Development and Pilot Testing of a New Psychosocial Intervention for Older Latinos with Chronic Psychosis

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Latinos constitute the largest minority in the United States, and there is an increasing number of Latino patients with schizophrenia and other psychoses living into old age. However, few specific behavioral interventions have been developed aimed at improving the functioning of this group. We evaluated a psychosocial intervention designed to improve the everyday living skills of middle-aged and older outpatients with very chronic psychotic disorders. Three psychiatric clinics, specializing in care of Latinos, were randomly assigned to (1) a 24-session intervention entitled Programa de Entrenamiento para el Desarrollo de Aptitudes para Latinos (PEDAL) group therapy (n = 21) targeting areas identified in our previous work as being problematic for this population (e.g., using public transportation) or (2) a time-equivalent friendly support group (SG; n = 8). Compared to the patients randomized to SG, PEDAL-treated patients’ performance on everyday living skills improved significantly postintervention and was still significantly better at a 6-month maintenance follow-up period and at a 12-month no-treatment follow-up period. There was no significant change in psychopathology. Limitations of this pilot study are discussed. Results suggest that participation in this skills training program, designed specifically for older Latino patients with long-standing psychotic disorders, has the potential to significantly increase the patients’ independence and improve functional skills.

Key words: psychosis/Hispanic/aging/skills training/everyday functioning

Introduction

As the proportion of Latinos in the United States grows, so does the number of Latinos who suffer from schizophrenia. Schizophrenia is among the most serious and expensive mental disorders in direct treatment costs, loss of productivity, and expenditures for public assistance.¹ The direct cost of caring for patients with schizophrenia was estimated at 22% ($22.7 billion) of the cost of all mental health services in 1995.² Little research has been conducted on the experiences of Latino schizophrenia patients or on ways to address the specific needs of this rapidly growing group. Thus, effective and cost-efficient treatments that are culturally tailored to the needs of Latinos with schizophrenia are needed.

Currently, the most effective mode of rehabilitation for most persons with schizophrenia is symptomatic (i.e., antipsychotic medication), yet it does not automatically result in improved ability to function in the real world. As a result, there has been a call for psychosocial interventions to address this gap.³ Recent meta-analyses have shown that psychosocial rehabilitation has been successful in reducing relapse and hospitalization and has been related to improvements in housing stability. However, improvements in other areas of functioning are less consistent (i.e., social, vocational, independent living skills).⁴⁻⁵ Most studies have focused on English-speaking non-Hispanic populations and have failed to take into account the language and cultural needs of Latinos. There has been an almost complete neglect of psychosocial interventions for Latinos with schizophrenia,⁶⁻⁸ and Spanish-speaking Latinos are very often excluded from research investigating innovative intervention programs.

We were able to identify 2 published interventions that attempted to improve the living skills of Latino patients with schizophrenia.⁷⁻⁸ The 2 studies report mixed results. Telles et al. have found no evidence that a behavioral family intervention focusing on communication skills produced added benefit compared to a case management control condition, and among less acculturated patients, the behavioral family therapy group actually had worse outcome after 1-year follow-up.⁸ The researchers implicated the highly structured program, which involved communication exercises and directives and may have been intrusive and stressful to Latino patients and family
members. In contrast, Kopelowicz and his colleagues have found strong positive effects among Latino schizophrenia patients of an intensive skills training approach, relative to usual care, that utilized key family members in generalizing skills.\textsuperscript{7} Significant effects were seen for psychiatric symptoms, skill acquisition, and reduced rehospitalization at 6-month follow-up. In this study, skills utilization mediated the relationship between skills training intervention group membership and relapse.

Differences in intervention findings may be due to a number of factors. Latino schizophrenia patients often have a different clinical presentation that is shaped by cultural factors,\textsuperscript{9–11} family and community environment,\textsuperscript{12–14} and treatment goals,\textsuperscript{15} translating to unique needs that require culturally relevant interventions.\textsuperscript{16} In San Diego County we found that Latino schizophrenia patients underutilize mental health services, and they mostly live with family members, in contrast to Anglos, who more often live in board and care (B&C) facilities.\textsuperscript{11} In a survey conducted in San Diego,\textsuperscript{15} Latino schizophrenia patients desired psychosocial outcomes of improved symptom management and family relationships versus more “Westernized” goals for self-sufficiency.\textsuperscript{17} Thus, psychosocial interventions targeting better symptom management, medication management, everyday living skills, and improved psychosocial functioning need to be culturally tailored to Latinos.

The goal of this report is to describe the development of an intervention entitled Programa de Entrenamiento para el Desarrollo de Aptitudes para Latinos (PEDAL [Program for Training and Development of Skills in Latinos]), which is designed to enhance the functioning of Latino patients with schizophrenia who live in the community. Based on focus groups with monolingual-Spanish patients, their families, and providers, we developed an intensive manualized intervention for Latino schizophrenia patients. This intervention was specifically designed for community-dwelling middle-aged and older Latino patients with late-life psychotic disorder. The study was conducted in psychiatric clinics in San Diego County, whose clients were predominately Latino. After developing this intervention we conducted a pilot test of the protocol. We hypothesized that patients participating in the PEDAL intervention would show greater improvements in everyday functioning and in psychopathology compared to patients randomized to a time-equivalent friendly support group.

The staffing, organization, operational procedures, nature of the patient populations, and clinic neighborhood demographics in the 3 sites appeared to be similar. From this sample of 3 clinics, 2 were randomly chosen to receive PEDAL, and 1 was randomly assigned to a time-equivalent friendly support group (SG). Staff identified patients with schizophrenia over the age of 40, and we approached them and inquired about their interest in participation. Of the 40 patients approached, 31 signed our Institutional Review Board–approved consent form, and 29 completed the baseline assessment battery (2 dropped out before completing the baseline assessments). Those who refused appeared to be demographically and psychiatrically similar to participants. All participants were Latino, of Mexican descent, and monolingual Spanish speakers or preferred to communicate and be tested in Spanish. Twenty-one patients were recruited into the PEDAL condition, and 8, to the SG condition.

Patients had a DSM-IV-based chart diagnosis of schizophrenia or schizoaffective disorder. Patients who had a DSM-IV diagnosis of dementia or a serious suicide risk, could not complete the assessment battery, or were participating in any other psychosocial intervention or drug research at the time of intake were excluded from this study. The study was approved by the University of California–San Diego (UCSD) Human Subjects Protection Program.

**Demographics of PEDAL Intervention and Attention Control Groups**

Patients in the PEDAL condition were younger and had experienced their first episode of psychoses at an earlier age compared to those in the SG. The groups did not differ on other demographic characteristics (see table 1).

**Assessments**

All assessments were conducted in Spanish by bilingual, bicultural research assistants. Assessments were conducted at baseline, at the end of the 24-week intervention, and at 6- and 12-month follow-ups. Project staff were blind to group assignment. Study participants were paid $20 for completing assessment at each time point but were not paid for attending the intervention sessions. Bus or taxi fares were provided to attend assessment and intervention meetings when requested.

Previously published measures in Spanish were utilized whenever possible. Where necessary, measures were translated into Spanish and back-translated into English by our staff members who were all bilingual Mexican Americans. Psychometric properties and differences in symptoms (positive, negative, and general psychiatric symptoms) and functioning (UCSD Performance-Based Skills Assessment [UPSA], Medication Management Ability Assessment [MMAA], Social Skills Performance Assessment [SSPA]) between Caucasians and Latinos...
with schizophrenia have been reported in a separate publication. We found that Latinos reported more severe depressive, positive, negative, and general psychiatric symptoms than did Caucasians. In regard to functional adaptation skills, Latinos displayed lower UPSA and MMAA scores than did Caucasians. Even after controlling for age and severity of symptoms, differences remained between Latino and Caucasian patients' performance on the UPSA. These findings suggest that our instruments appear to be appropriate for use with the regional Latino population, but care must be taken in comparing results with other non-Latino populations.

The primary outcome for this study was change in functional skills assessed using 3 indicators. The first was the UPSA. The UPSA involves role-play tasks similar in complexity to situations that an older community-dwelling person is likely to encounter (i.e., general organization, management of finances, social and communication skills, transportation, and household management). We also utilized performance-based assessments of social functioning and medication management. In addition, we assessed psychopathological symptoms with the Positive and Negative Syndrome Scale and health-related quality of well-being with the Quality of Well-Being Scale. We also queried patients at each intervention session if they had found the information from the previous session helpful (response: helpful versus not helpful), whether they could recall the material from the previous session (if they were able to recall any material, a “yes” was recorded), and whether they had practiced using their newly learned skills outside the session (response: yes versus no). Degree of acculturation was measured by the Acculturation Scale for Mexican Americans.

Development of PEDAL

The basis for PEDAL was formed by our Functional Adaptation Skills Training (FAST) program, which has been previously described. Briefly, the intervention is a manualized, cognitive-behavioral intervention based on social cognitive theory. Developed for older psychosis patients who live in B&C facilities, the intervention focuses on improving 6 areas of everyday functioning: (a) medication management, (b) social skills, (c) communication skills, (d) organization and planning, (e) transportation, and (f) financial management. These 6 functional skill areas are taught in 24 semiweekly, 120-minute group sessions.

Table 1. Demographic Characteristics of the Sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Programa de Entrenamiento para el Desarrollo de Aptitudes para Latinos (n = 21)</th>
<th>Support Group (n = 8)</th>
<th>t</th>
<th>χ²</th>
<th>p-Values</th>
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</thead>
<tbody>
<tr>
<td>Age (years): mean (SD)</td>
<td>46.8 (7.3)</td>
<td>57.3 (9.3)</td>
<td>t(27) = −3.22</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Education (years): mean (SD)</td>
<td>8.4 (3.3)</td>
<td>8.3 (3.4)</td>
<td>t(27) = 0.13</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>Age of Illness Onset (years): mean (SD)</td>
<td>28.3 (11.0)</td>
<td>43.5 (9.3)</td>
<td>t(27) = −3.46</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td>Gender, n (%)</td>
<td></td>
<td></td>
<td>χ²(1) = 0.51</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>10 (48)</td>
<td>5 (63)</td>
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</tr>
<tr>
<td>Male</td>
<td>11 (52)</td>
<td>3 (37)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status, n (%)</td>
<td></td>
<td></td>
<td>χ²(5) = 6.10</td>
<td>.30</td>
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</tr>
<tr>
<td>Single</td>
<td>10 (47)</td>
<td>3 (38)</td>
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<tr>
<td>Cohabitating</td>
<td>2 (10)</td>
<td>0 (0)</td>
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<tr>
<td>Separated</td>
<td>1 (5)</td>
<td>2 (25)</td>
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<tr>
<td>Divorced</td>
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<td>0 (0)</td>
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<tr>
<td>Widowed</td>
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<td>1 (12)</td>
<td></td>
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<tr>
<td>Married</td>
<td>4 (19)</td>
<td>2 (25)</td>
<td></td>
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<tr>
<td>Living Situation, n (%)</td>
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<td></td>
<td>χ²(5) = 3.67</td>
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<tr>
<td>Alone</td>
<td>1 (5)</td>
<td>1 (12)</td>
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<tr>
<td>With Someone</td>
<td>19 (90)</td>
<td>6 (76)</td>
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<tr>
<td>Board and Care</td>
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<td>0 (0)</td>
<td></td>
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</tr>
<tr>
<td>Homeless</td>
<td>0 (0)</td>
<td>1 (12)</td>
<td></td>
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<td></td>
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<tr>
<td>Diagnosis, n (%)</td>
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<td></td>
<td>χ²(1) = 0.12</td>
<td>.73</td>
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<tr>
<td>Schizophrenia</td>
<td>12 (57)</td>
<td>4 (50)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizoaffective Disorder</td>
<td>9 (43)</td>
<td>4 (50)</td>
<td></td>
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<tr>
<td>Daily Neuroleptic Dose (mg chlorpromazine equivalent): mean (SD)</td>
<td>272.6 (286.3)</td>
<td>131.1 (94.6)</td>
<td>t(26) = 1.27</td>
<td>.22</td>
<td></td>
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</tbody>
</table>
sessions. For this study, group leaders were bilingual and bicultural and held either a master’s or doctorate-level degree. In order to adapt FAST for Latino patients we took 3 steps: (1) focus groups with patients, family, and providers; (2) translations of intervention and assessment materials; and (3) pilot test of the PEDAL intervention in monolingual Latino patients.

Focus Groups With Patients, Family, and Providers
We conducted 3 separate focus groups (4 family groups, 4 patient groups, and 1 provider group). There were 15 patient participants, 21 family members, and 7 providers (e.g., psychiatrists, social workers, and psychiatric nurses). All patients and family members identified as Mexican American, and all patients were living with family in the community. The patient and family groups were conducted in Spanish, and the provider group was conducted in both Spanish and English. Of the 7 providers, 3 identified themselves as being of Mexican origin, and others, as belonging to other Latino cultural groups (Peruvian, Columbian, Puerto Rican). Providers reported an average of 8.5 years of clinical experience in the Latino community. Across all groups, participants expressed their desire for this type of skill-based intervention that is tailored to Latinos in this region. All 3 types of groups confirmed the importance of family involvement in the intervention. Although family members expressed a desire to be involved on a regular basis, attendance at every session with the patient was regarded as unnecessary. Family members felt that 3 in-person sessions would be desirable and also expressed expectations for psychoeducational information and support on a periodic basis in the form of a worksheet. Specifically, family members desired information about medication and the illness and about strategies to relate better to the patient. Finally, patients and families expressed a strong desire for feedback regarding treatment services. All 3 groups reinforced the importance of Mexican cultural values and concepts, such as familismo (i.e., placing family over the individual),27–28 respeto (i.e., respect for older persons), and personalismo (i.e., an emphasis on and an expectation of closeness in personal relationships)28–29 in the manner in which services are delivered. Notably, the concept of functional “independence” was defined in sociocentric/interdependent terms. Family members expressed an acceptance of the patient’s limitations regarding employability and daily functioning. Rather, their expectations for the patient consisted of improved functioning in daily tasks, managing medications, and getting along with others. The perspectives of all these group participants indicated that the patient’s current home situation was seen as a long-term living situation.

Adaptation of FAST Materials to PEDAL
The adaptation of the FAST protocol to be culturally relevant for Latino patients was performed in 3 stages: (1) performing direct translation; (2) integrating culture-specific icons and idioms in the materials; and (3) basing format, content, and treatment goals on Mexican values and cultural scripts.

Translation of Materials. The translation process occurred over the course of 6 months in 4 steps to ensure that intervention materials were acceptable and understandable for this group: (1) all materials were translated into Spanish and back-translated by 2 different persons of Mexican origin; (2) all problematic texts, words, and test items were reviewed by a 4-person committee; (3) the resulting Spanish measures, intervention materials, and manuals were compared by bilingual intervention group leaders to the original English materials; (4) all translated modules were then reviewed independently for cultural congruence and refinement by 3 mental health professionals (1 Ph.D. and 2 master’s level) of Mexican origin; and (5) some materials were reviewed by consultants from the Instituto Nacional de Psiquiatría (National Institute of Psychiatry) in Mexico City.

Cultural Content Adaptation. Some scenarios, roles, and icons were modified with the input from focus groups and by our team and consultants. Modifications to scenarios included using appropriate examples with regard to managing finances (e.g., focusing more on the management of cash and coins instead of checks, money orders, and credit cards) and transportation (e.g., emphasizing working with family members for transportation needs instead of traveling independently). The planning and organization section was adapted greatly to conform to many patients’ unfamiliarity with the practice of planning daily events, specifically in planning doctor appointments. Thus, the introduction to this module was adapted to educate patients on the importance of planning ahead of time and the value to their health of organizing their daily activities and schedules. Financial management and written communication were altered to accommodate lower educational backgrounds. In the transportation module, education and materials about public transportation services for disabled persons were provided, as we found that our pilot group was not well acquainted with the public transportation system due to their reliance on family members. Last, icons, sayings, and activities common in the Latino tradition were incorporated (e.g., foods, songs, popular actors and singers, telenovelas soap operas, commonly used proverbs).

Cultural Values and Scripts. The last level in the adaptation of our intervention material involved incorporating concepts found to influence the therapeutic alliance among Latino patients. For example, intervention leaders emphasized simpatı́a (the use of polite social relations)29–30 and personalismo (emphasizing warm
relationships,\textsuperscript{28-29} which were of primary concern to patients and their families. Based on feedback from our focus groups and consultations with professionals in the Latino community, each module was reviewed session by session to ensure that these values were concordant with those expected by our target group. In all modules, gender-appropriate activities were substituted, and modifications were made with regard to culturally expected roles in our scenarios and examples (cooking and house chores for women; working on the car and yard maintenance for men). In the social and communication skills modules, the language of respect and hierarchical expectations in Latino culture were observed (use of formal style with \textit{tu} and \textit{usted}). Proper distance and respectfulness were employed to address the participants who were older than the group facilitators. In addition, the emphasis on assertiveness in these modules struck a careful balance between \textit{respetoformalidad} (i.e., respect and formality) and encouraging patients to clearly state their needs. In medication management sessions, handling medications involved a sense of \textit{orgullo} (i.e., pride) for many patients, owing to a desire to alleviate symptoms in order to contribute to the family. Thus, information on adhering to and understanding treatment regimens was modified to include the potential benefits of medication adherence to the family system (versus the benefits of independence).

\textit{Description of the PEDAL Intervention}

As mentioned previously, the PEDAL program was based on the FAST intervention, which focused on improving 6 areas of everyday functioning: medication management, social skills, communication skills, organization and planning, transportation, and financial management.\textsuperscript{25} We used 4 sessions for each of the 6 domains to maximize the benefit for persons with cognitive impairment (i.e., built-in repetition, review, and additional skills building). This also served to assist individuals who might have missed a session (by using makeup sessions, in-class repetition, and review), as skills taught in each session build upon those learned in previous sessions. Individual participants identified problem areas that they wanted to improve. For example, patient 1 functioned relatively independently and was able to use familiar bus routes but wanted to gain skills and confidence to use the entire bus system. In contrast, patient 2 had never used the bus system unless accompanied by someone and wanted to become skilled enough to use the bus to go to the local shopping mall. A typical session included the following: (1) setting the class agenda for the day; (2) patient evaluation of the previous session; (3) review of the materials and skills learned in the previous session; (4) brief discussion of the application of skills learned during the previous session to other life domains (generalization); (5) class break; (6) introduction to new concept and skills/review of current concept and skills; (7) in-session practice including behavioral modeling, role-playing, hands-on practice with props, and reinforcement; (8) review of skills learned during the session; and (9) a quiz (brief evaluation of retention of new skills taught in session). For example, session 2 in the medication management domain was structured in the following way: therapists (1) reviewed the agenda for the day; (2) reviewed material and skills from the previous session (completing a personal medication chart with medication names, dosages, and time of administration); (3) discussed problems and skills with a focus on generalizing behaviors to various settings; (4) introduced new material on the importance of medication tracking; (5) expanded the chart to include daily medication tracking; (6) introduced the use of pillboxes (behavioral modeling and practice with props); (7) reviewed skills learned in the session; and (8) administered an in-class quiz on daily medication tracking and the use of pillboxes.

Following the completion of the 24-week PEDAL intervention and the 6-month assessment, booster sessions were held monthly for 6 months to review and reinforce learned materials. At the completion of these sessions, the 12-month assessment was completed.

\textit{Format of the SG}

Participants randomized to the SG condition were assessed at the same time intervals as those in the PEDAL treatment condition. Participants were queried about participation in other interventions both prior to and following participation in the present study. None of the patients reported participating in any new psychosocial or pharmacological interventions during this study. Our control condition permits us to address the question of whether contact with subjects results in behavioral change. A support group format was deemed preferable to a wait-list control condition as it allowed us to address the impact of contact on behavioral change. Further, a support group helps disentangle the effects of self-report bias, historical trends, and maturation in relation to the effects of the intervention. All participants in the SG condition received their medications as usual and participated in 30 sessions (24 weekly and 6 monthly) lasting approximately 120 minutes each. The sessions provided a supportive environment for patients to address their problems. The structure of each session was as follows: (1) a 50-minute structured “check in,” during which each group member had the opportunity to report about his or her experiences over the previous week and reveal any concerns that she or he had at that time; (2) 20 minutes during which the therapist identified themes or concerns common to most group members (e.g., difficulty communicating with the doctor); and (3) 50 minutes to address any themes identified by the therapist. Rather than teach skills to group members, the role of the support therapist was to keep the group focused on the current theme being discussed and to encourage...
members to develop solutions for one another. Furthermore, the support therapist attempted to bridge lessons learned and themes discussed from 1 session to the next.

**Statistical Analysis**

There were 3 outcome measures of interest: UPSA, MMAA, and SSPA performance. For each outcome, our primary interest was change from baseline to immediately following intervention. Therefore, for each of the 3 outcomes, we conducted an analysis of covariance (ANCOVA) with the follow-up score as the dependent variable and the baseline score entered as a covariate. We conducted additional ANCOVAs to determine group differences on these outcomes at 6 and 12 months postintervention. Alpha for these tests was set at .05. Prior to examination of the intervention effects we evaluated the distributions of the outcome-related variables at baseline assessment. Where necessary, appropriate transformations were applied in order to improve distributions. Finally, all analyses were repeated using clinic site as a covariate to ensure that site did not account for our primary results.

**Results**

Twenty-nine participants completed the baseline assessment and at least part of each of the 3 follow-up assessments. Seventy-eight percent of PEDAL patients attended at least half of the sessions, and 10% attended all sessions. In comparison, 50% of patients in the SG condition attended at least half of the sessions, and none attended all sessions. Differences between groups in the number of sessions attended were not significant. Feedback from participants in the PEDAL condition indicates that approximately 83% found the material to be helpful, most recalled information presented in previous sessions, and 83% reported practicing newly learned skills outside of sessions.

**Patient Outcomes**

**Everyday Functioning.** Table 2 gives the scores for the PEDAL and SG groups on measures of everyday functioning. For the UPSA, there was a superior result for the PEDAL group at 6 months ($F[1,23] = 15.81, p = .001$). No significant differences were observed between the 2 groups at 12 months ($F[1,23] = 3.36, p = .081$) and 18 months ($F[1,21] = 0.52, p = .478$). One of the goals of this study was to determine effect sizes that then could be used to estimate the number of participants that would be needed to detect significant differences. As shown in table 2, the effect sizes (Cohen’s $d$ recommended cutoffs for small—0.2, medium—0.5, and large—0.8) for the UPSA were large at 6 months and 12 months but small at 18 months.

Results for the medication management task (MMAA) indicate that the PEDAL measures just missed significance at 6 months ($F[1,23] = 3.65, p = .069$). There were no group differences at 12 months ($F[1,21] = 0.73, p = .403$). At 18 months, the PEDAL group performed significantly better than the SG group ($F[1,20] = 4.92, p = .038$). The effect size was large at 6 months, small at 12 months, and large again at 18 months.

Performance on the social functioning performance task (SSPA) was nonsignificant at 6 months ($F[1,23] = 2.42, p = .134$), 12 months ($F[1,21] = 2.99, p = .099$), or 18 months ($F[1,21] = 1.25, p = .278$). The effect size was medium at 6 months, large at 12 months, and medium at 18-month follow-up.

Given our small sample size, we conducted post hoc power calculations to determine the number of participants required per group to detect significant group differences ($p < .05$) and a moderate effect size of 0.5. The results of these calculations indicate that approximately 64 participants would be needed per group.

**Symptoms and Health-Related Quality of Well-Being.** For the secondary outcomes of interest there were few significant differences between conditions. For the PANSS, the difference between groups was nonsignificant at both 6 months ($F[1,23] = 0.69, p = .413$) and 12 months ($F[1,21] = 0.35, p = .563$). However, there was a significant difference at 18 months ($F = 4.76, p = .041$). As can be seen in table 2, this difference was due to worse PANSS ratings in the SG group. The effect sizes were small at 6- and 12-month assessments and large at the 18-month assessment. Health-related quality of well-being scores did not differ at any time point: 6 months ($F[1,23] = 0.17, p = .684$), 12 months ($F[1,21] = 0.31, p = .586$), and 18 months ($F[1,21] = 2.75, p = .112$). The effect sizes were small at 6 and 12 months and medium at 18 months.

Because sociodemographic variables may contribute to the current findings, we reran our analyses with the following covariates to determine if they explained our primary results. In these analyses, we included clinic site, age of illness onset, age at the beginning of the study, and acculturation as covariates to ensure that they did not account for our primary findings. In all cases, these variables did not predict outcome, while main effects for group remained significant.

**Discussion**

Findings from this study suggest that older Latino patients with schizophrenia can improve their everyday living skills. Although change on our primary outcome measures (i.e., performance-based assessments) from baseline to immediately following the intervention (i.e., 6 months) did not reach statistical significance, the effects of the PEDAL program were all in the medium-to-large.
Furthermore, while the magnitude of these effects tended to dissipate by 12–18 months postbaseline, effect sizes continued to fall in the small-to-medium range at these assessment points (i.e., 0.32–0.99), indicating that PEDAL has effects long past the completion of the intervention.

Because the PEDAL does not target symptoms of psychopathology or health-related quality of well-being, we did not expect the intervention to significantly improve functioning in these areas compared to the SG condition. As expected, the PEDAL intervention did not demonstrate significant improvements from preintervention to immediately postintervention compared to the SG condition, and effect sizes were small. However, effect sizes in these constructs were large at the 18-month assessment. While caution should be urged in interpreting this finding, it is possible that improvements in the functional skills areas (i.e., UPSA, MMAA, and SSPA) helped produce delayed effects in psychopathology and quality of well-being. We plan to test this hypothesis in future studies.

It is unclear how the observed behavioral changes may translate into real-life functioning. Numerous factors influence functioning in natural settings. For example, different behaviors (e.g., transportation) may be facilitated or hindered by the availability of rapid transit systems in specific communities. In addition, there were wide ranges in skill proficiency and acculturation level among our participants. Our previous study of older Anglo patients found that patients with greater cognitive deficits improved over the course of the intervention, but their final level of achievement was significantly lower than that in those with better cognitive functioning. This finding appears to be similar in the present sample of Hispanics, where improvement in functioning was negatively correlated with cognitive function. Other factors that may influence an individual’s functioning include the presence of a family caregiver, the availability of rapid transit systems, and the acculturation level of the patient. We plan to test this hypothesis in future studies.

Our study has several strengths. First, we employed a randomized longitudinal design. Second, we used a theory-based intervention specifically designed for older Latino patients with psychotic disorders. The latter strength can be emphasized by our use of feedback from focus groups. Indeed, during this pilot study family members dropped off their patients and waited for them to finish the classes. This has led our team to develop additional modules and materials for PEDAL specifically designed for family members. How the inclusion of these sessions will affect outcome is untested to date. As expected, the PEDAL intervention did not demonstrate significant improvements from preintervention to immediately postintervention compared to the SG condition.

Table 2. Treatment Outcomes by Group

<table>
<thead>
<tr>
<th>Measure</th>
<th>6 Months</th>
<th>12 Months</th>
<th>18 Months</th>
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</thead>
<tbody>
<tr>
<td><strong>University of California–San Diego</strong></td>
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<td></td>
</tr>
<tr>
<td>Performance-Based Skills Assessment</td>
<td>69.91 (2.98)</td>
<td>48.32 (4.50)</td>
<td>62.85 (16.20)</td>
</tr>
<tr>
<td>Medication Management Ability Assessment</td>
<td>14.44 (9.89)</td>
<td>19.88 (10.06)</td>
<td>11.38 (7.10)</td>
</tr>
<tr>
<td>Social Skills Performance Assessment</td>
<td>30.83 (5.57)</td>
<td>28.5 (5.81)</td>
<td>32.38 (5.39)</td>
</tr>
<tr>
<td>Positive and Negative Syndrome Scale Total</td>
<td>56.89 (11.73)</td>
<td>58.50 (14.18)</td>
<td>55.06 (11.29)</td>
</tr>
<tr>
<td>Quality of Well-Being Scale</td>
<td>0.55 (0.11)</td>
<td>0.55 (0.10)</td>
<td>0.54 (0.11)</td>
</tr>
</tbody>
</table>

Note: PEDAL = Programa de Entrenamiento para el Desarrollo de Aptitudes para Latinos, SG = support group; Cohen’s d effect size is reported as standardized mean differences.
from our formative focus groups, such as incorporating culturally relevant themes and values into the intervention. This becomes particularly salient when considering the underutilization of mental health services reported among Latinos. We believe that the cultural adaptations we made increased the willingness of patients to utilize and benefit from the PEDAL intervention.

Despite the strengths of this study, it also has several limitations such as its reliance upon performance-based measures. While performance-based measures may reduce self-report bias, when faced with the real world in all its complexities it is unclear how patients’ behaviors will play out. There is a need for objective and unobtrusive alternatives to assessment in contrived laboratory settings. The present study did not examine the effectiveness of our intervention in relationship to gender, patterns of symptoms, past psychiatric history, degree of acculturation, degree of family involvement, or the importance of specific cultural factors (e.g., simpatico). Considering factors such as these may provide information to suggest more specific intervention designs. For example, less acculturated patients with less family involvement may require additional assistance in all areas, with further help needed with reintegration into the family. In contrast, more acculturated patients may be better served by programs that focus on employment issues. In addition, the PEDAL intervention was targeted only to the patients themselves. Involving patients’ families, care providers, and B&C staff to ensure that they are alert to the skills taught in the PEDAL and can reinforce these behaviors in the patients would likely enhance the efficacy of the intervention. It should also be noted that patients enrolled in this study were recruited from 3 clinics. While the intervention and control conditions were randomly assigned to these clinics, and clinics appeared to be similar, it is possible that staffing or organizational factors of the clinics or homes where patients live may facilitate or hinder learning and maintenance of the functional skills taught in PEDAL. Future studies should include more groups and attempt to characterize the features of treatment clinics and families that may mediate the success of the intervention. In addition, the Hispanic population in San Diego is predominantly of Mexican origin, and our findings may not generalize to Hispanics from other cultures. Finally, our sample size was small, and most of our patients were middle aged.

Findings from this study suggest that we have developed a program that will meet some common needs in Latino patients, will be acceptable in terms of duration, will address a range of skill proficiencies, and is promising in terms of demonstrating functional and real-world improvements. While the multideterminant nature of reaching maximum functional potential makes it difficult to estimate the real-world consequences of our intervention, we believe that rehabilitation success, even in small increments, is significant in terms of reduced human suffering. Nevertheless, our work points to a need to continue to improve and test behavioral interventions designed for older, seriously mentally ill Latino patients in order to improve their “real-world” functioning.

Acknowledgments

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References


