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Blood Types and Impacts: *Beyond the Immune System*

Izzamil A. Camacho

Northern Mariana College

English 202 Section 01

Dr. Kimberly Bunts-Anderson

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Author Note

Izzamil A. Camacho, School of Education, Northern Mariana College.

This research project is not affiliated with any organizations or research groups in any way, and is strictly based on research that was conducted on the student researcher's personal time.

Correspondence concerning this project should be addressed to Izzamil

A. Camacho, School of Education, Northern Mariana College, Saipan, Northern Mariana Islands,

Zip Code: 96950.

Contact: izzamil.camacho@my.marianas.edu

Abstract

A student researcher from Northern Mariana Islands has conducted a 10 weeks study on The Blood Type Diet to see if it does work and one will be able to use it successfully. The researcher tried to achieve the purpose of this project by survey and a personal experiment. As a result of this, it was found that a blood type O could do a type A, B, and AB, separately and still lose weight successfully. Originally the project was to see if blood types affect more than just the immune system and if a certain blood type was prone to more disease. This paper will demonstrate methodology and findings accordingly.

Keywords: diet, blood type, health and fitness, human

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Blood Types and Impacts: *Beyond the Immune System*

Numerous studies have been done on blood, such as: hematologic diseases and disorders, genetic blood cells, blood physiology, transfusion, and many others. However, one can agree that only a limited, if not none, amount of studies has been done on the blood types and the possible link that it could have in order to create a successful diet plan to increase one's health in a positive manner. In addition to the different blood types, one must first be able to understand how blood types are determined. According to Regina Bailey, one's blood type could be identified by first, taking a blood test. Within that test, identifiers, called the antigens, are what is being looked for. Once the antigens have been found and have been observed to see what antigens present in the blood plasma, a determination is made and they are categorized in blood type A, B, AB, and O. The antigens in the blood also help determine how one's immune system functions by binding with the antibodies that will destroy any foreign substance that enters the system (2017). By using this information, a research project has been proposed by the student researcher. Over the course of ten weeks, the student researcher studied a different angle by introducing Dr. Peter D'Adamo's concept of The Blood Type Diet. In general, the Blood Type Diet states that one is to make health and nutrition choices that are purely based on one's genetic individuality. In order to do this, one must know their blood type which will then determine what blood type diet they should follow. The student researcher will also explain Dr. D'Adamo's concept and why he believes that the Blood Type Diet is effective. In order to decrease the chances of being biased, the student researcher will ask professors, physician assistants, obstetrics and gynecology specialist, and will make an effort to get in contact with hematologists located nationwide.

Literature Review

According to Dr. Peter D'Adamo's official website, in order to successfully formulate a diet plan that would greatly help one's lifestyle, research had to be done on the blood types themselves. As a result, he found out that individual's with certain blood types may be at a higher risk for certain diseases. For instance, people with blood type O have been found to have a lower risk for heart disease, but they have a higher risk for developing stomach ulcers, while blood type A have a higher risk of developing microbial infections, however they have a higher fertility rate (2015). It possibly could be common knowledge that blood types affect the way the immune system develops and functions. Jeanine Barone, author of Blood Type and Health, explained that blood type not only affects the immune system, but it also is very crucial when needing a blood transfusion. The way blood transfusion works is that before needing one, finding out one's specific blood type and Rh factors is needed because blood types that does not match each other will be hazardous. Barone explained that each blood type have both A and B antigens found in different places, and because of this it is crucial to ensure that the blood types are a match. This is because the body's immune system identifies and attacks any foreign substance that enters the body, whether bacteria, transplanted organ, or blood is the source. For example, if a person is a blood type A and received blood type O, then the specific immune proteins, better known as antibodies will respond to the blood type O as a foreign substance, and will soon attack the 'foreign substance' which will result in the red blood cells to clump, ultimately leading to death (2017). Kathy B., an advocate for The Blood Type swore that ever since an unfortunate event happened with her husband, and had him switch to The Blood Type Diet things changed. Kathy B explained that "the first check-in with the doctors evoked the same shock from each one

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who saw him. They said unanimously, “I cannot believe how good these tests look” (2017).

Andrea Mathieux, another advocate for the Blood Type diet explained that “the blood type diet is not a typical diet, where it’s a fad. After adapting the Blood Type diet, both energy and efficiency have skyrocketed (2016). Since Dr. D’Adamo’s Blood Type Diet has implemented the idea that people process food differently and accordingly based on their blood type, many advocates had sworn by it, but many had been against it. Berkeley Wellness, unlike many advocates had spoken as to why The Blood Type Diet is a fad like many others. Wellness had explained that as of today, there “is currently no evidence that an adherence to blood type diets will provide health benefits, despite the substantial presence and perseverance of blood type diets within the health industry.” Wellness had also explained that Dr. D’Adamo’s approach on eating right was that it was recommended that one must align the diet based on one’s early ancestors diet at that time in order to successfully lose weight and decrease the risk for chronic diseases. Wellness had also explained that if one has formulated a diet that was not around one’s ancestral blood group, this will result in a reaction between sugar-binding proteins found in food, commonly known as lectins, and one’s blood-type antigens. Wellness continued to elaborate about how one’s ancestral blood group can be determined. For instance, blood type O belongs to the “hunter” category, meaning that blood type O’s diet should eat a lot of meat while avoiding grains. Blood type A are considered “agrarians” who should formulate a vegetarian diet. Blood type B fall under the “nomads” categories and are known to live of a varied diet which includes dairy. The last blood type, which is AB, are known as “enigmas” who should eat a combination of both blood type A and blood type B diets (2014). Wellness then expressed that the reason why advocates tend to lose weight was not because the Blood Type Diet was working, but because

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like all diets, the body is restricted and being instructed to eliminate certain foods, which results in less calories being taken in (2014). By using this information, the student researcher was able to formulate a research topic of blood type and how it could possibly affect more than just one's immune system. According to Joe Leech, Dr. D'Adamo's Blood Type Diet has been put to a test in a "large observational study" involving around 1,455 young adults. All of them are required to eat a type A diet, which leans heavily on vegetables and fruits. As a result of this study, it was found that everyone following the type A diet, regardless of their blood type were all associated with better health markers. As Leech continues on, it was explained that in 2013, a major review study was conducted and it was concluded that "not a single well-designed study looking at the health effects of the blood type diet were found" (2017). Leech is supported by Joan Salge Blake, a health sciences professor at Boston University and is also known as the Academy of Nutrition and Dietetics' spokeswoman. Salge Blake stated that there is no correlation between blood types and what foods are best for you, since one's diet should compose of a well-balanced diet, so cutting off certain foods will not only ensure weight loss but will deprive your body of the nutrients it need (2014). Not only was the science behind the Blood Type Diet questioned, but the author of the book by Michael Greger, Medicinae Doctor at the Fellow of the American College of Legal Medicine elaborated more and has explained that after doing research and coming up empty handed, Dr. D'Adamo was question and the response that was given was that "if the Blood Type Diet was done correctly, then he would be vindicated," and the reason why there has been no studies on the Blood Type Diet was lack of interest and fundings." Greger then questioned his 40,000 sold and why no studies or fundings has been made with money earned from the sell (2015). Over the course of ten weeks, the student researcher formulated a research

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question about blood type and possible impacts that it could have on one's health. However, due to the lack of resources on island, the research question has been revised to whether or not Dr. D'Adamo's Blood Type Diet is as effective as claimed to be.

Methodology

By changing the research project, changing the method of approach is inevitable. The original best approach found were both surveys and letters since it was most relevant to the research project. The purpose of the surveys and letters were the targets were different. This allowed the student researcher to gather response on both the community's and the expert's perspective. The survey was made to target the community of Saipan, which allowed the student researcher to get an idea of how aware Saipan's community was, while the letters were designed to target hematologists nationwide.

The first approach that was made was the method of surveying and interviews via emails. The surveys went through a two-part revision process, the first process being the pilot survey and the second being the final surveys. The sample survey was structured in a way that first gathered demographic information, such as age, gender, and then delved into how aware the participants are about the topic. Since the topic is about the four major blood types and the possible link it has to one's health, it was a crucial move to focus my survey to the members of the community. The survey was targeted towards the starting age of 16 and above, due to the fact that they are most likely aware of the importance of blood. The pilot survey played an important role as to determining which questions were better left and better deleted. The pilot survey also revealed how each question should be altered and fixed towards how aware each participants are of their blood type and how their blood type has a possible link to their health. The pilot survey also

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revealed that most of the participants of the survey were females and were around the age bracket of sixteen to twenty-six. When creating a final survey, it was sent out again. The final survey was also sent out to more teachers and full time employees at different workplaces. This is due to the fact that the whole purpose of the survey was to gather responses from the entire community, regardless of gender or age. In order to effectively support the research paper, a second approach must be made (see Appendix A and B).

While the first approach focused on the community's perspective, the second approach focused more on experts and their opinions through emails. Before emails were sent out, prospective experts were chosen based on their specialty. Since the research project was all about blood type and the possibility of it working, it was best that all experts chosen were hematologist. Then, after it was decided that all experts receiving the email will be hematologist, it was then decided that hematologists were chosen nationwide (see Appendix C, D, and E). Although the choice of dispersing emails to hematologists nationwide seems like such a reach, it was the best method due to the fact that the letter was designed to have experts respond based to the best of their knowledge. The letter itself was sent to eleven hematologists that worked in places such as Turkey, Malaysia, Israel, and China. In order for the second approach to work effectively, the approach was designed to have the same email sent out to the eleven chosen hematologists so that their responses could be used in the research paper to be compared and contrasted. Eleven hematologists were chosen to increase the chances of receiving a response. The eleven hematologists were chosen based on their workplace, so they all worked in either a public hospital or a private hospital. The role of both public and private hospitals also plays a crucial role due to the fact that they are both funded very differently which means they have

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access to different technologies and have different budget funds. In addition to that, by choosing to write to hematologists all over the world, it decreases any chances of bias, which will ensure the credibility of the research paper.

However, since no response from the hematologists were received, the student researcher had decided to put The Blood Type Diet to the test as an experimental trial. The student researcher is a blood type O, and throughout the course of 8 weeks, had experimentally done The Blood Type Diet by testing out blood type A, B, and AB diet each week, switching by the end of the week. The student researcher had recorded everything that was felt and had recorded the weight during the duration of the experiment.

Finding/Analysis

The student researcher had shared the link through social media such as Twitter and Facebook and has kept it open for a month. During this time, the survey had received 82 responds. 79.27% of the survey takers ranged from 16-26. (See Appendix F). About 65.85% of the survey takers were females, and 45.95% were the targeted Northern Mariana College students and teachers. (See Appendix G and H). 70.73% of the survey takers do not know the blood type and 79.27% has never heard of the blood type diet. Only 48.46% have knowledge that blood type is related to one's immune system. (See Appendix I, J, and K). After explaining the blood type diet and its purpose, the student researcher had the survey takers rate 1 - 100, 100 being the highest while 1 being the lowest, how much one was interested in learning more and how much one was willing to make changes. As the student researcher analyzed the data, it was shown that an average number of 78 were interested in learning more, however only an average number of 65 were willing to make changes if proven to be true. (See Appendix L and M).

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Letters to experts had no response. The student researcher had given a month for the experts to respond. The student researcher had also done a backup experimental trial just in case the letters were a dead end. During the first month, the student researcher had created a diet plan that is solely based around Dr. D'Adamo's blood type diet. The first week, the student had a diet strictly for type O. The second week, the student researcher had switched to a type A diet and switched to a type B on the third week. By the last week, the student researcher had switched to a type AB and then recorded the result. (See Appendix N). By the end of the month, the student researcher had lost a total of 8.5 pounds. The student researcher's experimental trial was supported by a Northern Mariana College anatomy professor's email stating that "this [Blood Type Diet] sometimes gets mistaken is that people who do the blood type diet DO lose weight. This is because each of the diets restrict some type of food intake and decreases the total amount of calories consumed." (See Appendix O).

Discussion

In 1996, Dr. D'Adamo published *Eat Right 4 Your Type*, a book that informs readers that just by being aware of one's blood type, one is able to formulate a successful diet plan due to having unique genes that could be found in the blood. This project was supposed to focus on whether or not blood type not only affects the immune system, and whether or not there is a correlation between the rest of the human body like eyes, pregnancy, hearing, and if one blood type was more prone to a disease than the other. However, due to the lack of resources, the student researcher had change the researcher project to something that is doable for an island. By doing so, the student researcher put the The Blood Type Diet to the test to see if it worked or not.

Conclusion and Future Study

In order to gain understanding of The Blood Type Diet and how it functions, it is necessary to conduct studies that covers all angles. This includes, but is not limited to, getting in touch with dermatologists, creating a survey, setting up interviews with on-island and off-island doctors through physical meeting, private messaging, or through social media such as Facebook, Skype, or Twitter. The student researcher concluded that The Blood Type Diet is in fact effective. However, is in need of better resources that are not found on the island of Saipan to figure out if it works because of the reason Dr. D'Adamo states it does, or if it works because of the limited calories one is taking in.

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References

B. K. (2017). Kathy B: blood type diet success story. North American Pharmacal. Retrieved from

<http://www.4yourtype.com/blog/kathy-b-blood-type-diet-success-story/#>

Bailey, R. (2017). Learn about blood type. Thought co. Retrieved from

<https://www.thoughtco.com/blood-types-373447>

Barone, J. (2017). Blood type and health. Remedy Health Media, LLC.

Retrieved from

<http://www.berkeleywellness.com/self-care/preventive-care/article/blood-type-and-your-health-there-link>

D'Adamo, P. (2015). Blood type and your health. Hoop-A-Joop, LLC, Inc. Retrieved from

<http://www.dadamo.com/txt/index.pl?1001>

Greger, M. (2015). Blood type diet perceived as 'crass fraud'. Nutrition-Facts. Retrieved from

<https://nutritionfacts.org/2015/06/04/blood-type-diet-debunked/>

Juntti, M. (N.D.). Study finds 'the blood type diet' doesn't work. Word-Press.

Retrieved from

<https://www.mensjournal.com/health-fitness/study-finds-the-blood-type-diet-doesnt-work-20140127/>

Leech, J. (2017). The blood type diet: *an evidence-based review*. Healthline Media. Retrieve

from <https://www.healthline.com/nutrition/the-blood-type-diet-review#section2>

Mathieux, A. (2016). I adjusted my eating habits according to my blood type and i've never had more energy. Spoon University. Retrieved from

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<https://spoonuniversity.com/lifestyle/what-i-learned-when-i-tried-the-blood-type-diet>

Watson, S. (N.D.). The blood type diet. Web MD, LLC. Retrieved from

<https://www.webmd.com/diet/a-z/blood-type-diet>

Wellness, B. (2014). The blood type diet. Remedy Health Media, LLC. Retrieved from

<http://www.berkeleywellness.com/healthy-eating/diet-weight-loss/article/blood-type-diet>

Appendix A

Final Survey

1. How old are you?

- 16-26
- 27-37
- 38-50
- 50+

2. What is your gender?

- Female
- Male

3. Check the one that best describes you.

- NMC student/teacher
- Full time worker
- Both

4. Do you know your blood type?

- Yes
- No

5. If you do know your blood type, what is your blood type? (If you don't know your blood type, skip this question)

Appendix C

Hospitals Contacted

Dear Izzamil Camacho,

Your inquiry was sent successfully to Mahkota Medical Centre (Inquiry ID: [6412367](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Dear Izzamil Camacho,

Your inquiry was sent successfully to Hospital Universitario HM Montepríncipe (Inquiry ID: [6412366](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Hospital Universitario HM Montepríncipe usually replies within 1-3 work days.

Dear Izzamil Camacho,

Your inquiry was sent successfully to Anadolu Medical Center (Inquiry ID: [6412365](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Anadolu Medical Center usually replies within 1-2 working days.

Dear Izzamil Camacho,

Your inquiry was sent successfully to Rambam Medical Center (Inquiry ID: [6412364](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Rambam Medical Center usually replies within 1-3 working days.

Appendix D

Hospitals Contacted Continuation

Dear Izzamil Camacho,

Your inquiry was sent successfully to Centro Médico Teknon (Inquiry ID: [6412368](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Centro Médico Teknon usually replies within 24 hours.

Dear Izzamil Camacho,

Your inquiry was sent successfully to Sant Joan de Déu-Barcelona Children's Hospital (Inquiry ID: [6412369](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Hospital Sant Joan de Déu Barcelona usually replies within 1-2 work days

Dear Izzamil Camacho,

Your inquiry was sent successfully to Hospital Quirón Valencia (Inquiry ID: [6412370](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Hospital Quiron Valencia usually replies within 24 hours.

Dear Izzamil Camacho,

Your inquiry was sent successfully to Hospital Quirón Marbella (Inquiry ID: [6412371](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

Appendix E

Hospitals Contacted Continuation

Dear Izzamil Camacho,

Your inquiry was sent successfully to Hospital Quirón Barcelona (inquiry ID: [6412372](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Hospital Quirón Barcelona usually replies within 24 hours.

Dear Izzamil Camacho,

Your inquiry was sent successfully to Hospital Quirón Malaga (inquiry ID: [6412373](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

Hospital Quirón Malaga usually replies within 24 hours.

Dear Izzamil Camacho,

Your inquiry was sent successfully to Medipol Mega University Hospital (inquiry ID: [6412374](#))

Please check your email for login details and for replies from the hospital.

In order to receive quick and accurate response, please login and upload your:

*Medical records

*Diagnosis

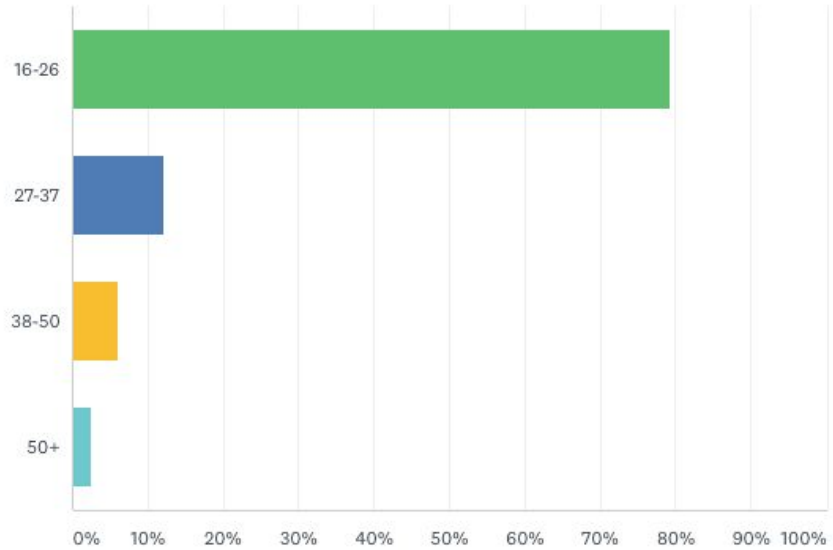
Medipol Mega Hospital usually replies within 2 work days

Appendix F

Age Range Survey Results

How old are you?

Answered: 82 Skipped: 0



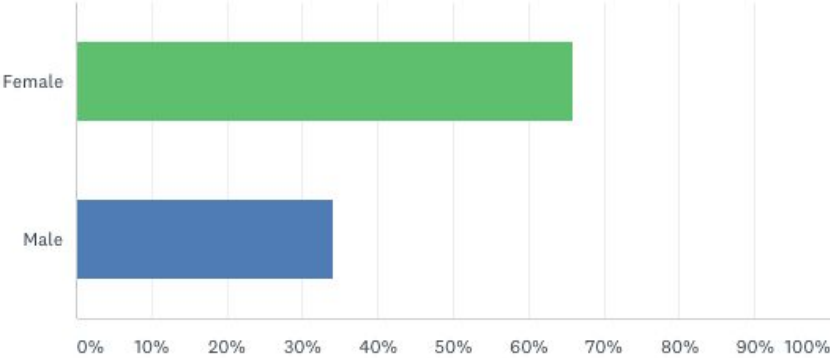
ANSWER CHOICES	RESPONSES
▼ 16-26	79.27% 65
▼ 27-37	12.20% 10
▼ 38-50	6.10% 5
▼ 50+	2.44% 2
TOTAL	82

Appendix G

Gender Survey Results

What is your gender?

Answered: 82 Skipped: 0



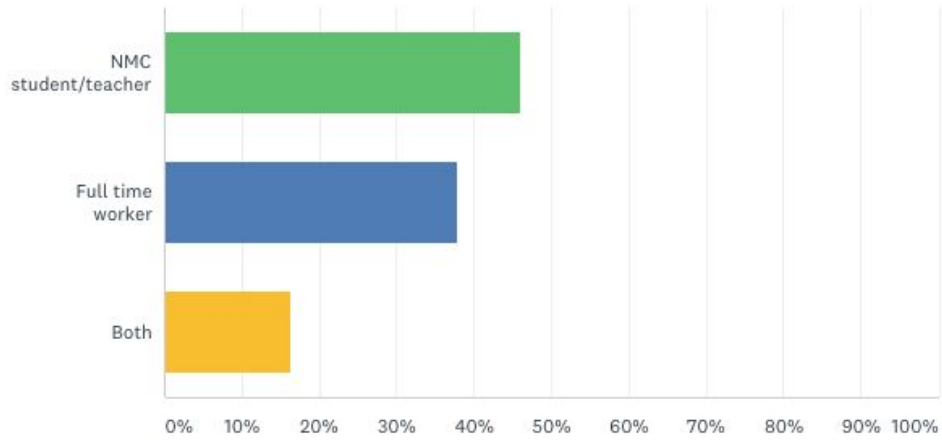
ANSWER CHOICES	RESPONSES
Female	65.85% 54
Male	34.15% 28
TOTAL	82

Appendix H

Occupation Survey Results

Check the one that best describes you.

Answered: 74 Skipped: 8



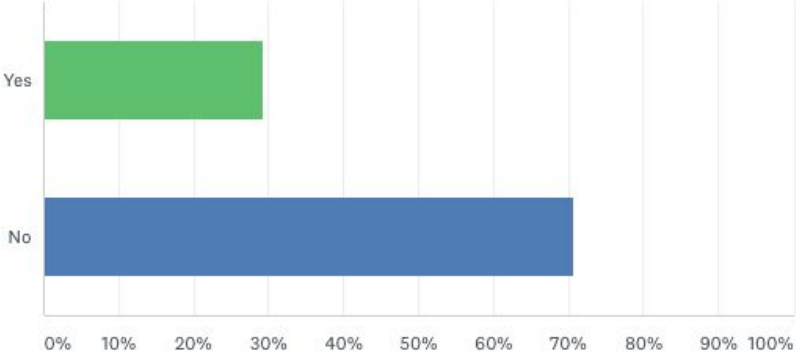
ANSWER CHOICES	RESPONSES
▼ NMC student/teacher	45.95% 34
▼ Full time worker	37.84% 28
▼ Both	16.22% 12
Total Respondents: 74	

Appendix I

Aware of Blood Type Survey Results

Do you know your blood type?

Answered: 82 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	29.27% 24
No	70.73% 58
TOTAL	82



Appendix J

Aware of Blood Type Survey Results

If you do know your blood type, what is your blood type? (If you don't know your blood type, skip this question)

Answered: 27 Skipped: 55

RESPONSES (27) TEXT ANALYSIS TAGS

Add Tags  Filter by Tag 

Search responses  

Showing 27 responses

A+

5/7/2018 5:57 AM

[View respondent's answers](#)

O positive

5/6/2018 3:23 PM

[View respondent's answers](#)

I don't know my blood type Izza.

5/6/2018 3:15 PM

[View respondent's answers](#)

A Positive

4/28/2018 4:29 PM

[View respondent's answers](#)

AB

4/28/2018 2:29 PM

[View respondent's answers](#)

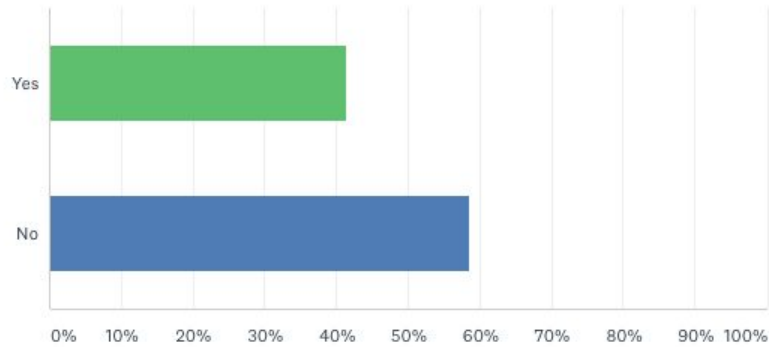
O	A+	A+	A
4/28/2018 1:50 PM	4/11/2018 1:47 AM	4/10/2018 9:30 PM	4/10/2018 8:57 PM
N/a	O Pos	B+	o+
4/28/2018 11:38 AM	4/11/2018 12:51 AM	4/10/2018 9:26 PM	4/10/2018 8:50 PM
O-	Skip	O+	N/A
4/28/2018 11:06 AM	4/10/2018 11:02 PM	4/10/2018 9:24 PM	3/8/2018 11:15 PM
O+	B	Skip	O
4/15/2018 10:33 PM	4/10/2018 10:05 PM	4/10/2018 9:19 PM	3/6/2018 3:54 PM
O-	O-Positive	O	B
4/11/2018 6:18 AM	4/10/2018 9:58 PM	4/10/2018 9:14 PM	3/4/2018 9:55 PM

Appendix K

Awareness of Blood Type Relating to Immune System Survey Responses

Are you aware that the differences between blood type is related to one's immune system?

Answered: 82 Skipped: 0



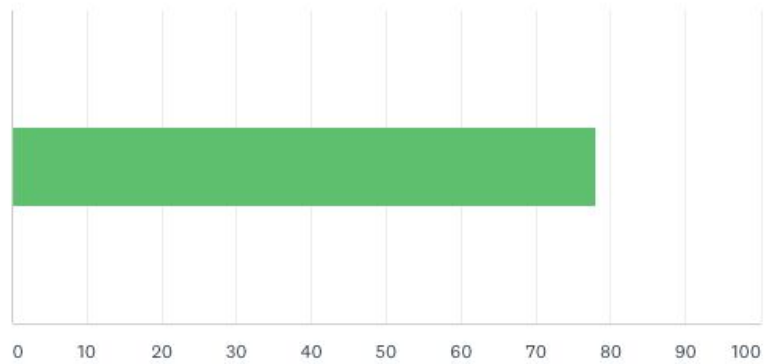
ANSWER CHOICES	RESPONSES
▼ Yes	41.46% 34
▼ No	58.54% 48
TOTAL	82

Appendix L

Average Number of Survey Takers Interested About Knowing More About Blood Type Diet

On a scale from 1 (very uninterested) to 5 (very interested) how interested are you in knowing if your blood type can affect your diet?

Answered: 81 Skipped: 1



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
Responses	78	6,323	81

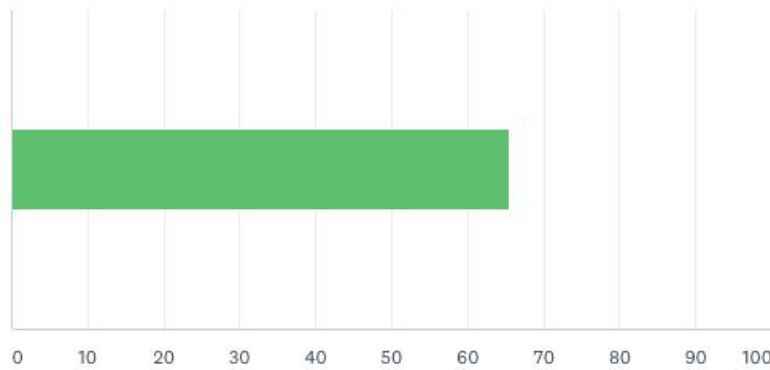
RESPONSES (81) TEXT ANALYSIS TAGS

Appendix M

Survey Takers Willing to Change Eating Habits

How willing are you, from 1 (not willing at all) to 5 (very willing), to change your eating habits if the blood type diet is proven to be true?

Answered: 81 Skipped: 1



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
Responses	65	5,296	81

[RESPONSES \(81\)](#) [TEXT ANALYSIS](#) [TAGS](#)

Appendix N

Blood Type Diet Food List

Type O	Type A	Type B	Type AB
<ul style="list-style-type: none"> - High protein diet, heavy on lean meat. - Fish - Poultry - Vegetables - LIGHT ON <ul style="list-style-type: none"> - Grain - Beans - dairy 	<ul style="list-style-type: none"> - Meat-free diet <ul style="list-style-type: none"> - Fruits - Vegetables - Beans - Legumes - Whole grains 	<ul style="list-style-type: none"> - AVOID <ul style="list-style-type: none"> - Corn - Wheat - Buckwheat - Lentils - Tomatoes - Peanuts - Sesame seeds - Chicken - GO FOR <ul style="list-style-type: none"> - Green vegetables - Eggs - Low-fat dairy - Certain meats - LEAN 	<ul style="list-style-type: none"> - GO FOR <ul style="list-style-type: none"> - Tofu - Seafood - Dairy - Green vegetables - AVOID <ul style="list-style-type: none"> - Caffeine - Alcohol - smoked/cured meats

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Appendix O

Northern Mariana College Anatomy Instructor Email



[Redacted name]

Feb 5 ☆ ↩

to [Redacted], me ↕

Hello Izzami,

I also agree with [Redacted], that there is no scientific evidence to support the blood type based diet. Attached in a link to an article about this exact thing. Why this sometimes gets mistaken is that people who do the blood type diet DO lose weight. This is because each of the diets restrict some type of food intake and decreases the total amount of calories consumed. So type A subject following the A type diet does cause them to lose weight BUT the type A subject that follows the type O diet also loses weight!

<https://www.ncbi.nlm.nih.gov/pubmed/24454746>