**Using Simulation in Stress Management Training: Can Stress Influence Performance Positively?**

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**Abstract**

Stress Management has been a long cherished topic for academic debates and discussions at popular forums. Bestseller books, popular magazines and newspaper articles suggest numerous ways of positive approach of handling stressful situations but stress research literature has shown heavy tilt towards ‘distress’ than ‘eustress’ or positive stress. The present study is an attempt to explore ‘dynamics of stress-performance relationship’ by using qualitative approach. An experiment was conducted on 46 MBA students who opted for a course on ‘stress management’. The data was analyzed by qualitative content analysis. The findings of the study suggested that students of high stress situation (HSS) group gained better performance scores, lost less penalty points, higher self-decided target and delivered better efficiency ratio in comparison to low stress situation (LSS) group. The study indicates to consider positive stress as a cognitive, motivational process that charges up an individual to perform better, energize and prepare to face greater challenges in future which could be useful in designing better stress management training programmes.

**Key Words:**  Positive Stress, Stress-Performance Relationship, Qualitative Approach, Stress Management Training

**Using Simulation in Stress Management Training: Can Stress Influence Performance Positively?**

**Introduction**

Stress Management has been a long cherished topic for academic debates and discussions at popular forums. Bestseller books, popular magazines and newspaper articles suggest numerous ways of positive approach of handling stressful situations but stress research literature has shown heavy tilt towards ‘distress’ than ‘eustress’ or positive stress (Edwards and Cooper, 1988; Le Ferve, Matheny and Kolt, 2003; Le Ferve, Kolt and Mathaeny, 2006). The concept of ‘eustress’ and ‘distress’ were first proposed by Selye (1956) and later supported by many researchers (Anderson and Arnoult, 1989; Edwards and Cooper, 1988; Pestonjee, 1987; Pestonjee, 1992; Simmons and Nelson, 2001; Nelson and Simmons, 2003; Le Ferve, 2003). However, three dominant theories of stress, P-E fit theory (Edwards et al, 1998), Cybernetic theory (Cummings and Cooper, 1998) and control theory (Spector, 1998) do not seem to be differentiating between eustress and distress (Le Ferve et al, 2003). Nelson and Simmons (2003) suggested that eustress and distress are separate and independents aspects of overall stress response. Le Ferve et al (2003) argued that if eustress and distress are separate constructs then it is also possible that both eustress and distress may occur simultaneously to the same environmental stimuli. Le Ferve et al (2006) supported study of Cavanaugh et al (2000) as a good empirical support to construct of eustress. McGowan et al (2006) tested eustress-distress model by using structural equation modeling and found that challenge appraisals and task-focused coping were positively associated with eustress, and distress has been found positively associated with threat appraisals and emotion-focused coping; eustress and distress were also found positively and negatively associated with ‘satisfaction with the outcome of stress process’. As a strong critique to positive psychology school, Lazarus (2000) argued that most of current research on stress and coping is quite balanced between positive and negative. However, it has been observed that because of growing influence of positive psychology school, stress researchers now have started exploring ‘positive-negative’ dichotomy of stress in a more serious manner than ever before (McGowan et al, 2006; Little et al, 2007; Swanson et al, 2007;Gibbons et al, 2008; Pandey, 2005, Pandey and Gandhe, 2011).

**Theoretical Framework of Stress-Performance Relationship**

The idea of positive stress or eustress (euphoria + stress = eustress) goes back to classical Yerkes-Dodson Law (1908) which argued about link between arousal and performance, and optimum level of stress which is needed to deliver peak performance up to a point, beyond this point performance starts declining because of increased arousal. The inverted U-shaped Yerkes-Dodson Curve is normally found in any basic chapter on stress in textbooks of psychology and organizational behavior. On explaining Y-D curve in context of work and organization situations, McGrath (1976) argued that performance declines beyond the mid-point in the Y-D curve because of increasing difficulty of the task to be performed. Selye (1956, 1976) argued eustress as a kind of good stress that leads to a positive outcome. In this original argument, eustress arises when increased endocrine activity prepares the stressed subject for fight or flight. Holmes and Rahe (1967) argued about effects of positive life events on individuals’ health and well-being because positive life events such as promotion, marriage etc. also induce changes in life of a person, hence may adversely affect health. Drawing arguments from Holmes and Rahe (1967), Anderson and Arnoult (1989) proposed that people experiencing lots of positive stress should be relatively unaffected by negative stress events, hence positive stress should be working as a moderator in coping with stressful life situations. Bicknell and Liefoughe (2006) challenged dominance of positivist methods in stress research that looks into stress as transactional process. By adapting Foucauldian perspective in interpreting pleasure, displeasure and ‘creating oneself as an artwork’ in context of stress, they proposed that while interpreting stress process, we should be looking into harmony between person and environment rather than ‘misfit between person and environment’. In their recent discourse paper, Bicknell and Liefooghe (2010) argued and proposed for *jouissance* (enjoy your stress) on the basis of *Lacanian* perspective discussed in context of stress and coping behavior in daily life. These alternative approaches suggest that we should not be looking into stress only from “problematic’ viewpoint but rather ‘as an essential inevitable component of life’. We may look into “living with stress” approach rather “avoiding or minimizing the stress”.

Though theoretical arguments and discourse strongly favor in understanding of positive stress (eustress) as optimum level of stress that results into maximum performance; or experiencing positive psychological responses/states as outcomes of external situations (which could be positive or negative), we believe that a common person has one’s own understanding of ‘positive and negative aspects of stress’ and this understanding is continuously nurtured by different information sources (formal and informal, both). So, rather than imposing our own theoretical definitions of constructs ‘positive stress (eustress)’ or ‘negative stress (distress)’, we should try to understand their ‘meanings as understood and interpreted by common people’. As researchers, we also believe that this ‘meaning’ is highly influenced by social and cultural environment of the people in which they live, so we need to understand and interpret constructs like ‘positive stress’ or ‘distress’ in culturally-appropriate way and how does positive/negative perception of stress influence individuals’ performance. This theoretical understanding could be very useful in designing culturally-appropriate stress management training programmes for different occupational groups.

**The Present Study**

The present study was designed to find answer to the following questions: 1) how do people perceive stress, “positive” or “negative” way? (2) What are cognitive and emotive processes that influence dynamics of stress-performance relationship?

As this study was designed as an exploratory study, we started with no hypotheses between pre-decided variables but rather open-ended research questions which we could find answers by using qualitative approach. However, regarding stress-performance relationship, we propose the hypothesis as “*High stress and low stress groups differ significantly in terms of performance outcomes*”. To find answers to our questions, we decided to conduct an experiment in classroom situation on students.

**Method**

*The Experiment:*

The experiment was designed to find answer to the question, *“can positive stress be created by manipulating external situations?”* In this experiment, 46 MBA students (males =42 and females = 4, Age Group = 22-30 years, Mean = 23.5, S.D.= 1.85 ) of the MBA prgoramme participated as a classroom activity of the elective course on “Stress Management” which they opted in the second year of the programme. This course was designed and taught by the lead author of this study and a very senior professor Prof. D. M. Pestonjee who had more than 40 years teaching and research experience in the field of stress management in India. The course material was heavily based on Prof. Pestonjee’s classical book *“Stress and Coping: The Indian Experience* (2nd edition, 1999)” and some selected research papers. The course was offered to students in the sixth (last trimester, Jan-March 2012) of the programme and it was delivered in 10 sessions of 90 minutes each (1.5 credits). The experiment was conducted in the first week of March 2012, just after first two sessions were over. We divided 23 students randomly to two different groups (1) experimental group and (2) control group. As there were 4 females in the sample, we assigned 2 female students randomly to the each group. In that way, every group had 21 male and 2 female students as participants. To ensure sincere participation of students, they were communicated that in the next class, there will be a surprise activity in which their participation will be considered as an essential component in the course evaluation process.

In the experiment, both the groups were given an assignment in which they received a set of 20 different types of paper-pencil tasks (one task only on a single sheet of paper) in a sealed envelope e.g. copy the given paragraph or poem on the backside of the sheet or draw five different fruits. A list of all 20 tasks reflecting on task preferences given by respondents and few sample tasks with detailed instructions is given in the appendix-A. The tasks were designed by the authors considering academic context of MBA students and Indian social/cultural context. We designed tasks not to test participants’ general knowledge, memory, creativity or special skills e.g. drawing, writing story or poem; but to test how they perform (by completing as many as tasks successfully) under ‘high stressful’ or ‘low stressful’ conditions. We kept some three

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time warnings after every 15 minutes. We assumed that time pressure and performance pressure could be good enough to create high stress situation to this group. In contrast, participants of the control group were asked to gain maximum reward points by completing as many as tasks within the given time limit (45 minutes) but they were not assigned any performance target nor given frequent time warnings after every 15 minutes. Though, we did not assign any performance target to the control group participants but we allowed them to set a performance target for themselves if they wish so, but they had to indicate it in their pre-test instruction sheet. We termed the control group situation as the *low stress situation* (LSS) because of less stressful conditions associated with the task completion assignment (only one time warning before the end of the task completion assignment and no pre-set definite performance target to be achieved). Both the groups were completely unaware about the purpose of experiment and specific condition exposed to the other group till the time experiment was over.

**Measures**

*Assessment and Measurement of Task Performance:*  In this experiment, we generated data on three major components; tasks performance, pre-test emotional state and post-test perception of tasks/simulation exercise. We calculated different performance scores on different parameters.

*Gained Reward Points = Total reward points gained on tasks successfully completed by the participant*

*Lost Penalty Points = Total penalty points lost by the participant on incomplete/incorrectly done tasks*

*Risked Reward Points = Sum of reward points associated with all the tasks attempted by the participant*

*Net Performance = 100 + (Gained Reward Points –Lost Penalty Points)*

*Efficiency Ratio = Gained Reward Points/Risked Reward Points*

Each task sheet indicating the task attempted by each participant was assessed and evaluated by two independent judges (authors themselves, as we designed the tasks and had clarity on evaluation criteria for each task). In case of tasks, where subjectivity comes in picture e.g. tasks related to evaluating quality of the drawing figures, completely darkened shapes like circles/pentagons or popular songs written by participants, both the judges discussed the task performance and arrived as consensus decision regarding consideration of the task as successfully completed/incomplete and award of reward/penalty points on that task. This step in the task assessment process was very important as it helped us in identifying/cross-checking discrepancies in tasks assessed by one evaluator, and correcting task performance through consensual decisions.

*Measurement of Pre-test Emotional State and Post-test Perception of Simulation Exercise:*

Each participant were asked to fill a self-assessment questionnaire in which there were 4 different questions intended to measure their pre-test emotional state (confidence, perceived stress management potential, curiosity, anxiety) on a 10-point bipolar rating scale (high=10, low=1) on each factor. After the completion of the 45 minutes task completion assignment, each participant was also asked to fill another self-assessment questionnaire in which they had to rate their overall experience with the simulation exercise on different factors (Stressful, interesting, challenging, creative, performance satisfaction, perceived stress management potential) on the basis of their individual perception by using 10-points rating system (10= high, 1= low). We used bipolar scale for each factor; Highly Stressful-Less Stressful, Highly Interesting-Not Interesting, Highly Challenging-Not Challenging, Creative-Mundane, Highly Satisfied-Not Satisfied. We tested stress management potential in pre- and post-test situations. Each participant was also asked to write one page descriptive note on their perceptions, feelings, comments related to the simulation activity.

Later, in the class conducted next week, we provided feedback on performance results and other relevant basic statistics (Mean and SDs on various psychological factors) to students and asked them to analyze and interpret in their context. Students also shared their feelings about the simulation experience with their peer group and openly discussed results in the classroom for enriching their understanding of ‘stress management’.

**Data Analysis**

Though in this experiment, both quantitative and qualitative data was generated but in this paper, we are focusing specifically on qualitative data and interpretations derived out of this data. We have mentioned some quantitative data in this paper but that is done to support our qualitative analysis, not to discuss statistical significance for testing pre-determined hypotheses.

We analyzed post-test descriptive notes written by participants of both the groups by using qualitative content analysis (Flick, 2009, p. 323-328). First, we separated key words, phrases and relevant statements connected to ‘positive stress themes’. We classified these key words as first-level categories e.g. interesting, challenging, creative, time pressure, anxiety, and so on. We identified 36 first-level categories which were later compressed to 6 second-level categories. We put mark ‘1’ to indicate presence of elements associated with that category against the respondent’s data record. In that way, we identified several categories in the content written by a respondent. We added all the frequency counts against each category to identify its strength against other categories. Higher frequency number indicates greater strength amongst various categories. To explore dynamics of positive stress, we also classified our sample into six different sub-groups on the basis of perceived stress ratings (*high perceived stress HPS* = 7-10, *moderately perceived stress MPS* = 5-6, *low perceived stress LPS* = 1-4 on the variable, “Stressful” in post-test evaluation) and their allotment to the high stress/low stress situation. We classified all second-order response categories generated from post-test evaluation of simulation exercise to these six sub-groups.

**Results**

*Descriptive Statistics on various performance parameters and pre-test/post-test psychological state of respondents*

Tables 1a, 1b and 1c give an account of descriptive statistics on pre-test psychological state of respondents on four different factors, performance data on seven parameters and post-test perception of simulation exercise on five different factors in case of both, HSS and LSS groups. As we can see in the table-1a that all of mean differences between HSS and LSS groups in pre-test assessment are not statistically significant that indicates about almost similar psychological state of individuals in both groups before the experiment was conducted. However, post-test results on perception of simulation exercise (on factors stressful, interesting challenging, performance satisfaction and personal stress management potential) also do not show significant

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category indicates that respondents recognized positive outcome of the experiment on their emotional state. Under ‘positive emotional feelings’ category, we can see that respondents found the simulation exercise as interesting (23), challenging (17), enjoyable (13), exciting (10), creative (10) and it was also perceived as instrumental to improve their learning (9) and self-development (9). We also found some phrases like “*the entire exercise was full of fun*” (by GT), “*good exercise as it diverts mind from tension and stress” (by PV),* “*it was wonderful, chilling of mind, stressless... I enjoyed it ”(by VN)* in students’ responses. Compared to 102 responses under category of ‘*positive emotional feelings’*, we found only 19 responses under the category of ‘*negative emotional feelings’* like, *“I am not satisfied with my performance*” (by AJ), *"Time should be more. Some exercises are not suitable enough in this tasks set. Tasks on filling and copying were mundane.” (by NR-1), “rewards and penalty points linked to tasks were not perceived as fair.” (by KS) ,* and *“it was stressful to meet my expectations.” (by SP)*. Time pressure (frequency= 42) and task focus (frequency =52) were also recognized as very powerful amongst all categories. Respondents used terms like time pressure, time management, and speed in their responses. Respondents identified tasks as instruments to test their cognitive abilities (memory, creativity, decision-making, writing, drawing, general knowledge etc.). They found task prioritization quite challenging and difficult (11), some of them reported tasks as ‘*sources of stress’* and 14 respondents reported that their perception of task difficulty changed when they started doing tasks and moved further in the simulation exercise. Many respondents used this phrase “*easy looking tasks were not so easy*” in their responses. 19 respondents clearly recognized that in this exercise, decision-making was quite difficult for them and they used different criteria (task difficulty level, task type, personal comfort, self-confidence, time available, performance target, risk assessment of the situation, reward/penalty points) to prioritize tasks for attempting order. Respondents considered reward/penalty points associated with tasks as very crucial criterion in decision-making, it is quite visible under the category ‘performance-focused responses’ where we can see 8 responses focused on reward/penalty points out of total 25 responses. Similar trends are also visible in the table-4, where we can see that highest number of respondents is falling against the category ‘positive emotional feelings’, followed by ‘task-focus’ (25) and ‘time pressure’ (25). These results also indicate that high stress situation group respondents were more focused on tasks, performance and decision-making process and felt significantly more time pressure than low stress situation group. If we look into interaction of external situation and perceived stress, we find that in case of both the groups, HSS and LSS, three sub-groups; High Perceived Stress (HPS), Moderately Perceived Stress (MPS) and Low Perceived Stress (LPS) show some differences under both the situations. We can see that 53.8% of respondents (HSS group) indicated ‘positive emotional feelings’ compared to 46.2 % in case of LSS group. However, in case of sub-groups, MPS group under HSS group indicated highest 52.4% respondents expressing ‘positive emotional feelings’, in case of LSS groups, trends are not so skewed towards any sub-group. Similarly, HSS group respondents indicated significant shift towards feeling ‘time pressure’ (68.0%), ‘performance focus’ (69.6%), decision-making focus (88.9%) and negative emotional feelings (63.6%) too. Three sub-groups under LSS group indicated different trends in categories time pressure, negative emotional feelings, task-focus, performance focus and decision-making focus.

**Discussion**

We started this research by asking two questions to ourselves: 1) how do people perceive stress, “positive” or “negative” way? (2) What are cognitive and emotive processes that influence dynamics of stress-performance relationship? To find answers to these questions, we decided to adopt qualitative and exploratory approach; and we decided to do it by conducting an experiment in the classroom situations on students who have opted to study a course on “stress management” as an elective in their second year of the MBA programme. In the experiment, we tried to control and manipulate external situations for two independent groups of student (randomly assigned) as high stress and low stress situations; but we focused on qualitative data to analyze results and understand ‘dynamics of positive stress’. We assumed that in this experiment, when participants would be presented variety of tasks to be successfully performed within the given time limit for maximizing gain and when they were at the risk of either gaining the full reward points on success and losing penalty points on failure, this situation could be enough challenging for different individuals and act as potential source of ‘positive stress’ or ‘distress’. We differentiated high stress situation and low stress situation on the basis of pre-decided performance target and time pressure for one group, and ‘target free’ situation for the another one. We were interested to know if high stress situation or low stress situation may lead to dominant perception of ‘positive stress’ or ‘distress’ in any of the groups. One contribution of this study, as we see in the findings is that respondents had identified very strong linkages among task, performance, reward/penalty points and time as the most precious resources while interpreting perception of positive stress (or distress) to them. We found a number of prevalent theories and models e.g. control theory (Spector et al 1998), conservation of resources theory (Hobfoll, 2001), eustress model (Le Ferve et al 2003) to explain these relationships in our

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The findings of this study strongly support acceptance of ‘positive/negative’ dichotomy of stress and our respondents perceived positive stress and distress as two different and opposite forces which leads to different outcomes (good and favorable outcomes in case of positive stress and bad/unfavorable outcomes in case of distress). These outcomes include physiological, psychological and behavioral changes in individuals, and social/organizational performance outcomes. While defining ‘distress’ our most of respondents wrote ‘outcome-focused responses’ than ‘situation-focused’ responses; whereas in case of responses related defining ‘positive stress’, situation-focused view was also very visible.

The findings of this study suggest us to consider three different components for redefining ‘positive stress’ as construct: (i) external situation or sources (ii) individual dispositions (cognitive capabilities, internal motivational force, energy, self-efficacy) and (iii) responses or outcomes (physical performance, physiological, psychological, behavioral). Experiencing positive stress is a cognitive process which connects all three components in a cyclical or spiral way. For example, when sportspersons perform in the competition, they get charged by their performance records and further charge up themselves for the next level. Similarly, people who participate in adventure sports like sky-diving, skiing, sea surfing, bungee jumping, also charge them up with positive stress. They know what kind of risk, they are going to take, but they take risk and enjoy the experience. Similarly, when people enjoy their job as a passion (though it may be risky job or full of negative factors e.g. police, fire brigade, pilot, military services and so on), they experience positive stress.

**Limitations**

The present study is based on an experiment conducted on MBA students as a kind of classroom activity in an academic course. Results obtained on students’ sample reflect on behavior outcomes in controlled classroom situations. When we are using data obtained from qualitative analysis of students’ responses written in the post-experiment feedback sheet, we need to be extremely careful about interpreting findings of the study as there could be very much impact of classroom learning (lectures, discussions etc.) on students’ thoughts, attitudes, feelings and behavioral outcomes as reflected in their responses, especially when the course is taught by a very noted professor. In a country like India, where power distance plays very important role in social interaction, students generally accepts professors as ultimate authority in the subject and very few students present different viewpoints. We need to cautiously interpret implications of these findings while understanding dynamics of stress in work organizations, other occupational groups or different cultural contexts.

We conducted this experiment on MBA students (young people in the age range of 22-30 years) studying in an Indian university. Hence, tasks were designed keeping in mind academic, social and cultural context of students. If any other researcher/trainer belonging to other cultural environment needs to replicate this experiment either in the same or with variations for stress management training programmes; the person should design tasks as per cultural context and training needs of the participants.

**Implications of the study in Organizational Context**

The present study attempts to explore dynamics of ‘stress-performance relationship’ through a simulation experience in the classroom. Though we conducted an experiment in classroom situation as an academic activity in a course but findings of this experiment could be quite valuable and useful in organizational situations too i.e. stress management training programmes. The findings of this experiment indicates that people perceive positive stress strongly in connection with task(s) in hand, performance target(s) to be achieved, time available, performance outcomes (results, achievements), efficiency, personal capabilities (self-efficacy) and decision-making situation/resources available to them. This experiment also suggests that we can also create ‘positive stress’ situations in organizations by redesigning systems and processes (e.g. redesigning jobs and performance rewards system, providing opportunities for redesigning organizational roles or new opportunities for taking up challenging and innovative assignments, flexibility to people in bringing improvements to systems and processes, providing more caring system and social support to people .. and so on). We identified performance targets and linked reward/penalty points very crucial factors in creating ‘positive stress’ situation and better performance results. This experiment also suggests that ‘positive stress’ is a kind of perception of individuals about an external situation and this perception can be managed effectively by manipulating external factors/situation for achieving expected results. These findings could be very to useful in designing better stress management training programmes for people employed in various industries, occupations. The simulation exercise used in this study can also be effectively used in workplace stress management training programmes with appropriate modifications/adaptations to the cultural context of the organization or target group.

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**Table-1a, Descriptive Statistics on Pre-test perception of respondents’ emotional state on different factors**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pre-Test Psychological State Factors** | **High Stress Situation (N= 23)**  Mean (S.D.) | **Low Stress Situation (N= 23)**  Mean (S.D.) | **Significance** |
| Confidence | 7.70 (0.63) | 7. 83 (0.98) | NS |
| Perceived Stress Management Potential | 7.13 (1.60) | 7.43 (1.50) | NS |
| Curiosity | 8.00 (1.73) | 8.00 (1.45) | NS |
| Anxiety | 5.09 (2.47) | 5.43 (2.87) | NS |

**Table-1b, Descriptive Statistics on different performance factors associated with simulation exercise.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Performance Parameters** | **High Stress Situation (N= 23)**  Mean (S.D.) | **Low Stress Situation (N= 23)**  Mean (S.D.) | **Significance** |
| Gained Reward Points | 107.39 (39.45) | 103. 91 (61.40) | F= 5.31, P < 0.05,  t= NS |
| Lost Penalty Points | 28.70 (19.03) | 41.96 (32.50) | NS |
| Tasks Attempted | 9.13 (2.05) | 10.17 (3.04) | NS |
| Risked Reward Points | 164.78 (36.54) | 190.43 (70.10) | F= 8.91, P< 0.01, t= NS |
| Self-decided Performance Target | 237.78 (21.30) | 201.54 (29.96) | t = 3.94, P< 0.01 |
| Net Performance | 178.70 (52.53) | 161.96 (80.55) | NS |
| Efficiency Ratio | 49.17 (30.90) | 33.27 (35.48) | NS |

**Table-1c, Descriptive Statistics on Post-test perception of simulation exercise on different factors**

|  |  |  |  |
| --- | --- | --- | --- |
| **Post-test Perception of Simulation Exercise and self** | **High Stress Situation (N= 23)**  Mean (S.D.) | **Low Stress Situation (N= 23)**  Mean (S.D.) | **Significance** |
| Stressful | 5.87 *(1.60)* | 5.83  *(2.35)* | NS |
| Interesting | 8.09 *(1.65)* | 7. 96  *(1.30)* | NS |
| Challenging | 7.91 *(1.59)* | 8.09 *(1.24)* | NS |
| Creative | 6.52 *(2.25)* | 7.61  *(1.20)* | F= 4.63, P< 0.01  t = -2.04, P<0.05 |
| Perceived Performance Satisfaction | 6.00 *(1.28)* | 6.09 *(1.56)* | NS |
| Perceived Stress Management Potential | 6.43 *(1.34)* | 6. 43  *(1.73)* | NS |

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