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Author(s): **Thomas Griggs ; Thomas Caves ; Edward S. Johnson ; Ann C. Meade**

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Reaching out to North Carolina's Law Enforcement Community

Grant # 98-FSWX-0008

Thomas Griggs

Thomas Caves

Edward S. Johnson

Ann C. Meade

February, 2001

PROPERTY OF

National Criminal Justice Reference Service (NCJRS)
Box 6000
Rockville, MD 20849-6000

INTRODUCTION

The proposal sought funds to evaluate a scheme for statewide distribution of a stress prevention and treatment program. The components of the program are the following:

1. Assessment of need using focus groups
2. Production and distribution of video taped training packages
3. Use of the statewide North Carolina Information Highway for a series of live interactive video training conferences for officers and families
4. Identification and referral of persons requiring professional counseling
5. Evaluation using an experimental model with three groups of 80 officers and families; one an experimental group, one a sham-control and one true control. The evaluation used a questionnaire to measure and compare stressors, stress buffers, and stress effects in each of the three groups after administration of the intervention.

METHOD

The components of the completed program, as of December 31 2000, were the following:

1. Assessment of needs using focus groups
2. Production and distribution of PowerPoint™ presentations on stress-related issues
3. Distribution of presentations to the field
4. Evaluation using an experimental model with two groups of 80 officers and their families
One was an experimental group and one a true control group. The evaluation used a questionnaire to measure and compare stress buffers and stress effects in each of the two groups after administration of the intervention.
5. Identification and referral of selected officers and families for professional counseling

Four focus groups were held in different regions of North Carolina. Five Troopers and their spouses attended each session, and feedback was gathered on topics to be addressed in a study on stress. Those suggestions that were mentioned in more than one focus group included "Scheduling Issues", "Pavement Attitude," "General Stress Management", "Critical Incident Stress", and the phenomenon of feeling like one is "Living in a Fishbowl."

The feedback was incorporated into a study design that involved four PowerPoint™ presentations. One on "General Stress, one on "Pavement Attitude", one on "Sleep Hygiene", and one on "Scheduling Issues". "Critical Incident Stress" and "Living in a Fishbowl" were included in the presentations entitled "General Stress". We intended to include "Sleep Hygiene" because we suspected this was an opportunity to address an important issue and because we had established a good collaborative relationship with the director of the sleep clinic at the University of North Carolina School of Medicine. That group developed a very nice training program, but they were not able to complete it for technical reasons in time for it to be distributed with our program.

The original design intended to create video presentations in VHS format. However, the state was hit with multiple natural disasters in 1999, including a 500-year flood and a 100-year snowstorm. Responding to these events demanded the attention of everyone working for the Highway Patrol. Since our video-presentation unit was involved with documenting the disasters and the subsequent response, the project director for this program decided to make PowerPoint™ presentations with audio instead of the video presentations.

The University of North Carolina School of Medicine Institutional Review Board (IRB) approved the methods and materials used in this project. The project was exempted from formal continuing review by the IRB because it was deemed no risk to the subjects since all aspects of participation were totally anonymous.

The computer disk package included the three separate programs. Each presentation was prepared as a script that directed both the slide presentation and audio narrated by the Deputy Director of the North Carolina Alcohol Law Enforcement Agency who was a professional radio personality before he began his career in law enforcement. Allied Vaughn, a private company that was selected by a competitive bid process, did the duplication of the computer disks. Allied Vaughn was able to incorporate an "auto-launch" feature that begins the presentations automatically when the CD is placed into the CD drive. We thought this was a good idea because it might help to reduce the number of calls after the CDs were mailed regarding how the participants were supposed to access the presentations. The total cost of production of the computer disks was \$927.50.

The CDs were printed and delivered in October of 2000. At the start of November 2000, the Project Director mailed 80 of those CDs to the experimental group of Troopers, along with questionnaires and bubble sheets. The package included a single CD plus two of the questionnaires, one for the Trooper and one for the spouse or partner. A control group of 80 Troopers was mailed questionnaires and bubble sheets, but no CDs. This package contained two questionnaires and two answer sheets, one each for the Trooper and the spouse or partner. An enclosed envelope was to be used to return both of the answer sheets. The answer sheets were labeled only to indicate "experimental" or "control". Therefore, there is no way to distinguish answer sheets from Troopers from answer sheets completed by spouses or partners. Thirty-one answer sheets from the experimental group and 77 from the control group were returned. This represents responses from 19% of the experimental group and 48% from the control group.

Delays:

The Highway Patrol has received a no-cost extension through January 2001. The extension was necessary because several key people involved in the project, including the Colonel of the Highway Patrol and the Director of Research and Planning, who had taken a major role in the project, retired during the original grant period. Additionally, the planned addition of a part-time psychologist who would have a significant role in this project was not pursued by the Patrol Administration, making coordination of activities

difficult. The disasters that occurred in 1999 and 2000 were additional sources of delay, because the Highway Patrol had to commit a significant amount of resources to the cleanup and response efforts to those disasters.

Expenses:

All of the delays experienced by this project had a significant impact on the program's budget. Specifically, the PowerPoint™ presentations were created at a much lower cost than the video presentations would have incurred. As a result, this project has been completed at a level that comes well short of predicted expenses.

All of the expenses that were paid by grant money total \$7,445.09:

GRANT EXPENSES:

ITEM AND VENDOR	DATE PURCHASED	AMOUNT
Counseling and Development, Dr. Dan Chartier	August 30 th , 2000	\$1,749.31
CD burners for creating master disk, Softmart, Inc.	Sept. 19 th , 2000	\$ 731.40
100 copies of master disk, Allied Vaughn, Inc.	Oct. 20 th , 2000	\$ 927.50
Invoice for data analysis services, Dr. Edward S. Johnson	January 31 st , 2001	\$ 2,018.44
Invoice for data analysis services, Dr. Ann C. Meade	January 31 st , 2001	\$ 2,018.44
	TOTAL:	\$ 7,445.09

All of the above expenses are listed in the project's original budget. Dr. Johnson's salary was originally planned to be paid for by the State Highway Patrol as our in-kind match. However, his salary turned out to be much lower than expected. Therefore, Dr. Johnson's salary has been paid for with grant funds and the salary paid to two other members of our team will serve as the required in-kind match.

More specifically, the in-kind match for this project involves time spent by the Project Director and the Data Entry Assistant, as listed in the project's original budget. Their salary has been paid by the North Carolina State Highway Patrol and the agency has not reimbursed itself for their (salary) expenses:

IN-KIND MATCH:

Project Director	250 hours	\$20/hour	\$ 5,000
Project Assistant	250 hours	\$20/hour	\$ 5,000
		TOTAL:	\$ 10,000

All of the above expenses are listed in the project's original budget.

Statistical Analysis

Participants

Participants were members of the North Carolina Highway Patrol and their spouses. Ten Troopers were randomly selected from each of the state's eight troops. Troopers' spouses were also included in the study. This yields a total of 160 potential participants. Within each troop, five Trooper-spouse pairs were randomly assigned to the experimental condition and five to the control condition.

Procedure

A package of materials was sent to each set of participants (Trooper and spouse). The package contained an instructional letter that was specific for experimental and control groups. Those couples in the experimental group were told to view the CD either individually or together then to respond to the questions on the questionnaire individually. A stamped and addressed envelope was enclosed for returning the questionnaire answer sheets. Directions for calling for assistance if there were problems with access to or operation of a proper computer were included. We waited for 4 weeks for the answer sheets to be returned.

Survey instrument

The 106 survey items are grouped into categories of items measuring essentially the same aspect of stress according to a system based on a theory of stress buffering developed by Harrell and Johnson in 1992. This system was previously standardized on a sample of NC Highway Patrol Troopers and Wake County, North Carolina, Deputies. The present study employed two portions of the original survey: Stress buffering and effects of stress. Each portion presents the respondent with an activity or a symptom and asks for a response on a five-point scale. There are four composite variables that appraise stress buffering as follows:

POSITIVE BUFFERING: 14 items. These are activities that are theorized to promote successful stress buffering. Examples are exercise, hobbies, and family outings. Respondents are asked to rate how helpful they have found each activity to be in reducing stress. Higher values indicate that the respondent engages in activities which he/she thinks help guard against stress.

NEGATIVE BUFFERING: 6 items. These are activities that are viewed as dealing with stress in a negative way. That is, they may do more harm than good. Examples include self-blame, arguing, and using alcohol. Higher values indicate greater levels of participation in activities that the respondent thinks may relieve stress but that many would view as having negative long-term consequences.

POSITIVE ACTS: Two items. These ask how frequently the respondent eats a good breakfast and gets vigorous exercise. Higher values indicate higher levels of healthful activities.

NEGATIVE ACTS: Four items. These ask how frequently the respondent eats poorly and becomes a "couch potato." Higher values indicate higher frequencies of activities that experts view as promoting higher levels of stress.

SOCIAL SUPPORT: 15 items. These inquire into the respondent's feelings about the degree of help and sympathy supplied by friends, family, boss, co-workers and church pastor. Higher values indicate that the respondent feels that he/she has an effective network of social support.

There are four composites that evaluate the effects of stress as follows:

ANGER: Six items. These inquire about the respondent's expression of anger. Higher values indicate that the respondent frequently becomes angry and blows off steam.

PHYSICAL SYMPTOMS: 28 items. These list physical symptoms and ask the respondent to rate how frequently they are experienced from never to ten or more times in the past year. Examples include shortness of breath, insomnia, allergies, ulcers, colds, and headaches. Higher values indicate that the respondent has experienced a large number of symptoms that may be caused by high levels of stress.

POSITIVE EFFECTS: 12 items. These ask about positive feelings the respondent has. Examples include feeling hopeful about the future, feeling satisfied about one's personal life, enjoying one's daily activities, and feeling rested and happy overall. Higher values indicate a respondent who is happy and satisfied with life.

NEGATIVE EFFECTS: 17 items. These ask about possible negative feelings Examples include feeling nervous, jumpy, tense, high-strung, depressed, out of control, and under pressure. High values indicate a respondent who feels demoralized and stressed-out.

In addition, there were two summary items that asked for an over-all appraisal of how well the respondent thought he/she handled the stress in his/her life and how much the stress in his/her life affected his/her physical and emotional health.

Hypothesis

It is hypothesized that the stress intervention programs on the CD will have a beneficial effect on the stress levels reported by Troopers and their spouses. That is, Troopers and their spouses in the experimental group will report more successful stress buffering activities and lower levels of stress effects.

It is also hypothesized that the measures of stress buffering will correlate with measures of stress effects. In particular, higher levels of positive stress buffering will be associated with lower reported frequency of physical symptoms and lower levels of negative stress effects.

The survey may also be thought of as a sampling of the overall level of stress among Troopers and their spouses. It will be possible to assess absolute levels of reported consequences of stress.

RESULTS

Seventy-seven participants in the control group and 31 participants in the experimental group returned data. Two respondents in the control group turned in blank answer sheets and were dropped from the analysis. Two respondents in the control group, apparently a married couple, responded in virtually identical ways, including omitting the last page of the survey. They were also dropped from the analysis. There were scattered items that were skipped. In most cases, it was possible to supply plausible responses. In a few cases, a missing response was replaced by the modal response for that item. The final analyses were performed on 104 participants, 75 in the control group and 29 in the experimental group.

Since there was no item that reported the employment status of the respondent, it must be pointed out that there is no way of distinguishing a Trooper from a spouse.

Group comparisons

The primary focus of the study was to attempt to reduce stress levels through an intervention program. This did not occur. There were no significant differences between the experimental and control groups on any of the nine composite variables. Table 1 presents the means and results of t-tests.

Relations among the buffering and stress effect variables

Theory predicts that high stress levels create a number of physical symptoms as well as feelings of distress. A major prediction of the model is that there should be a high positive correlation between reported levels of physical symptoms and levels of emotional distress. This was found to be true. The correlation between physical symptoms and negative effects was (+0.70)

It is also expected that the reporting of higher frequency of physical symptoms should be associated with lower reports of emotional well being. This was also found to be true. The correlation between physical symptoms and positive effects was (-0.46).

As a corollary, there should also be a negative correlation between reports of positive well being and negative well being. This was also true. The correlation between positive effects and negative effects was (-0.65).

The stress survey was constructed so that the five aspects of stress buffering were more or less independent. This turned out to be the case. The inter-correlations are close to zero with the exception of the correlation between social support and positive buffering ($r = +0.35$).

The model predicts that there should be benefits from successful buffering. That is, respondents who score highly on stress buffering activities should report fewer negative consequences of stress. For the most part, these expected relations failed to materialize. There were two exceptions: positive actions correlated with fewer reported physical symptoms (-0.24) and social support correlated with more positive effects (+0.28).

On the other hand, the two negative buffering composite variables should show significant correlations with outcome variables. Negative buffering correlated with anger (+0.42), with physical symptoms (+0.23), and with negative effects (+0.32). Negative actions correlated with physical symptoms (-0.24). It is interesting to note that the more negative aspects of buffering are better predictors of stress effects than are the more positive aspects.

DISCUSSION

Effectiveness of the computer disk training package:

This was a hypothesis-testing project to determine if reported stress buffering activities and effects of stress would be more positive in experimental subjects who were presented a packaged stress reduction training program than in a control group. The results indicate no differences between the two groups and do not support the hypothesis. The findings show that this unsolicited freestanding packaged program did not bring measurable immediate change in stress reduction behaviors or effects of stress.

Our questionnaires were designed to test the behaviors and effects of stress in a global manner without specific reference to the issues raised in the CD training packages. Moreover, many of the behaviors and attitudes addressed in the instrument reflect long-standing personality traits, and would not be immediately affected by instruction in a CD. Finally, our focus group experience showed that no matter how hard we tried to deal with nonspecific stress management, the participants returned to specific Highway Patrol administrative issues. It is likely, therefore, that the stress questionnaire we used and the context of its use as a Highway Patrol supported activity precluded accurate definition of the potential usefulness of the package.

The results of an informal poll of participating personnel in the experimental group and others who have viewed the program suggest that the technical quality of the computer disk package is good and that the material presented is potentially helpful. Therefore, the package might be measurably effective when presented to personnel who have an interest in the subject matter or when presented with supporting material and follow-up.

The level of return of the questionnaires was 19% from the experimental group and 48% from the control group. The return rate for the control group (48%) would be expected from an unsolicited mailing of anonymous material to a group of Troopers. The apparently significantly fewer returns from the control group, therefore, may mean that the CD technology was not available to about 60% of the subjects who would otherwise have participated, or, the corollary, that about 40% of the families had relatively easy access to an acceptable computer. These results suggest that the CD format is potentially a feasible technology for access to a significant proportion of law enforcement families. The cost of production of CDs is much lower than that for video presentations. Whether the viewer acceptability achieved with video can be matched with CDs is not known.

Results of the stress questionnaire:

A computer-derived random process chose the subjects selected for the study with stratification only by age. This allows us to imply that the results of this survey of stress buffers and stress effects is representative of the greater group of all Patrol Troopers. Therefore, the findings of the survey, as detailed in Tables 2-5, are evidence that there are possibly important numbers of Troopers with inadequate stress management habits and excessive effects of stress.

Some 26 percent of the respondents report 10 or more occurrences of insomnia during the past year. This finding is probably in part the result of sampling in a group of people who work at round-the-clock shifts or who live with someone who does. Regardless, it suggests a major problem with sleep hygiene and raises the possibility that this problem reduces the effectiveness of the Patrol and presents some danger to Troopers and to the motoring public. While the sleep segment of the CD was omitted from the tested package, it is now almost ready for testing. Our plan is to present it to Troopers who come to the SHP Medical Office for their official periodic physical examinations. The test will measure only retention of the points made in the program and will be given about 3 months after the intervention. After the sleep package has been tested and edited, and if it is acceptable, it will be added to the CD containing the other three packages.

The stress survey contains a section that focuses on a set of 28 physical symptoms. This set may be used to appraise the state of health and the level of stress of Troopers and their spouses. Table 2 presents the percentage of respondents who report a frequency of occurrence at the extreme upper range (ten or more times within the last year) for each symptom. It can be seen that the range is from a high of 26 percent reporting insomnia ten or more times to a low of zero percent reporting that flu and colds occurred as many as ten times.

There are several symptoms for which almost any occurrence is troubling. Table 3 presents nine such symptoms and the percentage of respondents who report even one occurrence during the past year. The range is from a high of 45 percent reporting a spell of dizziness to a low of 5 percent reporting the occurrence of cancer.

Repeated exposure to stress together with an inability to properly cope with it is known to promote heart-related problems. Table 4 lists four heart-related symptoms and the percentage of respondents who reported at least one occurrence during the past year. The range is from a high of 54 percent reporting an episode of a heart beating fast for no apparent reason to a low of 14 percent who report at least one occurrence of angina, chest pain, or heart disease.

Finally, Table 5 focuses on individuals. In surveys such as this, it is usually the case that everyone gets lumped together into averages. This overlooks the possibility that there may be individual respondents who are in severe distress and may be in need of care in order to help them maintain their ability to function normally. Table 5 presents a tally of "danger signs" for each respondent in the study. A danger sign is defined as the reporting of any symptom ten or more times during the last year (as reported in Table 2). To this is added a tally for each of the more serious symptoms (as listed in Table 3) for which at least one occurrence has occurred. Table 5 shows that a high percentage of the respondents reported very few danger signs. Sixty-eight percent report four or fewer danger signs and may be regarded as in satisfactory emotional health. On the other hand twelve percent report occurrence of ten or more danger signs.

As an example, consider a single individual reporting ten danger signs, the lower limit of what we have termed alarming. We know this person only as #126. We do not know whether the person is a Trooper or a spouse but in either case it may be assumed that the Highway Patrol is affected even if it is just a Trooper worried about his wife. This person reported:

- 10 or more spells of dizziness
- 10 or more cases of an upset stomach
- 10 or more cases of loss of appetite
- 10 or more cases of loss of sleep
- 10 or more cases of aches
- 10 or more cases of allergies or asthma
- 10 or more cases of back pain
- 10 or more cases of fatigue or lethargy
- 10 or more cases of sinus headaches
- 6-9 times in which bad health affected work
- 6-9 cases of an anxiety attack
- 6-9 cases of tension headaches
- 3-5 cases of the heart beating hard for no apparent reason
- 3-5 cases of nausea and vomiting
- 1-2 cases of irregular heartbeats

One can only wonder how effective this individual was last year.

These results reinforce the observation that stress and the effects of stress impact a significant proportion of law enforcement families.

Distribution of products:

The sleep hygiene package is being finalized now and will be presented to approximately 100 Troopers during their routine visits to the medical office over the next two months. The sleep hygiene program will then be added to the CD that has programs on general stress management, the "pavement syndrome" and scheduling. A final CD will be prepared and reproduced by our Information Management Unit, since they now have a CD duplicating system. The final CD will be made available to the library at the North Carolina Justice Academy and added to the NCSHP web site. CDs will also be made available to the officers with the state agencies served by the NSHP Medical Office. These include the NC Alcohol Law Enforcement Agency, NC Department of Motor Vehicle Enforcement, Butner Public Safety Department, and the Office of the State Fire Marshal.

Table 1: Means of stress composite variables by group

Note: values have been expressed on a mean per-item basis. Means that are expected by theory to be higher are in boldface type.

COMPOSITE	EXPERIMENTAL MEAN±SD	CONTROL MEAN±SD	t	p
Mean response category				
BUFFERING				
Positive Buffering slightly helpful	3.08 ±0.62	3.17 ±0.56	0.67	>.05
Negative Buffering did not do	1.50 ±0.38	1.55 ±0.38	0.55	>.05
Positive Actions on some days	3.01 ±0.83	2.86 ±0.78	0.90	>.05
Negative Actions on some days	3.43 ±0.67	3.43 ±0.57	0.03	>.05
Social Support sometimes helpful	3.33 ±0.51	3.40 ±0.65	0.52	>.05
EFFECTS				
Anger rarely/a few times	2.92 ±0.65	3.05 ±0.74	0.80	>.05
Physical Symptoms about one time last year	1.87 ±0.56	1.94 ±0.62	0.96	>.05
Positive effects felt this way a few times	3.68 ±0.83	3.58 ±0.76	0.84	>.05
Negative effects rarely felt this way	2.61 ±0.79	2.66 ±0.92	0.23	>.05

TABLE 2: Frequency of reported symptoms

Percentage of respondents reporting ten or more occurrences during the past year

SYMPTOM	PERCENT
56 Insomnia	26
52 Upset stomach	24
76 Tension headache	19
57 Aches	18
73 Fatigue, lethargy	16
72 Back pain	15
58 Allergies	12
75 Sinus headache	11
59 Teeth grinding	10
53 Heart beating fast for no apparent reason	09
55 Loss of appetite	08
66 Irritable bowel syndrome	08
50 Heart beating hard for no apparent reason	07
62 Irregular heartbeats	06
74 Migraine	06
49 Shortness of breath	05
65 Hypertension	05
67 Myofacial pain syndrome	04
69 Rashes, eczema	04
70 Ulcer	04
71 Anxiety attack	04
51 Dizziness	03
64 Chest pain	02
68 Nausea or vomiting	02
54 Bad health affecting work	01
60 Cancer	00
61 Flu	00
63 Cold	00

Table 3; OCCURANCE Of SERIOUS SYMPTOMS
Percentages reporting at least one occurrence during the
last year

<u>Symptom</u>	<u>Percentage</u>
51 Spells of dizziness	45
66 Irritable bowel syndrome	39
62 Irregular heartbeats	32
65 Hypertension	28
71 Anxiety attacks	27
70 Ulcer	16
64 Angina, chest pain	14
67 Myofacial syndrome	09
60 Cancer	05

Table 4: REPORTS OF HEART RELATED SYMPTOMS

Percentage reporting at least one occurrence during the past year

SYMPTOM	PERCENTAGE
53 Heart beating fast for no apparent reason	54
50 Heart beating hard for no apparent reason	51
51 Spells of dizziness	46
49 Shortness of breath	44
64 Angina, chest pains or heart disease	14

TABLE 5: FREQUENCY OF OCCURANCE OF DANGER SIGNS

Number of respondents who report "danger signs" defined as reporting of 10 or more occurrences of a physical symptom in the past year (Table 2) plus the occurrence of even one of the more serious symptoms listed in Table 3.

NUMBER OF DANGER SIGNS REPORTED	NUMBER OF RESPONDENTS REPORTING
0	19
1	20
2	9
3	6
4	17
5	7
6	2
7	2
8	5
9	5
10	3
11	1
12	2
13	2
14	1
15	0
16	2
17	1

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Box 6000
Rockville, MD 20849-6000