

The Stress Test

The Impact Of Stress On Body Temperature

Abstract

The purpose of the stress test was to see if taking time limited math tests affected body temperature. Research suggests that stress will increase body temperature. Thirty four 7th grade students from St. Cyril participated in a time-limited, stressful math test. Before and after the test we recorded their temperatures. The classroom temperature was 70 degrees. Results generally supported our hypothesis. Average temperatures increased in each class, but the increase was stronger in one class than the other. This experiment is good because we can see how much teenagers stress over a test, if stress does affect body temperatures, and if when you stress will increase or decrease. One implication of these results is that increasing the time to take the test may decrease the stress students feel.

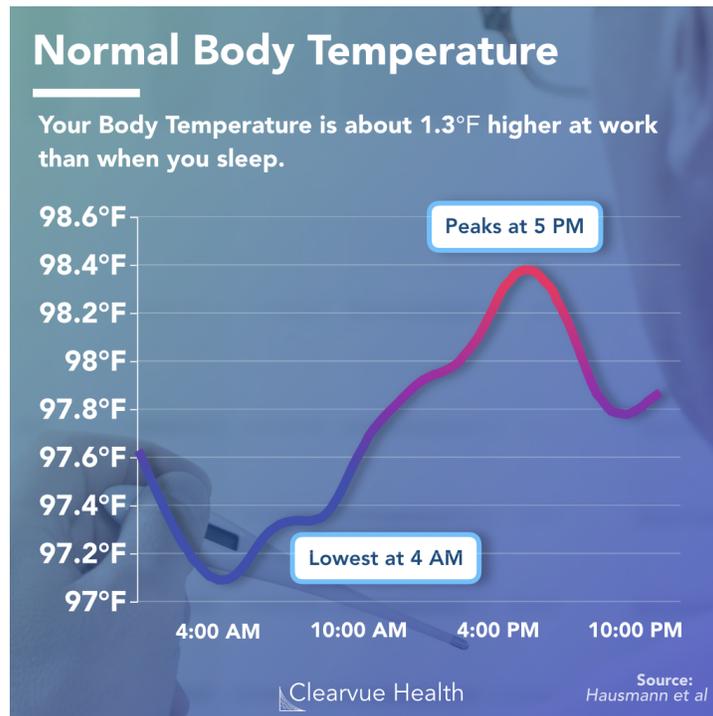
Introduction

Temperatures and Stress

Stress is feeling overwhelmed and anxious with things such as school, sports, or pressure. Temperatures can increase or decrease based on your anxiety, heart rate, and adrenaline. The purpose of our study is to answer the question: Does stress affect body temperature? If stress does affect body temperature, by how much?

Stress can change your temperature in the same way that exercise makes your face red and feels like it is on fire. Stressful situations can increase your core body temperature because your body is preparing to react to the stressor. Getting your body ready for the stressor means your body has to work. Your body's temperature increases because your body sends blood to circulate through your skin. This is why when you get embarrassed, stressed or you just exercised your face turns really red. Stress also can be affected by the time you do those stressful activities. For example, if you have a test at school you will be less stressed if you take it at the beginning of the day because you will remember more of the things you studied. If you take the test later in the day, then you may be more stressed in anticipation of the test and might forget some of the things you studied. (See Graph 1) (*Heat and Exercise: Keeping Cool in Hot Weather*)

Graph 1: Temperatures at different times of the day



(The Redefinition of Human Body Temperature, and How It Affects Fever, n.d.)

Common Effects Of Stress

Stress can cause all sorts of effects. You can see these changes in your thoughts, feelings, and behavior. Being able to realize these effects can help you manage your stress. If you cannot manage your stress, then you may have more health problems, such as high blood pressure, heart disease, and diabetes. (See graph 2) (*Stress Symptoms: Effects on Your Body and Behavior, 2021*)

Graph 2: How stress affects everyday events

Effects of great deal of stress in past month



Source: NPR, Robert Wood Johnson Foundation, and Harvard School of Public Health



Can stress make you sick?

I bet you are wondering an important question, can stress make you sick. Yes, stress can make you sick! Some physical symptoms of stress include low energy, headaches, and an upset stomach. You can also have stress reactions at very nerve racking events. This can cause anxiety. When you have high temperatures, it sometimes can be the impact of stress. If you are doing a high stress activity, you start to get nervous and your temperature can increase. (*8 Silent Signs Stress Is Making You Sick, 2017*)

Our project:

We will be doing the project: How Stress Affects Body Temperature. We will be giving a math test in both math classes to our classmates and they will have to do it in a certain amount of time (2 min).

Our classmates will have no idea that the test is fake and that our teacher, taking their temperatures is a part of it. We will say it's for our science fair project totally separate from the math test.

There will be 40 questions to be completed in 2 min, 3 seconds per. Our classmates will be allowed to use a piece of scratch paper and pencil, but nothing else. We will take their temperature with a thermometer before and after the test and see if/how their body temperature changed.

Then we will add up all 34 temperatures and divide that by 34 and see if it gets close to the average temperature for 12 year olds which is 98.6.

Methodology

Materials:

For this project, our materials included: thermometer, test/quiz, stopwatch, notebook

Procedure (Step by Step)

For our project the procedure will include:

1. Our first step is to design the difficult math test. We will also tell the participants it is for an important grade.
2. Next, we will take the participants' temperature.
3. The participants will take the test.
4. We will take their temperature immediately after the two minutes are up, and we take their temperature.
5. Finally we will analyze our results and make graphs.

Questions on our survey

(The survey is a math test, our classmates will take a certain amount of time to take it. There will be 40 math questions on our survey, that will need to be completed in 4 min)

(Addition)

1. $2 + 3 = 5$
2. $5 + 9 = 14$
3. $7 + 8 = 15$
4. $9 + 9 = 18$
5. $3 + 4 = 7$
6. $5 + 6 = 11$
7. $6 + 6 = 12$
8. $2 + 4 = 6$
9. $4 + 5 = 9$
10. $5 + 8 = 13$

Key: Yellow = Answer Black = Question

(Division)

1. 98 (divided by) 12 = 8
2. 45 (divided by) 5 = 9
3. 24 (divided by) 8 = 3
4. 36 (divided by) 6 = 6
5. 27 (divided by) 9 = 3
6. 54 (divided by) 9 = 6
7. 24 (divided by) 6 = 4
8. 12 (divided by) 3 = 4
9. 15 (divided by) 3 = 5
10. 100 (divided by) 10 = 10

(Subtraction)

1. 24 - 8 = 16
2. 96 - 12 = 84
3. 13 - 2 = 11
4. 38 - 5 = 33
5. 52 - 4 = 48
6. 62 - 3 = 59
7. 46 - 15 = 31
8. 6 - 5 = 1
9. 86 - 7 = 79
10. 23 - 18 = 5

(Multiplication)

1. 5 (times) 9 = 45
2. 6 (times) 6 = 36
3. 4 (times) 8 = 32
4. 6 (times) 4 = 24
5. 9 (times) 9 = 81
6. 8 (times) 2 = 16
7. 4 (times) 4 = 16
8. 7 (times) 8 = 56
9. 8 (times) 8 = 64
10. 9 (times) 12 = 108
11. Bonus Question: 21-3+18 (divided by) 6 = 6

Data Collection

Data will be collected by giving our students a test and we will collect data before they take the test and immediately after they finish the test. We will also collect information by finding the average of the temperatures before and after so we can compare.

Data Analysis

We will analyze our data by finding the similarities and differences of the temperatures before and after the test that we will provide for our participants. We will compare and find the average of both temperatures.

Participants

Our participants will be our classmates in our class(7A) and in our other 7th grade class(7B). These subjects are fellow peers and classmates who are all around the ages of 12, and 13.

Limitations

- Testing fewer people than we wanted to.
- Having less time to do the study.

Ethics

We'll be testing 12-13 year old boys and girls and will respect them even if their temperature doesn't change. We will also be adding some deception, by saying that the test is for extra credit and us taking their temperatures is a covid precaution. Or, if some classmates guess that the test is fake we will totally understand and we will still keep going with our experiment instead of complaining with the classmate. All in all we will respect every participant's attitude and opinion of our project.

Results

Discussion

The goal of our study was to see if stress increased body temperature. We created a stressful event, taking a math test without enough time to do the test. We looked at whether or not the kids' temperature increased after taking the test. Our results showed that stress did increase body temperature. Even kids taking tests at school will experience stress and this stress can affect body temperature. We did not know how much our body temperature would change. Our results showed that in one class (7A) body temperatures changed .3 degrees, but in the other class their temperatures changed 1 degree. This supports the expectation that when people get stressed their body temperature changes.

Conclusion

In conclusion, we learned that being stressed can increase your body temperature. Future studies may want to consider whether different scenarios are more stressful than others. For instance, public speaking, job interviews, and performing on stage in the theater or singing on stage may increase body temperature more than a math test. This project helped us realize the effects of stress on our bodies. We hope to teach people more about our project and the effects that stress can do to your body, from temperature to mind.

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