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ABSTRACT

It appears that chronic drug use may develop as a means of coping in which individuals use self-medication to produce a more desirable state of being. Because drugs are often used to cope with stress, this study examined stress among recovering male drug addicts (N=23) from an urban substance abuse program by administering a self-report inventory known as the Stress Audit. This inventory samples the magnitude and types of stresses experienced as well as a person's relative vulnerability to yield a stress profile with three summary scales: Situations, Symptoms, and Vulnerability. For the Situations scale, the mean for drug addicts showed a significant elevation relative to the standardization sample (N=1,450) and a local control group (N=20) of non-addicted, non-alcoholic males. All situations subscale means (Family, Individual Roles, Social Being, Environment, Financial, and Work/School) were significantly higher for the drug addicts with the Family, Individual Roles, and Financial subscales yielding the highest values. The Symptoms Summary scale group mean as well as the means for all seven Symptoms subscales (Muscular, Parasympathetic Nervous System, Sympathetic Nervous System, Emotional, Cognitive, Endocrine, and Immune) were also significantly higher for drug addicts, with the highest subscale means obtained for cognitive and muscular symptoms. In contrast to stress situations and symptoms, the Vulnerability scale was the only measure for which recovering addicts had a mean similar to established norms with no significant elevation. This profile of substantially greater stress situations and symptoms despite normal vulnerability indicates that, whether stress is a cause or consequence of drug addiction, stress management techniques should be an important component of drug rehabilitation programs. (Author/NB)

Stress Levels of Recovering Drug Addicts

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Abstract

As research has examined a variety of factors associated with drug addiction, it appears that chronic drug use may develop as a means of coping in which individuals use self-medication to produce a more desirable state of being. Drugs are often used to cope with stress and so we have examined stress among recovering male drug addicts (N=23) from an urban substance abuse program with a self-report inventory known as the Stress Audit. This inventory samples the magnitude and types of stress experience as well as a person's relative vulnerability to yield a stress profile with three summary scales: Situations, Symptoms, and Vulnerability. For the Situations scale, the mean for drug addicts showed a significant elevation relative to the standardization sample (N=1450) and a local control group (N=20) of non-addicted, non-alcoholic males. Situations stress items are divided into six subscales; Family, Individual Roles, Social Being, Environment, Financial, and Work/School. All situations subscale means were significantly higher for the drug addicts with the Family, Individual Roles, and Financial subscales yielding the highest values. The Symptoms Summary scale group mean as well as the means for all seven symptoms subscales (Muscular, Parasympathetic Nervous System, Sympathetic Nervous System, Emotional, Cognitive, Endocrine, and Immune) were also significantly higher for drug addicts, with the highest subscale means obtained for cognitive and muscular symptoms. In contrast to stress situations and symptoms, the Vulnerability scale was the only measure for which recovering drug addicts had a mean similar to established norms with no significant elevation. This profile of substantially greater stress situations and symptoms despite normal vulnerability indicates that, whether stress is a cause or consequence of drug addiction, stress management techniques should be an important component of drug rehabilitation programs.

Stress Levels of Recovering Drug Addicts

Stress has been identified as a factor which may have a central role in the process leading to substance abuse. As research has examined the correlates of drug use in search of the causes of drug addiction, a stress model has emerged which views drug use as a coping mechanism (Adams, 1988; Bry, 1983; Sullivan and Guglielmo, 1985). Chronic drug use develops as a means of coping with stress and its consequent negative emotional reactions. Psychological distress and limited coping resources are antecedents of drug use which serves as self-medication to produce a more desirable state of being. When stress is excessive or becomes otherwise unmanageable, drugs which produce appetitive "highs" or reduce negative feelings become powerful reinforcers for continued drug use. At the same time this pattern of escalating substance abuse adds to the stress experience of the drug user as the various physiological, psychological and social changes that accompany addiction come into play.

Independent of a putative causal role in addiction, stress is also an important determinant of therapeutic outcome. Most people enter drug rehabilitation programs in a state of crisis with a variety of psychological and emotional issues that must be resolved before the task of restructuring the patient's life without drugs can proceed. By monitoring stress and identifying specific sources in an individual's life, recovery programs may be able to develop more complete and effective treatment plans.

These considerations have led us to examine stress among recovering male drug addicts in comparison to a group of non-addicted, non-alcoholic males. The psychometric instrument used to assess stress was a self-report inventory known as the Stress Audit (Miller, Smith, and Mehler, 1990). Responses to the Stress Audit are summarized on a variety of scales which provide a comprehensive and quantitative profile of the various dimensions which characterize an individual's stress experience.

Methods

Subjects

One group of subjects consisted of 23 adult male recovering drug addicts (RDA) from an urban substance abuse program operated by a county mental health agency. Within this group the primary drug of choice was methamphetamine 48%, cocaine 35%, and heroin 17%, with 57% using intravenious drug administration. Program participants had weekly urine tests and the average clean time with no drug use prior to testing was 77 days, with a range from 5 to 182 days.

A control group of 20 adult males with no history of drug or alcohol abuse was obtained by placing public notices requesting participants at a college campus and various community organizations. All prospective control subjects were questioned concerning their drug and alcohol use and only those who responded that they did not use illegal drugs more than once per month or consume on average more than two alcoholic beverages per day were admitted to the study.

Participation by all subjects was voluntary and informed consent was received. Subjects were instructed that their personal identities would be confidential and that all information provided would receive coded identification. Additional subject characteristics are presented in Table 1.

The Stress Audit

The Stress Audit consists of 238 items which sample the magnitude and types of stress experienced or anticipated by the respondent as well as the individual's relative vulnerability to stress. This instrument is subdivided into 14 scales and yields a profile which reflects three major dimensions of stress; situations, symptoms, and vulnerability. Some Stress Audit items consist of situations or symptoms which have been or may become stressful. Respondents are instructed to rate each of these items twice on a five point scale indicating the amount of stress caused by an item during the past six months and the amount of stress they anticipate the item will cause in the next six months. The stress situations items are divided into six subscales: Family, Individual Roles, Social Being, Environment, Financial, and Work/School. Stress symptom items are organized into seven subscales by physiological system: Muscular, Parasympathetic Nervous System, Sympathetic Nervous System, Emotional, Cognitive, Endocrine and Immune. Vulnerability items require respondents to rate the frequency of occurence of certain behaviors or conditions which are thought to moderate vulnerability to stress. Rating values for all items of a particular scale are summed to provide combined raw scores for each scale. See Table 2 for sample questions from the various scales.

The Stress Audit has been standardized and provides norms for each of the scales. The standardization sample of 1450 people was drawn from an urban population in the northeastern United States and included adults of all ages with an equal number of males and females. The statistical information from standardization allows individual scores to be expressed as standard scores (T scores) which have a mean of 50 and a standard deviation of 10. To facilitate comparison with standardization norms, the combined scores for all scales have been expressed as T scores.

Results

For the three summary scales, the recovering drug addicts (RDA) showed substantial elevations for stress situations and symptoms, with relatively normal vulnerability. The group means for the Situations, Symptoms, and Vulnerability scales are presented in Table 3 and shown in a bar graph in Figure 1. The Situations scale mean of 73.5 for the RDA was significantly higher than means of the control group ($F(1, 41) = 38.99$, MS-error=136.7, $p < .001$) and the standardization sample ($Z=11.3$, $p < .001$). Within the RDA group 16 subjects had Situations scale T scores above 70 which would be considered clinically severe (Miller et.al, 1990). For the Symptoms scale, 12 RDA subjects had scores greater than 70 and the RDA group mean of 67.9 was also much higher than the means of the control group ($F(1, 41)= 37.1$, MS-error=106.5, $p < .001$) and standardization sample ($Z=8.6$, $p < .001$). For both the Situations and Symptoms scales the control group and standardization sample had similar means with no significant differences. The RDA mean of 52.8 for the Vulnerability scale did not differ significantly from the standardization sample mean, although the control group mean of 44.4 was significantly lower than the means of the RDA group ($F(1, 41)=10.29$, MS-error=73.8, $p < .01$) and standardization sample ($Z=2.5$, $p < .05$).

The RDA and control group means for the Situations subscales are presented in Figure 2 and Table 3. All six of the RDA Situations subscale means showed significant elevations indicating substantially higher stress levels from all sources relative to the standardization sample and control group. The Family, Individual Roles and Financial subscales yielded the highest RDA group means with many individuals scoring in the clinically severe range.

For all of the Symptoms subscale means the RDA group again had significantly higher values revealing for greater levels of stress symptomology. The Symptoms subscale means for the RDA and control groups are shown in Figure 3 and Table 3. All of the control group Symptom subscale means fall close to the standardization sample means with most having values below 50. Each of the RDA group means exceeded a value of 60 providing significant differences between group means (repeated-measures ANOVA, $p < .001$) for all subscales. The Muscular, Cognitive, and Emotional subscales produced the highest RDA group means indicating the problem areas most likely to demand clinical interventions.

Comparisons of mean past and future stress ratings for the Situations Summary scale are presented in Figure 4 for the RDA and control groups. It can be seen that both groups generally anticipated somewhat lower future stress levels, with the RDA

group showing a greater reduction and hence more optimism concerning stressful situations. However, a comparison of the mean difference between past and future ratings for the two groups did not reach statistical significance.

Mean past and future stress ratings for each of the Situations subscales are shown in Figures 5 and 6 for the RDA and control groups, respectively. Both groups tended to show greater reductions in the subscales which had higher stress levels in the past. For the RDA group the largest anticipated stress reductions were obtained with the Individual Roles and Social Being subscales, whereas for the control group the largest decrease was obtained on the Work/Schoo' subscale.

For the Symptoms Summary scale the RDA group maintained a pattern of lower future stress ratings while the control group showed only a slight decrease in anticipated symptoms stress. The mean difference between past and future ratings for the RDA was significantly larger than the mean difference for the control group ($t(41)=2.25$, $p< .03$). The decrease in symptoms stress anticipated by each of the groups is shown in Figure 7, a bargraph comparing mean past and future stress ratings.

Figures 8 and 9 depict mean past and future stress ratings from the RDA and control groups for each of the Symptoms subscales. In Figure 8, the RDA had lower future stress ratings for each of the Symptom subscales with larger decreases for those subsc.les with the highest past stress ratings. The symptoms stress ratings by the control group presented in Figure 9 show small anticipated declines for the Muscular, Emotional, and Cognitive subscales with approximately equal past and future means for the remaining subscales.

Discussion

Our findings suggest that stress plays an important role in the interaction leading to drug addiction. Moreover, the elevated stress levels of recovering drug addicts indicate an important consideration for clinical interventions. By making patients aware of their sources and symptoms of stress and providing more appropriate means of coping, treatment programs can reduce the distress which leads to recidivism. An immediate implication of this research is that emphasis on stress management techniques may provide important benefits in drug rehabilitation programs.

In drug rehabilitation, the individual must work on a number of psychological and emotional issues in order to escape addiction. Our study suggests that an important component for drug rehabilitation programs will be to provide techniques for effective stress management. If the person in recovery can monitor stress accurately and determine the source of these

reactions, there would be a greater chance of resolving many of the psychological and emotional issues that pose barriers for drug rehabilitation. Drug treatment programs must do more than simply prevent continued drug use, they must treat those psychological and emotional issues that lead an individual back to active addiction. One of the primary goals of stress management treatments is to provide a person with greater self-awaresness and ultimately self-control (Taylor, 1986). Monitoring stress will enhance the success of recovery programs not only by removing a potential cause of drug use, but by providing valuable self-regulation skills.

The finding that the stress vulnerability of recovering addicts was relatively normal suggests that one aspect of the "addictive personality type" may be an exaggerated response to the stressors associated with life events. Although ex post facto research cannot provide conclusive evidence to indicate whether stress is a cause or consequence of addiction, a severe elevation of stress measures together with normal vulnerability may be indicative of a basic difference in these subjects' reactions to stress. If stress causes drug use as a means of coping, then high stress levels should precede substance abuse and the removal of drugs as a coping mechanism may then lead to a return of previous high levels of psychological distress. In this regard, it is important to recognize that all of the subjects in our study had stopped using drugs prior to testing and so were not confronted with the problems and stresses of the street addict. It may also be true that the environments that produce drug addicts are so stressful that those of normal vulnerability are overwhelmed and must resort to drugs in order to cope. Both viewpoints are consistent with the finding that stressful situations and symptoms are dramatically higher for recovering drug addicts and give important direction for future studies of drug addiction and rehabilitation.

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Table 1
Subject Characteristics

Recovering Drug Addicts

Age: mean 31 years, range 19 to 40 years

Ethnicity: White 70%, Black 26%, other 4%

Marital Status: married/co-habitation 56%, single 22%
divorced/separated, 22%

Employment: full or part time employed 48%, unemployed 52%

Education: mean 12 years completed, range 9 to 16 years

Control Group

Age: mean 40 years, range 23 to 62 years

Ethnicity: White 80%, Hispanic 15%, Black 5%

Marital Status: married/co-habitation 50%, single 45%
widowed 5%

Employment: full or part time employed 70%, student 25%,
disabled 5%

Education: mean 16 years completed, range 12 to >17 years

Table 2
Sample Items for Stress Audit Situations,
Symptoms, and Vulnerability Scales

STRESS SITUATIONS SCALE ITEMS

Not enough money to pay bills

Past:

NOT STRESSFUL 1....2....3....4....5 VERY STRESSFUL
0 = Does not apply

Death of a close friend

Future:

NOT STRESSFUL 1....2....3....4....5 VERY STRESSFUL
0 = Does not apply

STRESS SYMPTOMS SCALE ITEMS

Tight muscles or muscular aches

Past:

NOT STRESSFUL 1....2....3....4....5 VERY STRESSFUL
0 = Does not apply

Difficulty concentrating

Future:

NOT STRESSFUL 1....2....3....4....5 VERY STRESSFUL
0 = Does not apply

STRESS VULNERABILITY SCALE ITEMS

I get 7-8 hours sleep at least 4 nights per week.

ALMOST ALWAYS 1....2....3....4....5 NEVER

I have one or more friends to confide in about personal matters.

ALMOST ALWAYS 1....2....3....4....5 NEVER

Table 3
T Score Group Means for Stress Audit Scales

Scale	Recovering Drug Addicts Mean	Control Group Mean
Situations - Summary	73.5	51.2
Family	75.5	51.1
Individual Roles	73.5	51.3
Social Being	68.9	51.5
Environment	67.3*	54.9
Financial	72.9	48.0
School/Work	66.0	50.1
Symptoms - Summary	67.9	48.7
Muscular	67.3	52.1
Parasympathetic Nervous System	63.4	46.5
Sympathetic Nervous System	63.0	49.0
Emotional	65.2	50.2
Cognitive	67.5	48.7
Endocrine	62.5	45.8
Immune	62.6	47.5
Vulnerability - Summary	52.8*	44.4

* $p < .01$ significant difference between group means; for all other scales differences between group means were significant at $p < .001$.

Figure Captions

Figure 1. Mean T scores for Stress Audit Summary scales. The recovering drug addicts showed substantial elevations of stress situations and symptoms, with normal vulnerability.

Figure 2. Mean T scores for Situations subscales. All six of the means for recovering drug addicts showed significant elevations indicating substantially higher stress levels from all sources.

Figure 3. Mean T scores for Symptoms subscales. For all subscales the recovering drug addicts had significantly higher means, revealing far greater stress symptomology.

Figure 4. A comparison of group means for past and future stress ratings from the Situations Summary scale. The recovering drug addicts anticipated greater reductions in future stress levels and hence had more optimism concerning stressful situations.

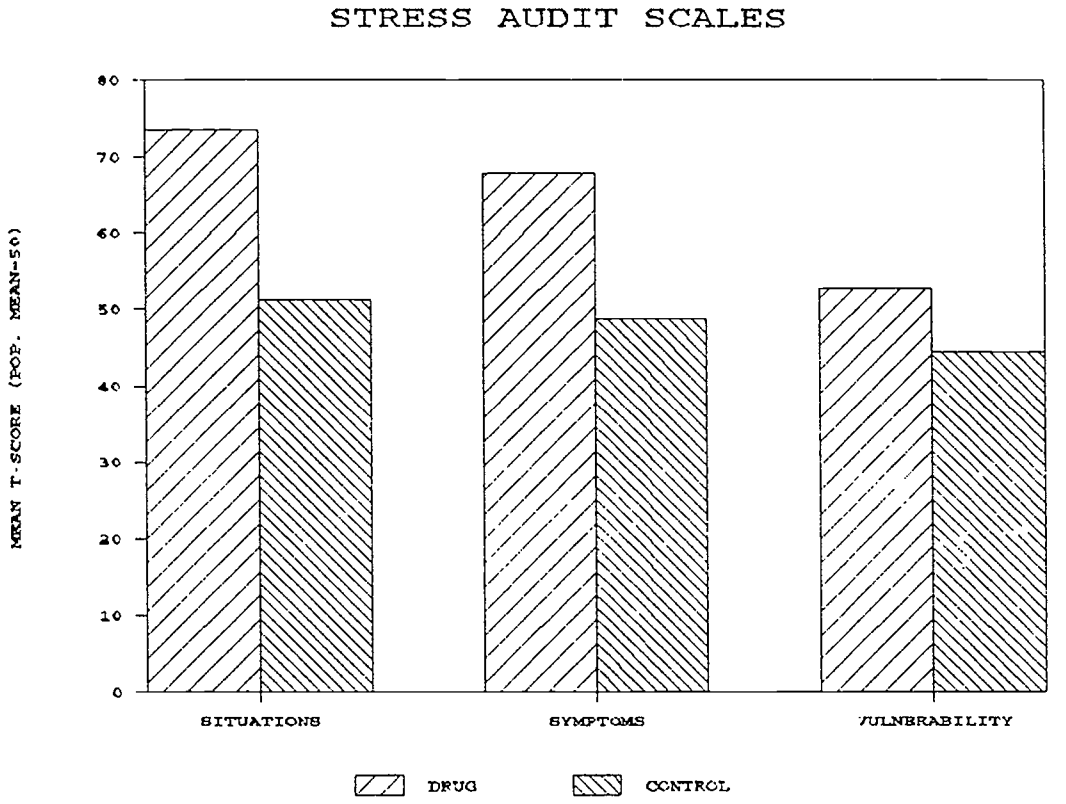
Figure 5. Mean past and future stress ratings of recovering drug addicts for the Situations subscales. The largest anticipated reductions were obtained with the Individual Roles and Social Being subscales.

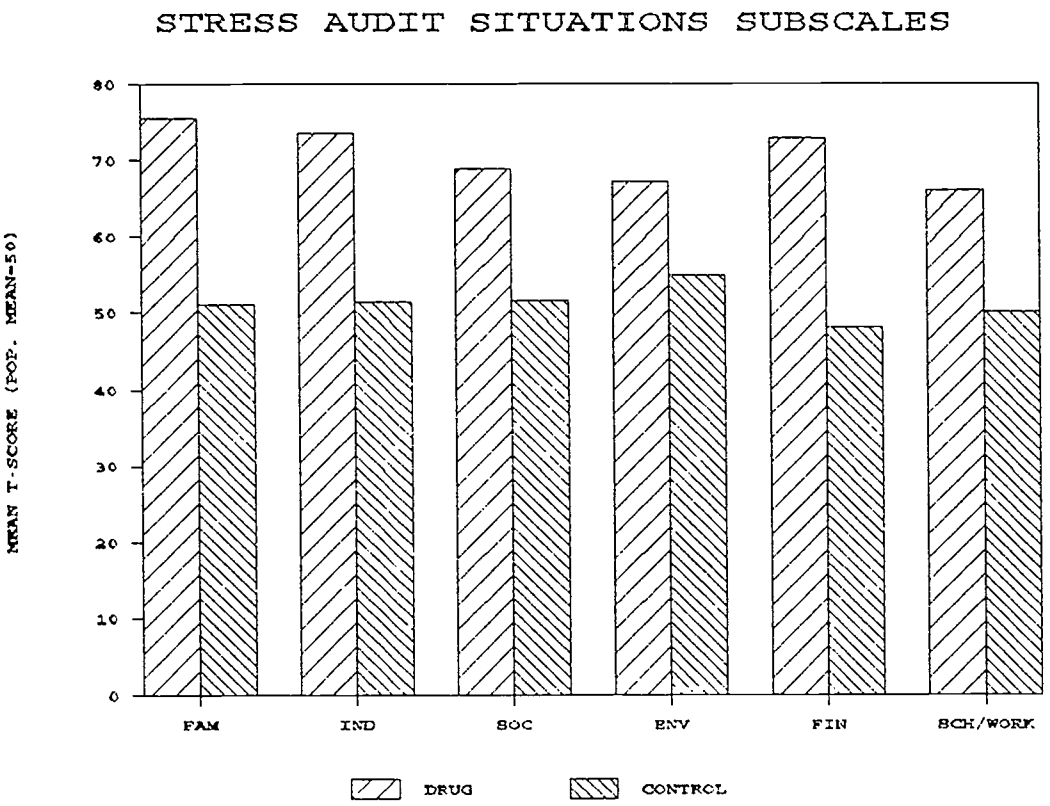
Figure 6. Mean past and future stress ratings of the control group for the Situations subscales. Only small anticipated declines were obtained with the various subscales.

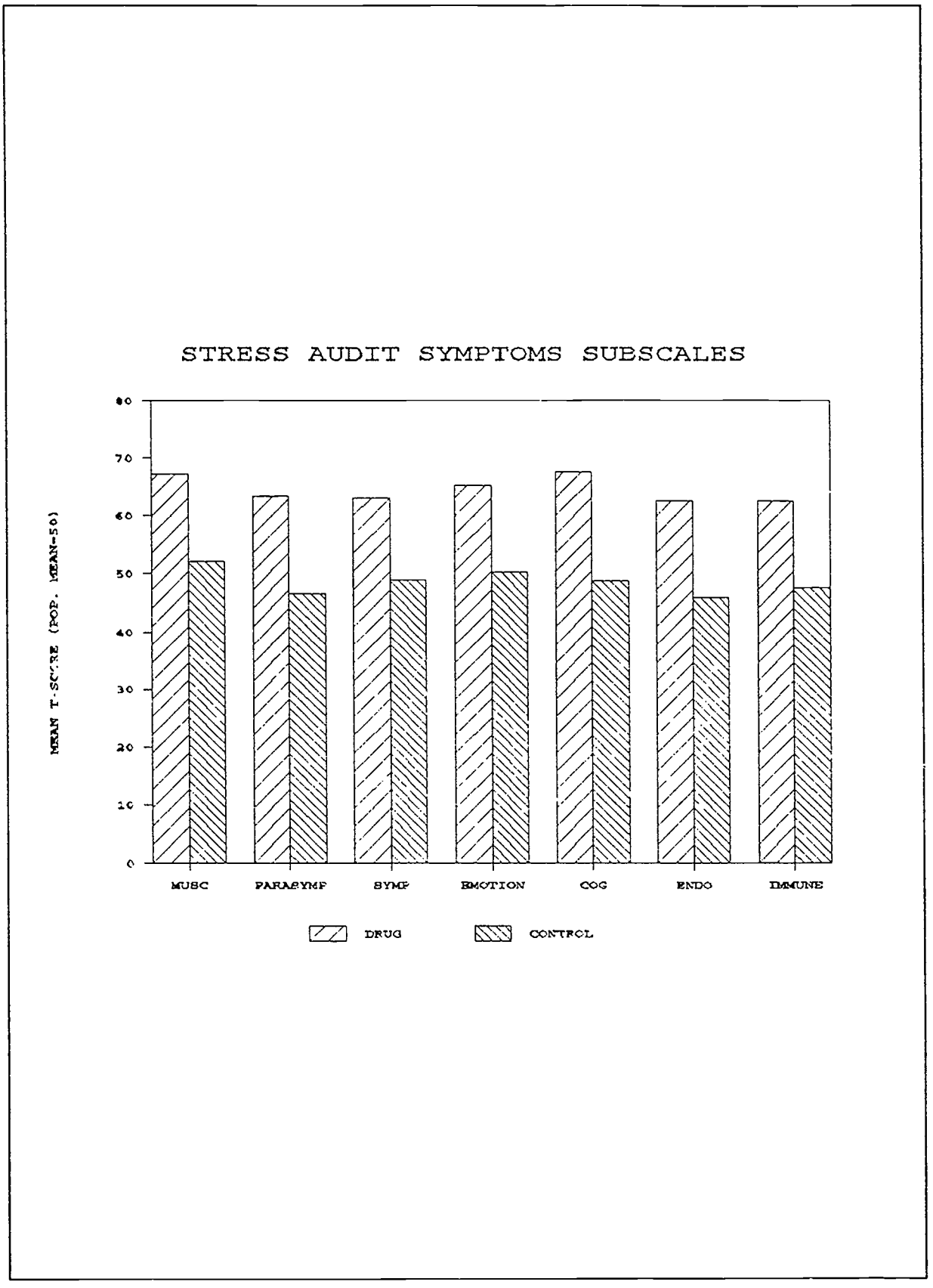
Figure 7. Symptoms Summary scale group means for past and future stress ratings. Recovering drug addicts anticipated much larger declines in stress symptoms.

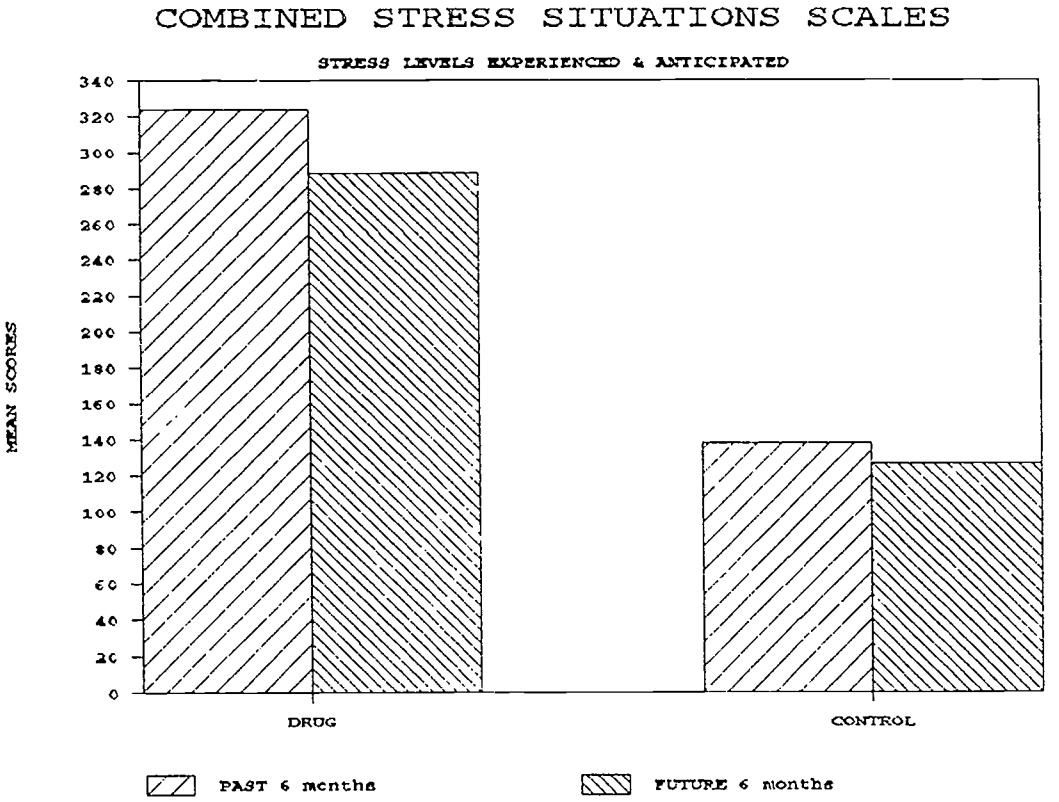
Figure 8. Mean past and future stress ratings of recovering drug addicts for the Symptoms subscales. On every subscale lower symptoms stress was anticipated.

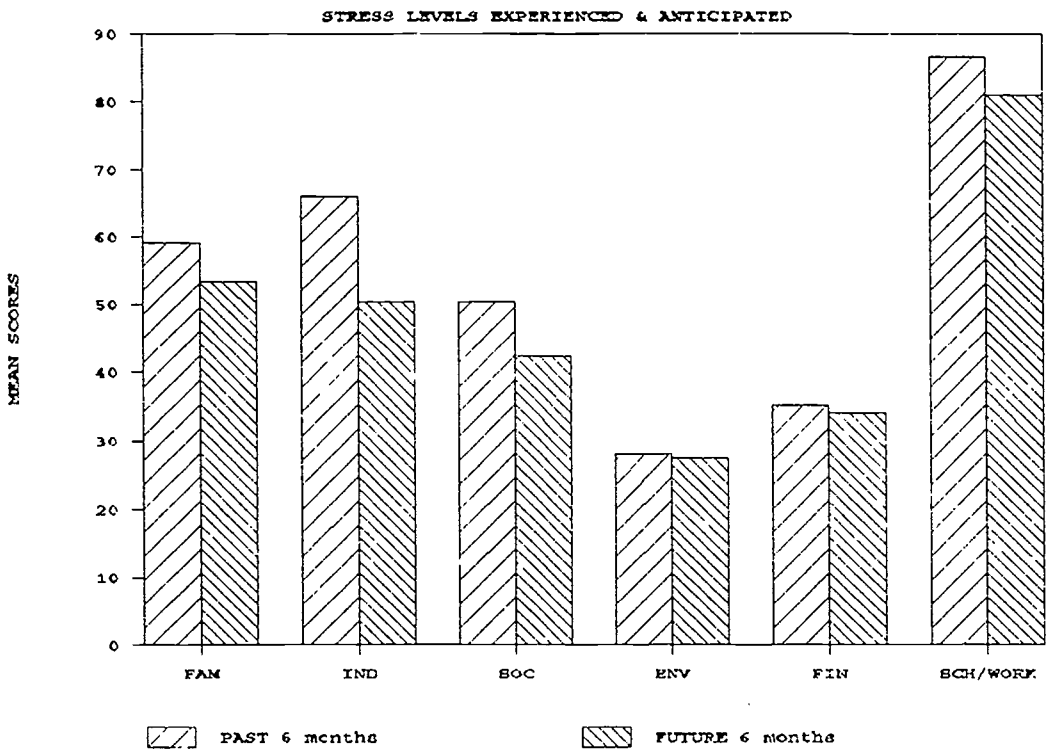
Figure 9. Mean past and future stress ratings of the control group for the Situations subscales. Small declines were anticipated for muscular, emotional, and cognitive symptoms.

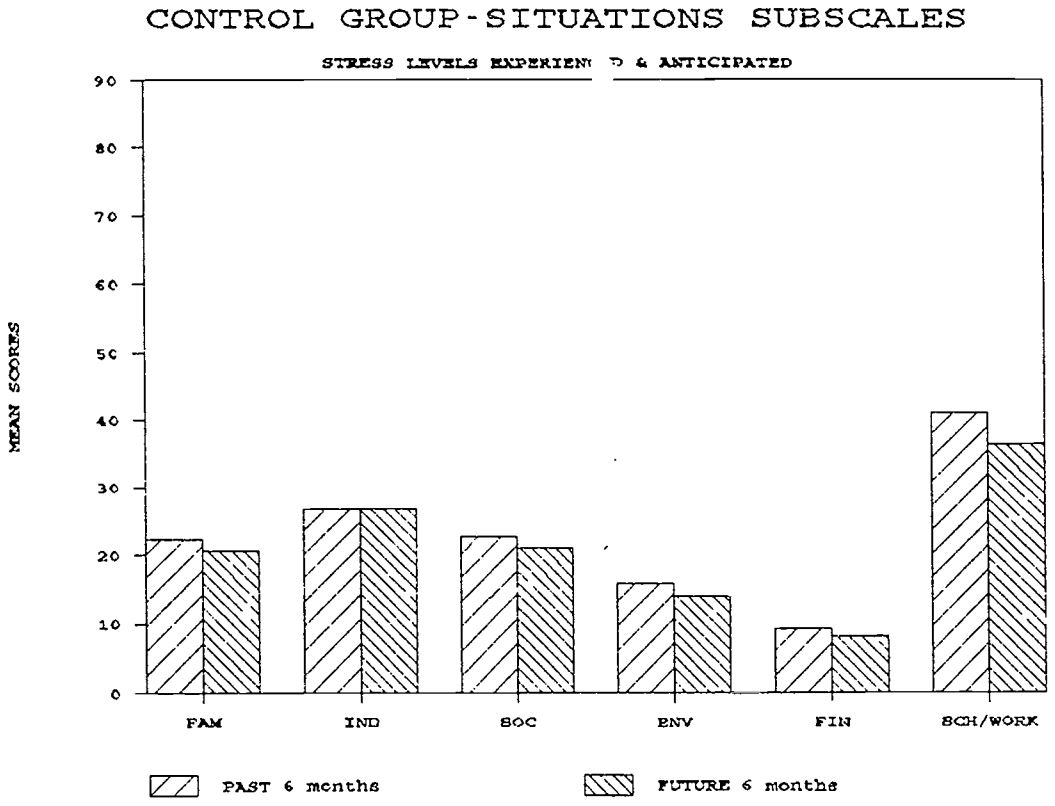

STRESS AUDIT SCALES
MEAN T-SCORE (POP. MEAN=50)
80
70
60
50
40
30
20
10
0
SITUATIONS
SYMPTOMS
VULNERABILITY
DRUG
CONTROL

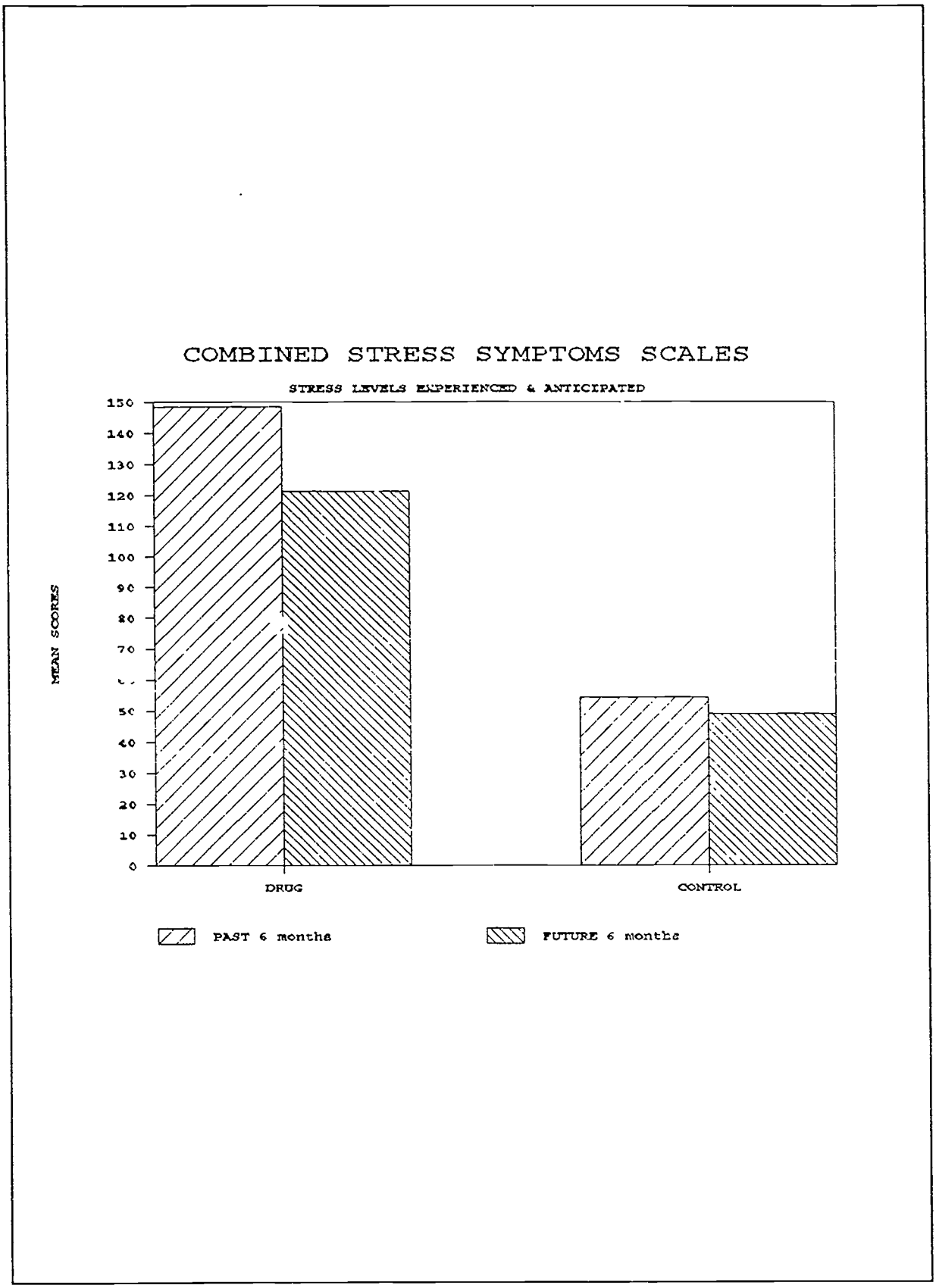

STRESS AUDIT SITUATIONS SUBSCALES
MEAN T-SCORE (POP. MEAN=50)
80
70
60
50
40
30
20
10
0
FAM
IND
SOC
ENV
FIN
SCH/WORK
DRUG
CONTROL

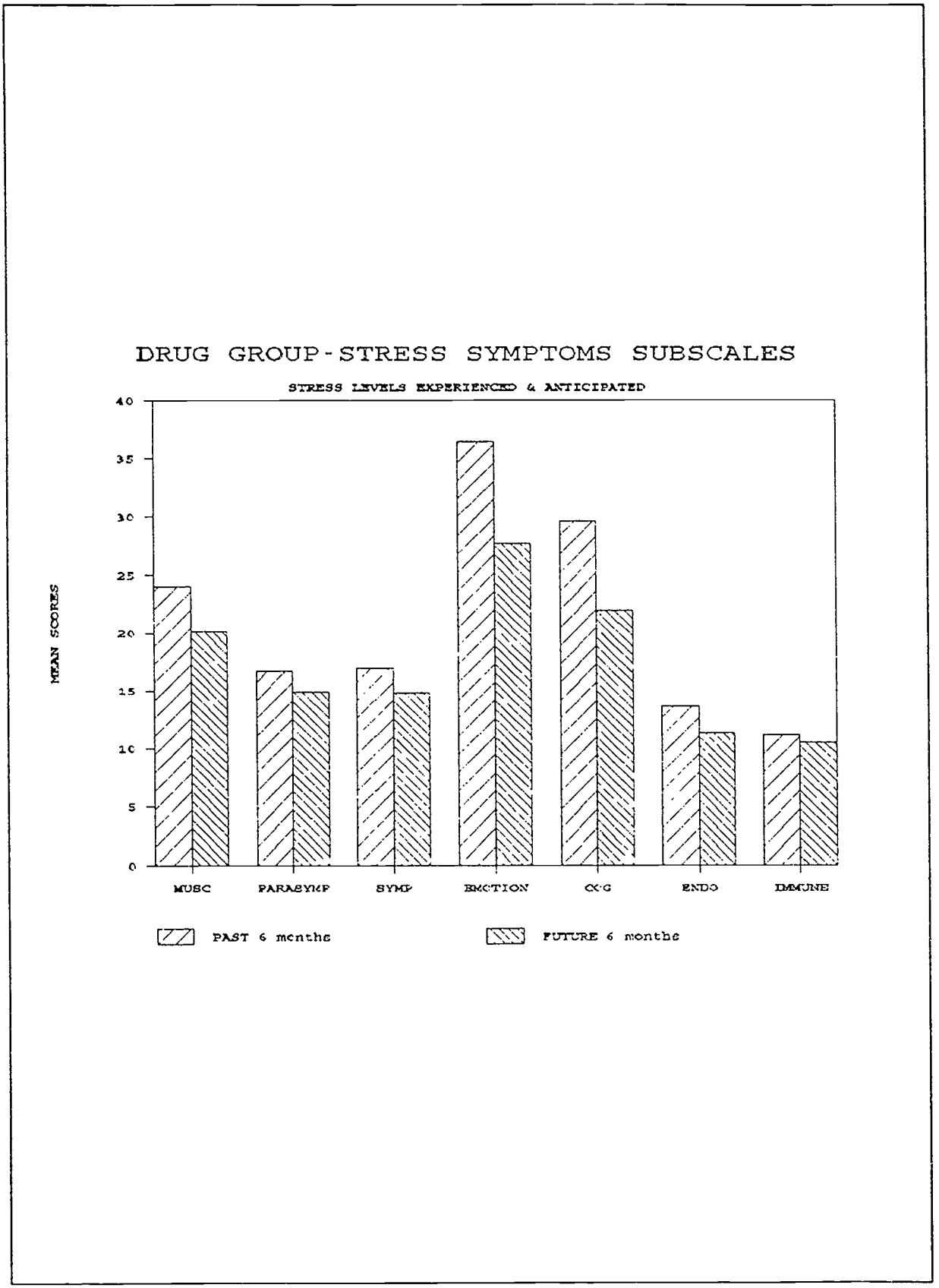

STRESS AUDIT SYMPTOMS SUBSCALES
MEAN T-SCORE (POP. MEAN=50)
80
70
60
50
40
30
20
10
0
MUSC
PARASYMP
SYMP
EMOTION
COG
ENDO
IMMUNE
DRUG
CONTROL

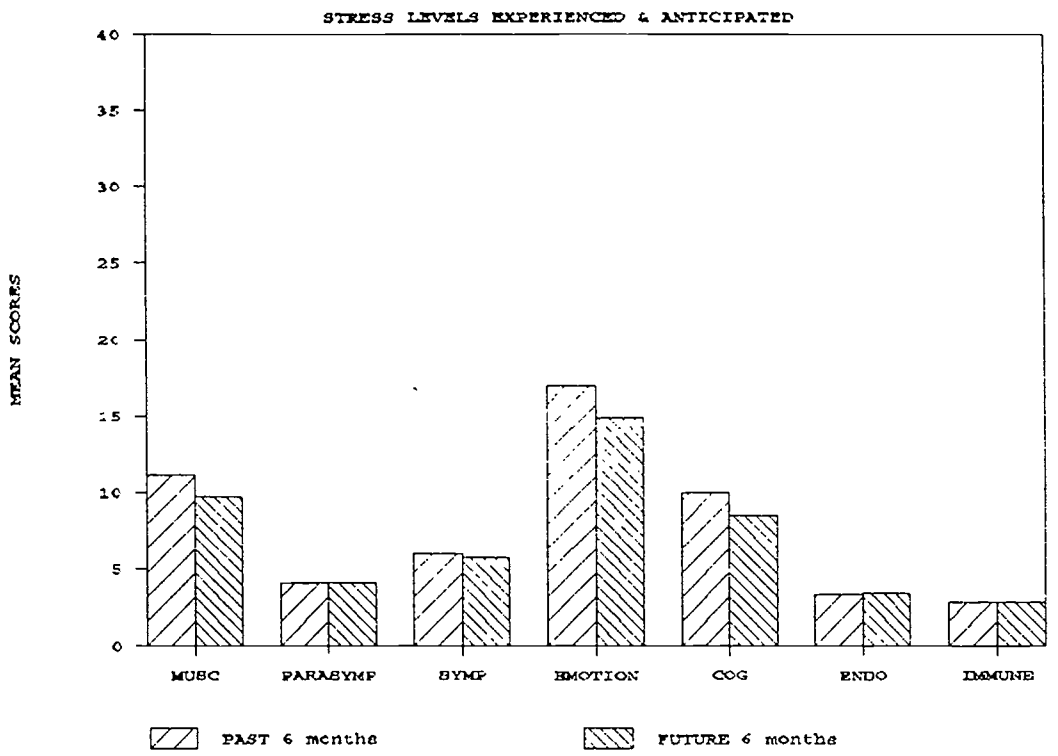

COMBINED STRESS SITUATIONS SCALES
STRESS LEVELS EXPERIENCED & ANTICIPATED
MEAN SCORES
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
DRUG
CONTROL
PAST 6 months
FUTURE 6 months


DRUG GROUP-STRESS SITUATIONS SUBSCALES
STRESS LEVELS EXPERIENCED & ANTICIPATED
MEAN SCORES
90
80
70
60
50
40
30
20
10
0
FAM
IND
SOC
ENV
FIN
SCH/WORK
PAST 6 months
FUTURE 6 months


CONTROL GROUP-SITUATIONS SUBSCALES
STRESS LEVELS EXPERIENCED & ANTICIPATED
MEAN SCORES
90
80
70
60
50
40
30
20
10
0
FAM
IND
SOC
ENV
FIN
SCH/WORK
PAST 6 months
FUTURE 6 months


COMBINED STRESS SYMPTOMS SCALES
STRESS LEVELS EXPERIENCED & ANTICIPATED
MEAN SCORES
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
DRUG
CONTROL
PAST 6 months
FUTURE 6 months


DRUG GROUP - STRESS SYMPTOMS SUBSCALES
STRESS LEVELS EXPERIENCED & ANTICIPATED
MEAN SCORES
40
35
30
25
20
15
10
5
0
MUSC
PARASYMP
SYMP
EMOTION
COG
ENDO
IMMUNE
PAST 6 months
FUTURE 6 months


CONTROL GROUP-STRESS SYMPTOMS SUBSCALES
STRESS LEVELS EXPERIENCED & ANTICIPATED
MEAN SCORES
40
35
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10
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0
MUSC
PARASYMP
SYMP
EMOTION
COG
ENDO
IMMUNE
PAST 6 months
FUTURE 6 months