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Does Response to the STEPPS Program Differ by Sex, Age, or Race in Offenders with Borderline Personality Disorder?

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Abstract

Systems Training for Emotional Predictability and Problem Solving (STEPPS) is an evidence-based group treatment program for ambulatory patients with borderline personality disorder (BPD). The program was introduced to the Iowa correctional system in 2005, and groups have been ongoing ever since. In this analysis, we examine whether response to the STEPPS program differs based on sex, age (< 40/ 40 years), or race/ethnicity (minority/non-minority) using data collected in Iowa prisons and in community corrections. Subjects were recruited and assessed by correctional staff. Offenders with BPD were offered the opportunity to participate in the STEPPS program. The presence of BPD was assessed using a module from the Structured Interview for DSM-IV Personality. Efficacy assessments included the Borderline Evaluation of Severity Over Time Scale, the Beck Depression Inventory, and the Positive and Negative Affectivity Scale. The Client Satisfaction Questionnaire-8 assessed program satisfaction. Data on 77 offenders were analyzed. All participated in the STEPPS program and 53% completed all 20 weeks. The analysis showed that there were no significant differences in response to STEPPS in terms of sex, age, or race/ethnicity on any of the three efficacy measures. Women expressed greater satisfaction than men, but there were no differences with regard to age or race/ethnicity. The implications of the findings are discussed.

Keywords

Borderline personality disorder; group psychotherapy; STEPPS; sex, age, race

Systems Training for Emotional Predictability and Problem Solving (STEPPS) is a group treatment for ambulatory patients with borderline personality disorder (BPD).¹ The program combines skills training and psychoeducation with elements drawn from cognitive-behavioral therapy. STEPPS is considered adjunctive and not comprehensive because it is added to whatever treatment the patient is already receiving, such as medication or

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individual psychotherapy. The growing evidence-base now includes three randomized controlled trials and eight uncontrolled trials.² In a randomized controlled trial conducted by our group, we showed that STEPPS plus treatment as usual was more effective than treatment as usual alone and led to improvement in BPD symptoms, depressive symptoms, impulsivity, and in overall functioning.³ A randomized controlled trial in the Netherlands produced similar findings.⁴

STEPPS was introduced to Iowa's correctional system in 2005, to address the needs of offenders with BPD. There are few formal treatment programs for BPD in these settings, which affects up to 30% of incarcerated offenders.⁵ STEPPS has several advantages over other programs for BPD in correctional settings, including the fact that it is of relatively short length (20-weeks). This is important because offenders have varying sentence lengths and are often transferred or released without notice. Another advantage is that STEPPS is easily learned and implemented, important because corrections-based therapists have little time for extensive additional training and budgets are limited.⁶ Last, the STEPPS manual can be used without modification in these settings.

In a preliminary study of 12 women offenders, we reported that STEPPS produced measureable improvements in mood and behavior, and that the program was well accepted by prison staff and offenders.⁷ We later analyzed the experience of 77 men and women offenders (including the original 12 subjects) and reported significant improvement in BPD-related symptoms, mood, and negative affectivity.⁸ Suicidal behaviors and disciplinary infractions were also reduced. In a subanalysis, we found that presence of antisocial personality disorder did not interfere with improvement.⁹

We now report results from a subanalysis of data on subjects who attended a STEPPS group in one of Iowa's prisons or in community corrections. The purpose was to compare the outcome of offenders participating in the STEPPS program with regard to their sex, age, and race/ethnicity. Based in part on our earlier work at an academic medical center,³ we hypothesized that men and women offenders would respond equally well to STEPPS, and that age would not be a barrier to positive treatment response. We expected that overall satisfaction would also not differ between groups. We made no *a priori* assumptions about the comparison between minority and non-minority offenders.

Methods

The correctional data have been reported elsewhere.⁷⁻⁹ Data from the Iowa Department of Corrections were collected during the routine administration of STEPPS. Participation by offenders is optional and never required. Because data are gathered for program evaluation, data collection was not considered research and informed consent was not obtained. University of Iowa Institutional Review Board permission was granted for a secondary analysis of de-identified data. The BPD module from the SIDP-IV¹⁰ was used by correctional mental health staff to confirm the presence of BPD. Offenders were enrolled in STEPPS groups at one of three Iowa prisons or in a community corrections program located in Cedar Rapids, IA. Violent offenders and those requiring special programming (e.g., close supervision or segregation) were excluded because of security risks. STEPPS was delivered

by correctional staff, typically master's level psychologists trained and supervised by one of the authors (NB).

For this subanalysis, efficacy measures of interest included all items from the Borderline Evaluation of Severity Over Time (BEST),¹¹ the Beck Depression Inventory (BDI),¹² and the Positive and Negative Affectivity Scale (PANAS).¹³ The BEST is a self-report instrument that is used to rate severity and change in BPD symptoms and is reliable and valid. The BEST was administered at baseline and weeks 4, 8, 12, 16, and 20 to subjects in both the randomized controlled trial and correctional samples. The Client Satisfaction Questionnaire-8 (CSQ-8)¹⁴ was administered at the conclusion of the program to assess the offender's overall satisfaction with STEPPS.

Brief Description of STEPPS

STEPPS is a manual-based 20 session program for ambulatory patients with BPD that combines cognitive behavioral elements with skills training, but does not involve individual therapy.¹ Key elements include psychoeducation about BPD, emotion management skills training, and behavior management skills training. A *systems* component is unique to the program, and involves education about BPD for family members and friends (corrections officers in the prison setting). Sessions are highly structured with specific therapist guidelines for each session, materials needed, and the homework assignment. Each skill builds upon the previously-taught skills. While specific skills are taught during group sessions, participants are expected to practice them during the week between sessions. Use of specific skills is identified from the previous week, and homework is reviewed while a new skill is then introduced. Each session has a specific handout, including an agenda, material pertinent to the skill, and the homework assignment for the next week. The program did not require modification for the correctional setting.

Statistical Analysis

We examined subgroup differences in response trajectories for three outcomes (BEST, BDI, PANAS). Subgroups were defined by gender, race/ethnicity (minority and Caucasian), and age group (<40/ 40). Each subject's trajectory of scores from baseline to week 20 was summarized with a subject-specific intercept and slope, and each group's mean slope measures improvement over the course of STEPPS treatment.

Effect sizes were computed as the mean improvement from baseline to week 20, divided by the standard deviation at baseline. Interactions between subgroup indicators and slope were used to test for differences in improvement by gender, race/ethnicity, and age. Significant interactions indicate an association between the subgroup indicator and level of improvement over the 20-week treatment period.

A secondary analysis examined subgroup differences in satisfaction with the STEPPS training program. Level of satisfaction was measured with the CSQ-8 for 37 of 41 incarcerated offenders who completed the 20 week program. The two-sample T-test was used to test for differences in satisfaction by gender, race/ethnicity, and age group. For the primary and secondary analyses, a significance level of 0.05 was used. Analyses were carried out using SAS.¹⁵

In addition to the dimensional outcomes, number of suicidal and self-harm behaviors (pooled together as “suicidal behavior”), and disciplinary infractions (occurring in prison) were recorded for each 4-week period. For analyses, two dichotomous variables were created – one representing any suicidal behaviors and another representing any disciplinary infraction over the past 4 weeks. Our earlier correspondence showed that occurrences of suicidal behaviors (attempts of suicide or self-harm) and disciplinary infractions improved significantly over the course of the 20 week training program.⁸ The logistic mixed-effects model was used to test for improvements in the dichotomous outcomes. Each subject’s trajectory of events from baseline to week 20 was summarized with a subject-specific intercept and slope, again allowing STEPPS efficacy to be tested by the mean slope. Subjects’ status (prison vs. community-based program) was used as a covariate because we expected events to be tracked less thoroughly for the community-based sample. Extending the logistic mixed-effects model, interactions between subgroup indicators and slope were tested. Significant interactions would indicate an association between the subgroup indicator and level of improvement (in suicidal behaviors or disciplinary infractions) over the 20-week treatment period.

Exploratory analyses were conducted to examine subgroup differences in responses to individual items of the three assessments (BEST, BDI, PANAS). The secondary analysis used the same linear-mixed effects model with interaction tests as used for the primary analysis. These analyses could reveal that specific symptoms improve more for certain subgroups during the course of STEPPS treatment. There were 96 items administered across the three assessments (15 BEST, 21 BDI, and 60 PANAS). The items from the BEST and PANAS used 5-point rating scales while the BDI used a 4-point rating scale.

Results

The 77 subjects enrolled in STEPPS included 14 men, 63 women; 65 Caucasians, 7 African Americans, 1 Native American, and 4 of unknown race/ethnicity; 40 subjects aged 19–29, 20 aged 30–39, 15 aged 40–50, and 2 of unknown age. Subjects were grouped as Non-minority (i.e., Caucasian) or minority and into two age groups (<40/≥40). Table 1 shows the number of subjects in each subgroup assessed at baseline, and at weeks 4, 8, 12, 16, and 20 of the STEPPS program. Overall, 41 of the 77 (53%) subjects completed the program and were assessed at week 20. Completion rate varied by sex (59% for women, 29% for men, $p=0.04$).

Improvements in BPD-related symptoms, mood, and negative affectivity were assessed by comparing means at baseline to those in subsequent weeks using a linear mixed-effects model (Table 2). The effect sizes (d) reported in Table 2 measure the mean change in outcome in standard deviation units, and positive values represent improvement. The effect sizes show a general pattern of improvement consistency across subgroups. For example, for BEST total score, effect size ranged from 1.16 for racial/ethnic minorities to 1.65 for men. Interaction tests did not detect any significant differences in improvement by gender, age, or race/ethnicity.

While not meeting the 0.05 significance threshold, relatively large differences in improvement were observed for subjects less than 40 (vs. subjects 40 and older) on BEST positive behaviors ($d=1.12$ vs. 0.18) and PANAS positive affectivity ($d=0.78$ vs. 0.21). Similarly, relatively large differences in improvement were observed for women (vs. men) on BEST positive behaviors ($d=1.03$ vs. 0.17), PANAS positive affectivity ($d=0.39$ vs. -0.40), and PANAS negative affectivity ($d=0.81$ vs. 0.33). Collectively, these results suggest lower levels of improvement in mood -- particularly positive expressions -- for men and older individuals.

Level of satisfaction with the STEPPS training program was measured with the CSQ-8 for 37 of 41 incarcerated offenders who completed the 20 week program. Satisfaction with the STEPPS training program was higher for women than men. The mean CSQ-8 score was 29.0 for women and 23.3 for men ($p=0.001$). Satisfaction did not vary significantly by age or race/ethnicity.

While improvements in suicidal behavior and disciplinary infractions were previously reported for the total sample, we found no significant interactions between subgroup indicators and slope for these outcomes. There were no detectable differences across subgroups in suicidal behavior or disciplinary infractions.

Discussion

The data show that at least among offenders with BPD, response to STEPP does not appear to vary by sex, age, or minority/non-minority status, partially confirming our hypotheses. With regard to overall program satisfaction, women expressed greater satisfaction, but there were no differences in satisfaction by age or race/ethnicity. These findings are important because men and minority persons are overrepresented in correctional settings so that treatment programs must be accepted by and effective for these individuals.⁵

In reviewing the literature, there are very few studies of psychotherapies for BPD that address the association of age^{16–20} or gender^{17, 19, 20} with outcome. In those studies, there were no significant associations with either baseline characteristic. To our knowledge, no study has examined the effect of race or ethnicity on outcome. At least with regard to STEPPS programs conducted in correctional settings, minority status and male sex are not barriers to experiencing positive improvement.

The data are largely consistent with findings from our randomized controlled trial of STEPPS plus treatment as usual compared to treatment as usual alone.²¹ In that study, we reported in an analysis of variables associated with a positive response to STEPPS plus treatment as usual that age and gender were not important predictors. Due to the sparse sample of minority subjects, we were unable to assess the effect of race/ethnicity.

There are several limitations to acknowledge. First, we experienced relatively high attrition among offenders. That said, most attrition resulted from offenders being released from prison or being reassigned to another prison, not program dissatisfaction. Next, for this study, we pooled subject samples collected at different times and places, each involving a different set of therapists. Nonetheless, all were systematically evaluated for BPD and assessed using

validated instruments. Because violent offenders, those requiring special programming (e.g., close supervision, segregation, seclusion), and those requiring maximum security were not included, the findings cannot be generalized to these groups. Last, because subgroups were small (14 men, 8 racial/ethnic minorities, and 15 subjects age 40 and older), there is little power for detecting subgroup differences in improvement during the 20-week STEPPS training session. While some large subgroup differences in effect size were observed, none were statistically significant. The sample size problem was exacerbated by a 47% non-completion rate, and the comparisons of satisfaction with the STEPPS training program was limited to completers. Also, the exploratory item analysis entailed many comparisons, increasing the threat of type 1 errors in detecting group differences.

Conclusions

The results show that STEPPS is effective in offenders regardless of sex, age, and race/ethnicity, though the program has greater levels of satisfaction in women. This is encouraging because of the high proportion of offenders who are male and minority members. Future research should focus on addressing how the program might be modified to have greater appeal to men and lead to higher levels of satisfaction. Based on these results and our personal experience we believe that offenders should not be excluded from participation from STEPPS based on their baseline characteristics of age, sex, or race/ethnicity, although other factors such as potential for violence may be exclusionary.

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Highlights

1. Seventy-seven offenders participated in the STEPPS program for borderline personality disorder in correctional settings.
2. Positive response to the STEPPS program did not significantly differ in men and women, young (<40 years) and old (≥ 40 years), and minority vs. non-minority subjects.
3. At least in correctional settings, age, sex, and race/ethnicity should not be used as factors to exclude individuals from participating in STEPPS.

Table 1.

Number of subjects assessed by week of STEPPS participation

Group	Baseline ^I	Week				
		4	8	12	16	20
Total	76	69	48	47	42	41
Female	62	55	37	39	38	37
Male	14	14	11	8	4	4
Minority	8	5	3	4	4	4
Caucasian	65	60	45	43	37	36
Age ≥40 years	14	13	9	7	6	6
Age<40 years	60	54	39	40	36	35

^I Note that data were not collected for one of the 77 subjects at baseline; therefore, the total sample size for baseline is 76.

Table 2.

Changes in Symptom Severity, Depression, and Positive and Negative Affectivity for Offenders Participating in STEPPS, by Subgroup

Outcome	Group	N	Baseline		Week 20 Mean ¹	Slope		d	p-value
			Mean	SD		EST	SE		
BEST Thoughts/ Feelings	Total	77	21.1	7.5	12.4	-0.42	0.06	1.12	<0.001
	Female	63	21.1	7.7	12.3	-0.43	0.06	1.10	<0.001
	Male	14	21.1	6.5	12.0	-0.44	0.19	1.35	0.043
	Minority	8	23.5	8.4	11.5	-0.49	0.15	1.18	0.033
	Caucasian	65	20.9	7.3	12.4	-0.43	0.06	1.16	<0.001
	Age 40	15	19.5	8.1	10.1	-0.46	0.08	1.14	<0.001
	Age < 40	60	21.4	7.4	12.8	-0.42	0.06	1.13	<0.001
BEST Negative Behaviors	Total	77	8.4	3.7	5.2	-0.16	0.02	0.86	<0.001
	Female	63	8.3	3.7	5.1	-0.16	0.02	0.85	<0.001
	Male	14	8.9	3.9	4.9	-0.20	0.06	1.04	0.007
	Minority	8	9.3	3.7	5.3	-0.18	0.06	0.96	0.044
	Caucasian	65	8.4	3.8	5.1	-0.16	0.02	0.86	<0.001
	Age 40	15	7.9	4.1	4.1	-0.15	0.04	0.75	0.001
	Age < 40	60	8.6	3.7	5.4	-0.16	0.02	0.88	<0.001
BEST Positive Behaviors	Total	77	10.2	3.0	13.0	0.14	0.03	0.95	<0.001
	Female	63	10.3	3.1	13.4	0.16	0.03	1.03	<0.001
	Male	14	9.7	2.4	10.6	0.02	0.13	0.17	0.879
	Minority	8	10.0	3.5	13.6	0.19	0.06	1.07	0.031
	Caucasian	65	10.3	2.9	12.9	0.13	0.03	0.92	<0.001
	Age 40	15	11.0	3.4	11.6	0.03	0.10	0.18	0.757
	Age < 40	60	9.9	2.9	13.2	0.16	0.03	1.12	<0.001
BEST Total	Total	77	34.3	11.1	19.5	-0.72	0.08	1.31	<0.001
	Female	63	34.1	11.5	18.9	-0.75	0.08	1.30	<0.001
	Male	14	35.4	9.3	19.5	-0.77	0.33	1.65	0.038
	Minority	8	37.8	14.8	18.3	-0.86	0.21	1.16	0.015
	Caucasian	65	34.1	10.7	19.6	-0.73	0.09	1.36	<0.001
	Age 40	15	31.4	11.1	16.1	-0.73	0.12	1.32	<0.001
	Age < 40	60	35.1	11.1	20.1	-0.73	0.09	1.32	<0.001
BDI Total	Total	77	25.5	13.5	10.6	-0.73	0.08	1.08	<0.001
	Female	63	26.6	13.9	10.7	-0.79	0.08	1.13	<0.001
	Male	14	20.6	10.6	11.9	-0.37	0.25	0.69	0.162
	Minority	8	24.8	13.3	13.4	-0.57	0.18	0.86	0.032
	Caucasian	65	25.8	13.5	10.3	-0.75	0.09	1.12	<0.001
	Age 40	15	25.2	11.9	10.4	-0.72	0.19	1.21	0.002

Outcome	Group	N	Baseline		Week 20	Slope		d	p-value
			Mean	SD	Mean ^I	EST	SE		
	Age < 40	60	25.5	13.9	10.5	-0.73	0.09	1.05	<0.001
PANAS Positive Affectivity	Total	76	28.1	8.1	30.2	0.12	0.07	0.29	0.087
	Female	62	27.7	8.3	30.6	0.16	0.07	0.39	0.029
	Male	14	29.7	7.4	27.3	-0.15	0.21	-0.40	0.488
	Minority	8	33.4	8.1	31.8	-0.07	0.17	-0.16	0.708
	Caucasian	64	27.5	8.1	29.9	0.13	0.07	0.32	0.084
	Age 40	14	27.2	7.9	35.0	0.31	0.29	0.78	0.308
	Age < 40	60	28.3	8.3	29.5	0.09	0.07	0.21	0.225
PANAS Negative Affectivity	Total	76	27.6	9.1	20.5	-0.31	0.06	0.69	<0.001
	Female	62	27.7	9.0	19.9	-0.36	0.06	0.81	<0.001
	Male	14	27.3	10.2	22.0	-0.17	0.28	0.33	0.555
	Minority	8	29.6	10.3	17.6	-0.56	0.16	1.09	0.024
	Caucasian	64	27.8	9.0	20.8	-0.30	0.07	0.66	<0.001
	Age 40	14	28.6	10.3	20.2	-0.40	0.16	0.77	0.027
	Age < 40	60	27.6	9.0	20.7	-0.30	0.07	0.67	<0.001

^I Because not all subjects were assessed at week 20, the mean is derived from the linear mixed-effects model mean intercept and slope estimates.

BEST=Borderline Estimate of Severity Over Time; BDI=Beck Depression Inventory; PANAS=Positive and Negative Affect Schedule