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Abstract

Apple cider vinegar has shown great promise for weight loss in controlled lab settings, yet these claims are widely shared on social media and may not yield the same benefits. This study used directed content analysis to examine how apple cider vinegar weight loss drinks were portrayed on Pinterest, a social media website utilized to bookmark online content. Using the search terms "apple cider vinegar weight loss drinks," researchers sampled every fifth pin to collect 200 relevant pins. A codebook was developed, pilot tested and used to code pins. Of the 200 pins, the majority (66%) positively portrayed the effectiveness of apple cider vinegar drinks for weight loss, and 36% contained images of a drink. Sixty percent of pins made weight-loss claims for specific pounds lost; however, most of those pins did not present a particular number of pounds that an individual will lose from drinking apple cider vinegar. Also, a time frame for weight loss promised was only present in 15% of pins. In this sample, 6% of pins had comments. Social media is a powerful source of health information. However, this study demonstrated evidence of the propagation of misleading and potentially dangerous weight loss methods. This study revealed widespread interest and acceptance of insufficient weight loss drink information.

Keywords: social media, apple cider vinegar, Pinterest, content analysis, health information

Introduction

In the past decade, people have turned for health advice to social media, including Pinterest, a large social media platform with more than 322 million active users (Cover, 2020; Iqbal, 2020). Pinterest differs from other social media platforms because it is used for more than just posting and sharing content. This platform is

also one of the largest search engines on the Internet (Cover, 2020; Iqbal, 2020). Pinterest users search for, find, "pin" or bookmark, and share content in which they are interested. Pinterest is a powerful consumer influence tool because many users report that they made a purchase as a result of a pin suggestion. In addition, 40% of consumers claim that information found via social media affects how they deal with their health (Simon et al., 2019; PricewaterhouseCoopers Health Research Institute, 2012). Notably, health and fitness pin boards are among the most utilized, with approximately 5.37 followers per pin (Mittal et al., 2013). The popularity of health-related topics on Pinterest aligns with a population-based study that found that an estimated 45 million Americans go on a diet each year. Additionally, Americans spend $33 billion each year on weight-loss products (Tsai & Wadden, 2005).

Dieting is a common practice among individuals in the U.S. Among adults, 24.3–32.8% of men and 37.6–46.3% of women are trying to lose weight (Bish et al., 2005; Gillen, 2012; Kruger et al., 2004). Although dieting may be beneficial for specific individuals, research indicates that some people who diet are not overweight (French et al., 1999; Kenardy et al., 2001). Further, when individuals diet, they may not use effective weight loss methods; few dieters combine eating fewer calories and exercising more (Kruger et al., 2004). Dieting has important implications for physical and mental health. Among women, more frequent dieting is linked to more disordered eating and lower body image (Ackard et al., 2002; Cachelin et al., 1997; Kenardy et al., 2001). Dieters share some characteristics with individuals who have eating disorders (French & Jeffery, 1994; Polivy & Herman, 1987), and dieters are at heightened risk for clinical eating problems (French & Jeffery, 1994). More frequent dieting is also associated with other psychological issues in women, such as lower self-esteem, poorer emotion regulation, and schizophrenia (as measured on the MMPI-2; Ackard et al., 2002; Cachelin et al., 1997). In adult men and women, weight instability (a potential outcome of dieting) is linked to lower satisfaction with health and lower self-esteem (Serdar et al., 2011). Dieting often only results in temporary weight loss, with many individuals ending up weighing more than they did before they began dieting (Gorin et al., 2004). Once people lose weight, they tend to go back to the same eating strategies they had before starting the diet, resulting in weight gain. This weight fluctuation often leaves people in a cyclical pattern of repeat dieting with no permanent results (Gorin et al., 2004). Cycles of dieting and disordered eating could be linked to fictitious information frequently conveyed to consumers.

Searching for health information on the internet is a growing activity for adults, especially on social media platforms. One social media platform, in particular, is Pinterest, which is a visual-bookmarking website launched in 2010 that allows users to manage and create their theme-based collections to "pin" onto their virtual bulletin boards (Franks & Krause, 2017). According to Pew Research Center, Pinterest was the third most popular social media platform among internet users in 2016 at 31% (Greenwood et al., 2016). Users can search for and share content in the form of photos, videos, recipes, or infographics to pin on their boards to access at any time and share with followers. Infographics are increasing in popularity as an educational data visualization tool for their simplicity in presenting complex data (Wilkinson et al., 2016). Pinterest is considered a "go-to" resource for health information for 40% of daily users, and 84% of those daily users reported trying something new each week based on a pin they saw on Pinterest (Wilkinson et al., 2016).

Health and fitness posts occupy a large proportion of Pinterest, promoting diets, weight loss products, and workout plans targeted towards women. The majority of Pinterest users are women (82%), and 67% of users are below the age of 40 (Wilkinson et al., 2016). Pinterest is one form of feminized social media, and scholars are beginning to explore it as a site of pleasure, empowerment, and optimism (Lewallen & Behm-Morawitz, 2016; Mittal et al., 2013). Unfortunately, the shared information is not regulated and often comes from unreliable sources, like "mommy blogs" or even companies with agendas (Shelby & Ernst, 2013). These biases mean that the information released into society could be false or misleading, leading to dangerous effects such as discouragement or even body image issues in some cases (Ackard et al., 2002; Dedrick et al., 2020; Mittal et al., 2013). Users are subjected to inaccurate and false information due to the semi-regulated Pinterest Community Guidelines, where most people and topics are free to exploit (Lewallen & Behm-Morawitz, 2016; Mittal et al., 2013).

Several studies examine how unproven and inaccurate health information is shared on social media, specifically Pinterest. For instance, one study pulled 189 pins from Pinterest, investigating the use of homemade sunscreens on Pinterest, with 95.2% of pins painting homemade sunscreens in a positive light and 68.3% of pins offering insufficient Sun Protection Factor (Merten et al., 2019). A study conducted on how waterpipe smoking is portrayed on Pinterest revealed that 97% of pins, out of a sample of 800, depicted waterpipe smoking positively, with only nine addressing

the potential health risks (Guidry et al., 2016). Another study analyzing weight loss promotion (fitspiration) on Pinterest examined 1050 pins, with findings that suggest these posts being problematic, particularly among users with a high risk of eating disorders and health-related issues (Simpson & Mazzeo, 2017). It seems that lately, weight loss drinks have increased in popularity as easy alternatives for diets. Some are even so bold to claim that you can lose weight fast without exercising or changing the way you eat (Tsai & Wadden, 2005). In particular, Pinterest has advertised numerous recipes for apple cider vinegar weight loss drinks that share these claims.

Given the rise in the use of Pinterest to find health information related to weight loss and a societal trend toward natural, do-it-yourself, and organic solutions, we are examining the use of apple cider vinegar as a weight-loss trend. The use of apple cider vinegar has been covered in mainstream media and widely shared on social media. Yet, there is limited evidence of its effectiveness outside of a controlled environment. Apple cider vinegar, which is made of probiotics, B-vitamins, and polyphenols, results from the fermentation of sugar and the sourness of acetic acid (McDonald, 2018). One study has shown a reduction in systolic blood pressure in rats, and while animal testing is valid, rats are different on a metabolic level. Therefore, humans could not assume the same results. When apple cider vinegar is consumed daily over a long period, it can cause erosion of the tooth enamel (Gambon et al., 2012). Apple cider vinegar has been associated with improvements in blood sugar levels. In a small-scale study of 29 randomly assigned patients, vinegar ingestion has been shown to raise insulin sensitivity in Type-I and Type-II diabetic patients (Johnston et al., 2004). Apple cider vinegar has also been associated with increased weight loss when combined with caloric restrictions. In a small-scale randomized control trial, patients who consumed apple cider vinegar for 12 weeks showed a decrease in body weight, body mass index (BMI), hip circumference, visceral adiposity index (VAI) and appetite score, plasma triglyceride (TG), and total cholesterol (TC) levels and an increase in high-density lipoprotein cholesterol (HDL-C) concentration (Khezri et al., 2018). When implemented in a controlled environment with diabetic and obese individuals, apple cider vinegar demonstrated positive, statistically significant results for a decrease in BMI and decreased blood glucose levels (Pusparatha et al., 2019). However, despite the promising lab-based research, there is minimal evidence demonstrating the effectiveness of apple cider vinegar in regular daily use outside of clinical trials.

With the popularity of Pinterest and an increase of apple cider vinegar drinks being introduced, this study seeks to answer the following research questions:

1. How are apple cider vinegar drinks portrayed on Pinterest?
2. What health benefit claims are being mentioned on Pinterest about apple cider vinegar drinks?
3. How do users engage with apple cider vinegar drinks on Pinterest?

Methods

Sample

On February 18th, 2020, one researcher entered the keywords "apple cider vinegar weight loss drinks" into the Pinterest search bar. The researcher sampled every fifth pin and took a screenshot to capture the pin, the website link, and any user comments. Duplicate pins, advertisements, and unrelated pins were removed for a final sample of 203 pins.

Coding Instrument

A codebook for the study was designed, tested, and used for this study while using code categories from previous studies that looked at the effect of Pinterest on health decisions (Merten et al., 2017). See Table 1 for Pinterest variables. The codebook was tested by two of the researchers in February 2019 by using a pilot sample of ten pins each. They each coded their ten pins separately then met to discuss any discrepancies.

Each pin was coded of one of four appearance categories: 1. Image; 2. Text only; 3. Image and text combined; or 4. Video. The image contents were coded as 1. Product only; 2. Product and person together; 3. Body; 4. Drink; 5. Recipe; 6. Multiple images combined; or 7. Other. The pin was coded as 1. Appearance or body-image; 2. Health; 3. Crafty; 4. Multiple appeals; or 5. Not apparent. See Figure 1 for study sample.

Specific additional ingredients (lemon, honey, water, or cinnamon) were documented for each pin if included. The numerical claim for weight loss was also included. Each pin was coded for the claims made: claimed to aid in weight loss (yes/no), claimed to help with body detox (yes/no), claimed to burn fat (yes/no), or organic (yes/no).

Results

Apple Cider Vinegar Weight Loss Depiction

The Excel file of 203 coded Pinterest pins was imported into Statistical Package for the Social Sciences v.25 for analysis (IBM Corp, 2012). The first research question aimed to answer how apple cider vinegar weight loss drinks were portrayed on Pinterest. The majority of pins were images with text (87.7%, n=178), 6.9% (n=14) were only images, 4.9% (n=10) were videos, and only 0.5% (n=1) were solely text. Many pins contained images of a drink, ideally apple cider vinegar, (35.5%, n=72), 19.2% (n=39) contained multiple images, and 14.8% (n=30) displayed only the bottle of apple cider vinegar.

Most of the pins positively portrayed apple cider vinegar weight-loss drinks and their effects (66%, n=134) while 34% (n=69) of the pins had a balanced or unapparent portrayal. While 59.1% (n=120) of the pins made weight-loss claims, 86.2% (n=175) of the pins did not make a weight loss claim within the image.

When analyzing the type of appeal used within the pin, the majority of the pins (44.3%, n=90) had a health-based appeal, 37.9% (n=77) of the pins had an appearance-based appeal, 7.9% (n=16) showed no specific appeal, 5.9% (n=12) had a combination of multiple appeals, and 3.9% (n=8) had a craft-based appeal (by using mason jars, etc.).

Apple Cider Vinegar Weight Loss Drinks Health Claims

The second research question strived to determine the health claims about apple cider vinegar weight loss drinks that were portrayed on Pinterest. Besides the weight-loss claims, only 29.1% (n=59) make detox claims and only 17.1% (n=35) make fat-burning claims.

Only a few of the pins made claims that apple cider vinegar weight loss drinks were organic (8.4%, n=17). Most pins did not address proper serving sizes (82.8%, n=168) or the time of day to ingest the drink (89.7%, n=182).

Pinterest User Engagement

The third research question examined how Pinterest users engage with apple cider vinegar weight loss drink pins. At the time of this study, users had four ways to engage on Pinterest: saving a pin to their personal board, posting a comment on a pin, posting a reaction on a pin, or posting whether you have tried the pin.

In this sample of pins, only 6% (n=12) of the pins had comments. From these pins, the majority only had one or two comments, with the exception of one pin which had an outlier of eighty-eight comments. We did not formally analyze the comments, however, we felt comfortable interpreting that users rarely engaged with apple cider vinegar weight loss drink pins via comments.

A similar outcome was found with posting a reaction to a pin and posting whether you have tried the pin. In all two hundred pins we collected, only one (0.5%) had a reaction posted on it, and none (0%) had a post about whether they had tried the pin before.

Discussion

This study was the first to examine how apple cider vinegar is depicted as a solution to losing weight on Pinterest. Analysis of the 200 pins revealed a positive portrayal of apple cider vinegar use to lose weight. In addition, the majority of the pins made weight-loss claims but did not provide any scientific evidence to back up the claims. Many also included a time frame for the weight loss promised; however, some of the time frames were unrealistic for healthy weight loss. For example, one pin claimed that the drink would help people lose 10 pounds in three days. These kinds of claims raise concern for how Pinterest may be setting users up with unrealistic expectations that will lead to failure and discouragement. Inability to lose weight quickly without proper diet and exercise may have adverse physical and mental effects or lead to body image issues.

The way people receive and view health information over the years has shifted strongly towards the influence of social media. On Pinterest alone, health and fitness posts occupy a large proportion of the site, promoting diets, weight loss products, and workout plans targeted towards women. This prevalence becomes relevant when you consider that in adults, 24.3-32.8% of men and 37.6-46.3% of women in the U.S. are trying to lose weight, with many of these individuals not being overweight, according to a 2012 article (Gillen et al., 2012). This source of information and demand for it has the potential to become harmful when false information is presented. In the U.S. population, 30-40% of people report using social media sites for seeking health-related information (Thackeray et al., 2013). Numerous health topics have social media cure claims, such as a drug called "Laetrile." This drug is popularly promoted in India as an anti-cancer remedy through YouTube and other

forms of social media, with one study showing 2,417 mentions on it in the context of cancer (fake cures). When information may be inaccurate, this type of promotion has the potential for devastating effects (Ghenai & Mejova, 2018).

Fast weight loss diets or get-rich-quick schemes are nothing new, but they are being shared more broadly with social media. Recipes and promising advertisements for apple cider vinegar usage for weight loss were readily available on Pinterest. Although apple cider vinegar does show evidence as a tool to aid in weight loss, the timelines to lose weight promised by many of these pins are unrealistic. According to the American College of Sports Medicine, safe weight loss should be no more than two pounds per week (Dedrick et al., 2020). The scientifically backed suggestions for weight loss directly contradict our Pinterest findings as drastic weight loss, such as 10 pounds, is promised in short time frames, such as three days.

In an unrealistic timeline, users who drink apple cider vinegar could get discouraged from the promises to lose weight quickly not being met. Many pins even showed body images illustrating an overweight individual in a "before" picture and a much slimmer figure in an "after" picture from supposedly using ACV to lose weight. This visual comparison could negatively affect a woman's self-worth (Dedrick et al., 2020). After seeing these images with promises of similar results in specific time frames, this could lead to body image issues. Along with this, a person who cannot reach the goal that a pin claimed may have an even harder time getting back on a diet that works. This discouragement could result in a vicious cycle of unattainable goals failing to be met, which is detrimental to physical and mental health (Ackard et al., 2002; Cachelin et al., 1997; Kenardy et al., 2001).

Although there has been evidence of apple cider vinegar being assistive in weight loss, all trials for this data have taken place in controlled lab environments with specific dosages and ingestion methods. One such study had ten diabetic patients and ten obese patients mix 20 mL of apple cider vinegar into 200 mL of water every night before bed. They did this consistently for 30 days. It showed a significant decrease in BMI in diabetic patients (Pusparatha et al., 2019). While this study was completed in a lab setting, there is always room for error in society. The pins seen on Pinterest regarding the ingestion of apple cider vinegar do not include a universal dosage or procedures. These pins do not consider the significance of the controlled environment in producing these weight loss results and instead give off the impression that you will lose an unrealistic amount of weight with minimal

instructions. For example, some encouraged people to take shots of it, while others encouraged you to blend it in a drink with lemon and water. Inconsistencies and incomplete directions found on Pinterest set up these pins' viewers for failure. Data collected from a controlled lab environment with specific dosages and methods are not comparable to results that someone may get from following one of these pins on Pinterest. It gets people's hopes up, and their results often fall short.

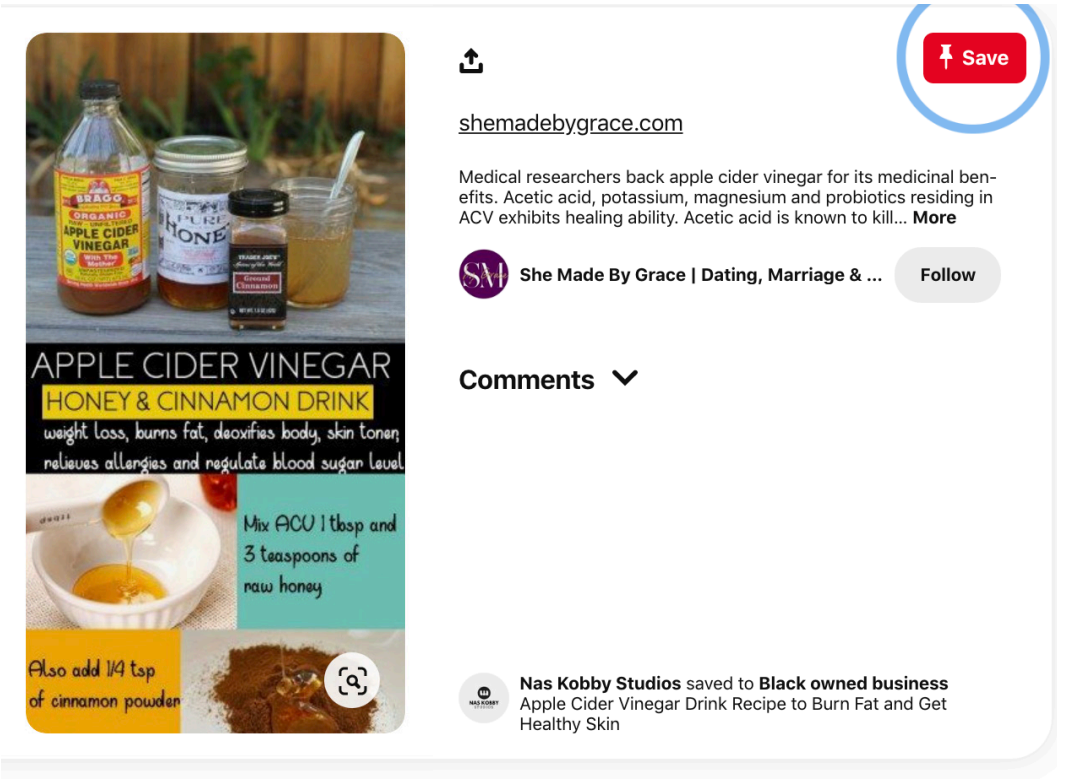
For the average consumer, apple cider vinegar's lab-controlled efficacy is less relevant than the effects of regular consumption on the human body in a less-than-ideal environment. Additionally, the claims boasted on Pinterest, with unrealistic timelines and inaccurate information, could cause potential physical and mental harm. The health information portrayed on social media sites, like Pinterest, needs to be demonstrated with caution. As such, consumers should be aware of the inconclusive effects of apple cider vinegar and should be wary of the claims posted on Pinterest.

Limitations

There are many restrictions with this study. There are a limited number of existing Pinterest studies that leads to disagreement over sampling methods during analyzing. For this study we collected every fifth pin related to our study. Two pairs coded fifty pins each and compared the results. Additionally, with Pinterest, it is unknown if people act on what they pin, there is no statistical information, and there is no exact way to analyze time range. This study is simply a snapshot of the information displayed on Pinterest. It does not discuss the entire narrative as it covers only 203 of the thousands of the pins that are produced.

Despite the many restrictions, this study offered awareness of the influence of social media on weight loss. It fortified the obligation of public health organizations to interact with the social media population to teach them and prevent the spread of false health information. Moreover, we need to further analyze the behaviors of Pinterest users to figure out if they are engaging with what they pin. Organizing a focus group to take a deeper dive into apple cider vinegar on Pinterest would be our ideal next step. This would give us the opportunity to analyze further how the pins affect people socially and mentally, and how great of a reach they have on social media.

Figure 1


Save
shemadebygrace.com
Medical researchers back apple cider vinegar for its medicinal benefits. Acetic acid, potassium, magnesium and probiotics residing in ACV exhibits healing ability. Acetic acid is known to kill... More
She Made By Grace | Dating, Marriage & ...
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Comments
APPLE CIDER VINEGAR
HONEY & CINNAMON DRINK
weight loss, burns fat, deoxifies body, skin toner, relieves allergies and regulate blood sugar level
Mix ACV 1 tbsp and 3 teaspoons of raw honey
Also add 1/4 tsp of cinnamon powder
Nas Kobby Studios saved to Black owned business
Apple Cider Vinegar Drink Recipe to Burn Fat and Get Healthy Skin

Tables

Table 1

Pinterest Variables

Variable	*Response Options*
Portrayal of Apple Cider Vinegar Weight Loss Drinks	Negative Positive Not Apparent
Overall Appeal	Appearance Health Crafty Multiple Appeals Not Apparent
Image Type	Image Text Image and Text Video
Image Contents	Product(s) Product and Person Body Drink Recipe Multiple Images Other
Audience	Women Men Both Not Apparent
Lemon	No Yes
Honey	No Yes
Water	No Yes
Cinnamon	No Yes
Other	No Yes
Number of Comments	Exact #
Number of People Who Have Tried	Exact #
Reaction	None Love (heart) Like (thumbs up) Dislike (thumbs down) Wow (surprised face) Sad (tear)
Website Link	Commercial Personal Not Apparent
Option to Follow	No Yes
Weight Loss Claims	No Yes
Pounds Lost	None 2-5 lbs. 6-10 lbs. 11-15 lbs. 16-20 lbs. 21 lbs. and up
Detox	No Yes
Fat Burning	No Yes
Time for Weight Loss Promised	None 7 days or less 8-14 days 15 days - a month More than a month
Mentions Organic	No Yes
Serving Size	No Yes
Times a Day	None 1-2 times 3-4 times 5 or more times
Time Suggestions	None Morning Afternoon Evening Multiple times

Table 2

Pinterest Variable Frequencies

Variable	*Response Options*	*Frequency (n=226)*	*Scott's pi coefficients*
Portrayal of Apple Cider Vinegar Weight Loss Drinks	Negative Positive Not Apparent	19.5% 11.1% 54.9% 14.6%	.77
Overall Appeal	Appearance Health Crafty Multiple appeals Not Apparent	12.8% 11.9% 11.1% 19.9% 11.5% 5.5% 27.0%	.89
Image Type	Image Text Image and Text Video	85.2% 14.8%	1.0
Image Contents	Product(s) Product and Person Body Drink Recipe Multiple Images Other	98.7% 1.3%	1.0
Audience	Women Men Both Not Apparent	34.8% 42.0% 1.3% 20.0% 1.9%	.88
Lemon	No Yes	6.2% 13.7% 22.6% 57.5%	.89
Honey	No Yes	7.0% 3.7% 74.3% 15.0%	.82
Water	No Yes	2.7% 2.7% 1.3% 2.7% 4.1% 65.5% 21.7%	.82
Cinnamon	No Yes	4.9% 95.1%	1.0
Other	No Yes	3.1% 96.9%	1.0
Number of Comments	Exact #	17.7% 82.3%	1.0
Number of People Who Have Tried	Exact #	10.2% 4.0% 85.8%	1.0
Reaction	None Love (heart) Like (thumbs up) Dislike (thumbs down) Wow (surprised face) Sad (tear)	98.2% 1.8%	.81
Website Link	Commercial Personal Not Apparent	91.6% 8.4% 0%	.74
Option to Follow	No Yes	97.8% 2.2% 93.4%	.92
Weight Loss Claims	No Yes Not Apparent	2.6% 0.8% 96.5%	1.0
Pounds Lost	None 2-5 lbs. 6-10 lbs. 11-15 lbs. 16-20 lbs. 21 lbs. and up	3.1% 58.8% 4.0% 5.3% 28.8% 0%	.72
Detox	No Yes	6.2% 93.8%	.96
Fat Burning	No Yes	2.2% 97.8%	.96
Time for Weight Loss Promised	None 7 days or less 8-14 days 15 days - a month More than a month	2.2% 97.8%	.96
Mentions Organic	No Yes	2.2% 97.8%	.96
Times a Day	None 1-2 times 3-4 times 5 or more times	2.2% 97.8%	.96
Time Suggestions	None Morning Afternoon Evening Multiple times	2.2% 97.8%	.96

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