To Study the Effect of Favourable Prompts and Resilience on Stress Levels among Young Adults: An Experimental Study

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Abstract: *It is well established that stress affects the physiological and mental health of young adults who due to their busy schedule cannot cope effectively. Thus, stress gets accumulated in the body. To find a solution for this, the following study aimed to find out if the stress levels reduce significantly after the immediate provision of a prompt (a relaxing stimulus). It also explores the relationship between resilience levels and perceived stress intensity. Participants (n=60) were selected for an experiment on the basis of the scores obtained on the Perceived Stress Scale (PSS). An experiment was conducted to test the first hypothesis. They were also given the Brief Resilience scale. The t test and Pearson Product Moment Correlation methods were usedto test the hypothesis. Results indicate that the stress levels decreased significantly after the provision of the prompt (t =16.879) and the resilience levels were negatively correlated with the intensity of the perceived stress (r value = - 0.305).*

Keywords: Stress levels, Chronic stress, Coping, Resilience, Prompts

1. Introduction

According to Lazarus and Folkman (1984), "psychological stress is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well - being." When a person experiences stress, a series of reactions take place in his or her body. This stress can be measured using psychological stress scales or physical measurements like heart beats, blood pressure, etc. It is a commonly established fact that stress has an adverse impact on the health of humans. With changing times, the gravity of this health concern is increasing rapidly causing fatalities in young adulthood. The lifestyle of people has changed for the worse over the years making stress a fundamental component of it. Right from the beginning of the day young adults are subjected to a series of reasons or events which prove to be stressful for them. Some of these reasons cause a minor amount of stress which humans are easily able to surpass. But when their stress levels increase considerably, many people are unable to cope with it and are unable to reduce it or let it go. As a result, this stress accumulates in the body and starts deteriorating its normal mechanism. Eventually a point comes where the stress saturates for a long period and the body becomes unable to handle or hold it inside. At this stage, the body starts showing signs of different problems and disorders. These signs include constant stomach distress and digestive issues, high fluctuations in moods, issues in the sleep cycle, appetite problems, getting ill after small periods of time, breathing difficulty due to ineffective coping of stress, weakening of the heart and related issues, etc. If these symptoms or signs still remain untreated, the severity of these conditions increases and starts causing threats to the life of the person. With such kind of stress levels increasing in the body regularly, the chances of living of that person decrease. Stress proves to be one of the most common reasons for deaths in young adults and is also responsible for the decreasing age of heart attacks.

To prevent this entire chain, stress should be stopped from accumulating into the body in its primary stages. This paper focuses on the same preventative solution and explores different aspects of it as well. A prompt is an immediate stimulus that is provided by the environment after some action or situation. In this study a prompt will include different positive and calming stimuli that will be used to reduce the stress levels of the participants. In reality, these prompts can be personalized and are thus termed as 'favourable'. One can decide upon the stimuli in advance and then use them to reduce or maintain their stress levels.

Along with this mechanism, a connection between the intensity of the stress and a person's resilience is also studied. Resilience is the ability to bounce back after difficult situations. Resilience is the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioural flexibility and adjustment to external and internal demands. (APA dictionary of Psychology, 2020). The intensity of stress means how much peoples' stress levels affect their heart rates or causes them other physical and psychological issues. Even if stress accumulates less in a person but he or she faces intense stress suddenly, it will cause damage to the health. The following study also focuses on this aspect of preventative measure of stress. A connection or a relationship between intensity of stress and resilience will guide people to regulate and maintain their own levels of resilience accordingly.

The following paper is an experimental study that was carried out to check the truth value of the hypotheses. This experiment was designed to see if the premise of preventing stress from accumulating has any possible applications in real life and if it has any kind of benefit to the masses.

2. Literature Survey

Schraml, et al., (2012) in their study Chronic Stress and its Consequences on Subsequent Academic Achievement among Adolescents have discussed the prevalence of chronic stress in not just adults but also adolescents. They have further discussed of this chronic stress among adolescents have any effects on their academic achievement. A questionnaire on stress symptoms was given to 270 students at the beginning and end of their high school. It was found out that those who reported the experience of stress at both times, that is the beginning and end of the school, were found to have worse grades than the students who reported stress only once or at no points.97 students of these 270 students, that is 39% of the total study population was highly stressed at least once in their high school life. It was seen that adolescents who suffered from low global self - esteem, poor health, insufficient sleep duration, etc., were more prone to developing chronic stress. Receiving low grades in their high schools can prove to be hinderance for them in getting admission in good tertiary line educational institutions. They have also stated clearly that early prevention of such chronic stress is extremely essential and if failed to do so, it can have serious consequences on the future health and career possibilities of these adolescents.

Blum, et al., (2012) in their study Coping Strategies have discussed different aspects of coping strategies. They have enlisted some common coping strategies which are accepting the situation or one's role in it, avoiding or escaping the stressor or the associated feelings of distress, active or confronting coping to remove the stressor or oneself from the stressor, anticipatory coping aimed toward an expected but uncontrollable event, denying the problem or feelings, reinterpreting the stressor as a positive or goal - oriented experience, seeking social support, etc. They have also talked about proactive coping which includes future and action related behaviours. They have also mentioned that proactive coping builds and strengthens all resources like practical knowledge, experiences, sufficient number and variety in social contacts, etc. It also involves gaining skills and abilities to assess the changing environment from signs of a possible stressor to use of appropriate strategies to cope with such stressors. Future oriented coping strategies tend to have positive outcomes and lead to lower level of stress. The author has also discussed the problem focused and emotion focused coping strategies effectively. They have also mentioned how the best type of coping is a combination of the two. There is no universal coping strategy that is useful for everyone or useful in all situations.

Tung, et al., (2014) in their study Effect of Resilience on Self - Perceived Stress and Experiences on Stress Symptoms A Surveillance Report examined the relationship between perceived stress, emotional syndromes and quality of life among students. They also evaluated if the personal resources of students have any kind of connection with their stress levels. Students' physical and psychological well - being, and their personal resilience were measured. Their sociodemographic factors and outcome measures were also assessed. For these measurements they were given some self - report questionnaires. The results indicated that only half of the student participants experienced some emotional symptoms of stress but about 86.8% of the students reported higher to much higher than the average level of perceived stress. Findings suggest that higher level of stress was experienced by those with low resilience. These students reported of having significantly poor physical, psychological and social health. The paper concludes stating that personal resilience affects the level of the perceived stress experienced by students. This affects the general well - being of the students leading to deterioration in their life quality. Thus, the stress intensity had a strong association with low levels of personal resilience. It was said that the necessity of monitoring students' stress levels regularly and using appropriate interventions to help them cope with this stress is increasing.

3. Problem Definition

Do the stress levels drop significantly and immediately when a relaxing stimulus is provided and does the level of resilience affect the intensity of stress perceived by the individuals?

4. Methodology

4.1 Sample

30 males and 30 females between 18 to 30 years of age were selected for the experiment from the population of Pune city, Maharashtra using the sampling techniques:
- Snowball sampling while circulating questionnaire.
- Quota sampling to select the final sample for the experiment.

To remove any gender or age bias in the sample, the 30 males were divided into 15 males from the ages 18 to 24 and 15 males from ages 25 to 30. Similarly, 30 females were divided into 15 females from ages 18 to 24 and 15 females from the ages 25 to 30 were selected.

4.2 Tools

The following tools were used to collect the data:

4.2.1 Perceived Stress Scale (PSS - 10) by Sheldon Cohen (1983)
The perceived stress scale (PSS 10) has 10 items. Each item is scored with the help of a Likert scale. As this scale is measured on the basis of frequency, the Likert scale ranges from Never to Very Often. The least score on this scale is 0 and the highest score is 40. If the obtained score falls in between 0 to 13, it means that the individual has low stress. If it falls between 14 to 26, the individual has moderate stress and if the scores fall in between 27 to 40, the individual has high stress. Internal Consistency reliability and validity of the PSS 10 are well studied and give satisfactory results.

4.2.2 Brief Resilience Scale (BRS) by Smith, B. W., et al. (2008)
The Brief Resilience Scale has 6 items. Each item is scored with the help of a Likert scale. The Likert scale ranges from Strongly Disagree to Strongly agree. The least score on this scale is 1 and the highest score is 5. If the obtained score

falls in between 1 to 2.99, it means that the individual has low resilience. If it falls between 3 to 4.30, the individual has normal resilience and if the scores fall in between 4.31 to 5, the individual has high resilience. A preliminary study of its psychometric properties showed adequate internal consistency, test - retest reliability, and convergent and divergent validity. (Scali et al., 2012)

Gadget Description:

Partial concept of the study is based on a smart watch called Dominix designed by Mr. Dhruva Paknikar, founder and CEO of Dominix Global. This band is based on the premise that if stress accumulates over time, it causes many physical health problems and whether providing an immediate favourable prompt, after the experience of stress, reduces the stress levels. The Dominix band is a kind of wearable technology that uses skin conductance to measure the stress levels when a person wears them and provides personalized favourable prompts when the stress levels exceed the threshold value.

4.3 PROCEDURE
The perceived stress scale by Sheldon Cohen was circulated via Google forms. On the basis of the results, subjects were divided into 3 groups namely subjects with low stress level, moderate stress level and high stress level. For the further study, those who were under moderate and high stress, were considered for the experimental aspect of the research.

The experiment

a) Apparatus:
Heart rate monitor, tool (scale), mobile to provide the prompts, material for stress test: pen, papers, etc.

b) Procedure:
Part 1: Heartbeats of the subjects were measured at normal resting position.

Part 2: All the participants were subjected to mild stressful situations* using the method mentioned below. Heartbeats were measured after the exposure to the stressor.

Part 3: After the stressful situation, they were provided with a favourable prompt (which included 1 minute meditation, calming music and a calming video). Again, they were scored on the basis of heart rate.
Each selected participant was given the Brief Resilience Scale (BRS).
The results of both the tests were compared and analysed.

c) Controls:
Out of the entire sample, 60 participants (30 males and 30 females) were selected at random. Every participant was subjected to the same situation and for the same duration to induce stress. This minimized the biases. Every participant was tested in the same environment. Same settings were managed for each participant during both parts: inducing stress and provision of prompts.

Same method was used to monitor the heart rates of the patients. Three different prompts were used: meditation, music and video. These three prompts were chosen randomly for the 60 participants (20 participants for one prompt).

Stress inducing situation:
1) Settings: Each participant was called separately for the experiment over a month's period. The experiment timings and setting were kept the same throughout. There were 2 other people in the room to observe the participant (excluding the experimenter) to induce social anxiety. They did not take part in the experiment.

2) The stress test:
   a) The participants were given 20 arithmetic questions. They had to solve as many as they could in 90 seconds. Before starting the timer, the following was mentioned. Number of questions solved: below 10= bad, between 10 to 15=average and above 15= good. (This interpretation does not have an empirical basis. It was only used to induce stress. In the debriefing session, the participants were clearly informed about this.)
   b) The participants were given an extempore topic and had to give a speech for 60 seconds. 5 different topics were given to choose from to the 60 participants.

3) Heart rate measurement: The heartbeats of the participants were measured during the following situations:
   a) Resting.
   b) Explanation of the test.
   c) Arithmetic test.
   d) Speech test.
   e) Prompt.

4) To avoid triggers for the participants in any way, heart patients, young adults with learning disabilities and clinically diagnosed social anxiety disorder were not allowed to be a part of the experiment. This was confirmed from each participant before starting the experiment.

4.4 Statistical Analysis

With reference to study of the correlation between resilience and stress, Pearson product moment correlation method was used and to study the effect of favourable prompts on the stress levels (pre - test post - test), t test was used.

5. Results and Discussion

5.1 Results

SPSS 18.0 was used of the analysis of the data. Using the t test function, the hypothesis: 'The stress levels will decrease significantly after the provision of favourable prompts among young adults' was analysed. This hypothesis was *accepted.*

Table 5.1.1: T - table showing comparison between stress levels before and after prompts

Variable	Condition	Mean	SD	't'	df
Stress	Before prompt	110.25	16.924	16.879	59
	After prompt	77.3	12.228		
Significant at 0.01 level of significance					

Table 5.1.1 shows the comparison between the stress levels before and after the provision of the prompt. The mean stress levels (measured in terms of heart beats) of the group, before the prompt, had risen up to 110.25 from the resting heart rate. After the provision of the prompt their mean stress levels decreased down to 77.3. This indicates that there is significant difference between the two levels. Thus, the hypothesis was found to be true at 0.01 level of significance.

Using the Pearson correlation function, the hypothesis: 'There will be a negative relationship between resilience levels and intensity of stress among young adults' was analysed. This hypothesis was *accepted* as well.

Table 5.1.2: Correlation between the levels of resilience and stress intensity

Variables	Resilience	Intensity of perceived stress.
Resilience	1	
Intensity of perceived stress	- 0.305	1
Significant at 0.05 level of significance		

Table 5.1.2shows the correlation between the resilience levels of the participants and the intensity of the perceived stress. This correlation was found to be - 0.305. The negative sign indicates that the level of resilience is inversely proportional to the intensity of the perceived stress of the participants. The r value = - 0.305. This indicates that the hypothesis is significant at 0.05 level of significance.

Upon further analysis, it was also found that among the three prompts used, music was the least effective. Meditation and video were almost equally effective.

6. Discussion

It was hypothesized that there will be a significant difference between the stress levels before and after the provision of the favourable prompts. This hypothesis stood corrected. The resting level of the heart beats of the participants was measured as soon as they entered the room after asking them to have a glass of water. This ensured that whatever anxiety they might have had after entering the experimental room could be removed. After the exposure to the stressful tasks given to them, their heart rate increased significantly which proved the efficacy of the design of the stressor. The heart rates of the participants were measured continuously throughout the stressful situations. To lower their heart rates and reduce the level of their stress, each participant was provided with a favourable prompt. In each case it was seen that the heart beats of the participants came close to their resting levels. In some cases, it went slightly lower than their resting levels and in some their heart rates were found to be above the resting levels, but significantly lower than their stress heart rates. This is proof that immediate provision of

any favourable prompts has the capacity to reduce the stress levels in individuals. At the end of the experiment, each participant was also asked if they felt calmer after the exposure to a relaxing prompt. The majority of the participants reported in affirmative. Although some participants reported that these prompts did not make them feel calm, a clear reduction could be seen in their heart rates. The reason behind thiscan be predicted as follows: the prompt that was assigned to them was not personalized to their choice. The participants were also asked about what stresses them out, how long does the stress persist and how do they cope up with the stress. The answer to the above discussion was found in this survey. If the coping strategy comfortable to the participant and the given coping technique did not match, the participant did not feel as calm but reportedly had reduced heart rate because of the relaxing effect of the prompt itself. For example, if the normal go to strategy of a participant in daily stressful situations is meditating with eyes closed, he would not feel as calm after watching a video. Thus, what prompt was given to them mattered in the psychological aspect but the physical aspect showed significant reduction in the stress levels.

Further analysis also showed that of the three prompts provided to the participants, music was the least effective. The meditation and the video had similar effects in stress reduction. Different individuals have different preferences when it comes to music. This might be one of the reasons why music was the least effective among the three. With the similar logic explained in the above paragraph, it can be said that preference of the coping strategy determines the psychological relaxation or in simple terms, the feeling of being relaxed mentally. Another possible explanation to this might be the presence of the observers. When the participants were asked to listen to the music, they were asked to close their eyes as well. The thought of being observed when one has their eyes closed can be a cause for slight increase in the anxiety levels. The participants were also asked to close their eyes in case of the meditation. But as it was a guided mindfulness meditation, thoughts which might provoke anxiety of being observed might have been comparatively less. The participants were instructed continuously throughout the meditation. Hence as they were doing as instructed, their thoughts also might have been in control which was not the case with music. As a result, music proved to be less effective in comparison to the video and the meditation. But it was still effective in significantly reducing the stress levels of the participants.

The second hypothesis was that there will be a negative correlation between the level of resilience and the intensity of the perceived stress experienced by the participants based on their heart rates. This hypothesis was also accepted during the analysis. The resilience measured during the experiment by a self - report scale and the perceived stress measured at the initial part of the data collection process by a self - report online google form scale were used for the correlation. Both of these, measure the respective levels of the participants in daily life. None of the two was situation specific. Thus, this indicates that higher the resilience levels, lower is the intensity of the stress. Considering this, a strong connection can be drawn between all the three variables. If an individual is highly resilient, the intensity of the stress

perceived by them will be less. If the levels of stress remain low, the necessity of the prompts reduces. But if the resilience of a person is between low to moderate, the intensity of their stress might be high. In such cases they will require the coping mechanism of immediate prompts more to stop this high intensity stress from accumulating. In the analysis it was found that of the 60 participants, 22 participants had low resilience, 37 participants had moderate resilience and only one participant had high resilience. Thus, the need for resilience - based interventions and more technological advancement in using the prompt as a coping mechanism is needed. Future research can be done on using this connection in practical life.

7. Conclusion

After the analysis of the data using T test and Pearson's correlation method, it was concluded that -
1) There was a significant decrease in the stress levels of the participants after the provision of prompts.
2) There is a significant negative correlation between the levels of resilience and the intensity of stress among young adults.

8. Future Scope

Although the prompt was provided immediately after the end of the stress inducing task, in a few cases, it was difficult to say if the reduced stress levels were as a result of the end of the stressor or due to the effect of the relaxing prompt. Future research could be done to explain this limitation. The initial part of the data collection of the perceived stress was done using the Google forms. The accuracy of this data cannot be guaranteed as the participants were not observed when they filled the forms. This limitation was removed when the data related to resilience levels was collected but not in the case of perceived stress.

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Author Profile

Mayuri Godbole, a student from Pune – Maharashtra. I recently completed BA (Hons) in Psychology from MIT World Peace University. This experimental study was designed to find a quick solution to the increasing problem of stress and its adverse effects on the physiological health of humans.