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### The Impact of Social Class on Health: How to Take Control

My grandfather had a heart attack in 2008 and my father has been suffering from hypertension for as long as I can remember. Am I next in line to fight the battle that is heart disease? According to the American College of Cardiology, 25.9% of Hispanic men suffer from hypertension. If a quarter of men like me suffer from something, as well as my father and grandfather, it may seem like the odds are not in my favor in regards to long term health.

While taking a Health Psychology class in the spring, I learned about a concept that changed my perspective on health, and in life in general. What if I had more control over my long term health, rather than leave my future in the hands of genetics?

Epigenetics is the study of how your behaviors and environment can cause changes that affect the way your genes work. The food we consume, the amount of water we drink, how much we sleep at night, and if we are up and active are all some of the factors that can potentially change the expression of a gene. While those factors can be controlled, there are other factors that play a role in our health such as the air we breathe, our ethnicity, and what our community looks like. For the longest time, I figured if a certain disease ran in my family it was more likely than not that I would too suffer from it, but there are ways to reverse this fate using the concept as epigenetics.

Addressing differences in social class is critical to an examination of racial disparities in health care. Low socioeconomic status is an important determinant of access to health care. First, to define one's socioeconomic status the American Psychological Association states, "Socioeconomic status is the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. There are numerous reasons as to why a group of people from a high-income suburban area may be in better health than a group of people stemming from a low-income densely populated area. As stated before, what humans consume plays a pivotal role in one's health. Typically areas of lower income lack resources that those of higher income have the privilege to utilize. Grocery stores and access to fresh produce are examples of this, and to illustrate this point I would like to talk about an example that I see everyday.

Fairfield and Bridgeport are two neighboring cities in Fairfield County, Connecticut. Walk down Main street in Bridgeport, one would see McDonalds, Subway, KFC, Dominos Pizza, and Burger King. The abundance of fast food places may seem convenient, but these businesses offer what many would consider less than healthy options. Now walk down Main Street the city of Fairfield is full of healthy and fast alternatives. Places like Trader Joes, Whole Foods, Aldis, and a variety of fresh grocers can be found throughout the city. The discrepancy between the two cities in terms of food selection is evident, and it is all because of income. In fact, the Health Foundation stated, "Consuming the same calories from healthier food is on average three times more expensive compared to less healthy food" (Bibby). The thing about one's socioeconomic status and health, is that it is not only the food but also

numerous other factors that will be discussed like air quality, how stress affects health, and things like if we are sleeping enough at night.

Another aspect that socioeconomic status plays a role in, is access to health care. According to the Commonwealth Fund, “Lower-income people are still much more likely to be uninsured (26%) compared to higher-income people (4%). In addition, almost one-quarter (23%) of low-income adults lack a usual source of care.” Especially in the United States, where healthcare is not universal, a trip to a doctor can cost hundreds of dollars if uninsured. If one needs to pay a copay of one hundred dollars for example, it makes receiving medical attention even less attractive. If one cannot afford a routine visit to a medical practitioner, how would one be able to afford prescriptions, preventative health measures, and health specialists who are even more expensive than a regular visit. If one is unable to have easy access to healthcare, it will be difficult to prevent and address future health issues utilizing epigenetics.

In terms of my socioeconomic status, I am a 21 year old Hispanic male who lives in a middle-class family in the suburbs of New Jersey. According to the CDC, “Hispanics are about 50% more likely to die from diabetes or liver disease than whites”. To be two times more likely to die of a disease than a white counterpart is a staggering statistic. To be in a position where family members suffer from diseases that plague many people similar to you is eye-opening to say the least. In addition to problems with diabetes and liver issues, the CDC also states that Hispanics, “24% more poorly controlled high blood pressure; 23% more obesity; 28% less colorectal screening”. To be able to identify potential issues that may affect me in the

future is a pivotal step in understanding epigenetics and moving forward in the right step to living a healthy lifestyle.

While these issues are definitely serious, it is not a death sentence. In order to control high blood pressure, one can attempt to keep stress levels low, reduce the sodium intake, and refrain from drinking alcohol. To prevent obesity, one can maintain a caloric deficit until the desired weight is reached, exercise regularly both with cardio and strength training, and have high levels of water intake. In terms of colorectal health, one can begin to get checked yearly once the age of 50 is reached. For me personally, my grandfather is currently battling with colon cancer so this is something that my uncles, father, and I will be on the lookout for.

To put things in the most simple context, food is fuel. The things that humans consume are what allows for the body to function. There are numerous reasons as to why eating grilled chicken and rice make humans feel more energetic and upbeat than eating a Mcdouble from McDonalds. The nutrients that we get from food is what provides the energy that is necessary to function. In order to get the most out of the food we eat, it is essential to have a well balanced diet that consists of the three main macronutrients: Carbohydrates, fat and protein. Each macronutrient plays a pivotal role in maintaining bodily functions.

Carbohydrates, commonly referred to as carbs, are sugar molecules and when broken down in the body are converted into glucose. Glucose is the main source of energy for the body and is important in order to function properly. Chemically, a carbohydrate consists of one carbon, two hydrogen, and one oxygen molecule. Carbs can be categorized into two groups: simple and complex carbs. Simple carbs consist mainly of sugar and are often referred

to as unhealthy and bad carbs. In comparison, complex carbs consist of fiber and starch are what are considered to be healthier alternatives. If one were to walk into the Stop'n Shop on Main Street in Bridgeport, some examples of the simple carbs you would see on shelf include candy, soda, baked goods, and most of the popular brands of cereal. In terms of complex carbs, one would see fruits, vegetables, rice, oats, and quinoa. While one type of carbohydrate may be relatively more nutritious than the other, nothing is good in excess and there should be a balance. The Dietary Guidelines for Americans recommends about fifty percent of a person's total caloric intake should consist of carbohydrates. While carbohydrates play such a pivotal role in giving us energy, there is a negative stigma around the macromolecule that they are a cause of weight gain. Many fad diets call for the removal of carbs from one's daily intake, but this causes a lack of energy. Even the healthiest foods like vegetables for example can cause a gain in weight, as it is all about portion size and caloric intake.

The next macromolecule that is essential for the body to function efficiently are fats. There are four dietary fats in food which include: saturated fats, trans fats, monounsaturated fats and polyunsaturated fats. The primary functions of fats as a micronutrient are to store energy, protect organs, hormone creation, and assist in absorbing certain vitamins. Nutritionally speaking, monounsaturated fats and polyunsaturated fats are considered to be good as they are linked to lower disease risk ("Fats and Cholesterol"). One thing to note about these two types of fats, is while they offer lots of nutrients and vitamins, they are high in calories and can lead to weight gain if used excessively. Examples of these so-called "good fats" would be olive oil, nuts, and fish. Trans fats are considered to be the worst type of fat as

it is linked with an increase in risk for diseases. Something that is true about trans fats that do not apply to many foods is that even a small amount of trans fat can cause health issues. Trans fats can be found mostly in processed foods like microwave popcorn, frozen pizza, and fried foods. Especially in the United States of America, a country known for having high obesity rates, it is important to try to avoid this type of fat as it is detrimental to one's health and can have long term effects. It is especially unfortunate that trans fats can be found in so many fan favorite foods. Lastly, saturated fats can be considered to be in the middle of the pack in terms of health. While definitely not as bad as trans fat, there are little to no health benefits. Like many other foods, if eaten in moderation then it can be acceptable for one's health. Examples of saturated fats are red meat, butter, cheese, and ice cream. Some plant-based fats like coconut oil and palm oil are also rich in saturated fat. According to The Dietary Guidelines for Americans, fats should be about 25% of one's caloric intake.

Last, but not least, the macronutrient that has taken the world by storm, protein. Whether for building muscle or for fat loss, protein is a swiss knife of macronutrients. Consisting of "building blocks" also known as amino acids, proteins are used as an energy source, to build muscle, and to secrete certain hormones. Foods that are high in protein include: lean beef, chicken, eggs, cottage cheese, and greek yogurt. In terms of how much protein one should consume, if one wants to maintain the same weight, then protein should be about 25% of one's caloric intake.

While weight is not always the best indicator of health, there is a positive correlation with lower risk of disease at lower weights in comparison to being overweight which could

induce a number of health complications. Every single living thing on this planet has what is called a basal metabolic rate. In layperson's terms, a basal metabolic rate measures the minimum amount of calories that your body needs to perform necessary functions. Each person's basal metabolic rate (BMR) varies. For example, I stand at five feet, eight inches tall, and weigh one hundred and seventy-five pounds, so the amount of calories that is necessary for me to be performing daily functions is around 1,940 calories. If someone of my stature were to want to lose weight, going in a caloric deficit (anything below 1,940 calories) would cause gradual weight loss. If someone of the same stature were to gain weight, a caloric surplus of more than 1,940 calories would cause gradual weight gain. I have seen how my family members have been affected by being overweight, problems like arthritis and heart issues plagued members of my family. Controlling my weight will be a very important factor in ensuring long term health for me.

The human body is not meant to sit at a desk from nine in the morning to five at night, only to return home to sit down on the couch and watch television. Living an active lifestyle not only affects people physically, but can also improve emotional and mental health. Physical activity reduces many major mortality risk factors including arterial hypertension, diabetes mellitus type 2, dyslipidemia, coronary heart disease, stroke, and cancer. In addition to reducing risk factors for an abundance of diseases, there is also a positive correlation between physical activity and increased life expectancy

The Center for Disease Control and Prevention has provided Americans with a quantitative baseline in terms of how much physical activity adults should be performing in a

given week. According to the report, “150 minutes of moderate-intensity physical activity and 2 days of muscle strengthening activity, according to the current Physical Activity Guidelines for Americans” (“How much physical activity do adults need?”). While these numbers may seem like a lot, there are a variety of ways to perform physical activities in enjoyable ways. For example, whenever the sun is out and the weather outside is manageable, I enjoy going for long walks. For me, walking is not even meant for physical activity, but rather going for walks is a safe space where I can clear my head while also enjoying the added benefit of cardiovascular exercise. In addition to walking, I enjoy playing basketball, a sport that captured my heart since I was an adolescent. In terms of weight-training, this is something that I have recently just picked up, but for the last year I have been strength training in the gym through the use of compound lifts as well as accessory movements.

Heart disease is the leading cause of death for both men and women in the United States. While consuming proper foods is a great start, performing cardio exercises has an abundance of benefits that can improve heart health. Some of these benefits include: strengthens your heart, improves lung capacity, and improves sleep quality. In terms of strengthening your heart, when cardio is performed, more blood is pumped which increases resting blood pressure and heart rate. Thus when resting, the heart does not need to work as hard in comparison to when training. Examples of cardiovascular activities include, but are not limited to, jumping rope, going for a run, swimming, and cycling.

In terms of strength training, there are four main types which are as follows: training for muscle power, training for muscle strength, muscle entropy, and, lastly, muscle endurance.



Each type of training varies in its end result, but at the end of the day each will benefit the body and long-term health. Training for muscle power aims to improve the muscles' explosive power. One will most often see this type of training utilized by athletes in particular football or track athletes that need to engage fast-twitch fibers in the body. The next type of training which is for muscle power, aims to achieve maximum strength gains. Often, powerlifters who perform compound movements like bench press, squats, and deadlifts will be seen training for muscle power. Next, training for muscle hypertrophy is something that I partake in. Training for muscle hypertrophy aims to increase the amount of lean muscle in the body. Often, when one has never trained for strength, they can increase muscle while also burning fat. This type of training is probably the most beneficial for the common person as maintaining a healthy weight while also putting on muscle benefits all. Lastly, training for muscle endurance does the opposite of training for muscle power, as in endurance training the body utilizes slow twitch fibers which allows the body to perform movements for a prolonged period of time.

While the physical benefits of exercise have been reported, what about the emotional and mental benefits? Whenever I feel anxious or stressed, walking clears my mind and allows me to feel free. I experience the same sense of freeness when I shoot a basketball. Keeping stress levels low are one of the key components to maintaining longevity. In terms of stress, the reason why exercising makes people feel better is that certain endorphins in the brain are released. This allows the brain to relax the muscles and relieve tension in the body. It is often said that physical health and mental health go hand in hand, so focusing on one can invariably help the other. There is also a positive correlation between exercise and alleviating

things like depression and anxiety. People with depression are often prescribed antidepressants which come with a number of side effects. A study done by the Harvard T.H. Chan School of Public Health found that running for 15 minutes a day or walking for an hour reduces the risk of major depression by 26%. While antidepressants have been tested and prescribed by doctors for years, running or walking is not only free of cost and comes with very minimal side effects. Unlike depression, anxiety is a more common condition that most people experience on a daily basis. Similar to depression, exercise releases the same endorphins in the brain that assist in subduing anxiety. Walking for example, can help one feel less anxious as instead of worrying about the things at hand, one can focus on steps or rhythm of breathing that can allow for the mind to be at ease.

Often, the hardest type of exercise that people must battle through is putting down the spoon. One could train intensely for seven days a week, and see no progress if the diet is not up to par. There is another factor in the equation that could possibly be more important than both diet and exercise, which is sleep. First of all, humans require sleep to allow the brain and body to repair itself, while also reenergizing itself before waking up. According to most medical professionals, adults require 7-9 hours of sleep everyday. Americans currently average 6.8 hours of sleep at night, which is slightly less than the required amount of sleep (“Newman”). Lack of sleep is a serious issue that can lead to chronic health issues later down the line, such as obesity, diabetes, cardiovascular disease, and hypertension. The combination of a well-balanced diet, active lifestyle, and an adamant amount of sleep are three pieces to the puzzle that humans can control in order to prolong life and live a healthier illness-free life.

At this point, it is understood that external factors like food, exercise, and sleep can be controlled, but the interesting aspect about epigenetics is how everything comes together for gene expression. Genes provide the instruction for the development and maintenance of the body. The epigenome interacts with DNA to activate or suppress the expression of genes. There are chemicals in the body referred to as epigenetic tags that alter expression without changing the genetic code. While there is no surefire way of turning off certain genes for diseases, a healthier lifestyle like the one described before increases the odds of the so-called “bad” genes being expressed.

In PS-295, or Health Psychology, there is a unit on epigenetics. In this unit there was an example of how external factors affect gene expression, with identical twins being the subject. Essentially, identical twins are a result of a single embryo splitting into two. Each embryo has the same genetic information, hence making the twins identical. The difference between my fraternal twin and me, for example, is that our genetic information differs as we did not come from the same embryo. How epigenetics was explained was that if one were to separate two identical twins at birth, and each twin was placed in polar opposite situations, the following would probably occur. If one twin was placed in a middle-class suburban neighborhood with access to fresh produce and grocery stores as well as sports and recreation, and the other twin was placed in a low-income urban environment with food deserts or poor urban areas with limited or no access to healthful affordable food options, then the twins would look drastically different if they were to be reunited in a number of years. The first twin would most likely be in better physical health, while the other twin would most likely be overweight and suffering from illnesses that the other twin is not. While the twins have the

same DNA, external factors change the trajectory of their lives inevitably. As my fraternal twin is a sister, it is even more obvious that social context will have differential impacts on our similar, yet different biologies.

To a certain extent, the ball is in my court in terms of health. In order for me personally to live a healthy life, I need to keep my weight down, exercise regularly, and sleep an ample amount of time. Socioeconomically speaking, there are certain factors that I may not be able to control as in my income and age, but there are things that are in my control such as my education and occupation. Life is all about choices, and decisions that are made can have an immense effect on how we live the latter portion of our lives.

The common misconception is that one's health is predetermined, when in reality there are a number of factors and ways that people can alter gene expression. Cardiovascular issues run in my family, and as well affect a portion of people of the same ethnicity, but I have more control of my health than it appears at the surface. While life itself is meant to be enjoyed, there is a certain discipline that is required in order to prolong its duration. Knowing that my life is not completely predetermined and that I have a great deal of say about my health makes me feel good, because I can learn from others before me and do not have to suffer the same fate.

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