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Efficacy of a Stress Management Module in Managing Stress and Clean Time in Dual Diagnosis (Mental Illness and Substance Misuse) Clients

Patricia Precin

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Abstract

A 1-year pilot quasi-experimental efficacy study of the Stress Management for Recovery Module (SM) was performed with 37 dual diagnosis (DD) clients from a DD outpatient clinic in the United States. It was hypothesized that clients who received the SM would show more improvement in their ability to manage stress and clean time than controls and when compared to themselves before and after the SM intervention. Outcome data showed that clients who received the SM learned new material and used it to make changes in their lives. Results from paired sample t tests demonstrated that clients who received the SM showed a significant improvement in their number of clean days during intervention as compared to before ($p = 0.008$). Clients showed a significant improvement in their knowledge of stress after the intervention as compared to before (pre- versus post-test) ($p = 0.033$), but there was no significant difference when compared to the control group. These results indicate that this SM is an effective method for improving stress management skills and clean time in DD clients at this clinic and a need for future randomized and controlled experimentation.

Keywords: living skills, occupational therapy, addiction

1. Introduction and literature review

Over the last 30 years, clinical researchers have been establishing best practices for dual diagnosis (DD) clients (clients diagnosed with a chronic major mental illness and substance abuse or dependence). Treatment techniques often involved motivational enhancement, peer support, harm minimization, and relapse prevention. Group treatment usually focused on psychoeducation on drug use and mental health, reasons for drug use, reasons to change,

harm reduction strategies, planning for the future, assertiveness training to cope with high risk situations [1–3], leisure activity development [4], and skills training (stress management, time management, and social skills including assertiveness training) with an emphasis on problem solving [5, 6], refusal of drugs, and coping with cravings throughout topics. Treatment facilities included both inpatient and outpatient programs. Most of these researchers used an intervention group that ran anywhere from 2 to 18 months [7] with a closed cohort group, or an open group of ongoing duration where clients were discharged after meeting the group's objectives. Timko, Dixon, and Moss [8] reported 70% of the 298 nationwide *psychiatric* residential Veterans Affairs treatment facilities in their study offered some form of stress management treatment for their DD clients and 90% out of 114 nationwide *substance abuse* residential Veterans Affairs treatment facilities they studied offered some form of stress management treatment for their DD clients.

Even though the efficacy studies above all included some form of stress management to help clients develop alternative ways to manage their problems, there have been few studies published to date that examine the effects of a treatment group focused exclusively on stress management training for DD clients. Yet, many clinician/authors have stated that the inclusion of stress management training in a DD rehabilitation program is imperative. Hodgson et al. [4] stated that DD clients need to develop alternative coping behaviors to substance misuse. Lindsay [9] believed that one of the major roles of a therapist working in alcohol treatment facilities is to help clients identify daily problems and learn to cope with them in new ways that do not include substance misuse. Patrick [10] stated that persons with schizophrenia and substance misuse are particularly susceptible to stress, both perceived and anticipated, and that stress management helps prevent relapse in these clients. Goldman and Barr [11] offered an explanation for increased anxiety and depression upon drug cessation, the rapid decrease in abnormally high (from substance misuse) levels of dopamine. Gutman [12] recommended stress management to deal with these intense initial emotions but also ongoing emotions, since addiction effects neurological pathways throughout the lifespan even after drug cessation. Buijsse et al. [13] suggest stress management training to teach techniques that can be used to decrease the effects of environmental stress on people who misuse substances.

The Living Skills Recovery Curriculum (LSRC) [14] is a treatment intervention that helps DD clients acquire basic living skills. It contains four different modules: Activities of Daily living for Abstinence, Social Skills for Sobriety, Time Management for 12-Step Treatment, and Stress Management for Recovery. Each skill is taught in relation to how it aids in relapse prevention and recovery for each client's personal lifestyle and pattern of addiction.

The purpose of this study was to examine the efficacy of the Stress Management Recovery training module on reducing substance misuse and increasing the ability to manage stress in DD clients with the hope that it can be utilized in other settings by occupational therapists. A reduction in substance misuse is defined as an increase in the number of days sober, or a decrease in the length of drug relapses, or a decrease in the number of drug relapses. The ability to manage stress is defined as the use of healthy coping skills to manage daily stressors. The hypothesis is that clients who received the LSRC's SM would show more improvement in

their ability to manage stress and clean time than controls and when compared to themselves before and after SM intervention.

2. Method

2.1. Sample

The subjects in this 1-year quasi-experimental efficacy study (both experimental and control) were adults (over 18 years of age) from a DD outpatient clinic in a metropolitan hospital in the United States where the average length of stay was 5 years. The clinic was in operation Monday through Friday from 9:00 am to 2:00 pm. Both experimental and control group clients received treatment through the DD clinic as clinically necessitated. Treatment for both groups included the possibility of substance misuse groups, vocational groups, task groups, music therapy, nursing intervention, and psychiatric services. All received once-a-week case management services and random drug screens. All gave written consent to be in the study.

The total number of subjects in the experimental group (those that received the LSRC's SM) was 21. For their demographics, see **Tables 1** and **2**. Some of the clients' clean time data were not available before the SM began because these clients started the SM when they started the program. For some other clients, clean time measures could not be obtained 4 months after the SM because they graduated from the program. Therefore, when statistical analyses on clean time were performed, the number of clients (N) in the groups varied. Occasionally, some of the clients preferred not to take the pre- or post-test; so the N was adjusted accordingly and reported separately for each outcome. The total number of subjects in the control group was 16. Their demographics are also reported in **Tables 1** and **2**.

	Experimental		Control	
Demographic	#	%	#	%
Median age	18	37	16	36
Male	12	67	11	66
Female	6	33	5	34
African-American	12	67	11	68.75
Caucasian	3	12	2	12.5
Hispanic	2	11	2	12.5
Other	1	9	1	6.25
Mean # psychiatric hospitalizations	18	6	16	6
Mean # detoxifications	18	1	16	1
Mean # of rehabilitations	18	0.5	16	1

Table 1. Demographics of experimental and control groups.

	Experimental		Control	
Diagnoses	#	%	#	%
Schizophrenia with				
Polysubstance	5	28	8	50
Crack	3	17	4	25
Alcohol & crack	3	17		
Alcohol & cocaine	1	5.5		
Alcohol & marijuana	1	5.5	1	6.25
Cocaine	1	5.5		
Alcohol	1	5.5	2	12.5
Marijuana	1	5.5		
Marijuana & crack	1	5.5		
Other	1	5.5	1	6.25
Total	18	100	16	100

Table 2. Diagnostic Statistical Manual diagnoses.

2.2. Treatment

The SM of the LSRC included 16 topic areas dealing with stress management for recovery. The topics provided a structured skeleton useful to elicit personal information from clients on their strengths and problem areas in coping with stressful recovery situations and identifying stressful situations and their personal signs of stress. Topics also provided stress management techniques that had to do with recovery, such as developing alternative coping strategies that did not involve drugs, managing raw emotions (anger management), identifying triggers and warning signs, relaxation skills, stretching exercises, biofeedback, nutrition, music, poetry, crafts, and how to work through relapses. The SM utilized a cognitive behavioral approach to recovery and living skills acquisition. Paradigms of treatment included peer support (universality from group intervention), harm minimization, and relapse prevention. Goal setting and problem solving skills were emphasized throughout all topics.

2.3. Measures

2.3.1. Pre-test

A pre-test was administered to both the experimental group and control group the day before the SM began in order to determine the clients' knowledge of stress management prior to

intervention. The pre-test used was a paper and pencil open-ended questionnaire with six questions on stress management that was replicated from Precin's *Living Skills Recovery Workbook* [14] for this population. No reliability or validity studies have yet been published using this questionnaire. Clients completed the questionnaire in 5–10 min.

2.3.2. Post-test

A post-test was administered to both the experimental group and control group the day after the SM ended in order to determine how much of the SM material was learned and/or relearned, stored, and recalled after 4 months of SM intervention. The post-test was the same as the pre-test, and clients were able to complete it in 5–10 min.

2.3.3. Outcome measures

2.3.3.1. Attendance

Attendance was a measure of the number of sessions attended per client in the experimental group.

2.3.3.2. Objectives

Each session of the SM had approximately 4–6 objectives to be learned by each client as listed in the LSRC Group Leader Plans [14]. Scores were percentages of total possible objectives that a client met on the days he or she attended the SM. This was a measure of the amount of material learned each session and only gathered for the experimental group.

2.3.3.3. Goals

Goals were the number of SM-related goals that the clients in the experimental group achieved during the 4-month treatment period. This is a measure of how well material generalized to the outside.

2.3.3.4. Members report that they learned new material (MRLNM)

At the end of the intervention, each client in the experimental group completed a satisfaction questionnaire [14] in which he or she stated whether or not they learned new material.

2.3.3.5. Members report that they made changes in their lives (MRMCL)

At the end of the intervention, each client in the experimental group completed a satisfaction questionnaire [14] in which he or she stated whether or not they made changes in their lives due to the SM intervention.

2.3.3.6. Staff observations (SO)

At the end of the 4-month intervention period, staff members not involved in the LSRC reported whether they thought their clients in the experimental group's skills in stress management improved, stayed the same, or got worse during the 4-month intervention period.

2.3.3.7. Clean time

Clean time was collected three different ways to increase the accuracy of measuring substance use. The number of clean days (#CD), the number of relapses (#R), and the average length of relapse (ALR) were counted 4 months before, during, and 4 months after intervention. To control for the influence of other aspects of treatment taking place in the dual diagnosis clinic, the same clean time measures (#CD, #R, ALR) were gathered at enrollment. Clean time measures were obtained from the clients' charts through the substance abuse counselor's documentation of drug screen results.

2.4. Procedures

Treatment began after the facility's Internal Review Board approved this study under an exempt status because no risks were involved and no invasive procedures were used. The LSRC's SM was run in the DD clinic by an occupational therapist for 4 months three times consecutively in 1 year. Clients attended twice-a-week. Each time, the module was run with seven clients in the group, so that at the end of a year, a total of 21 clients received the SM and constituted the experimental group.

The control group consisted of clients in the DD clinic not currently assigned to the module who gave consent to be in the study through their case managers. There were three control groups of six, five, and five clients each with a total of 16 clients. Each time, outcome measurements were taken from the SM experimental group, and the same outcome measures were gathered from each control group. Data were gathered, recorded, and analyzed by the author.

2.5. Statistical and data analysis

Statistical data were analyzed using the Statistical Package for the Social Sciences (SPSS) program. Percentages were calculated by the author. In order to examine the effectiveness of the LSRC SM, a within subjects, paired t-test was used to compare the difference in post-test scores from the pre-test scores. In addition, an independent t-test was used to compare the participants of the SM to controls to see whether the change in score was due to the intervention or to participation in the program. The data distribution was evaluated using Leven's test for Equality of Variance. For non-normal data, the Mann-Whitney U test (a nonparametric statistic) was employed. Findings with a *p* value < or = to 0.05 were considered statistically significant. To further examine the effectiveness of the LSRC, percentages of the number of objectives met, attendance, MRLNM, MRMCL, and SO, along with the number of goals met were

calculated for clients in the experimental group. Within subjects analyses, using paired t tests were performed to investigate whether the DD members significantly increased their clean time during and after receiving the SM as compared to their previous amount of clean time before intervention began. Correlations using a Pearson-product moment correlation coefficient were used to answer the following investigative questions. Was newly learned material lost over time? Was attendance a factor in clients' progress? Did staff's observations correlate with members' self-reports of progress and/or objective findings? Did members' self-report of progress correlate with other objective findings? Did the number of goals met on the outside correlate with the amount of material each patient learned throughout the session? Do patients who report having learned new material also tend to report that they made changes in their lives due to the SM? Pearson-product moment correlation coefficients were also used to see whether there were any correlations between demographics and the ability to utilize the SM.

3. Results

3.1. Change in pre- and post-test values

The change in pre- and post-test values between experimental and control groups over time is presented in **Table 3**. For 18 members in the SM experimental group, the mean pre-test in SM was 0.30 ($SD = 0.16$). This increased to a 0.46 ($SD = 0.26$) post-SM score. This increase in value was statistically significant ($p = 0.033$) within the experimental group as per a paired samples t test. For the 16 individuals in the control group, the mean pre-test in SM was 0.15 ($SD = 0.19$). This increased to a 0.22 ($SD = 0.21$) post-SM score. This increase in value was not statistically significant ($p = 0.331$) within the control group as per a paired samples t test. The rate of change between pre- and post-test scores was compared in the experimental group with the control group. The average change from pre- to post-test for the experimental group was 0.16, whereas the average change for the control group was 0.07. The resulting p value of 0.92 ($t[19] = -0.10$) generated from an independent t test reflecting the magnitude of change per groups (experimental verses control) was not statistically significant. The 95% confidence interval for the mean difference between the two was -1.91 to 1.73.

Treatment				Control				p-Value
Pre-test		Post-test		Pre-test		Post-test		
N	M (SD)	N	M (SD)	N	M (SD)	N	M (SD)	
18	0.30 (16)	18	0.46 (0.26)	16	0.15 (0.19)	16	0.22 (0.21)	0.92

Note: *p*-Value is derived from unpaired t test on the mean change from pre-test to post-test and reflects a paired analysis reflecting the magnitude of change per groups.

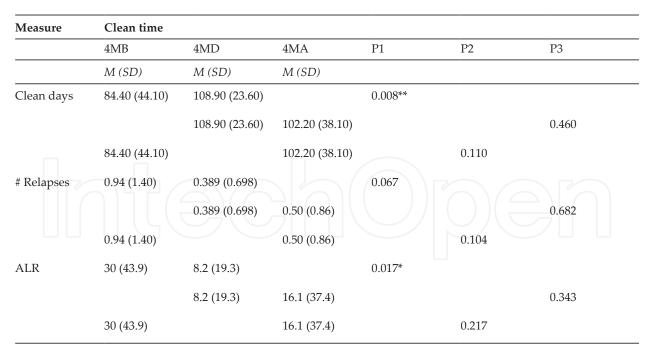**Table 3.** Average change from pre- to post-test values between treatment and control groups over time.

3.2. Effectiveness of SM on the experimental group

The 21 clients in the SM experimental group achieved an average of 77% of the total number of objectives possible in SM on the days they attended. The average number of goals related to stress management achieved by each client during the SM was four. The average attendance throughout the 4 months was 63%. Ninety-one percent of the clients reported that they learned new material, and 86% reported that they made changes in their lives as a result of the SM training. The staff observed that 73% of the clients showed improvement in their ability to manage stress during the intervention.

3.3. Substance use

3.3.1. Clean days

For the results of the #CD, see **Table 4**. For 18 individuals in the SM, the mean #CD 4 months before treatment was 84.4 ($SD = 44.1$). This increased to 108.9 ($SD = 23.6$) during intervention. This increase in value was statistically significant ($t[17] = -3.01$, $p = 0.008$) within the experimental group as per paired samples t test. The 95% confidence interval for the mean difference between the two was −41.58 to −7.30. There was a slight drop in the #CD 4 months after intervention ($M = 102.2$, $SD = 38.1$). This drop was not significant when compared to the #CD 4 months before treatment ($t[17] = 1.69$, $p = 0.11$, 95% CI −4.46 to 40.02) or the #CD during intervention ($t[17] = -0.76$, $p = 0.46$, 95% CI −25.07 to 11.74).

Measure	Clean time					
	4MB	4MD	4MA	P1	P2	P3
	M (SD)	M (SD)	M (SD)			
Clean days	84.40 (44.10)	108.90 (23.60)		0.008**		
		108.90 (23.60)	102.20 (38.10)			0.460
	84.40 (44.10)		102.20 (38.10)		0.110	
# Relapses	0.94 (1.40)	0.389 (0.698)		0.067		
		0.389 (0.698)	0.50 (0.86)			0.682
	0.94 (1.40)		0.50 (0.86)		0.104	
ALR	30 (43.9)	8.2 (19.3)		0.017*		
		8.2 (19.3)	16.1 (37.4)			0.343
	30 (43.9)		16.1 (37.4)		0.217	

Notes: P1 = the magnitude of difference (p) between 4MB and 4MD, P2 = the magnitude of difference (p) between the magnitude of difference between 4MD and 4MA, P3 = the magnitude of difference (p) between 4MB an 4MA, 4MB = 4 months before treatment began, 4MD = 4 months during treatment, 4MA = 4 months after treatment, * = significant at the $p < 0.05$ level, ** = significant at the $p < 0.01$ level.

Table 4. Clean time comparisons before, during, and after treatment through paired t tests, $N = 18$.

3.3.2. Relapses

For the results of the #R, see **Table 4**. For 18 individuals in the SM experimental group, the mean #R 4 months before intervention was 0.944 ($SD = 1.4$). This decreased to 0.389 ($SD = 0.698$) during intervention. This decrease in value was marginally significant ($t[17] = 1.97$, $p = 0.066$) within the experimental group as per paired samples t test. The 95% confidence interval for the mean difference between the two was −0.04 to 1.15. The mean #R 4 months after intervention was 0.500 ($SD = 0.857$). The difference between the average #R 4 months before intervention and 4 months after intervention was not significant ($t[17] = −1.72$, $p = 0.104$, 95% CI −0.99 to 0.10), nor was the difference between the average #R during intervention as compared to 4 months after intervention ($t[17] = 0.42$, $p = 0.682$, 95% CI −0.452 to 0.674).

3.3.3. Average length of relapses

For the results of the ALR, see **Table 4**. For 18 individuals in the SM experimental group, the ALR 4 months before intervention was 30 days ($SD = 43.9$). This decreased to 8.2 ($SD = 19.3$) days during intervention. This decrease in value was statistically significant ($t[17] = 2.65$, $p = 0.017$) within the experimental group as per paired samples t test. The 95% confidence interval for the mean difference between the two was 4.45 to 39.1. The ALR 4 months after intervention was 16.1 days ($SD = 37.4$). The difference between the ALR 4 months before intervention as compared to after intervention was not significant ($t[17] = −1.28$, $p = 0.217$, 95% CI −36.87 to 8.98), nor was the difference between the ALR during intervention and 4 months after intervention ($t[17] = 0.97$, $p = 0.343$, 95% CI −9.12 to 24.78).

3.4. Correlations

For the results of correlations between SM outcomes in the experimental group see **Table 5**. In the SM experimental group, the following positive correlations were significant at the $p < 0.05$ level: attendance and number of objectives met, attendance and number of goals met, attendance and MRLNM, attendance and MRMCL, number of objectives met and MRLNM, number of objectives met and SO, MRLNM and MRMCL, MRLNM and SO, MRMCL and SO. All other correlations in the stress management experimental group were not significant at the $p < 0.05$ level. There were no significant correlations between the demographics of the experimental group and any of the outcome measures.

	Attendance	Objectives	Goals	MRLNM	MRMCL
Attendance					
Objectives	$r = 0.553$**				
	$N = 21$				
	$p = 0.009$				
Goals	$r = 0.723$**	$r = 0.292$			
	$N = 22$	$N = 18$			
	$p = 0.000$	$p = 0.240$			

	Attendance	Objectives	Goals	MRLNM	MRMCL
MRLNM	$r = 0.710^{**}$	$r = 0.618^{**}$	$r = 0.330$		
	$N = 21$	$N = 18$	$N = 21$		
	$p = 0.000$	$p = 0.006$	$p = 0.144$		
MRMCL	$r = 0.645^{**}$	$r = 0.414$	$r = 0.393$	$r = 0.795^{**}$	
	$N = 21$	$N = 18$	$N = 21$	$N = 22$	
	$p = 0.002$	$p = 0.09$	$p = 0.078$	$p = 0.000$	
SO	$r = 0.274$	$r = 0.535^{**}$	$r = 0.226$	$r = 0.513^{*}$	$r = 0.647^{**}$
	$N = 22$	$N = 18$	$N = 22$	$N = 21$	$N = 21$
	$p = 0.218$	$p = 0.022$	$p = 0.311$	$p = 0.017$	$p = 0.002$

Notes: **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (two-tailed). MRLNM = members report that they learned new material as a result of SM, MRNCL = members report that they made changes in their lives as a result of SM, and SO = staff observations.

Table 5. Correlation matrix of LSRC outcomes using Pearson-product moment coefficient.

4. Discussion

The experimental group significantly increased their knowledge of stress management infor-mation after completing the SM, demonstrating the ability to learn, store, and recall new information, whereas the control group did not show a significant increase. However, the increase noted in the experimental group when compared to the control group was no longer significant. Since there were improvements in so many other aspects of stress management in the experimental group, it could be that stress management is best learned and utilized through hands on experience and talking about feelings instead of obtaining knowledge about the subject. It is one thing to "know about" stress reduction, but a different experience to "feel it in one's bones." The fact that the SM does both could account for the difference in outcomes. For instance, the objectives for each session of the SM incorporate knowledge about stress management with hands on experience. The objective for day 26, "clients will use biofeedback as a stress management technique," presents the knowledge of how to count breaths and gives the client the physical experience that respiration rate can be controlled and decreasing respiration rate can be calming. Clients did very well in achieving the objectives for each session (an average of 77% of the objectives was met in the SM). The fact that clients achieved on the average of four stress management goals that they set during the SM demon-strates that the material learned and experienced generalized to their lives outside the clinic.

The other outcome measures also support the efficacy of the LSRC's SM. Clients in the exper-imental group (91%) reported that they learned new material and 86% reported that they made changes in their lives as a result of the SM. This is consistent with staff members report-ing that 73% of their clients in SM were better able to manage stress. Clients who participated

in the SM significantly improved their #CD and their ALR. Four months after SM ended, they experienced a slight decrease in #CD and ALR. Although this decrease was statistically insignificant when compared to their clean time during SM, it was also statistically insignificant when compared to before SM, indicating that clients were almost back to where they started before intervention. In order for stress management for recovery intervention to be effective, it should be longer than 4 months. Clients showed no significant change in the #R before, during, or after SM. This could be because the average #R was and remained one, so there was not a lot of improvement to be made. Correlations indicated that newly learned material was not lost over time (percentage of objectives met x post-test scores). This may be due to repetition, review, and multiple modes of training (visual, auditory, bodily sensations, and eliciting prior experiences), which have been built into the curriculum. Attendance was an important factor in clients' progress. The more clients came to SM, the more objectives and goals they met, the more they reported that they learned new material, and the more staff observed improvements in their ability to manage stress. Even though the attendance rate of 63% achieved by the experimental group is standard for what is reported in psychiatric clinics, it may be beneficial, given the significance of attendance, to generate ways to improve it.

Staff's observations correlated positively with members' self-report of progress and the number of objectives met. Staff's sensitivity to improvement is necessary to encourage and provide positive feedback to clients and provide continuity across intervention modalities throughout the clinic, just as their sensitivity to ongoing needs of the clients can be helpful in referring future clients to the LSRC. Members' self-report of progress correlated with one of two objective findings. There was a positive correlation between member's reporting that they learned new material and achieving objectives, but not with the number of goals met outside the clinic. Perhaps the clients in answering this question did not consider goal achievement an indicator of change. If so, this would be an important connection to help the clients make in order for their self-esteem to fully benefit from their progress. The number of goals met on the outside did positively correlate with the amount of material each patient learned throughout the session. Patients who report having learned new material also tend to report that they made changes in their lives due to the SM.

4.1. Limitations

This study was a quasi-experiment. The author used a sample of convenience that followed the selection/referral procedure found in most clinics. Although the demographic profile of these clients closely approximated those in the literature for dual diagnosis outpatient clinics, caution should be used if generalizing the results to other settings because of a possible sample bias. Validity and reliability of the pre-/post-test had not been established.

4.2. Conclusion

The LSRC's SM is an effective method for improving stress management skills and clean time in DD clients in this DD clinic. Clients significantly increased their number of clean days, decreased their average length of relapse, and were able to learn, store, and recall information on stress management. They achieved over three-fourths of the daily objectives, reported

learning new material, and were able to make changes in their lives by generalizing what they learned/experienced to their environment outside the clinic. These results lend support for future randomized controlled experiments to investigate the efficacy of this SM with DD clients and also for the use of this module by occupational therapists working with the DD population.

Acknowledgements

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