

RELATIONSHIP BETWEEN WATER CONSUMPTION AND  
OVERALL SKIN HEALTH IN INDIVIDUALS

AGES 18-24

by

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OVERALL SKIN HEALTH IN INDIVIDUALS  
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## ABSTRACT

*Background:* Water is an essential component of the skin cells. Research suggests that lack of proper hydration causes skin to become dry, tight, and less resilient. A recent study showed that an increase in water intake has a positive correlation with skin appearance, especially in those who had inadequate water intake to begin with. However, opposing research studies have found that there are too many external factors to glorify water intake as the main contributor to skin appearance.

*Purpose/Objective:* To determine the effects of water consumption on skin complexion.

*Methods:* An online survey, regarding skin type, skin care processes, medications, physical activity, and fluid and dietary intake, was developed to evaluate the relationship between water intake and skin health. Researchers recruited Texas Christian University student participants using email and social media. Once the survey sample of 105 participants was met, data was analyzed using SPSS.

*Results:* Upon surveying participants (N=105), there were strong correlations ( $p \leq 0.01$ ), between skin type and fruit servings, skin type and yogurt consumption, and skin type and alcohol intake. There was also a strong correlation ( $p \leq 0.01$ ) among those who consumed water and additional healthy habits, such as higher fruit, vegetable, and yogurt consumption, and higher amounts of moderate or vigorous exercise. Approximately 24% (n=25) of the respondents mentioned that their skin appearance changes due to many factors including weather, medications, stress, dehydration, makeup, or menstrual cycle. There were no significant relationships between water intake and skin satisfaction or water intake and acne.

*Conclusions:* While water provides many benefits, other factors likely contribute to optimum skin health. Those who reported drinking more water had healthier habits overall, including exercising and consuming fruits, vegetables, and yogurt, which implies that further assessment is needed to determine which of these factors impact skin appearance and satisfaction.

Keywords: Skin Complexion Satisfaction; Fluid Intake; Physical Activity; Fruit and Vegetable Consumption; Acne

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## **CHAPTER I**

### **INTRODUCTION**

Water is one of the most important components of the body. It has many functions, including: a lubricating agent for joints and eyes, allowing proper swallowing, a medium in which most bodily reactions occur, a component of cerebrospinal fluid which cushions the nervous system, assisting with waste elimination, and regulating body temperature. The body can sense as little as 2% loss of water, leading to symptoms such as headache or fatigue. Consequently, the body cannot survive without water intake, especially since the human body does not produce sufficient water to sustain itself.<sup>1</sup>

Water can compose up to 80% of the skin's cells, which implies that it may have a significant impact on skin health and appearance.<sup>4</sup> There are many studies that support this idea. One study suggested that increased water intake is correlated with improved skin appearance, especially in those who had minimal water intake to begin with.<sup>4</sup> However, opposing literature says that water has little effect on the skin, as there are multiple external factors that may affect the skin, including physical activity, weather, medication, disease, or stress. Additionally, the body has many physiological mechanisms that may protect it from over hydration or dehydration. For instance, the kidneys regulate the amount of fluid in the body with the help of hormones as vasopressin, atrial natriuretic hormone, and aldosterone.<sup>2</sup>

The lack of conclusive results leads us to create this study, with the purpose of determining the effects of water intake on skin complexion. We hypothesize that the individuals ages 18-24 who report greater than thirty-two ounces of water intake per day will rate higher their overall skin complexion satisfaction ( $p \leq 0.05$ ) when compared to those who drink less than thirty-two ounces of water daily, and will classify their skin as "smooth" or "clear."

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **THE EFFECT OF WATER ON THE SKIN**

Water is the most important nutrient in the body, as the body can be composed of anywhere between 55-75% water.<sup>3</sup> With this in mind, a considerable intake of water is needed to adequately perform bodily function and maintain skin integrity.

Research attributes adequate hydration with improved skin appearance and health. This general concept has been researched by many food and beverage industries to explore whether increased water intake may have antiaging effects. Research attributed dermal water to decreasing the friction between fibers, thus acting as a lubricant. Therefore, the association between skin health and improved skin appearance has been widely accepted because water is an essential component of the skin, as the skin is an organ composed of many cells that consist of 80% water.<sup>4</sup> Without proper hydration, this organ will not have the ability to carry out its intended function(s). If lacking adequate hydration, skin will become dry, tight, flaky, and less resilient.<sup>5</sup> Further research explains that if the epidermal layer of the skin lacks water, then the skin becomes rough and loses elasticity.<sup>6</sup> These symptoms may be due to the fact that skin cells undergo crenation without a sufficient amount of water.

In a recent research study, 49 healthy women were asked to complete a food frequency questionnaire to determine their total water consumption comprising drinking water, water from dietary sources, and water produced by metabolism. The participants were divided into two groups. Group one had a total water consumption less than 3,200 milliliters per day, whereas group two had a total water consumption greater than 3,200 milliliters per day. Both groups were asked to increase their water intake. Skin moisture baseline measurements were taken, and were

taken again on day fifteen and day thirty. It was shown that an increase in water intake did not significantly change the epidermal layer of the skin, but it did have a positive correlation with skin appearance, especially in those who had inadequate water intake to begin with. The researchers concluded that increasing dietary water intake could impact skin as a topical moisturizer.<sup>4</sup> Further articles explain the role of water in maintaining moisture, and therefore, preventing dryness, poor elasticity, and flakiness.<sup>5</sup>

Opposing research studies, however, have found that proper hydration has little effect on the skin. There are too many external factors to glorify water intake as the main source of skin appearance in regards to dryness, flakiness, and elasticity.<sup>2</sup> External factors such as cold weather, humidifiers, air conditioning/heating, sun exposure, medications, use of cleansers or humidifiers, and hot water can affect skin complexion and hydration just as much as water intake.<sup>7</sup> In addition, the body also has multiple regulatory mechanisms to maintain fluid balance in the body. Excess water gets expelled from the body via vasopressin, a hormone that triggers the reabsorption of water in the kidneys when the body is dehydrated or blood pressure is low. In contrast, atrial natriuretic hormone is a cardiac hormone that is released in response to high blood pressure or hypervolemia. It triggers the excretion of fluid, thus counteracting effects of vasopressin. Aldosterone is produced in the cortex of the adrenal gland, and it works to increase reabsorption of sodium and water in the blood. Since there are external and internal factors that may affect body water content, an increase in water intake may not change skin complexion, especially if the excess water is lost from the body.<sup>2</sup>

Research is inconclusive on the effects of water intake on skin. In research studies, if individuals are not meeting recommended amounts of water per day, then the skin is already dehydrated, which may affect results. In addition, large amounts of water are lost from the body

each day through urine and sweat. Therefore, water must be replenished frequently to stay adequately hydrated.<sup>8</sup>

## **THE EFFECT OF FRUIT AND VEGETABLE INTAKE ON THE SKIN**

Although water may have an impact on the skin, research has demonstrated that there are other factors that may affect skin health. In a study published in the British Journal of Nutrition, 42 overweight, non-smoking pre-menopausal women were randomly assigned to take a Juice Plus+ treatment or a placebo for eight weeks. Juice Plus+ is a whole foods supplement that uses powder concentrates from thirty different fruits, vegetables, and grains. The results showed that the group who took the Juice Plus+ supplements had improved skin microcirculation as evidenced by better capillary blood flow, oxygen saturation, and the relative concentration of hemoglobin. An improvement in these is related to positive changes to the density, thickness, and hydration of the skin.<sup>9</sup>

A similar study was conducted by the Experimental Dermatology at the University of Witten-Herdeck. Fifty-two middle-aged women were assigned to take daily either a capsule with fruit concentrates or a placebo pill. After twelve weeks, the group that consumed the supplement had a 39% increase in microcirculation, 9% improvement in skin hydration, 6% increase in skin thickness, and 16% improved density. Increased microcirculation is important as optimal circulation ensures that more oxygen and nutrients will be delivered to the skin.<sup>9</sup>

Although the effect of fruit or vegetable intake on the aging process is unknown, these studies support the idea that the consumption of fruit and vegetable concentrates may improve markers of overall skin health.<sup>9</sup>

## THE EFFECT OF YOGURT ON SKIN

Research has suggested that the lactic acid produced by probiotics in yogurt may have a positive impact on skin health. In a study published in the Journal of Cosmetic Science, researchers created a facial yogurt-based pack using natural ingredients. In addition to yogurt, it also contained the Eastern prickly pear *Opuntia humifusa* Raf., which is known to have antioxidant and anti-inflammatory characteristics. Sixteen Korean adults, with a mean of 29 years of age, were assigned either to a group who applied this product on their forehead, cheek, and chin or to a group that received a placebo treatment. An invitro assessment of biological activity and in vivo assessments of moisture, melanin content, elasticity, and transepidermal water loss were performed. When compared to the control group, the group who applied the yogurt-based pack demonstrated increased moisture in all areas:  $89\pm6.26\%$  (forehead),  $140.72\pm10.19\%$  (cheek), and  $123.29\pm6.67\%$  (chin). Transepidermal water loss decreased in the treated areas when compared to the control, while elasticity decreased for the control, but did not change for the treatment group. Researchers concluded that yogurt likely plays a role in the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, superoxide dismutase, and lipoxygenase activity, leading to improved moisture, brightness, and elasticity of the skin.<sup>10</sup>

In another study, 23 healthy women, ages 19-21 from Jutendo University, were randomized into a group that received *Lactococcus* lactic strain H61 milk or conventional yogurt daily for four weeks. Results demonstrated that skin hydration at the inner forearm was higher in both groups while sebum content rose significantly only in the group consuming the H61 milk. The researchers concluded that skin lipids are essential for healthier skin, so H61 milk may have positive effects on young women.<sup>11</sup>

## **OTHER FACTORS AFFECTING SKIN**

A study attributed differences in skin hydration related to sex, environmental exposure, individual habits, and other external and internal factors. In a cross-sectional population-based study using a Brazilian sample, researchers found that men were more likely to have dry skin when compared to women. Moreover, black and mixed individuals were more prone to have hydrated skin when compared to white individuals, but other studies have found no significant relationship between skin hydration and race. There was also a significant relationship between smoking and skin damage, as smoking may lead to decreased water content in the skin. When analyzing the use of cosmetic products on skin moisture, such as moisturizers, these appeared to have only short-term effects on skin hydration. However, sunscreen use correlated positively with skin moisture levels. It is believed, however, that this is due to decreased sun exposure.<sup>12</sup>

## **CHAPTER III**

### **METHODS**

#### **Study Design**

A five- to ten-minute online survey was administered to male and female college-aged students with the purpose of assessing whether there was a correlation between water intake and skin complexion satisfaction. The online document was divided into four parts. The first part explained the purpose of the study and listed all potential risks and benefits of the study. A HIPAA form was included, which explained that the participants' information was going to be maintained confidential and anonymous. The participants had provide an online signature to the consent form, agreeing to have read and understood all the information and highlighting that their participation on the study was voluntary. The survey portion of the online document asked questions regarding participant demographics and lifestyle, skin-related questions, including skin complexion overall satisfaction, skin type, and skin care procedures, as well as questions regarding water consumption, diet, and exercise habits. The study was approved by the TCU Department of Nutritional Sciences Research Review Board and the TCU Institutional Review Board.

#### **Participants**

Researchers recruited participants from Texas Christian University classes, such as Contemporary Issues in Nutrition and Nutrition, and the TCU Student Nutrition and Dietetic Association (SNDA). Researchers also used social media, iMessage, and email, as a means to recruit diverse student populations at Texas Christian University. Interested participants were contacted by researchers via email with the link to the online HIPAA form, consent form, and survey. The email also provided instructions for completing the survey.

Researchers recorded a total of 128 responses to the survey, but only 105 were used to analyze the data, as the rest were incomplete surveys. The study population included only Texas Christian University students, ages 18-24, with 29 males (28%) and 76 females (%). To prevent researcher bias and protect participants, responses appeared as numbers, not names.

## **Protocol**

An online survey was created using Survey Monkey. The online document was divided into two parts. The first part included the HIPAA and consent forms. The second was the online survey with demographic and lifestyle questions regarding gender, height, weight, age, menstrual cycle, birth control use, and tobacco use. The survey also included general skin questions, including questions related to skin type, presence of acne, length of acne, overall skin complexion satisfaction, skin care procedures, perception of current skin condition, and external factors that participant thought influenced his or her skin. The overall skin complexion satisfaction question was asked on a Likert scale from one to five, one being completely unsatisfied and five being completely satisfied. The skin care procedures questions were very specific. The questions regarded use of makeup, cleansers, moisturizers, sunscreen, soap, soap and water, among other items, for skin care. Participants were asked to check the box that indicated the frequency in which they followed the procedures. The options of frequency were either daily (morning and night or morning or night), weekly (1-6 times per week) or never. The question regarding external factors that affected skin was free response. The final part of the survey asked the participants questions about their food and beverage consumption, as well as exercise habits. In this set of questions, the participants selected the estimated number of fluid ounces consumed for each beverage option. Examples were provided to indicate the number of ounces in various sized Starbucks coffees, water bottles, and restaurant beverage glasses. Participants were asked to designate the number of fruit, vegetable, yogurt and

broth-based soups servings they consumed, as these foods can contribute to the total fluid intake. Finally, participants were asked to select the number of times per week that they performed light, moderate, and/or vigorous activities. Light activity was defined as walking leisurely or stretching, while being able to carry on a conversation. Moderate activity included exercising to an exertion level that allowed them to talk, but not sing, such as strength training or walking briskly. Vigorous activity was defined as exercising to an exertion level that left the participant unable to say no more than a few words between breaths, such as running or spinning class.

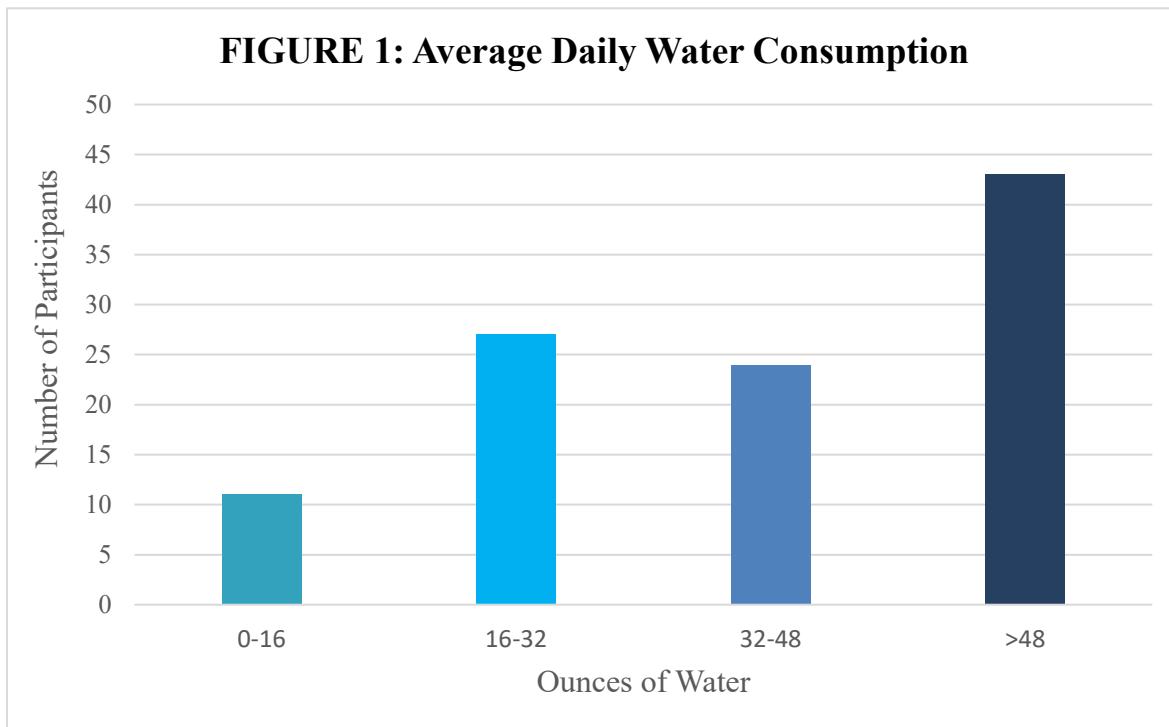
### **Statistical Analyses**

All data was run on SPSS for Windows, Version 24.0 (IBM, Inc. Armonk, NY) for frequencies and correlations. A level of significance of  $p \leq 0.05$  was considered strong, while a level of significance of  $p \leq 0.01$  was considered very strong.

## CHAPTER IV

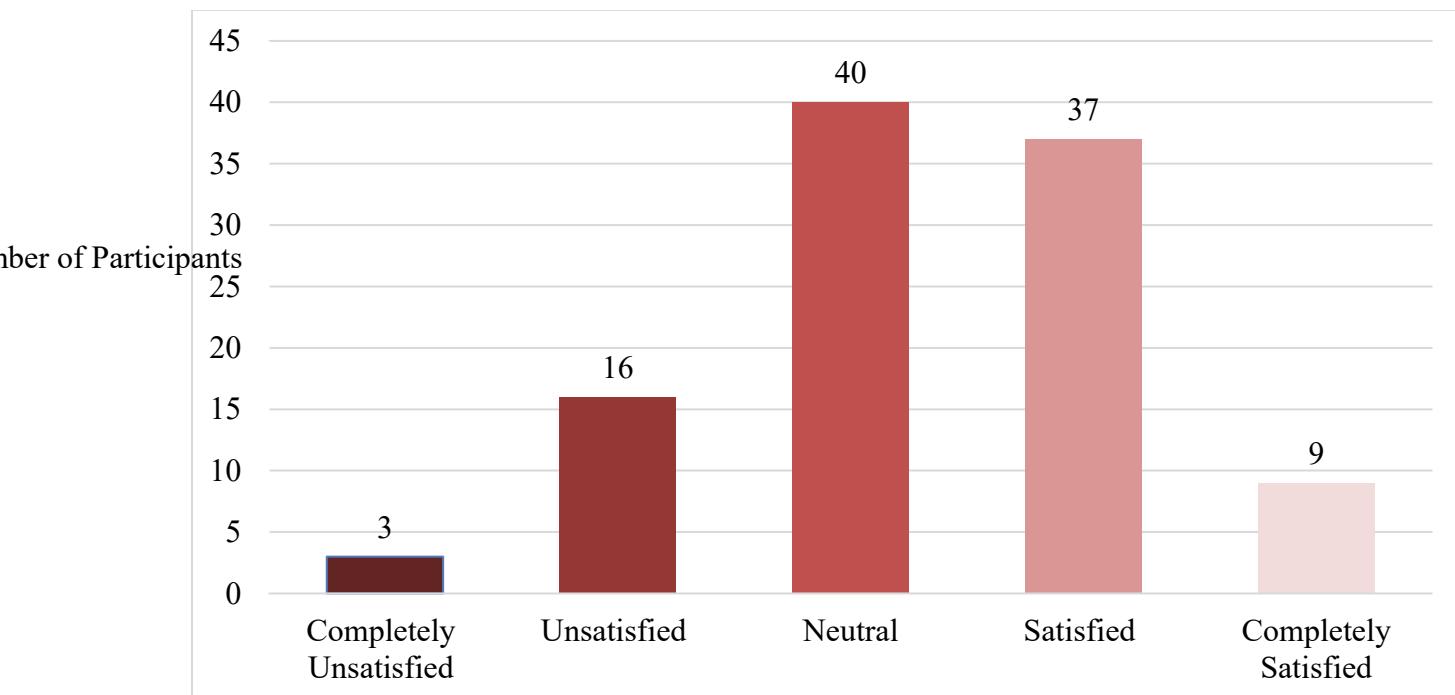
### RESULTS

Upon surveying participants ( $N=105$ ), there were strong correlations between normal skin type and increased number of fruit servings ( $p<0.003$ ), normal skin type and increased yogurt consumption ( $p<0.000$ ), and sensitive skin type and high alcohol intake ( $p<0.004$ ). There was also a strong correlation among those who consumed water and presence of additional healthy habits, such as higher fruit ( $p<0.002$ ), vegetable ( $p<0.001$ ), and yogurt consumption ( $p<0.006$ ), and higher amounts of moderate or vigorous exercise ( $p<0.02$  and  $p<0.001$ , respectively). In the free response question, approximately 24% ( $n=25$ ) of the respondents mentioned that their skin appearance changes due to external factors including weather, medications, stress, dehydration, makeup, or menstrual cycle. Approximately 41% ( $n=43$ ) of the participants reported consumption of  $\geq 48$  cups (384 oz.) of water per week as depicted on Figure 1.



Additionally, 61% of participants (n=64) reported that they did not have acne. With regards to skin satisfaction, 43.8% (n=46) had a high skin satisfaction rating between a 4-5 compared to a moderate (38.1%, n=40) or low satisfaction (18.1%, n=19) depicted in Figure 2. However, there were no significant correlations between water intake and skin satisfaction or water intake and presence of acne.

**FIGURE 2: Skin Complexion Satisfaction**



## **CHAPTER V**

### **DISCUSSION & CONCLUSIONS**

Based on the results of this study, it appears that greater water intake may positively influence skin appearance, though no statistical significance was found. Eighty two percent (n=86) of the participants rated their skin satisfaction above 3, and about 64% (n=67) of the participants reported water intake greater than 32 ounces. This tells us that the majority of the participants were drinking more than the recommended water intake for the standard individual, and that they were satisfied with their overall skin complexion. However, there are many other factors that may influence skin appearance, as well, which likely contributed to the findings. When reviewing individual responses, those who drank greater amounts of water also demonstrated other healthy habits such as consuming more fruits, vegetables, and yogurt, and exercising more frequently. As a result of these varying factors, it is inconclusive whether water alone impacts skin appearance and satisfaction, based on our survey. Other studies support the idea that we cannot attribute water as the sole contributor of skin health, as evidenced in Wolf, et. al's and Sayer's articles.<sup>2,7</sup> Future studies should consider executing a randomized controlled trial in which water intake serves as the independent variable and skin moisture as the dependent variable. Baseline values should be recorded, and participant water intake can be prescribed and monitored. Using objective measures of skin moisture, any physical changes in skin moisture could be observed. This would help to eliminate all confounding variables present in our study that might have affected the results.

Additionally, approximately 24% (n= 25) of our participants responded that their skin is affected by factors such as weather, stress, and/or menstrual cycle. This is interesting because this was a free response question, and we noticed that similar factors were reported among the participants. A long-

term study is needed to determine skin appearance and satisfaction with both optimal and suboptimal external conditions. It would be most beneficial to only include participants in the results if their skin appearance and satisfaction were normal to them despite external factors.

However, it is almost impossible to completely remove external factors, such as weather; thus, determining the sole impact of water intake on skin is difficult.

The results indicated that 61% (n=64) of participants did not have acne. With regards to skin satisfaction, 43.8% (n=46) had a high skin satisfaction rating, between a 4 and 5, compared to a moderate (3) rating (38.1%, n=40) or a low (1-2) satisfaction rating (18.1%, n=19). However, it is not known whether the individuals' skin satisfaction ratings were based on presence or absence of acne or on actual skin type. Future surveys should include a more detailed and defined rating scale to better assess the relationship between these two variables. In addition, future surveys should include a question related to family history of acne, as acne can be attributed to genetics.<sup>13</sup> Water intake may not have influenced a participant's skin appearance if genetics was a major contributing factor to their overall complexion.

Through this study, we were able to obtain data which has some strengths and some weaknesses. It is important to learn about people's thoughts and personal skin health perceptions to explore what people believe affects their skin. Also, it brought light to the idea that skin type may be related to fruit, alcohol, and yogurt consumption, not necessarily fluid water intake. These relationships have been analyzed in other studies, and our study supports the notion that these may be beneficial for skin health.<sup>9,10,12</sup> Therefore, a new study examining the mechanisms of why and how these foods affect the skin would be beneficial. This study also resulted in data that has led to new research questions that should be explored. For instance, what is the relationship between sensitive skin type and alcohol intake? What element of fruits and vegetables leads to improved skin

health? How does yogurt consumption impact skin? How do people define overall skin complexion satisfaction?

There were several limitations to our study. First, data was collected via survey, so all data is self-reported. This means that the participants could have over- or under-reported information related to food or beverage intake. Moreover, the data is subjective. For instance, for the overall skin complexion satisfaction level, participants could be satisfied with their skin, but have a dry skin type or have acne. Whereas another person may have low skin satisfaction level, but a normal skin type. Additionally, there were some terms that were not defined for the participants, which could have caused some confusion. For example, for some people having acne means being diagnosed with the condition, while for others it means having a few skin blemishes. Finally, the study population may not have been representative of all individuals ages 18-24. We used convenience sampling by obtaining responses largely from students in the TCU Department of Nutritional Sciences and Nursing, and Pre-Health Sciences departments. These individuals may be more knowledgeable about health due to their fields of study, which is why they might have displayed healthier habits, such as increased fruit, vegetable, and yogurt intake and physical activity. Future studies should include increased diversity in race, ethnicity, and gender. Our study had only 28% male participants, with the rest being females. Females are thought to use more skin care products and be more skin health conscious than males.<sup>12</sup> Therefore, all of these variables could have impacted the results.

Overall, the primary results of our study to determine the effects of water intake on skin appearance and satisfaction were not statistically significant; therefore, no definitive conclusions can be made based on this data. In general, it was observed that participants who had greater water intake reported better skin and healthy eating and exercise habits. Therefore, skin appearance may be attributed to an overall healthy lifestyle.

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## **APPENDIX**



## **Relationship Between Water Consumption & Overall Skin Health in Individuals 18-24 Years of Age**

**2.**

### **PROTECTED HEALTH INFORMATION AUTHORIZATION FORM**

Researchers from the study "The Relationship Between Water Consumption & Overall Skin Health in Individuals 18-24 Years of Age" would like your permission to use your health information which will be gathered as a part of this study.

The following health information will be gathered from you:

Height and weight  
Dietary intake of specific foods  
Personal questions about hygiene  
Personal questions about meds that may impact results

The names of the TCU researchers who will gather this information from you are (insert the names of all TCU researchers starting with the lead researcher):

Researchers from the study "The Relationship Between Water Consumption & Overall Skin Health in Individuals 18-24 Years of Age" would like your permission to use your health information which will be gathered as a part of this study.

The following health information will be gathered from you:

Height and weight  
Dietary intake of specific foods  
Personal questions about hygiene  
Personal questions about meds that may impact results

The names of the TCU researchers who will gather this information from you are (insert the names of all TCU researchers starting with the lead researcher):

Rebecca Dority, MS, RD, LD, CDE  
Vivian Castillo  
Katie Keatley  
Ashley Peek

Your health information may be shared with others who are working with the TCU researchers on this study, institutes that are paying for this study or involved in any other way, or as required by law. The names of these other researchers (include name, affiliation, and role in the study) or institutions (name and role in the study) are listed below.

No others will have access to individual information.

The TCU researchers and other researchers who work with TCU will protect your health information in the following ways:

- Your health information will be kept private
- Your name or any other identifying information will not be made known
- Your health information may be shown in research papers or meetings without any information about you that will link it to you.
- Your health information will be given a special code for security
- Your health information will be grouped together with other people's health information to form an average
- Your health information will be locked in a cabinet and kept safe

You can agree or not agree to sign this form. If you agree to sign this form but change your mind, you can choose to stop being in the study at any time. If you decide to stop being in the study, you will need to contact the researcher (insert the name, telephone, and e-mail of the PI): Mrs. Rebecca Dority, r.dority@tcu.edu, 817-257-6322.

If you would like a copy of this form to keep, please contact Mrs. Rebecca Dority at r.dority@tcu.edu.

If you have any questions or concerns about your rights as a study participant, you can contact:

Dr. Dennis Cheek, Chair, TCU Institutional Review Board, 817-257-6741.

Dr. Tim Barth, Co-Chair, TCU Institutional Review Board, 817-257-6427.

Dr. Bonnie Melhart, TCU Research Integrity Office, Telephone 817-257-7104.

2. By selecting "I Agree" below, you are saying that you understand what is being said in this form, you have been told who to contact if you have questions regarding your rights as a participant, and you have allowed TCU to gather, use, and share your health information as described in the form.

I Agree



## Relationship Between Water Consumption & Overall Skin Health in Individuals 18-24 Years of Age

### 3. Demographics

3. What is your gender?

- Male
- Female

4. What is your height (ft and in)?

5. What is your weight in pounds?

6. What is your age?

- <18
- 18-19
- 20-21
- 22-23
- 23-24
- >24

FOR THE FOLLOWING TWO QUESTIONS, PLEASE SELECT "NOT APPLICABLE" IF MALE.

---

7. Are you currently on your menstrual cycle?

- Yes
- No
- Not Applicable

8. Are you currently on birth control?

- Yes
- No
- Not Applicable

9. Do you smoke?

- Yes
- No



## Relationship Between Water Consumption & Overall Skin Health in Individuals 18-24 Years of Age

### 4. General Skin Questions

10. What is your skin type?

- Oily
- Dry
- Combination (dry in some areas, oily in others)
- Sensitive
- Normal

11. Do you have acne?

- Yes
- No

12. If you have acne now, about how long have you had it?

- 1 year
- 2-3 years
- 4-6 years
- 7+ years
- I don't have acne.

13. Rate the following on a scale of 1-5

	1 Completely Unsatisfied	2	3	4	5 Completely Satisfied
What is your skin complexion satisfaction level?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. How regularly do you do the following?

	Daily (morning <b>and</b> night)	Daily (morning <b>or</b> night)	1-2 times/week	2-3 times/week	3-4 times/week	4-6 times/week	Never
Rinse face with water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rinse face with soap and water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wear sunscreen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a facial moisturizer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Take medications for acne	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a facial cleanser (Neutrogena, Cetaphil, CeraVe, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a cleansing brush (i.e. Clarisonic)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Get facials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visit the dermatologist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use face masks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use toners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use astringents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use eye cream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use pore strips (i.e. Biore)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Today, my skin is...

- Dry
- Flaky
- Tight
- Smooth
- Clear
- Breaking out
- None of the above

16. Do these characteristics represent your skin on a normal day?

- Yes
- No

17. If not, what is anything specific contributing to these different skin factors?



## Relationship Between Water Consumption & Overall Skin Health in Individuals 18-24 Years of Age

### 5. Water Consumption, Diet & Exercise

18. On average, how many of the following beverages do you consume daily? (1 serving=1cup=8oz)  
(Starbucks tall=12oz ; grande=16oz ; venti=20oz ; trenta=31oz) (standard restaurant small=16oz ; medium=20oz ; large=30oz) (standard water bottle=17oz)

	< 8oz	8-16oz	16-24oz	24-32oz	32-40oz	40-48oz	48-56oz	56-64oz	>64oz
Water	<input type="radio"/>								
Soda	<input type="radio"/>								
Tea	<input type="radio"/>								
Coffee	<input type="radio"/>								
Hot Chocolate	<input type="radio"/>								
Juice	<input type="radio"/>								
Alcohol	<input type="radio"/>								
Milk	<input type="radio"/>								
Other (Kombucha, milk alternatives, etc.)	<input type="radio"/>								

19. On average, how many servings of fruit do you consume/day? (1 serving = 1 small apple, 1 small banana, 1/2 cup berries)

- 0-1
- 2-3
- 4-6
- 7-9
- >9

20. On average, how many servings of fresh vegetables do you consume/day? (1 serving = 1c leafy greens, 1/2c carrots/broccoli/peas/etc.

- 0-1
- 2-3
- 4-6
- 7-9
- >9

21. On average, how often do you consume yogurt?

<1 times/week	1-2 times/week	3-4 times/week	5-6 times/week	>6 times/week
<input type="radio"/>				

22. On average, how often do you consume broth-based soups?

<1/week	1-2 times/week	3-4 times/week	5-6 times/week	>6 times/week
<input type="radio"/>				

23. On average, how often do you participate in the following exercises? Light = able to carry on a conversation (walking leisurely, stretching); Moderate = able to talk, but not sing (strength training, walking briskly); Vigorous = unable to say more than a few words between breaths (running, spinning class)

	<1/week	1-2 times/week	3-4 times/week	5-6 times/week	>6 times/week
Light Activity	<input type="radio"/>				
Moderate Activity	<input type="radio"/>				
Vigorous Activity	<input type="radio"/>				