Stress Reactions: Its Management

by

Preksha Meditation & Yoga

Chapter – 3

Methodology
3. METHODOLOGY

3.1. Lacunae

Several studies are available which have assessed the effect of Yoga, Meditation and Yogic Life Style on managing the stress. But till date no study has been done in which physiological, psychological & biochemical impact, in relation to stress management following the practice of Preksha Meditation.

3.2. Problem

In view of relevant reviewed references and lacunae it is proposed to carry out a scientific study on

“Stress Reactions: It’s Management by Preksha Meditation & Yoga”.

3.3. Objectives of the study

While working on the aforesaid problem the following objectives were set to achieve.

1. To assess the therapeutical effect of Preksha Meditation on stress reduction.

2. To establish an effective and viable therapy capsule for stress management in executives & other professionals.

3. To co-relate the altered psychological state of the persons undertaking Preksha Meditation with physiological & biochemical changes during stress.

3.4 Hypothesis

1. The experimental group of subjects will show declining trend in blood pressure both systolic and diastolic.

2. Pulse Rate (PR) & Respiratory Rate (RR) will decrease after regular practice of Preksha Meditation and Yoga.

3. Stress Hormone (Cortisol) level will decrease after practice of Preksha Meditation and Yoga.

4. Post value of Frustration & anxiety will be found reduced as compared to their basal values i.e. pre-evaluation values in the subjects practicing Preksha Meditation & yoga regularly.
3.5. Research Design:

Self controlled, multilevel, pre-post testing research design was adopted. The group of adult subjects (130 in number) under taking the practice of Preksha Meditation & Yoga Module was termed as Experimental group (self controlled). The pre-evaluation data was collected at on set of experiment and then at subsequent follow up schedules as per table given below. The total duration of observation was 180 days and there was three follow up observation schedules. First follow up observation was conducted after 30 days, second follow up after 90 days and third follow up after 180 days of pre-evaluation phase.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-evaluation Phase</th>
<th>Post-evaluation phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Control-cum experimental group</td>
<td>Parameters for Evaluation</td>
<td>1 Month</td>
</tr>
<tr>
<td>Total Subjects = 130, Male= 65 Female= 65</td>
<td>Blood Pressure, Pulse Rate Respiratory Rate, Cortisol, SCAT &amp; RFS</td>
<td>Same Parameters</td>
</tr>
</tbody>
</table>

3.6. Material and Methods

Subject Selection

Adult male (65) and female (65) subjects between the age group of 25-45 yrs from both public and private sectors were screened for the study who was suffering from chronic stress. Level of stress of these subjects was determined using Sinha’s Comprehensive Anxiety Test (SCAT). Male & Female subjects were kept in separate groups. Case history of each subject was taken and subject suffering from any chronic disease except Hypertension and Stress were excluded from the study.

Every individual subject has been assessed for his / her stress level by using relevant physiological and psychological parameters at the on set of the study and this data is
called pre-evaluation record. All the selected subjects were given training of Preksha Meditation module for 2 weeks and there after they undertook that practice for the entire experimental duration i.e. 180 days at their own level. Each subject was assessed by using parameters as given in research design on the the follow up schedules of 30 days, 90 days & 180 days and the data was termed as post-evaluation record.

**Preksha Meditation and Yoga intervention module**

1. Asanas - 15 minutes
2. Recitation of Mahaprapana Dhvani - 05 minutes
3. Kayotsarg - 20 minutes
4. Swas Preksha - 15 minutes
5. Jyoti Kendra Preksha - 10 minutes
The details of the techniques along with practice instructions of these components were as follows:

1. **Asanas**

   **Surya Namaskar**

Known variously as Surya Namaskar or Prostrations to Sun or Sun Salutation, the Surya Namaskar is one of the best exercises that people can perform. The benefits accruing from these exercises are unique and excellent. This is a yoga based exercise and it is customary to perform Surya Namaskar after performing loosening yoga exercises.

Surya Namaskar provides benefits of a holistic nature by working on the physical body, praana (breathing), mind, intellect and the bliss components (or kosas) of the entire human personality. In that sense, Surya Namaskar can be considered to be a personality development tool and must be included as part of one’s wellness program.

The Surya Namaskar is performed usually early in the morning facing the morning rising Sun. The Surya Namaskar is done in 12 steps, each step having its own posture (including position and form) with its own breathing pattern (inhalation or exhalation).

1. Stand facing the Sun with palms folded and both the thumbs touching the chest. Breathing: Inhale while raising the hands and exhale as hands are brought down to chest level.
2. Raise hands upward, with feet firmly on the ground, bend backwards, stretch arms fully. Breathing: Inhale
3. Slowly bend forward, hands touching the earth with respect, head touching the knees. Breathing: Exhale
4. Set both hands with the palms down firmly on the ground, pull the left leg backward, raise the head looking at the Sun, full weight resting on the two palm and ten fingers. Breathing: Inhale
5. Bring right leg back close to left leg, keeping hands and legs straight, bend the body at the hip forming an arch, just like a mountain, known as 'parvathasan or mountain pose’. Breathing: Exhale

6. Stretch yourself fully on the ground in the Saashtanga Namaskar pose (all eight ‘anga’ or parts of the body on the ground – head, thigh, eyes (sight), mind, word, feet, hands and ears (hearing)). In reality, feet, knees, thighs, chest, forehead touch the ground with the hands stretched out and in folded position, with your mind and thoughts on the full namaskar, then slowly turn the head to the sides first to left and then to right so that each ear touches the ground. Breathing: Inhale first and then Exhale fully.

7. Slowly raise the head, bend backward as much as possible, hands straight, in the cobra pose. Breathing: Inhale

8. Parvathasan – same as Step 5. Breathing: Exhale

9. Same as Step 4 with the difference that the right leg is brought forward. Breathing: Inhale

10. Same as Step 3 – Breathing: Exhale

11. Same as Step 2 – Breathing: Inhale

12. Same as Step 1 – Breathing: Exhale, Inhale and Exhale

2. **Praksha Meditation**

2.1. **Recitation of Maha Prana Dhvani**

“Let us start meditation with repeated recitation of the Mahapraana Dhvani. All of you should join in the repetition of mahapraana Dhvani. Exhale fully, and then inhale deeply as long as you can. By slow exhalation, produce the sound hmmm….. Through the nostrils like the buzzing of a bee, while concentrating your mind on the centre knowledge situated on the top of the head and keeping the mouth closed. Inhale deeply again and repeat the same process nine times.”
2.2. Kayotsarga (Relaxation with self Awareness)

“Keep your body steady, relaxed and free from tension. Keep your spine and neck straight but without stiffness. Relax all the muscles of your body. Let your body become limp. Kayotsarg has two implications- complete relaxation of the body and self-awareness. For achieving complete relaxation of the body, mentally divide it into several parts and concentrate your mind on each part of the body one by one from feet to head. Allow your mind to spread in whole part; allow it to undertake a trip in the whole parts of the body. Use the technique of autosuggestion to relax the whole part and experience the resulting relaxation. Experience that each and every muscle, each and every organ has become relaxed. And in the same way, attain the relaxation of the whole body. Use deep concentration and remain completely alert. The success of the exercise depends upon the deep relaxation of the body.”

2.3. Swas Preksha (Perception of Breathing)

“Direct full attention to your breathing, excluding all thoughts and sensation. Regulate your breathing; make it low, deep and rhythmic. Focus your consciousness on the navel and become fully aware of the contraction and expansion of the abdomen accompanying each exhalation and inhalation respectively.”

“Continue the perception of navel region for about five minutes and experience that the breath has been regulated to a slow rhythm.”

Continue the slow, deep and rhythmic breath, shift your attention from the navel and focus it inside the nostrils, at the junction where two nostrils meet. Let the perception of breathing fill your entire mind. Be fully aware of each and every breath. Fix your consciousness totally on the process of respiration so that each and every inhalation and exhalation is perceived.”

“Do not permit yourself to be distracted, but if distraction does occur, return your attention to the breath. If the distraction is due to thought, do not try to dismiss it, but observe it patiently and calmly until it goes away. If the distraction is frequent, hold your breath for a while without causing discomfort.”

Maintain the continuity of awareness throughout the session.
2.4. Jyoti Kendra Preksha (Perception of Enlightenment)

“With your mind’ eye visualize that every thing around you, including the air itself, is coloured bright white. Take a deep breath and as you slowly inhale, visualize that you are breathing long streams of white air. Repeate the breathing exercise several times, each times inhale white air. Continue this for two minutes. Focus your attention on Jyoti Kendra (Centre of enlightenment) located on center of forehead and visualize bright white light radiating from the center. Your full attention shoud be used for visualization of white colour. If light does not appear, do not feel disappointed. Intensify your efforts for sustained visualization.” Visualizing this, repeat to your self mentally the following words three times:

“I realized that my passions (anger etc.) and emotions (fear etc.) are brought under my conscious control.”

**Parameters of Study**

In this regard to conduct the experimental work the parameters of observations were as shown in the table under title of research design. The standard methods of estimation and evaluation as given in the literature were applied for all the parameters. The technical details of parameters are as follows:

1. **Blood Pressure**
2. **Pulse Rate**
3. **Respiratory Rate**
4. **Stress hormone (Cortisol)**
5. **Anxiety**
6. **Frustration**
1. Blood Pressure

Blood pressure is measured in millimeters of mercury (mmHg) and a blood pressure reading consists of two numbers, e.g. 120/80. The first number is the systolic pressure (the maximum pressure when the heart contracts) and the second is the diastolic pressure (the minimum pressure when the heart relaxes).

Measuring Blood Pressure & Pulse Rate by Using OMRON BP Instrument


This digital blood pressure monitor uses the oscillometric method of blood pressure measurement which detects the blood’s movements through branchial artery and converts the movements into a digital reading.

Hand cuff was tied at the arm and the radial artery was used to measure the diastolic and systolic blood pressure.
2. *Pulse Rate*

**Measurement of Pulse Rate (PR)**

In this study Pulse Rate was measured by Omron Automatic Pulse monitor which was manually checked randomly by counting the palpitation at the base of thumb of the wrist. It has been measured with index and middle fingers by counting the beats in 15 seconds and by multiplying the count by 4 to get a pulse rate per minute, a stop watch with a second hand has been used.

1. Turn the palm side of the hand facing up.

2. Place your index and middle fingers of the opposite hand on the wrist approximately One inch below the base of the hand.

3. Press the fingers down in the groove between your middle tendons and the outside bone. It should feel a throbbing the pulse.

4. Count the number of beats for 10 seconds, then multiply this number by six. This will give the pulse rate for a minute.

3. *Respiratory Rate (RR)*

The respiratory rate is the number of breaths a living being, such as human, takes per minute. Average respiratory rate in a healthy adult at rest is usually given as 12 breaths per minute (12/60 HZ) but estimate do vary between: e.g. 12-20 breaths per minute.

The value of respiratory rate as an indicator of potential respiratory dysfunction has been investigated.

The respiratory rate in this study was measured by counting the number of chest expansions per minute with the help of a timer.

Subject was asked to be in supine position & takes normal breathing, counting was done by feeling the rise & fall of the chest with the right palm of the investigator.
4. Stress Hormone (CORTISOL)

Principle of the Test

The patient sample i.e saliva which may contain elevated level of the cortisol incubated with enzyme labeled antigen (conjugate) in a microwell plate which are coated by the corresponding antibodies & enzyme immunoassay test follows the typical competitive scenario. Competition occurs between an unlabeled antigen (present in standards, control and patient samples) and an enzyme-labelled antigen (conjugate) for a limited number of antibody binding sites on the microwell plate. The washing and decanting procedure removes unbound materials. After washing step, the enzyme substrate is added. The washing and decanting procedure remove unbound material. After the washing step the enzyme substrate is added. The enzymatic reaction is terminated by the addition of the stopping solution. The absorbance is measured on a micro titer plate reader (Elisa Reader). The intensity of the colour formed is inversely proportional to the concentration of the cortisol in the sample. A set of standard is used to plot a standard curve to which the amount of the cortisol in patient sample and controls can be directly read.

Clinical Applications

Cortisol is the most abundant circulating steroid and the major glucocorticoid secreted by the adrenal cortex. Cortisol is physiologically effective in blood pressure maintenance and anti-inflammatory activity. It is also involved in calcium absorption, gluconeogenesis as well as the secretion of gastric acid and pepsin. It is increased under stress situatuins, physical exercise and external administration of ACTH. Measurement of cortisol level in general can be used as an indicator of adrenal function and the differential diagnosis of Addison’s and Cushing’s diseases as well as adrenal hyperplasia and carcinoma.

Most circulating Cortisol is bound to Cortisol binding globulin or transcortin and albulin. The free Cortisol, which is considered the active part of blood, is about 1-2%.
In the absence of appreciable amounts of the Cortisol binding proteins in saliva. Salivary Cortisol is considered to be free and shows a diurnal rhythm with the highest levels in the morning and the lowest levels at night.

**Estimation of Cortisol**

The stress hormone (cortisol) in the subject saliva was measured using Direct Elisa test. Kit supplied by Diagnostic Biochem, Canada. Catalogue No. CAN-C-290, Lot No. 092280, Expiry Date- 2010-09.

**Cortisol Saliva ELISA KIT from dbc (Diagnostic Biochem Canada)**
ASSAY PROCEDURE SUMMARY

Requirements
- Variable Volume Micropipette of 50 µl, 100µl, 150µl & 300µl
- Disposable microtips
- Absorbant paper
- MilliQ water or deionized water
- Timer

Specimen Collection
All the subjects were given instructions to collect 4-5ml saliva in a clean glass tube provided without force or instrument and before eating, drinking or brushing the teeth in the early morning.

Prepare all reagents
Dilute 50 ml wash buffer concentrate reagent with 450 ml deionized water. All other reagents are ready for use.

Assay Procedure
1. Add 50 µl of each calibrator in duplicate, control and samples in to correspondingly labeled wells.

2. Add 100 µl Enzyme Conjugate to each well. Cover and throughly mix for 10 seconds. Incubate for 45 minutes at room temperature

3. Briskly shake out the contents and wash 3 times each Well with 300 µl of diluted wash buffer and tap the plate firmly against absorbant paper to ensure that the wells are dry.
4. Add 150 µl of TMB substrate in to each well. Incubate for 15-20 minutes at room tempature.

5. Add 50 µl of stopping solution in to each well. Read at 450 nm filter within 10 minutes.

Calculation of results:
Mean optical density of each calibrator in duplicate has been calculated.
A calibrator curve has been drawn on a semi-log paper with the mean optical densities on the Y-axis and the calibrator concentration on X-axis.
Values of the unknown samples read directly off the calibrator curve as under:

<table>
<thead>
<tr>
<th>Calibrator</th>
<th>OD1</th>
<th>OD2</th>
<th>MeanOD</th>
<th>Value(ng/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2.241</td>
<td>2.133</td>
<td>2.187</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>1.965</td>
<td>1.914</td>
<td>1.940</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1.757</td>
<td>1.799</td>
<td>1.778</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>1.221</td>
<td>1.254</td>
<td>1.238</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>0.540</td>
<td>0.502</td>
<td>0.521</td>
<td>30</td>
</tr>
<tr>
<td>F</td>
<td>0.222</td>
<td>0.216</td>
<td>0.219</td>
<td>100</td>
</tr>
<tr>
<td>Unknown</td>
<td>0.287</td>
<td>0.283</td>
<td>0.285</td>
<td>63</td>
</tr>
</tbody>
</table>

Following Calibrator Curve has been used to calculate results
Psychological Parameter

Level of mental conflicts Frustration and anxiety measured By using Standard Psychological Questionnaire Indexes i.e. SCAT& RFS. The standard questionnaire booklets T.M.No.458715 and their assements by Dr.B.M.Dixit & Dr. D. N. Srivastav (Agra) for RFS and Dr.A.K.P.Sinha & L.N.K.P.Sinha (Patna) for SCAT, has been obtained from National Psychological Corporation 4/230, Kacheri Ghat, Agra-282004.

5.Anxiety

The SCAT questionnaire table has 90 questions and each question has 2 options i.e. Yes or No and subject has to answer only one option. On the evaluation of percentile equivalents of test scores the interpretation done whether subject is suffering from- Extremely High Anxiety (30-69), High Anxiety (24-29), Normal Anxiety level (16-23), Low level anxiety (13-15) or Very Low Level Anxiety (3-12)

<table>
<thead>
<tr>
<th>Percentile</th>
<th>Male scores</th>
<th>Female scores</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-99</td>
<td>30-69</td>
<td>29-71</td>
<td>Very high level of anxiety</td>
</tr>
<tr>
<td>70-75</td>
<td>24-29</td>
<td>27-28</td>
<td>High level of anxiety</td>
</tr>
<tr>
<td>40-60</td>
<td>16-23</td>
<td>17-26</td>
<td>Normal anxiety</td>
</tr>
<tr>
<td>25-30</td>
<td>13-15</td>
<td>14-16</td>
<td>Low level of anxiety</td>
</tr>
<tr>
<td>1-20</td>
<td>3-12</td>
<td>4-13</td>
<td>Very low level of anxiety</td>
</tr>
</tbody>
</table>
6. Frustration

The RFS questionnaires table has 40 questions and each question has 6 options (3 negative & 3 positive) and subject has to answer only one option. For Scoring positive items No.1 to 20 has marks as 5,4,3,2,1,&0 for each question and negative items No.21 to 40 has marks as 0,1,2,3,4,&5.

On the evaluation of the options and answer total score is calculated. And mode of frustration calculated as AGG, RES, FIX & REG.

Table for Item distribution in RFS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Reactions of Frustration</th>
<th>S.No. of Positive Items</th>
<th>S.No. of Negative Items</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AGGRESSION (AGG)</td>
<td>1-5</td>
<td>21-25</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>RESIGNATION (RES)</td>
<td>6-10</td>
<td>26-30</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>FIXATION (FIX)</td>
<td>11-15</td>
<td>31-35</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>REGRESSION (REG)</td>
<td>16-20</td>
<td>36-40</td>
<td>10=40</td>
</tr>
</tbody>
</table>

Table for Scoring of the Items for RFS

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>MOST LIKED</th>
<th>MUCH LIKED</th>
<th>LIKED</th>
<th>DISLIKED</th>
<th>MUCH DISLIKED</th>
<th>LEAST DISLIKED</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSITIVE ITEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1-20)</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>NEGATIVE ITEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(21-40)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Table for evaluation the level of Frustration on basis of Scores Obtained

<table>
<thead>
<tr>
<th>PERCENTILE</th>
<th>AGG</th>
<th>RES</th>
<th>FIX</th>
<th>REG</th>
<th>TOTAL</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>39</td>
<td>44</td>
<td>45</td>
<td>44</td>
<td>159</td>
<td>VERY HIGH FRUSTRATION (VHF)</td>
</tr>
<tr>
<td>95</td>
<td>35</td>
<td>38</td>
<td>39</td>
<td>42</td>
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</tr>
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<td>33</td>
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<td>75</td>
<td>27</td>
<td>28</td>
<td>32</td>
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<tr>
<td>70</td>
<td>26</td>
<td>27</td>
<td>31</td>
<td>32</td>
<td>110</td>
<td>HIGH FRUSTRATION (HF)</td>
</tr>
<tr>
<td>60</td>
<td>24</td>
<td>26</td>
<td>29</td>
<td>31</td>
<td>107</td>
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</tr>
<tr>
<td>50</td>
<td>23</td>
<td>24</td>
<td>27</td>
<td>30</td>
<td>104</td>
<td>AVERAGE FRUSTRATION (AF)</td>
</tr>
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<td>23</td>
<td>25</td>
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<tr>
<td>30</td>
<td>20</td>
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<td>23</td>
<td>26</td>
<td>96</td>
<td>LOW FRUSTRATION (LF)</td>
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<td>19</td>
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<td>23</td>
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</tr>
<tr>
<td>10</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>19</td>
<td>82</td>
<td>VERY LOW FRUSTRATION (VLF)</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>13</td>
<td>12</td>
<td>16</td>
<td>72</td>
<td></td>
</tr>
</tbody>
</table>
**Intervention Schedule**

On the day 1 these subjects were introduced the basic concept and effects of the stress and explained the benefits of the study i.e. after completing the study a module will be made for the masses so that they can get relief from the Stress for happy & healthy life without any medication which is a root cause of many disease and very common now a days. Due to suffering from stress and its effects many individuals are committing suicide almost every day.

On the 2nd day the details of the experimental protocol has been explained to all the subjects and ascertain that each subject follow & understand the detail procedure of the Preksha Meditation and Yoga which they have to practicise daily for six months. The duration of the each program was the same as given earliar i.e.

1. Asanas - 15 minutes
2. Recitation of Mahaprapana Dhvani - 05 minutes
3. Kayotsarg - 20 minutes
4. Prreception of Breathing - 15 minutes
5. Jyoti Kendra Preksha - 10 minutes

All the subjects were followed up.

The written consent was obtained from the each subject that they will not leave the programme till the completion of the studies.
Statistical analysis

Statistical design plays a significant role in representing the collected data in a systemic way and making it easy to understand. By adopting an appropriate statistical design, the results can be presented in brief and precise language and thereby complicated problem can be studied in a very simple way. As the research design is considered to collect the data scientifically, so also the statistical design represents the methods of data analysis whereby inference drawing and hypothesis testing become possible. Hence, in order to facilitate the interpretation of numerical data an appropriate statistical design is to be adopted. In this thesis the following statistical strategy is applied to interpret the data:

In this study Intra-Group and Inter-Group comparison was made to evaluate the effect of intervention programme on both the groups and changes if any in self control group.

The data was analysed using SPSS (Statiscal Package for Social Science) version 15 and the comparison between two groups at each point of time was done applying paired T test. The comparison of change at various follow up stages in each group was done by applying paired t-test. Significance levels were given in following manner:

\[ t \geq 1.98 = P \leq 0.05 \text{ denoted as } * \]

\[ t \geq 2.62 = P \leq 0.01 \text{ denoted as } ** \]

\[ t \geq 3.37 = P \leq 0.001 \text{ denoted as } *** \]