, evaluate intervention effectiveness, or provide additional care).

Measures

Data were obtained from patient electronic medical records (EMRs) by research assistants, all psychology doctoral students. Each underwent a mandatory HIPAA training before accessing clinic medical files. Study information was coded directly into a de-identified SPSS data file housed on a nonnetworked password protected laptop stored at one of the two clinics. Spot checking of data entry was conducted on ~10% of patients to ensure reliability of coding. EMRs contained demographic information, current medical and psychiatric diagnoses, chart notes, lists of medications, and appointment history. We culled the

following patient demographic variables: age, ethnicity, race, and primary language. We also obtained dates of BHC appointments (including follow-up visits), referral reason, primary clinical diagnosis, and primary focus of the initial session (typically, either assessment or intervention components).

Both clinical diagnoses and interventions were indicated from multiselect pull-down menus, with options for "Other" categories and free-text specifiers, and permitted up to three selections per field. Clinical diagnoses were selected from a menu of ICD-9 classifications. The content of the interventions menu was modified by clinic behavioral health personnel in consultation with on-site information technology specialists at the time integrated behavioral health services began and allows for continual updating as needed. Sessions focused exclusively or nearly exclusively on psychoeducation or assessment (i.e., sessions that did not include additional intervention components) were coded as "psychoeducation" and "assessment," respectively. Patients with presenting concerns that, in the clinician's estimation, warranted more than six visits were referred for more intensive services, consistent with recommendations by Dundon, Dollar, Schohn, and Lantinga (2011). These patients were coded as "outside referral." Outside referrals were primarily influenced by intensity of patient needs; however, they also depended on insurance coverage, linguistic needs, and availability of outside providers.

Psychological functioning—Psychological functioning was measured using the GAF score (Jones, Thornicroft, Coffey, & Dunn, 1995) assigned to patients by BHCs after each behavioral health visit. The GAF is a widely used clinician-rated measure of overall psychological distress. Scores range from 1 (persistent danger of severely hurting self or others) to 100 (*superior functioning*). The GAF has demonstrated high interrater reliability (intraclass correlation = .86) and criterion validity (Hilsenroth et al., 2000).

Data Analysis

We first examined frequency of primary diagnoses and type of intervention delivered to IBHC patients using the full sample of patients. Descriptive statistics were also used to examine types of interventions used for the most common diagnoses. To examine the relation between BHCs' choice of intervention strategy and patient rate of change as assessed by GAF scores, we used latent growth curve (LGC) modeling with a truncated sample of patients. We limited our LGC analyses to participants who attended at least three behavioral health visits and were *not* referred out of the clinic. Of the original 1,150 patients, 126 had three or more visits. Eight of these patients were referred out and one patient's medical record did not contain GAF scores, reducing the sample size to 117 patients. Demographics for this truncated sample are in Table 1. Analyses indicated no significant differences between the full and truncated samples on any demographic variables (see Table 1) or diagnoses (see Table 2); only average number of BH sessions.

LGC modeling was run using Amos version 19 (Arbuckle, 2010). Because assumptions for normality were met, we used maximum likelihood estimation. Model fit was assessed with the chi-square statistic (χ^2), the Comparative Fit Index (CFI), and the root mean square error of approximation (RMSEA), as per Schreiber, Nora, Stage, Barlow, and King (2006). Good

fit was based on CFI values greater than .95 and RMSEA values less than .06 (Hu & Bentler, 1999).

Results

Interventions Delivered

Results indicated that the most common interventions used across the full sample of patients were behavioral activation (26.1%), consultation specific to behavioral medicine concerns (e.g., diet and exercise counseling, medication adherence, sleep hygiene; 14.6%), relaxation training (10.3%), and parent-management training (8.5%; see Table 3). In addition, 17.5% of interventions focused solely on the provision of psychoeducation, and 12.4% of visits involved assessment only, with no intervention offered. On the whole, we found evidence to support our first hypothesis that BHCs would use primarily directive, action-oriented approaches commonly associated with CBT interventions, relying less on nondirective approaches.

Diagnosis-Intervention Concordance

Table 3 provides descriptive information for interventions by diagnoses. For patients with a depressive disorder, the most common interventions were behavioral activation (65.5%) and psychoeducation (14.2%). For patients with an anxiety disorder, the most common interventions were exposure therapy (32.7%) and relaxation training (27.6%). For patients with an externalizing disorder, the most common interventions were PMT (58.6%) and referral to an outside provider (28.7%). For patients with an adjustment disorder, the most common interventions were behavioral activation (53.1%) and relaxation training (18.5%). For patients with no diagnosis (or v codes), common interventions included behavioral medicine consultations, psychoeducation, other interventions (e.g., relapse prevention, safety planning, and family therapy), and assessment. Our second hypothesis that there would be empirically based concordance between patient diagnosis and BHC intervention strategies was supported.

Changes in GAF Across Sessions

Before examining predictors of change, we ran descriptive statistics examining baseline and final session GAF scores for all patients seen for 1–7 sessions (N = 1,035, Figure 1). Only one patient was seen for 8+ sessions and was therefore excluded. We also excluded patients who were referred to outside providers. Independent samples t tests revealed patients referred to outside providers had significantly lower baseline GAF scores (M = 56.85, SD = 8.67) compared with patients who were not referred out (M = 60.31, SD = 7.97), $t(1,124) = 3.95$, $p < .001$.

Across all groups, patients showed improvement from baseline to final session. Baseline GAF ranged from 45.0 (for patients ultimately seen for 7 sessions) to 61.1 (for patients seen for only 1 session), with most scores falling between 50 and 60, a range typically associated with “moderate symptoms . . . OR moderate difficulty in social, occupation, or school functioning” (APA, 2000, p. 34). A general trend suggested patients with lower baseline GAF attended more BHC sessions than those with higher baseline GAF. GAF scores at the

final session ranged from 55.0 (for patients seen for 7 sessions) to 64.5 (for patients seen for 4 sessions). A general trend suggested modest improvement for patients in the first five sessions, while greater gains were noted for patients who attended six or more sessions. By the final session, nearly all averages were in a GAF range associated with "some mild symptoms . . . OR some difficulty in social, occupational, or school functioning . . . but generally functioning pretty well" (APA, 2000, p. 34).

Predictors of GAF Improvement

To address our final questions, we used LGC modeling with a truncated sample of 117 patients seen for at least three BHC visits. The model (see Figure 2) fit the data well; $\chi^2(38) = 52.03$, $p = .06$, CFI = .97, RMSEA = .06 (90% CI [.00, .09]). The variables significantly predicted both baseline GAF (R^2 intercept = .36) and improvements in GAF (R^2 slope = .31) over time.

First, we examined whether baseline GAF related to rate of change. The path between the GAF intercept and slope factors was marginally significant and negative (β = −.38, p = .079); patients with lower baseline GAF tended to improve at faster rates than patients with higher baseline GAF. Second, we examined whether demographic variables predicted baseline GAF (intercept) and change in GAF over time (slope). Ethnicity significantly predicted the intercept (β = .44, $p < .001$); Hispanic patients had baseline GAF scores that were, on average, 6.41 points higher than non-Hispanic patients. Insurance status also predicted the intercept (β = −.19, $p = .036$); uninsured patients had baseline GAF scores that were, on average, 2.67 points lower than insured patients. Age and gender did not significantly predict the intercept (p values > .50). Hispanic patients tended to improve at faster rates than non-Hispanic patients (β = .25, $p = .082$). No other demographic variables significantly predicted change over time.

Third, we examined whether demographic variables covaried with diagnoses. Compared with men, women were more likely to be diagnosed with depression (β= .20, $p = .035$) and adjustment disorders (β= .19, $p = .046$). Older patients were more likely to be diagnosed with depression (β = .33, $p < .001$); younger patients were more likely to be diagnosed with externalizing disorders (β = −.35, $p < .001$). Hispanic, compared with non-Hispanic, patients were more likely to be diagnosed with adjustment disorders (β= .21, $p = .024$). We found no other significant associations between demographic variables and diagnoses (p values > .10).

Fourth, we examined whether patients' primary diagnosis was related to their baseline GAF. Patients with an anxiety disorder had, on average, a baseline GAF 4.26 points lower than patients without an anxiety disorder (β = −.24, $p = .015$). We found a nonsignificant trend for patients diagnosed with depression to have a lower baseline GAF (3.26 points lower) compared with patients without a depressive disorder (β = −.21, $p = .056$). A primary diagnosis of adjustment or externalizing disorder did not predict baseline GAF (p values > .30).

Fifth, we examined concordance between patients' primary diagnosis and the type of intervention they received. Patients with depression were significantly more likely to receive behavioral activation (β = .68, $p < .001$) and significantly less likely to receive PMT (β = −.

22, $p = .018$) when compared with patients without depression. Patients with anxiety disorders were significantly more likely to receive exposure therapy ($\beta = .50$, $p < .001$) and significantly less likely to receive PMT ($\beta = -.19$, $p = .034$) than patients without anxiety disorders. Patients with an adjustment disorder were significantly more likely to receive supportive therapy ($\beta = .28$, $p = .005$) and behavioral activation ($\beta = .27$, $p < .001$) than patients without an adjustment disorder. Patients with an externalizing disorder were significantly more likely to receive PMT than those without an externalizing disorder ($\beta = .38$, $p < .001$). All other paths connecting diagnoses to interventions were not significant (p values > .20). Linear trends between intervention choices and GAF improvements across behavioral health sessions are depicted in Figure 3.

Finally, we examined whether diagnoses and intervention choices predicted the rate of improvement in GAF scores. None of the diagnoses significantly predicted rate of improvement (all p values > .36). On the other hand, intervention choices did matter: patients receiving behavioral activation improved at a greater rate (2.07 points higher) than those who did not ($\beta = .27$, $p = .042$), and patients receiving exposure therapy improved at a greater rate (2.56 points higher) than those who did not ($\beta = .22$, $p = .049$). PMT and supportive therapy did not significantly predict rate of change over time (p values > .84). GAF scores by intervention choice for the three behavioral health visits are provided in Table 4.

Discussion

Based on a patient sample that was primarily low-income and ethnically diverse, we explored intervention activities used by BHCs and examined whether those interventions were associated with patient rate of change. We found that BHCs used primarily action-oriented, evidence-based interventions consistent with a behavioral or cognitive–behavioral tradition. Selected interventions corresponded predictably with patients' primary diagnosis. We also found that IBHC delivered over two or more sessions was associated with significant gains in patients' GAF, with greatest gains being observed in patients who received three or more sessions. Growth curve analyses revealed more rapid gains when patients received behavioral activation and exposure therapy than other types of interventions, even when controlling for diagnosis. Taken together, these results provide support for use of the IBHC model in primary care settings.

Early proponents of IBHC have recommended empirically supported strategies derived from a behavioral or cognitive–behavioral tradition (Bluestein & Cubic, 2009; Hunter et al., 2009), and Funderburk and colleagues (2011) found evidence that BHCs followed those recommendations. Our results fit this same trend and revealed that BHCs frequently selected the following interventions: behavioral activation, relaxation training, psychoeducation, parent-management training, and consultation specific to diet, exercise, medication adherence, or sleep hygiene. Compared with BHCs in the study by Funderburk et al. (2011), BHCs in this study were similarly likely to use behavioral activation and relaxation training, but less likely to use supportive therapy and cognitive techniques. This difference may be because of the training of the BHCs in the current study (all doctoral students enrolled in a psychology program with a strong behavioral emphasis) or aspects of the patients seen for

behavioral health services (e.g., a great many of them pediatric patients, compared with veterans in the Funderburk et al. study).

Our second question was whether BHC-selected interventions varied systematically with patients' primary diagnosis. As expected, we found BHCs chose interventions consistent with published research on empirically supported treatments for specific disorders (Chambless & Ollendick, 2001). Clear examples of this trend were noted for patients identified as having a depressive or anxiety disorder (typically adults), or an externalizing disorder (typically children). In particular, 65% of patients with a depressive disorder were treated using behavioral activation, 32.7% and 27.6% of patients with an anxiety disorder were treated using exposure therapy and relaxation training, respectively, and 58.6% of patients with an externalizing disorder were treated using parent management training. Greater variability in choice of intervention was found for patients identified as having an adjustment disorder, although the interventions selected were consistent with adjustment disorders with depression or anxious features.

Our third question considered the link between intervention and patient rate of change. We found that patients improved generally over the course of behavioral health visits, but there was particular support for outcomes being linked with behavioral activation or exposure. These interventions offer BHCs a clear set of parameters for symptom targets when working within the context of a brief visit. As such, both may be an especially good fit for IBHC. This is important and suggests BHCs who practice in primary care are not limited to supportive or nonspecific interventions. In fact, our findings showed that supportive therapy as an intervention failed to predict patient rate of change. Together these findings suggest that improved outcomes for IBHC patients are not merely because of attention, support, or common factors in psychotherapy (Imel & Wampold, 2008). Instead, patients who presented with depression or anxiety were routinely offered an empirically supported intervention focused specifically on their primary diagnosis. Because depression- and anxiety-related conditions are the "common colds" of mental illness, these findings provide additional support for the merits of the IBHC model in primary care. We should note there was a tendency for IBHC patients to improve regardless of intervention strategy. Bryan et al. (2012) speculate that documented gains following IBHC result from the use of focused interventions that engaged patients in behavioral practice or assigned homework. This could explain the general tendency for patients to improve and offers a rationale for why patients who attended only two behavioral health visits also showed improvements.

Not surprisingly, we found that patients with higher baseline GAF attended fewer sessions overall than patients with lower baseline GAF and that patients who attended a greater number of visits (up to seven in the current study) tended to make the most gains in functioning. Consistent with other research (Bryan et al., 2012; Corso et al., 2012; Ray-Sannerud et al., 2012), patients who had lower baseline GAF improved more rapidly than patients with higher baseline GAF. Because patients whose symptom presentations were more complex or severe were often referred to outside specialty services, our findings regarding baseline functioning and rate of improvement is limited to patients whose initial symptoms were mild or moderate.

Our findings are consistent with prior studies exploring the effectiveness of IBHC but expand this literature to a patient sample that was not military or military connected. Our data were gathered from two primary care clinics located in a medically underserved area, and a majority of patients in our sample were low income (i.e., uninsured) and Hispanic. Thus, we captured trends from a population in great need and perhaps one that is more representative of other practices than has been the case with studies of military-connected IBHC clinics.

Our study is also the first to index IBHC gains using clinician-assigned GAF scores instead of patient-reported decreased symptoms. Patient improvement in this diverse sample did not vary systematically by age, ethnicity, or insurance status. This suggests IBHC has the potential to reduce disparities in access to, quality of, and outcomes associated with mental health care for underserved groups (U.S. Department of Health and Human Services, 2001). We found that uninsured patients and non-Hispanic patients tended to have lower GAF scores at the initial visit compared with insured or Hispanic patients, respectively. We suspect uninsured patients face greater financial hardship and thus experience more health-related difficulties than insured patients. We are less clear, however, about why non-Hispanic patients had lower initial GAF scores, although Bridges et al. (2013) reported a similar finding. Perhaps it reflects a tendency for medical providers to overrefer Hispanic patients for mental health care if they encounter a language barrier. Higher GAF scores could also reflect a bias among BHCs to see dysfunctional behavior in Hispanic patients as culturally normative and less serious (Sue et al., 2007). Hispanic patients in our sample were younger and more likely diagnosed with an adjustment disorder when compared with non-Hispanic patients, which could also explain better baseline functioning.

Limitations and Future Directions

Though encouraging, our findings should be considered in light of several limitations. First, our study lacked a control group and thus leaves unanswered key questions about how patients would fare relative to patients never seen in IBHC or patients seen in a more traditional mental health care setting. Because BHCs coded their use of supportive therapy, we were able to account for the contribution of therapist attention or other nonspecific factors in our LGC model, but we did not account for changes in patient medication or for the possibility of ancillary services. Furthermore, BHCs in our study were predoctoral students from a training program with a strong CBT focus, which could explain why CBT-based interventions were commonly used.

Another important limitation was our use of GAF scores to assess patient outcomes. Several authors have critiqued the GAF because of its heavy emphasis on psychiatric symptoms (Hilsenroth et al., 2000; Roy-Byrne, Dagadakis, Unutzer, & Ries, 1996) and because single-item measures are generally less content valid and reliable than multi-item measures (Kane & Radosevich, 2011). Positive patient outcomes could also reflect regression to the mean or bias in the assigning of GAF scores by attending IBHC providers. We would note, however, that clinicians were unaware of the study's goals and hypotheses at the time services were provided and data for the current study were culled from archival data. A related limitation was the lack of assessment of clinically significant improvements in patients. Although, on

average, patients improved from a GAF range that reflected moderate impairment to a range that reflected only mild impairment, we did not specifically assess clinically significant gains in functioning.

Our use of LGC modeling was restricted to patients with at least three behavioral health visits (only 10% of the total sample). Limited sample size reduced the power of LGC analyses and could have led to less stable estimates of patient functioning. Although the truncated sample was similar demographically to the full sample, results on rates of improvement cannot be generalized to patients seen for fewer than three behavioral health visits. On the other hand, the fact that only 10% of patients in our larger sample were seen for three visits is entirely consistent with the IBHC model and its focus on functional improvement rather than symptom amelioration (Robinson & Reiter, 2007). This proportion is also comparable with what has been reported in previous studies of IBHC in primary care settings (Bryan et al., 2012; Corso et al., 2012; Funderburk et al., 2011). The LGC analyses also excluded patients referred to outside providers. These were generally patients with more serious clinical presentations or children with state-funded health benefits that afforded multiple options for continued specialty care. The effectiveness of integrated care services for these patients remains unknown.

Our decision to analyze patients with and without psychiatric diagnoses also limits generalizability. We chose to examine rate of change for all patients because each was referred by their medical provider (i.e., the physician sought the consultation and expertise of the BHC) and because a sizable proportion of our patients did not receive a diagnosis at baseline. However, future studies could examine these two patient groups separately. Readers should also recognize that patients' episodes of care occurred at variable time points, which violates the assumption of equal intervals in LGC modeling. Our goal was to examine rate of change across actual episodes of care; we were less interested in change across equal time points. For the majority of patients, a second IBHC visit occurred 2 to 4 weeks after the initial visit.

Our study lacked evidence for interrater reliability for clinicians' diagnoses, choice of intervention, or GAF scores. In most cases, patient diagnoses were tentative (e.g., used the specifer "rule out") and were not assigned with the aid of formal diagnostic tools. Also notable was the relatively low rate of substance use disorders in our sample (<5% of patients), compared with rates of ~8% in urban medical settings with low-income patients (e.g., Olfson et al., 2000). However, this may be because of the high percentage of pediatric patients in the study. Although the EMRs permitted specifying up to three intervention strategies per visit, clinicians may have used more than these. We had no way to account for this variability. However, BHCs were all well-trained in multiaxial diagnosing and evidence-based interventions and were shadowed periodically by the first author, who was responsible for treatment quality assurance.

Despite the limitations, our findings are encouraging and suggest further research on the IBHC model is warranted, especially studies that use rigorous experimental designs with adequate control groups. A longer follow-up period would help determine if improvements persist after many months. It would also be important to examine if medication changes and

other aspects of integrated care services account for patient outcomes, beyond the BHC interventions. This study was limited to patients who had a first encounter with behavioral health services. However, because patients may be seen for multiple episodes of care across time, it would be interesting to examine if repeated behavioral health services for different (or recurring) issues improves functioning. The present study used clinical psychology predoctoral trainees, but future studies should examine whether approaches vary by BHC experiences or training and by patient variables. For instance, clinician-related variables (e.g., gender, age, training, theoretical orientation, and experience in IBHC settings) or setting-related variables (e.g., rural vs. urban, military vs. civilian, and hospital vs. free standing clinic) might be related to patient improvements over time. Future studies using multilevel modeling may wish to explore these factors.

Increasing efforts are being made to implement and expand integrated care models within VA agencies, FQHCs, and other primary care sites. This expansion calls for more providers with appropriate competencies to deliver integrated services (McDaniel et al., 2014). Some writers have questioned whether there is adequate workforce availability to meet these expanded demands (Miller et al., 2014). Training opportunities are still somewhat limited for trainees (Correll, Cantrell, & Dalton, 2011) and for currently practicing psychologists (Blount & Miller, 2009; Kelly & Coons, 2012). Ensuring that BHCs are competent to practice in primary care will also require moving beyond an adaptation or extraction approach to using empirically supported interventions.

Needed are systematic trials of intervention strategies and techniques used routinely in IBHC; in this way, the label of “empirically supported” will no longer be referring to the status of an original treatment protocol but to the documented efficacy of an IBHC-specific intervention. This work would benefit from efforts to identify essential components of evidence-based interventions that were designed for use in specialty mental health clinics. Research that contributes to a solid scientific base for IBHC should serve well larger policy efforts designed to address the issue of how to fund this innovative approach. In addition, research that more precisely documents the activities of IBHC providers and the benefits to their patients (and to their medical providers) can be used to gauge the economic impact that IBHC can have on reducing health care costs and health-related disparities.

Conclusion

This study offers support for the promise of IBHC-delivered care and extends previous findings to an ethnically and economically diverse patient group. The real-world, nonrandomized control context allows for greater generalizability of our findings to other primary care settings. EMR use promoted accuracy in data gathering and thus increases the potential replicability of the study. Our findings offer a “peek under the hood” of the IBHC model and provide greater detail about the diagnostic and therapeutic activities of providers working in a primary care setting. We found a tendency for systematic and research-supported links between patients’ primary diagnosis and providers’ choice of intervention. We also found evidence that behavioral activation and exposure-based interventions were an especially good fit for IBHC patients; both of these CBT-based strategies were significantly and positively related to patient rate of change. These findings should be considered in light

of IBHC's broader potential: Primary care settings are thought to offer greater access and earlier access to behavioral health care than that provided by traditional mental health care settings (Blount, 1998; Brawer et al., 2011; Pomerantz et al., 2014; Robinson & Reiter, 2007). To the degree those claims are valid, current findings indicating that patients receive quality care via empirically supported interventions add supportive evidence to the promise of this innovative model.

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What is the public health significance of this article?

This study suggests brief behavioral health interventions delivered in integrated primary care target specific patient concerns (rather than provide only generic support) and improve patient functioning, even across 2–3 sessions.

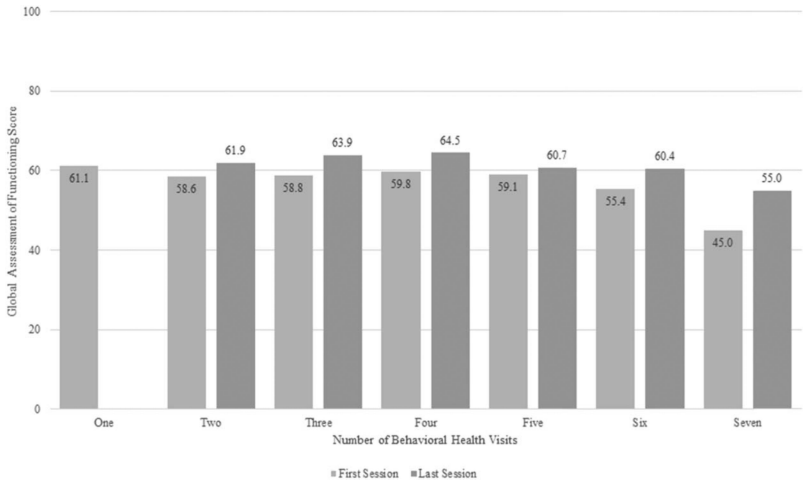

Figure 1.

Global assessment of functioning (GAF) scores at first and last behavioral health session as a function of number of sessions attended.

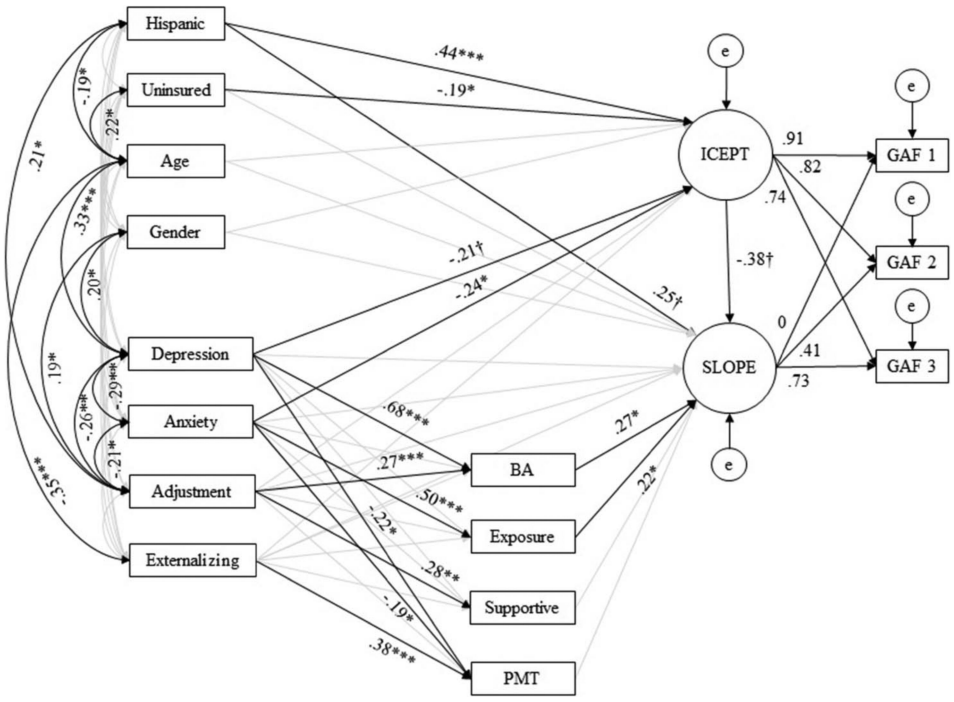

Figure 2.

Model with significant standardized coefficients. CFI = .97; RMSEA = .06; $\chi^2 = 52.03$; *df* = 38; *p* = .06. BA = behavioral activation; PMT = parent management training; ICEPT = intercept; GAF = global assessment of functioning; CFI = Comparative Fit Index; RMSEA = root mean square error of approximation; *df* = degrees of freedom. Marginal paths are indicated by †. * $p < .05$. ** $p < .01$. *** $p < .001$.

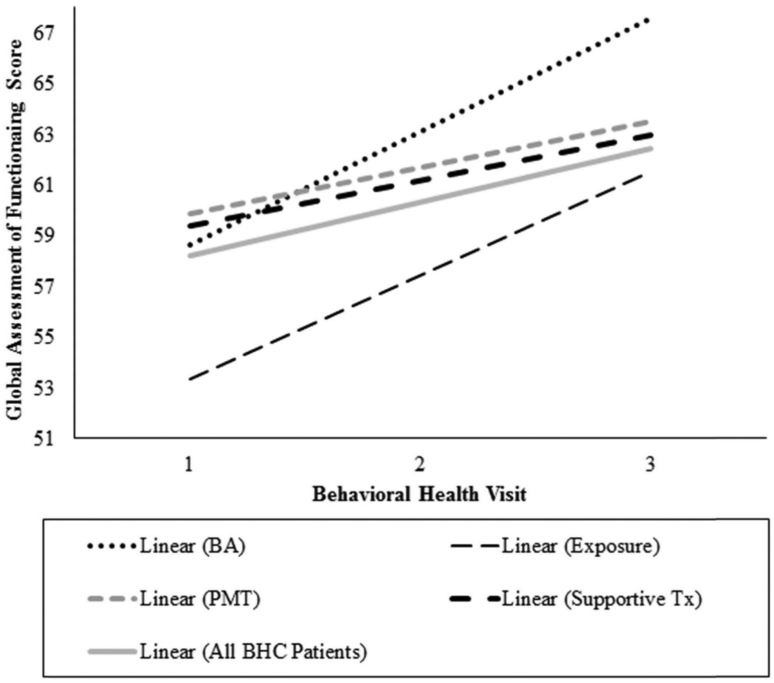

Figure 3.

GAF score trajectories across Sessions 1 to 3 by intervention. For comparison, a trajectory has been added which represents average GAF scores for all behavioral health patients. GAF = global assessment of functioning; BA = behavioral activation; PMT = parent management training; BHC = behavioral health care.

Table 1

Demographic Variables for the Total (N = 1,150) and Truncated (n = 117) Samples

	Full sample		Truncated sample		
Demographic variable	***n* or *M***	**% or *SD***	***n* or *M***	**% or *SD***	**χ^2 or *t* statistic**
Gender					$\chi^2(1) = 0.15$, $p = .699$
Male	384	33.4%	37	31.6	
Female	766	66.6%	80	68.4%	
Age (range 1-76 years)	30.10	18.03	31.41	17.77	$t(1265) = 0.75$, $p = .454$
Race					
White	1,092	95.0%	112	95.7%	$\chi^2(1) = 0.22$, $p = .638$
Black	20	1.7%	1	0.9%	
Asian	12	1.0%	1	0.9%	
Other	18	1.6%	2	1.7%	
Ethnicity					$\chi^2(1) = 0.97$, $p = .325$
Hispanic	691	60.1%	76	65.0%	
Non-Hispanic	455	39.6%	41	35.0%	
Primary language					
English	573	49.8%	50	42.7%	$\chi^2(1) = 2.14$, $p = .144$
Spanish	569	49.5%	67	57.3%	
Marshallese	6	0.5%	0	0%	
Other	2	0.2%	0	0%	
Interpreter used					$\chi^2(1) = 0.03$, $p = .861$
Yes	199	17.3%	21	17.9%	
No	951	82.7%	96	82.1%	
Insurance status					$\chi^2(1) = 1.10$, $p = .295$
Uninsured	551	47.9%	62	53.0%	
Insured	599	52.1%	55	47.0%	
Number of behavioral health visits	1.50	0.96	3.74	1.11	$t(1265) = 23.68$, $p < .001$
1 visit	797	69.3%	0	0%	
2 visits	227	19.7%	0	0%	
3 visits	75	6.5%	71	60.7%	
4+ visits (up to 8)	51	4.5%	46	39.3%	

Table 2

Diagnostic Impression at First Behavioral Health Visit for the Total (N = 1,150) and Truncated (n = 117) Samples

	Full sample		Truncated sample		
Diagnosis	***N***	**%**	***N***	**%**	**χ^2 statistic**
No disorder	296	25.7	24	20.5	$\chi^2(1) = 1.54$, $p = .215$
Depressive disorder	267	23.2	31	26.5	$\chi^2(1) = 0.63$, $p = .426$
Anxiety disorder	214	18.6	22	18.8	$\chi^2(1) = 0.00$, $p = .959$
Other DSM disorder	156	13.6	16	13.7	$\chi^2(1) = 0.00$, $p = .974$
Adjustment disorder	130	11.3	18	15.4	$\chi^2(1) = 1.71$, $p = .191$
Child externalizing disorder	87	7.6	6	5.1	$\chi^2(1) = 0.93$, $p = .336$

Note. No disorder = no disorder, v code; depressive disorder = major depressive disorder, dysthymia, depressive disorder not otherwise specified; anxiety disorder = posttraumatic stress disorder, panic disorder (with and without agoraphobia), obsessive compulsive disorder, social phobia, specific phobia, generalized anxiety disorder, anxiety disorder not otherwise specified; other DSM disorder = learning disabilities, substance use disorder, Asperger's syndrome, autism, bipolar disorder, cognitive disorders, dissociate identity disorder, sleep disorders, elimination disorders, sexual disorders, impulse control disorders (e.g., kleptomania), eating disorders (e.g., anorexia nervosa), reactive attachment disorder of infancy, psychotic disorders (e.g,. schizophrenia), selective mutism; child externalizing disorder = opposition defiant disorder, conduct disorder, attention deficit/hyperactivity disorder, disruptive behavior problem not otherwise specified.

Table 3

Most Commonly Delivered Interventions by Major Diagnostic Categories (%)

	Depression (*n* = 267)	Anxiety (*n* = 214)	Externalizing (*n* = 87)	Adjustment (*n* = 130)	No diagnosis (*n* = 296)	All patients (*N* = 1,150)	Truncated sample (*n* = 117)	χ^2 difference test between full and truncated samples
Behavioral activation	65.5	13.1	2.3	53.1	5.1	26.1	28.2	$\chi^2(1) = 0.25$, $p = .620$
Psychoeducation	14.2	20.6	24.1	17.7	16.6	17.5	13.7	$\chi^2(1) = 1.08$, $p = .298$
Behavioral medicine	10.1	5.6	1.1	2.3	27.7	14.6	15.4	$\chi^2(1) = 0.05$, $p = .821$
Assessment	13.9	14.0	6.9	4.6	14.9	12.4	12.8	$\chi^2(1) = 0.01$, $p = .906$
Relaxation training	2.6	27.6	4.6	18.5	5.7	10.3	8.5	$\chi^2(1) = 0.34$, $p = .558$
Parent management training	0.7	0.9	58.6	6.9	5.1	8.5	10.3	$\chi^2(1) = 0.40$, $p = .526$
Referral	6.4	4.2	28.7	9.2	5.4	8.3	0.0	$\chi^2(1) = 10.45$, $p = .001$
Other	4.1	2.8	4.6	4.6	15.2	8.1	9.4	$\chi^2(1) = 0.24$, $p = .621$
Exposure	0.4	32.7	1.1	3.8	1.4	7.5	10.3	$\chi^2(1) = 1.15$, $p = .284$
Supportive therapy	3.4	2.8	0	16.9	5.4	4.7	7.7	$\chi^2(1) = 2.02$, $p = .155$
Cognitive techniques	1.9	1.9	1.1	10.0	8.1	4.5	4.3	$\chi^2(1) = 0.02$, $p = .903$
Communication skills	1.5	0.9	3.4	3.1	5.4	2.6	2.6	$\chi^2(1) = 0.00$, $p = .975$
Other behavioral	0.4	0.5	0	1.5	3.4	2.4	0.0	$\chi^2(1) = 2.91$, $p = .088$

Note. Behavioral medicine = diet and exercise counseling, medication consultation, and sleep hygiene; relaxation training = breathing retraining and progressive muscle relaxation; referral = referral to outside provider or a referral to Department of Human Services; other = relapse prevention, safety planning/crisis management, and family therapy; cognitive techniques = cognitive therapy, problem solving, motivational interviewing, mindfulness, and acceptance and commitment therapy; communication skills = assertiveness training and anger management skills; other behavioral = stimulus control, habit reversal, and sensate focus.

Table 4

GAF Scores Across Behavioral Health Visits by Choice of Intervention for the Truncated Sample (n = 117)

	N	GAF 1 *M* (*SD*)	GAF 2 *M* (*SD*)	GAF 3 *M* (*SD*)
Intervention choice				
Behavioral activation	33	58.93 (6.85)	62.50 (7.99)	67.86 (10.84)
Exposure	12	52.27 (7.86)	59.55 (9.34)	60.45 (8.20)
PMT	12	60.45 (6.88)	60.45 (6.88)	64.09 (8.31)
Supportive therapy	9	60.44 (7.37)	59.11 (9.06)	64.00 (7.68)
All interventions	117	58.44 (7.87)	59.83 (8.34)	62.68 (9.54)

Note. GAF = global assessment of functioning; PMT = parent management training.