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## Epidemiology of The Use of Whitening Agents on the Health of Teeth.

### **Abstract**

Many people desire what is said to be "the perfect smile" : glistening white teeth. To reach this, they go to any method that is accessible. The most common is teeth whitening. This study investigated how teeth whitening agents correlate to the weakening of the enamel. To investigate this, the mechanism of teeth whitening first needed to be understood. In the process of teeth whitening, oxidised materials are used such as hydrogen peroxide. This material is made to reach the enamel dentine junction and the dentine regions. This allows the colour of the teeth to become whiter. Data was obtained through the Tooth Bleaching—a (Critical Review of the Biological Aspects Journal) The data showed that the majority of the participants had hypersensitivity after teeth whitening, which was conducted at their homes. People who whiten their teeth are 3.68 times more likely to have a weak enamel than people who do not whiten their teeth. Informing the public regarding these findings could lead to various changes. These include a change in the quality in oral hygiene in individuals (better brushing techniques), lesser usage of whitening methods, and possible advances in science to make bleaching or teeth whitening less harmful to teeth.

*Excellent  
Abstract!*

## Intro

In today's society much depends upon the first impression when meeting someone.

When it comes to a job interview or even meeting a new person, people desire to look their best. Since the first thing that is noticed about a person is their smile, people search for ways to better their smiles. The method that many people seek is teeth whitening and ranges from whitening toothpaste to bleaching the teeth. These procedures could be done in a dentist's office or in an individual's home. The people most common to get teeth whitening are those whose age<sup>s</sup> are from 20-40 years. As the individual gets older, teeth whitening is used more frequently (Wu 2010). However, teeth whitening agents could have an impact on the chemical makeup of teeth.

The method that is widely used in teeth whitening is bleaching. This procedure is done by a dentist and at home. The purpose of this study was to determine how teeth whitening agents correlate with the weakening of the enamel. In this study, people ages 20-40 were tested. People in their thirties are more common to teeth whitening mainly because of teeth discoloration due to aging (Wu.2010). Due to the frequency of teeth whitening, research on the effect on teeth of these procedures is essential to alert the users in case of lack of knowledge. Although research tests the hypersensitivity of teeth, sensitivity is an outcome of teeth whitening. The results could change the quality in oral hygiene in a significant amount of individuals (better brushing techniques could take place of whitening). The results could also lead to advances in science. If whitening agents weaken the enamel then advances in science could lead to bleaching or teeth whitening less harmful to teeth.

Great  
Intro

## **Methods**

For this study, a cross-sectional study was conducted. At the beginning of this study, the ingredients used in whitening products were researched. The mechanism of teeth whitening was also investigated. There were no initial groups of people chosen and secondary data was used. Male and female participants were tested and were from ages 20-40. A total of 66 participants were involved in this study all of which had no existing oral illness. The research was conducted in 1994 and 1997. Although the research is not recent, it provided the best data collection. The data collected indicates that the participants underwent a bleaching procedure that ranged from two hours to 6-8 hours. At the end of the study, the incidence of hypersensitivity reactions were measured. Hypersensitivity is a symptom in the weakening of dental enamel.

Secondary data was essential to this investigation due to probable patient oblivion. Participants may not be aware of the health of their teeth. Participants may also have lack of knowledge regarding the side effects of whitening agents in oral products that they use. With the data gathered in this study, a 2-by-2 contingency table was used. The table that was used shows the risk factor (use of whitening agents), the non-risk factor (no use of whitening agents), the outcome (weakening enamel), and no outcome (healthy enamel) was used. From this table, the relative risk factor was calculated. The equation used was

*RR = incidence rate in exposed group / incidence rate in unexposed group.*

## Results

This study was performed to determine how teeth whitening agents correlate with the weakening of the teeth's enamel. Table 1 shows that people who are subjected to teeth whitening are more likely to result in the teeth's enamel weakening than individuals who do not get their teeth whitened.

**Table 1:** 2x2 contingency table for Teeth Whitening's Effect on the Enamel of Teeth.

	Outcome: Weak Enamel	No Outcome: Healthy Enamel	Total
Risk Factor: Teeth Whitening	20	18	38
Non-Risk Factor: No Teeth Whitening	4	24	28
Total	24	42	

*Table 1 was used to calculate the relative risk of having a weak enamel after teeth whitening*

From the calculations done, people who whiten their teeth are 3.68 times more likely to have a weak enamel than people who have not whitened their teeth. Furthermore, it was found that people are more likely to use whitening products that can be used at home rather than going to a dentist. Also, the people are more prone to have teeth sensitivity due to weak enamel.

$$79 \text{ pts} \times .8 =$$
$$\times 1.2 =$$

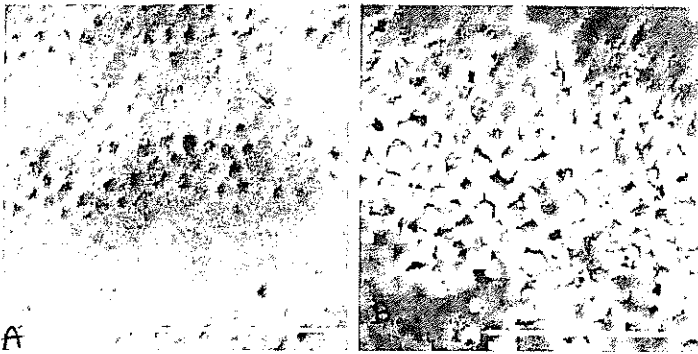


Figure A: No Teeth Whitening

Figure B: After Teeth Whitening

(J.E Dahl. "Tooth Bleaching—a Critical Review of the Biological Aspects." *Oral Biology and Medicine* 14 2003: 292-304.)

The figures above show the damage that was done to a tooth after it was whitened. The tooth's surface was significantly damaged after the whitening procedure.

### Discussion

Based on the results from the investigation, the teeth whitening process does weaken the enamel of teeth. As shown previously, after teeth whitening the teeth develop small dentures which is caused by the damage of the biological make up of the teeth. The use of whitening agents not only weaken<sup>s</sup> the enamel but lead<sup>s</sup> to more oral illnesses. These include dental decay, tooth sensitivity, and gum irritation (Batrell .2010).

In the process of this investigation, few studies were conducted. When compared to other research studies done in the past, this investigation had very limited data that was recent. Due to this, the data that was available was relatively small. The total <sup>number</sup> amount of participants in this study was sixty-six. This may not be the best population to form conclusions from. However, due to availability of data, this was the most suitable sample size and most accessible. The data also included thorough information about the effects of teeth whitening on the enamel of teeth. Based on the results from

the investigation, the teeth whitening process does weaken the enamel of teeth. As shown previously, after teeth whitening the teeth develop small dentures which is caused by the damage of the biological make up of the teeth. The use of whitening agents not only weaken<sup>4</sup>the enamel but lead<sup>4</sup>to more oral illnesses. These include dental decay, sensitivity, and gum irritation(Batrell .2010). Based on the results from this study, people are more likely to use over the counter whitening products. Due to the frequency in the use of these products, advancement in science can lead to better quality and safer oral whitening products. It can also lead people to use these methods less. The awareness in people who whiten their teeth could lead to better quality of oral hygiene as a protective factor. Possible ways to improve the study <sup>are</sup> is<sup>d</sup> to use a larger sample size. Interviewing dentist<sup>6</sup> could also lead to a better understanding of the mechanics of teeth whitening. Finding the direct source of weak enamel could lead to eliminating the source in teeth whitening.

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Kevyn -  
In the 2 years I've taught you, this <sup>is</sup> by far,  
the best paper you've ever written! It was  
well-researched, well-structured,  
and very interesting. Good job!  
Ms. B

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### Injury Among Pitchers: Young Pitchers and the Effect of Off Speed Pitching

The purpose of this study is to determine if throwing off speed pitches can lead to injury in a young pitcher's arm. For this experiment 50 male boys, ages 10-14, were surveyed on their pitches and any type of injury they might have due to certain types of pitches. It was discovered through this study that off speed pitches and injuries were very strongly related. 17 out of the 50 participants had some type of injury, meaning 34% (Velazco, 2010) of them were injured. The relationship is strong between both off speed pitches and injury. When the relative risk was determined it was found that if you threw off speed pitches you were 18% more likely to get an injury than not. (Velazco, 2010) There were several ways in which this study could have been conducted but it was conducted through a survey because it was most convenient and realistic.

Very good  
abstract

Young pitchers have always seen off speed pitches as one of the best possible ways to improve their ability to pitch. Studies show that young pitchers throw off speed pitches about 40 percent of the time (Hyman, 2005). Can throwing off speed pitches have some type of correlation with the injuries among young adolescent pitchers? This is an important topic to address because more pitchers are starting to throw off speed pitches rather than throwing the primary pitch, the fastball. These injuries can later effect the lives of the kids whether it involves baseball or in their work environment. A study was conducted to



## **The Association between Obesity/ Physical activity level and Chronic Kidney Disorder among people ages 30-75.**

### **Abstract:**

Since obesity became an epidemic, many obesity-related illnesses have risen in America. Many people might not suspect that Chronic kidney disease is associated with obesity. The purpose of this study is to determine the relative risks of obesity for chronic kidney diseases. This study used secondary data from a cohort study (Stengel B. 2003). It showed that when BMI was greater or equal to 35, the individual had a relative risk of 2.3, which is dramatically higher chance of developing chronic kidney diseases than a normal weight. It also showed that an individual's physical activity level also affects the chances of getting chronic kidney diseases. The relative risk for an individual who is sedentary is 2.2, which is a high risk compared to an active individual. This shows that the eating habits an individual has can dramatically affect their lives in the long-term. America has to start by teaching nutrition to kids at early ages to help prevent many obesity-related illnesses.

### **Introduction:**

Some teenagers are eating unhealthy for many reasons. Some of these reasons include: stress, time, or it is just the way their habits are in their lifestyle. Many teens are influenced by their parents to eat the way they do. If they have lots of homework and are always on the run, then they are more likely to stop by an unhealthy fast food restaurant and get dinner rather than going home and get a cooked meal. They soon get into a habit of eating unhealthy and this can lead to obesity. If obesity doesn't stop it



will effect future generation's health because they will have higher risks of getting obesity and other illnesses that hurt their health.

Since the epidemic of obesity broke out, many obesity-related illnesses have risen in America, including diabetes, hypertension, and heart disease. Kidney disease is not usually on the list of diseases people typically consider to be obesity-related; however, some recent speculation has cause epidemiologists to begin examining this possible linkage. People have begun to see kidney disorder as an threat due to the fact that, It is the 9th rank <sup>ed</sup> cause of death in America (CDC). The purpose of this study is to determine whether obesity is associated with kidney disorders. It is important to decrease the rise of obesity because this can help people's health and can help stop chronic kidney disorders.

#### **Method:**

Data collected from Benedicte Stengel's cohort study, published in Lifestyle factors, Obesity and Risk of Chronic Kidney Diseases in 2003, was used to conduct secondary data analysis. Stengel's research was used to determine how many factors are associated with chronic kidney diseases. He tested how BMI was associated with chronic kidney disorder using 9,082 individuals (weighted to reflect the general U.S. population ages 30-75) in a cohort study. He linked several data sources together which include a cross-sectional survey conducted between 1976 and 1980 (NHANES II) and a Health Care Financing Administration's end stage renal disease Program Management and Information System. Mortality data was also collected for the original NHANES II population. His experiment kept the same controls which were: physical activity, no smoking or alcohol, diabetes status, adjusted age, gender, and race. It



calculated body-mass index (BMI) from height and weight ( $\text{kg/m}^2$ ) and subjects were classified according to the following: thin ( $\text{BMI} < 18.5 \text{ kg/m}^2$ ), normal weight ( $18.5 \leq \text{BMI} < 25$ ), overweight ( $25 \leq \text{BMI} < 30$ ), obese ( $30 \leq \text{BMI} < 35$ ), and morbidly obese ( $\text{BMI} > 35$ ). The study measured chronic kidney diseases as either having 1) treatment of end-stage kidney diseases due to any factor or 2) death related to chronic kidney diseases.

Stengel's cohort study was chosen as a secondary source because it tested how BMI and other factors affected the chances of getting kidney disorders. The study will focus on his BMI section because BMI can also show if someone is obese or not so we will be able to see if obesity is associated on chronic kidney disorders or not based on his data collected in his study.

**Result:**

The purpose of this study was to determine if obesity is associated with Chronic kidney diseases. Table 1 shows that people with BMI greater than or equal to 35 will have a significantly higher chance of developing chronic kidney disorders than those of normal weight. It is important that people with obesity be aware of the risks they have for getting chronic kidney disorders, so they can change lifestyles to prevent becoming morbidly obese.

Table 1: Body mass index associated with chronic kidney diseases

Body-mass index	*RR for chronic kidney disease	95% CI??
Thin(<18.5)	1.3	0.5-3.1
Normal(18.5-24)*	1.0	

*no CI because it's the start point value for RR calculations?*



Overweight(25-29)	0.9	0.5-1.5
Obese(30-34)	1.0	0.6-1.8
Morbid obesity ( $\geq 35$ )	2.3	1.1-4.9

\*reference category

In the study, 189 participants developed chronic kidney disease. 44 (23%) entered Medicare end-stage renal disease program, 23 (12%) had kidney disease as main cause of death, and 122 (65%) had as a contributing cause. The overall cumulative incidence by age of 75 was 8.9%. Individuals who were morbidly obese had twice the risk of chronic kidney disease than a normal weight person. This study also showed that individuals who were thin, normal, overweight, and obese didn't have a significant relationship to developing chronic kidney disease.

In addition, I found there is higher risks for chronic kidney diseases for an individual who is inactive than an individual who is highly active.(see table 2)

Table 2: Physical activity level vs. RR for chronic kidney disease.

Physical Activity	*RR for chronic kidney disease	95% CI
High	1.0	
Moderate	1.2	0.7-1.8
Low	2.2	1.3-3.8





\*relative risk (RR) is the risk of an event (or of developing a disease) relative to exposure. Relative risk is a ratio of the probability of the event occurring in the exposed group versus a non-exposed group

**Discussion:**

The results show that obesity may have an impact on your kidney's health. The risks are even higher for an individual who is morbidly obese. In addition this study doesn't support that being overweight or obese has any risks to developing chronic kidney disorder than a normal weight, but it does show that being morbidly obese has double the risks to develop chronic kidney disease. This might be due the body's strength to be able to use the kidney correctly and constantly when an individual is overweight or obese. However, once an individual is morbidly obese, the kidneys are overworking to filter the blood, which many contain lot of sugar, so the kidneys may tend to shut down leading to kidney failure or chronic kidney disease. In addition, the study supports that individual who are active are less likely to develop chronic kidney disease than those who are sedentary. This is because exercise helps the body burn off fat and helps prevent many diseases. This research supports the idea that people in the U.S. must change their eating habits because eating habits can affect future generation's health. Teens must change their eating habits, especially, because they are less likely to watch what they are consuming. Classes and program should be created to show teens the effect of obese and sedentary lifestyles, so they can have lower risks of developing obesity-related illnesses, especially chronic kidney disease. This can prevent future obesity-related medical care and can save thousands of dollars. The study stated that

*give evidence*

*unclear how this is related to obesity?*

*OK*

*why?*

the larger the number of participants and the longer the study took the more cases of incidence occurred.

*larger sample = more cases, always right?*

*mis-placed flow of ideas*



My study limitation was that I couldn't actually survey individuals myself or conduct a cohort, cross-section, or case control study due to time. An alternative way to approach this study would have been a case control study. I would identify people who already have chronic kidney diseases and I would survey them to find factors that affect them to get the disease.

Based on the conclusion of this study, follow-up research could be on how calorie intake and physical activity level is associated with chronic kidney diseases. I would like to see how calorie intake or constantly consuming artificial foods has an effect on the risk of developing chronic kidney disease. This is important because now a days many people, especially teens, don't watch what they are eating. Also many people consume artificial foods because it is become a norm in society due to many factors.

← need a conclusion sentence



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