

Run... Walk...Jump!
How Can Exercise Affect your Blood Sugar?

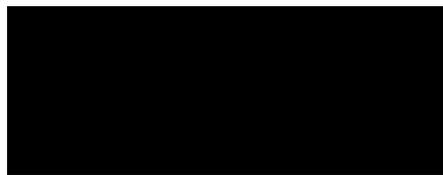
Researcher:



Research Sponsor:



School:



We below, certify that this grant proposal is a true and accurate representation of the research intentions of the student.

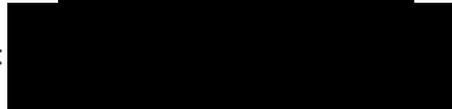
Researcher Signature:



Research Sponsor Signature:



School Principal Signature:



This is a continuation of last year's project. Last year, I discovered that temperatures do affect blood sugar. After having the hand submerged to hot and cold temperatures, I found that my results were correct. This year I will be focusing on the ways that exercising causes temperature to affect blood sugar.

STARR GRANT APPLICATION

From the beginning, my best friend was diagnosed with type one diabetes. We have been best friends since the third grade, and she has been a big inspiration to me. One hot day at recess, we were running around and she kept saying "I'm dizzy." This would always make her have to go inside and check her blood sugar. Last year, it took me awhile to figure it out but I decided how about seeing if the temperatures could affect her blood sugar so that she can be safer when being submerged to extreme temperature such as hot and cold. I made that into a project. It was called "How Can Hot and Cold Temperatures Affect your Blood Sugar?". In addition to my best friend being diagnosed with diabetes, both of my grandmothers were diagnosed with type 2.

This year I wondered do many people think about how exercise could affect their blood sugar? Could one of the reasons my best friend kept saying she was dizzy be due to the exercising we were doing? Well that's what I am going to test and I believe that after having each of my participants run, walk, and jump that their blood sugar will go down. The cause of all the stress of working out I believe that their pancreas will become more stressed and not want to produce insulin whether they are diabetic or a non-diabetic. Hopefully I will learn more about diabetes and be able to increase the depth of my project for the future.

More than 100 million people in the United States of America have been diagnosed with diabetes, which is 9.4% of the country's population. With my research, diabetics will be able to know what they can or can't do but also when to be precocious. Eventually we will be able to make apps on our phones that can tell you your blood sugar at any time, and it will be able to alert you when it gets low. With the research I can tell both my grandmothers and my best friend who both have been diagnosed with type 2 and type 1 that way I can look out for them if I am with them. I can make an average of either when it increases/decreases and diabetics will be able to know if they run or exercise their blood sugar may change about how much my average is.

Bibliography

Berg, Kris. "Why Does My Sugar Go Up After Exercise?" *Diabetes Health*, June 1, 1994. Web. accessed 16 Oct. 2017 <<https://www.diabeteshealth.com/why-does-my-sugar-go-up-after-exercise/>>.

This website includes answers for a person who was diagnosed with diabetes reasons on why a person's blood sugar goes up after exercise. It shows that people are really looking for my research and that it could change the future. This research could change my research help it be reached out to others that need it or doctors who need this research as well.

Greenlaw, Ellen. "Exercises to Lower Your Blood Sugar." *WebMD*, 2017. Web. Accessed 16 Oct. 2017. <<https://www.webmd.com/healthy-aging/features/exercise-lower-blood-sugar#1>>

This website includes exercises to decrease your blood sugar and how to make sure you maintain it. This can help me applicate my research and help others know that sometime exercise is good for your blood sugar, but also let people know that it is important to be careful with what they eat.

Johnson, Scott. "High blood sugar after exercise?" *MySugr* June 26, 2015. Web. Accessed 16 Oct. 2017. <<https://mysugr.com/high-blood-sugar-after-exercise/>>

This website included problems with someone in the real world who struggles with high blood sugar after exercises, and good tips for working out when you have diabetes. This research will help my research tell others that exercise can be good for your blood sugar because if you suffer from having high blood sugar that happens often then exercise could be a good thing for you.

Joslin Diabetes Center. "Why Do Blood Glucose Levels Sometimes Go Up after Physical Activity?" *Joslin Diabetes Center*, 2017. Web. Accessed 17 Oct. 2017. <http://www.joslin.org/info/why_do_blood_glucose_levels_sometimes_go_up_after_physical_activity.html>.

This website included safety tips for exercising if you have exercise, also, what happens when you are exercising and what happens to the insulin in your pancreas. It let me know what is happening in my research.

“Why Is My Blood Glucose Sometimes Low after Physical Activity? *Joslin Diabetes Center, 2017*. Web. Accessed 17 Oct. 2017.

<http://www.joslin.org/info/why_is_my_blood_glucose_sometimes_low_after_physical_activity.html>.

This website includes tips on how often you should check your blood sugar after doing exercise. It also included reasons why it could be going down after exercise. The research in this website can help me inform others how often you should check your blood sugar if you are a diabetic and you exercise on a regularly basis.

Procedure

1. Get approval from sponsors and FMCH in order to do project
2. Apply for a grant from the Iowa Academy of Science
3. Hand out forms for photo release and approval to participate in my project
4. Test blood sugar of participants as a control along with their temperature
 - a. Turn on glucose meter
 - b. Apply test strip
 - c. Prick participant with lancet
 - d. Apply blood to test strip
 - e. Record data on my iPad through a google doc
5. Tell all participants to make sure to stay in their order for data purposes
6. Demonstrate how to do first activity
 - a. Jump up and down (above and below) a piece of tape 50 times
 - b. Take 10 second break while walking
 - c. Jump side to side on a piece of tape 50 times
 - d. Check participant's temperature
 - e. Repeat steps 4a - 4e
7. Demonstrate second activity
 - a. Run sprints 3 times each (down and back)
 - b. 10 second break while walking
 - c. Run sprints 3 times (down and back)
 - i. Participant will run down and back 6 times
 - d. Check participant's temperature
 - e. Repeat steps 4a - 4e

Budget

Item	Cost/Unit	Quantity	Total Cost	Provided By	Vendor
TrueTrack Test Strips	\$40.00	4	\$40.00	Grant	Amazon
CareTouch Twist Top Lancets	\$7.99	1	\$7.99	Grant	Amazon
CareTouch Alcohol Wipes	\$10.00	1	\$10.00	Grant	Amazon
Bandaid Flexible Fabric Bandages	\$5.47	1	\$5.47	Grant	Amazon
Pancreas Model	\$46.00	1	\$46.00	Grant	Amazon
Photos for Project	\$0.50	25	\$12.50	Grant	Walgreens
Total for Items Requested by Grant:			\$121.96		
Lancet Device	\$10.00	1	\$10.00	School	
Glucose Meter	\$24.99	1	\$24.99	School	
Total Other Items Used:			\$34.99		
Estimated Project Total:			\$156.95		

I request that the Iowa Junior Academy of Science provide \$121.96 for my research project.

Qualified Scientist Form (2)

May be required for research involving human participants, vertebrate animals, potentially hazardous biological agents, and DEA-controlled substances. Must be completed and signed before the start of student experimentation.

Student's Name(s) _____

Title of Project _____

Run...Walk...Jump! How Can Exercise Affect Your Blood Sugar?

To be completed by the Qualified Scientist:

Scientist Name: _____

3 year AA Nursing Degree

Degree(s): RN

Experience/Training as relates to the student's area of research:

Worked on Med/Surge and OB department at FMCH. Experience checking blood sugar of newborns and diabetics.

Nurse _____

Position: _____

Institution: _____

Address: _____

Email/Phone: _____

- 1) Have you reviewed the Intel ISEF rules relevant to this project? Yes No
2. Will any of the following be used?
- a. Human participants Yes No
- b. Vertebrate animals Yes No
- c. Potentially hazardous biological agents (microorganisms, rDNA and tissues, including blood and blood products) Yes No
- d. DEA-controlled substances Yes No
3. Was this study a sub-set of a larger study? Yes No
4. Will you directly supervise the student? Yes No
- a. If no, who will directly supervise and serve as the Designated Supervisor? _____
- b. Experience/Training of the Designated Supervisor: _____

To be completed by the Qualified Scientist:

I certify that I have reviewed and approved the Research Plan/Project Summary prior to the start of the experimentation. If the student or Designated Supervisor is not trained in the necessary procedures, I will ensure her/his training. I will provide advice and supervision during the research. I have a working knowledge of the techniques to be used by the student in the Research Plan/Project Summary. I understand that a Designated Supervisor is required when the student is not conducting experimentation under my direct supervision.

Qualified Scientist's Printed Name

Signature

10/15/17

Date of Approval

To be completed by the Designated Supervisor when the Qualified Scientist cannot directly supervise.

I certify that I have reviewed the Research Plan/Project Summary and have been trained in the techniques to be used by this student, and I will provide direct supervision.

Designated Supervisor's Printed Name

Signature

10/15/17

Date of Approval

Phone

Email

Human Participants Form (4)

Required for all research involving human participants not at a Regulated Research Institution. If at a Regulated Research Institution, use institutional approval forms for documentation of prior review and approval.
(IRB approval required before experimentation.)

Run...Walk...Jump! Effect of Exercise on Blood Sugar

Student's Name(s)

Title of Project

Adult Sponsor

Phone/Email

Must be completed by Student Researcher(s) in collaboration with the Adult Sponsor/Designated Supervisor/Qualified Scientist:

1. I have submitted my Research Plan/Project Summary which addresses ALL areas indicated in the Human Participants Section of the Research Plan/Project Summary Instructions.
2. I have attached any surveys or questionnaires I will be using in my project or other documents provided to human participants.
 - Any published instrument(s) used was /were legally obtained.
3. I have attached an informed consent that I would use if required by the IRB.
4. Yes No Are you working with a Qualified Scientist? If yes, attach the Qualified Scientist Form 2.

BELOW - IRB USE ONLY

Must be completed by Institutional Review Board (IRB) after review of the research plan. All questions must be answered for the approval to be valid. (If not approved, return paperwork to the student with instructions for modifications.)

- Approved with Full Committee Review (3 signatures required) and the following conditions: (All 6 must be answered)
1. Risk Level (check one):
 - Minimal Risk
 - More than Minimal Risk
 2. Qualified Scientist (QS) Required:
 - Yes
 - No
 3. Designated Supervisor (DS) Required:
 - Yes
 - No
 4. Written Minor Assent required for minor participants:
 - Yes
 - No
 - Not applicable (No minors in this study)
 5. Written Parental Permission required for minor participants:
 - Yes
 - No
 - Not applicable (No minors in this study)
 6. Written Informed Consent required for participants 18 years or older:
 - Yes
 - No
 - Not applicable (No participants 18 yrs or older in this study)
- Approved with Expedited Review (1 signature required). Study involves either of the following:
- Human participants will only provide feedback on project design/student-designed invention or prototype. etc., no personal data will be collected and there are no health or safety hazards.
 - Student is the only subject of the research and no more than minimal risk is involved.

IRB SIGNATURES (All 3 signatures required unless expedited review checked above) None of these individuals may be the adult sponsor, designated supervisor, qualified scientist or related to (e.g., mother, father of) the student (conflict of interest).

I attest that I have reviewed the student's project, that the checkboxes above have been completed to indicate the IRB determination and that I agree with the decisions above.

Medical or Mental Health Professional (a psychologist, medical doctor, licensed social worker, licensed clinical professional counselor, physician's assistant, doctor of pharmacy, or registered nurse) with expertise related to this project.

Shanna Martin RN
 Printed Name: [Redacted] Degree/Professional License: 10/15/17
 Signature: [Redacted] Date of Approval (Must be prior to experimentation):

Educator
 Nadine Weirather MS Science Education, University of Iowa
 Printed Name: [Redacted] Degree: 10/15/17
 Signature: [Redacted] Date of Approval (Must be prior to experimentation):

School Administrator
 Printed Name: [Redacted] Degree/Professional License: 10/15/17
 Signature: [Redacted] Date of Approval (Must be prior to experimentation):