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# Framing, Advice-Seeking, and Medical Trust in the r/Keto Community: An Analysis of the Medical Flair on r/Keto

## Abstract

First created in 1921, the ketogenic diet was used as a medical intervention for children suffering from severe epilepsy. However, in recent years, this highly restrictive diet has gained mainstream popularity for a number of illness management, wellness, and weight loss uses. Despite its rise in use and popularity, mainstream medical opinion still views the ketogenic diet as a last resort for severe conditions. Using a content analysis of posts tagged with the “medical” flair on the subreddit “r/Keto,” this thesis found commonalities among posts which praised the ketogenic diet and shared positive personal anecdotes were the most likely to receive positive engagement from the community. These findings are in line with similar studies of both online medical communities and online diet and weight loss communities and the positive social effects those communities can have for users.

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University of Denver

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In Partial Fulfillment

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Master of Arts

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by

Sabrina Finke

June 2022

Advisor: Dr. Renée Botta

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Title: Framing, Advice-Seeking, and Medical Trust in the r/Keto Community: An Analysis of the Medical Flair on r/Keto

Advisor: Dr. Renée Botta

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### **Abstract**

First created in 1921, the ketogenic diet was used as a medical intervention for children suffering from severe epilepsy. However, in recent years, this highly restrictive diet has gained mainstream popularity for a number of illness management, wellness, and weight loss uses. Despite its rise in use and popularity, mainstream medical opinion still views the ketogenic diet as a last resort for severe conditions. Using a content analysis of posts tagged with the “medical” flair on the subreddit “r/Keto,” this thesis found commonalities among posts which praised the ketogenic diet and shared positive personal anecdotes were the most likely to receive positive engagement from the community. These findings are in line with similar studies of both online medical communities and online diet and weight loss communities and the positive social effects those communities can have for users.

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## Introduction

The ketogenic diet might seem to be the latest in a long line of popular low-carb diets—a trend which has existed at least as far back as 1958 in the United States (Mackarness & Mackenzie, 1958). However, unlike *Eat Fat, Grow Slim*, Atkins, the South Beach diet, and other low-carb trends which began as a weight loss solution for the increasingly common, highly processed and carbohydrate rich diet of industrialized, urban societies (Atkins, 1972; Cullinen, 2005; Smith, 2018), the ketogenic diet was originally created with a very specific medical purpose: treating severe epilepsy (Peterman, 1925; Wilder, 1921). The keto diet, or simply “keto” as many dieters call it, therefore, is an interesting intersection of medical legitimacy and popular fad.

While keto has enjoyed some popularity in niche fitness communities since the 90’s, the internet and popular fitness influencers have significantly contributed to its recent rapid rise in adherence (Easter, 2019). While various online forums have been created to house crowds interested in the diet (Bostock, Kirkby, Taylor, & Hawrelak, 2020), the original, restrictive guidelines from 1921 act as a backbone keeping the diet relatively consistent across platforms. However, whereas the original diet had patients consuming large amounts of heavy cream to meet their lofty daily fat goals (Peterman, 1925), modern keto dieters have a myriad of food products to choose from which imitate staples in a standard American diet, such as cereals, bread, desserts and more (Krampf, 2020).

Plenty of companies, both new specifically keto brands and legacy baking giants such as Duncan Hines, also provide keto-friendly versions of classic baking ingredients and other pantry staples (Morillo, 2020). Keto friendly foods are only becoming more available as the ketogenic diet market continues to grow steadily (Insight Partners, 2020), and grocery chains like Kroger are beginning to sell keto-friendly food items under their house brand Simple Truth (Keto Daily, 2019).

As the accessibility and diversity of ketogenic diets has expanded, so have the reasons which people follow the diet. While weight loss is still a common reason for adherence, keto is also used to treat chronic conditions such as insulin resistance, inflammation, migraines, and arthritis as well as to increase mental clarity, and improve fitness in endurance athletes (Evans, 2018; McSwiney, et al., 2018; Dupuis, Curatolo, Benoist, & Auvin, 2015; Gazerani, 2020; Moore, 2014).

One platform where keto-interested individuals are able to collaborate and communicate is Reddit. Reddit, the “fifth most popular website in the United States” (Sager, et al., 2021), houses a number of forums, or “subreddits,” which reflect the diverse reasons and ways people follow the keto diet—such as “r/KetoGains” for bodybuilders, “r/KetoBabies” for parents of children with epilepsy, “r/KetoDrunk” for dieters who include alcohol in their diet, “r/xxketo” for keto dieters assigned female at birth, “r/VegetarianKeto,” for vegetarians and “r/KetoTrees” for keto dieters who also use a lot of marijuana, and more (based on Reddit search results for “keto” in “communities,” retrieved March 2022). However, the largest keto subreddit, created on May 27, 2010, is still “r/Keto,” which boasts 2.9 million members as of March 2022. The subreddit’s “about community” section reflects the diverse reasons people follow the keto

diet, describing the subreddit's purpose as: "Helping people with diabetes, epilepsy, autoimmune disorders, acid reflux, inflammation, hormonal imbalances, and a number of other issues, every day." While I was unable to get user data specific to r/Keto, a 2021 survey of Reddit user demographics found that the largest group of users by age was users age 20-29. This group accounted for 28.1% of all users. Users age 30-39 accounted for 26.1%, users 10-19 for 21%, users age 40-49 for 14.1% and users age 50 and over for 10.3% (Statista, 2022). A 2022 survey found that 36.2% of users are female and 63.8% are male (Statista, 2022). The United States accounts for the majority of Reddit's user base with the UK and Canada accounting for 7.73% and 7.52% respectively (Pengue, 2021).

Popular articles distinguish Reddit from advice and information-seeking websites like Quora and Yahoo answers because while subreddit threads do often revolve around answering inquiries, Reddit is also "a social news aggregation, discussion, and web content rating website" (Fromaget, 2022). A few of the most popular subreddits are r/Funny, where people post everything funny from user generated memes to ridiculous news stories, r/Gaming where users post game reviews, game related news, and ask for opinions and suggestions, and r/Aww, where people mostly post pictures of animals and feel-good stories (Baer, 2022). Additionally, while Reddit shares many features with classic internet forums, researchers of Reddit classify the site as social media due to its upvote and downvote features as well as the similarities between how users act on Reddit and other social media like Twitter and Facebook (Tadesse, Lin, Xu, & Yang, 2019; De Choudhury & De, 2014; Eghtesadi & Florea, 2020). Like Twitter, Facebook and Instagram, Reddit has an app which users are encouraged to use when they view the

website in a browser. Users are required to use the app and log into a registered Reddit account if they want to view mature content. Reddit itself differentiates its platform from classic internet forums because it employs an algorithm to order posts and comments rather than having “strictly threaded” conversations ([gentlebot], 2012).

Reddit has somewhat of a negative reputation due to its housing of anti-feminist “incel” and “alt-right” communities (Høiland, 2019; Grover & Mark, 2019). Recognizing this issue, Reddit introduced new, stricter community guidelines and engaged in a mass-banning of harmful subreddits on the platform in 2015 (Matney, 2015), which caused a mass exodus of users to other platforms such as Gab and Voat (Chandrasekharan, et al., 2017). However, the platform’s size means that smaller toxic subreddits are still sometimes able to exist until they grow large enough to become problematic (Coldewey, 2017). Furthermore, because Reddit’s moderation system relies mostly on volunteers employed directly by subreddit creators who may judge their moderation subjectively, moderation across the website often varies in strictness (Birman, 2018).

Another potential danger of the growing online keto community is that some online health-concerned forums in general have acted as sites of misinformation, especially related to vaccines and Covid-19 (Kata, 2012; Burki, 2020). While the open access nature of online health forums has led to the discovery of new adverse drug effects (Wang, Li, Ferguson, & Zhai, 2014) and can potentially help researchers discover latent infectious diseases through aggregated user testimonials (Lim, Tucker, & Kumara, 2017), online health forum users tend to share and seek experiential health information rather than evidence-based health information (Farnood, Johnston, & Mair, 2022; Brady, Segar, &

Sanders, 2016), leading to the potential sharing of both accurate and inaccurate information from well-meaning individuals.

The purpose of this study is to examine the types of posts which appear on the r/Keto subreddit, specifically those tagged with the “medical” flair. This study will first review literature relevant to online diet communities, online health communities, and social media in general. Then, using a content analysis, this study will seek to situate r/Keto amongst those online communities and understand why certain posts tend to receive more positive engagement than others. Finally, this study will discuss possible implications for health communicators.

## Literature Review

### History of the Ketogenic Diet and its Recent Rise in Popularity

In 1921, Dr. Russel M. Wilder of the Mayo Clinic coined the term “ketogenic diet” to describe a set of dietary restrictions which would encourage a patients’ body to produce ketones, which the body can use as an energy source when carbohydrates are not present. The ketogenic diet was originally intended to be a treatment for epilepsy as it was a more sustainable alternative to fasting, the dominant treatment at the time (Freeman & Vining, 1999). The original guidelines of the diet, published by The Mayo Clinic in 1925, are as follows: “one gram of protein per kilogram of body-weight [sic] per day, 10-15 grams of carbohydrates, and the remainder of calories from fat” (Peterman, 1925). For comparison, the 2020-2025 dietary guidelines for Americans suggest a 10-35% protein, 45-65% carbohydrate and 20-35% fat macronutrient breakdown for a man on a 2000 calorie per day diet (USDA, 2020).

Use of the keto diet reportedly decreased after its initial discovery (Wheless, 2008). It wasn’t until NBC’s *Dateline* aired an episode in 1994 detailing the story of Charlie Abrahams, a boy whose severe epilepsy was treated with the ketogenic diet, that mainstream interest resurged (Phillips, 1994). However, the ketogenic diet was still usually only prescribed after other treatments had been exhausted (Mastriani, Williams, Hulsey, Wheless, & Maria, 2008).

The first major low-carb, high-fat diet trend in the United States came from a book titled *Eat Fat Grow Slim* by Mackarness and Mackenzie (1958). After a period of industrialization in the 1940's, most Americans moved to urban areas and began consuming high-carbohydrate, pre-made foods (Smith, 2018). What resulted was increased weight gain which Mackarness and Mackenzie (1958) argued could be solved with a low-carb diet. However, in the 1960's, the Sugar Research Foundation funded research which singled out fat as a leading culprit in heart disease and downplayed the role of sugar as a cause of ill health (Kearns, Schmidt, & Glantz, 2016). The Sugar Research Foundation then used these studies to lobby policymakers and encourage low-fat dietary guidelines for those at risk of heart disease.

In the 1970's, low-carbohydrate diets once again gained popularity with the publication of *Dr. Atkins' Diet Revolution* by Dr. Robert Atkins in 1972 (Craig, 2019). However, whereas until this point a low-fat diet had been something doctors recommended to patients with specific heart disease risk factors, in the 1980's a low-fat diet became a general dietary guideline for all Americans as a preventative measure (La Berge, 2008). In 1980, the United States government issued the first ever *Surgeon General's Report on Nutrition and Health*, promoting a low-fat diet to quell rising rates of heart disease (Nestle & Jacobson, 2000).

In the 1990's, as rates of obesity and heart disease continued to increase, there was another surge in interest in low-carb diets (Knight, 2012). The Atkins diet and South Beach diet were the two most popular low carbohydrate diets of this period. In 2003, *Dr. Atkins New Diet Revolution* sold 2 million copies in the United States and *The South*



*Beach Diet* sold 2.3 million (Colford, 2003). Although not quite as high in fat and low in carbohydrates as the keto diet, both of these diets basically sought to produce rapid weight loss by inducing a state of ketosis (Cullinen, 2005), with Atkins' book describing "a happy state... [where] fat is being burned off with maximum efficiency and minimum deprivation" (Easter, 2019; Atkins, 1972). In the 2000's, the ketogenic diet was popular in some bodybuilding communities where it was known as the "fish and water diet," (Easter, 2019).

However, keto remained relatively niche until September 2016 when Dom D'Agostino, Ph.D., a professor of physiology at the University of South Florida and proponent of the diet, appeared on the *Joe Rogan Experience* in September 2017 (Easter, 2019). Dieting and fitness are common topics on Rogan's podcast, so his audience was extremely receptive to Dr. D'Agostino's message. Since 2017, the ketogenic diet has become increasingly mainstream. In 2018, the global ketogenic diet market was valued at \$9.7 billion and is projected to reach \$15.6 billion by 2027 (Insight Partners, 2020). However, medical professionals and researchers warn that the public's enthusiasm for the diet exceeds the currently available evidence supporting its efficacy and safety (Joshi, Ostfeld, & McMacken, 2019; Bueno, de Oliveira, & da Rocha Ataide, 2013; Giroux, 2020).

The keto diet is followed for many reasons, including treatment of illnesses, health and wellness, weight loss, physical fitness, mental health and more. O'Conner (2019) notes, based on a series of interviews, that keto dieters tend to see keto as a sustainable lifestyle rather than a short-term fix and often use it to manage chronic health conditions

such as diabetes. Multiple online communities have emerged where those interested in keto can share stories, form relationships with others trying a keto lifestyle, and share or ask for advice (Kianpour, 2021). The subject of this study, the subreddit r/Keto, was created in 2010, seven years before the podcast which Easter (2019) attributes to keto's rise in popularity. However, Reddit has always catered to and housed niche communities (Lu, 2018), so this doesn't necessarily negate the importance of Joe Rogan and Dom D'Agostino in keto's current popularity.

### **Diet, Identity and Community Membership**

An individual's identity refers to the way an individual defines themselves based on their social category membership as well as the emotional and value significance they place on that membership (Tajfel, 1972; Turner, 1985). In health communication, identity is often linked to health behaviors and motivations (Moran & Sussman, 2014). An identity formed by relation to a peer group has the ability to reinforce cultural norms "by indicating successful and unsuccessful ways of participating in the culture" (Ashmore, Del Boca, & Beebe, 2002; Sussman, Pokhrel, Ashmore, & Brown, 2007). For this reason, understanding the groups which individuals identify as "peers" can allow researchers and health practitioners to understand and even predict behavior.

Many studies have shown that diet can be strongly linked to identity (Tung, Tsay, & Lin, 2015; Louis, Davies, Smith, & Terry, 2007). This is especially prevalent when people identify as being "healthy;" individuals who identify as being "healthy" are more likely to consistently eat a nutrition-rich diet and exercise than individuals who do not

(Tung, Tsay, & Lin, 2015). “Healthy” identities can also be strong predictors of people’s purchasing habits, such as buying organic food (Tung, Tsay, & Lin, 2015).

Politicized diets, such as vegan or vegetarian diets, can become a strong part of both individuals’ social identity and their sense of group membership (Chuck, Fernandes, & Hyers, 2016). This sense of group membership and the accompanying social norms are also strong indicators of people’s ability to maintain diets (Yun & Silk, 2011; Armitage & Conner, 1999; Masson, Jugert, & Fritsche, 2016; Louis, Davies, Smith, & Terry, 2007). This is because group norms have a significant effect on individuals’ perceptions of food and food behaviors. Nook and Zaki (2015), using an fMRI scanner, found that presenting participants with the food preferences of people the participants considered peers shifted the participants’ preferences for that food at both a behavioral and neural level.

A more recent study by Ryan et al. (2022) studied Australian adults who were on a variety of diets (unrestricted, vegetarian, flexitarian, or the ketogenic diet) and their “diet-related self-identity constructs (centrality, prosocial motivation, personal motivation, and strictness).” The researchers found that the strictness of a diet and the type of food being avoided could generally determine the quality of the diet. Dieters who restricted animal products tended to have a diet richer in whole grains, fruits, and vegetables. While ketogenic dieters only made up 2% of the study participants, the researchers found that this group had a higher consumption of protein-based foods with less emphasis on fiber-rich fruits and vegetables. Because self-identity had such a strong ability to predict dietary behavior, the researchers recommend potential health campaigns should begin

advertising the social benefits of healthy dietary patterns which would be relevant to their target audiences.

Eating habits and BMI trends, even when not related to a political (e.g., vegan) or social identity (e.g., healthy) tend to spread naturally through close social networks (Christakis & Fowler, 2007). The researchers termed this phenomenon Social Contagion Theory. Social contagions (Christakis & Fowler, 2013) do not travel as easily online as they do through face-to-face networks. However, a study by Centola (2010), in which a totally anonymous online messaging platform was created for participants looking to lose weight, found that behavior change can be achieved in online social networks as long as individuals receive social reinforcement “signals,” from other individuals (Centola, 2010). On social media, these “signals” are forms of engagement allowed by the platform, such as likes, comments, and instant messages. A greater number of signals is more likely to change an individuals’ behavior, and individuals who receive multiple signals per log-on tend to return more often to the site. Study participants who received more signals lost more weight even though the supportive relationships they formed on the online platform were totally anonymous. On r/Keto, comments and upvotes are observable signals that users can send one another. For this study, they will be a useful tool in understanding what kind of behavior is more likely to be replicated because it is being rewarded with positive signals.

Research on the keto diet and subsequent identity formation is limited, but some recent studies offer important insight. Kianpour (2021), after conducting in-depth interviews with members of an Iranian social media group called “Our Keto Lives,”

found that “Keto dieters experience a sense of common identity and solidarity by becoming members of a group which sets specific goals for its members and tries to help them achieve those goals” (p. 127). In some cases, the power of dieters’ sense of belonging to their keto community was able to mediate isolation they might feel from intimate, real-life social connections not on the keto diet. “Many keto dieters have to cook separate meals for themselves and for their family members, but in their Telegram group, they are enabled to find co-dieters with whom to share a ‘virtual meal’” (Kianpour, 2021, p. 128). Additionally, Protogerou et al. (2020), in an online survey of serious zero-carb dieters, found that “Internet families,” or the various online communities to which zero-carb dieters belonged, were “an important aspect of participants’ lives” and gave them a sense of belonging (p. 17).

As discussed in the previous section, while not a strictly weight-loss focused community, the keto diet is used by many for that purpose (Giroux, 2020). For that reason, it feels important to investigate the growing body of research concerning the popular weight loss subreddit r/LoseIt. Studies have found that both positive feedback and support from the community (Cunha, Weber, Haddadi, & Pappa, 2016; Enes, et al., 2018; Chancellor & De Choudhury, 2018) as well as real-life feedback, like measurable weight loss in this example (Pappa, et al., 2017), increased the likelihood that people would return to the sites and post more frequently. This is in line with the earlier cited behavior change study by Centola (2010), in which individuals who received more interactions returned more often to the online, anonymous weight loss group they’d been assigned, and were more likely to lose weight. If a users’ goal is weight loss, the same

effect may be present on r/Keto. However, it is less clear how signals might affect a user whose reason for following the keto diet is medical and whose intent is ongoing treatment of a condition rather than meeting numeric goals.

### **Online Medical Communities**

Research regarding online medical communities largely concerns forums for chronic illnesses (Keeling, Khan, & Newholm, 2013; Cole, Watkins, & Kleine, 2016) taboo subjects like sexual health (Seale, Charteris-Black, MacFarlane, & McPherson, 2010; Yeo & Chu, 2017) or specific event-based health issues like pregnancy (Wexler, et al., 2020). However, this research is certainly relevant to this study as many keto dieters in general begin the diet as a treatment for chronic illnesses like diabetes or insulin resistance, as the diet advertises keeping insulin levels incredibly low (Abbasi, 2018).

Users of online health forums receive three types of value from their online interactions: informational, such as shared experiences and resources, hedonic, or the ability to have extended discussions about medical issues, and sociability, or a sense of belongingness and an ability to build social capital (Keeling, Khan, & Newholm, 2013; Mathwick, Wiertz, & De Ruyter, 2018; Nambisan & Watt, 2011). This third benefit is not unlike the benefits which users can receive from online dieting and wellness communities, as discussed above.

Furthermore, health-related message boards have been capable of producing evidence of previously unknown side effects to medical treatment (Mao, et al., 2013; Benton, Ungar, Hill, Hennessy, & Mao, 2011; Sampathkumar, Chen, & Luo, 2014). The massive amounts of user testimonies which aggregate on these boards, especially on boards

dedicated to uncommon or vague, chronic illnesses, can give medical professionals new insight which clinical trials and studies might miss. While users often turn to online medical communities for support and information, Huh (2015), in a study of WebMD diabetes forums, found that where questions about diagnoses or medication arose, moderators were likely to direct posters to consult with a doctor. This means that moderated online communities were able to offer users a supportive social environment while still deferring to mainstream medical professionals regarding serious clinical issues.

On the subject of collaboration with mainstream medicine, Jucks and Thon (2017) found that quantitative social validation, or validation by the masses, is just as influential as qualitative social validation, or validation by a trusted expert source. According to the researchers, users tended to prefer information which had both types of validation. Additionally, both types of validation interact with one another, as comment threads tend to grow quantitatively when people are able to find and share supporting qualitative information. Reddit's algorithm tends to prioritize posts which are newer and receiving more engagement, so it's likely that this effect, with engagement begetting more engagement, will be observable on r/Keto threads (JungleTopp, 2020).

Reddit's algorithm and its prioritization of posts based on engagement makes gaining a full understanding of the total impressions (views) a post receives and the relation of those impressions to total engagement difficult. However, previous studies on Reddit have found links between user engagement and users' behavior and beliefs (Record, Silberman, Santiago, & Ham, 2018; Hara, Abbazio, & Perkins, 2019). For that reason,

studying the engagement posts receive despite not being able to compare total impressions should still offer meaningful insight into users' beliefs and behaviors.

### **Framing and Community Engagement**

Framing effects (Tversky, 1981) are the effects that the description of a situation or information has on a receiver's choices. On social media, frames may not be able to affect an individual's sense-making process when those individuals already hold strong perceptions of a given topic (Hilverda & Giebels, 2017; Borah, 2021). However, the framing of information in a post can have a measurable effect on community engagement (e.g., likes and comments a post receives). In a study of an online diabetes health forum, Mamykina et al. (2015) found that the framing of a question had a significant impact on engagement. They contrast two posts, titled "At the end of the rope..." and "How Soon to Insulin" (p. 3222). Both posts were asking for personal advice, but the more neutral title of the second post led to more engagement and discussion. The researchers attribute this to the second title's generalizability and broader utility for the community who likely have interest in the topic of insulin as well.

This idea of utility leads me to wonder how the implied or explicitly stated intent to continue the keto diet contained in a post might affect community reaction. If the post implies the maker of an inquiry might quit the keto diet, does the community view the post as worth responding to? Is it possible that a post which discloses a problem in a way which implies an intent to solve it and continue on the keto diet might be seen as more useful for the community and therefore receive more engagement?



**RQ1:** Does a post's stated or implied intent to continue or begin the keto diet affect community reaction?

Another important aspect of framing is emphasis and reduction (Leeper & Slothuus, 2018). When a story is told, certain information is often emphasized or reduced for the sake of brevity and clarity. Although Reddit's platform allows for posts up to 40,000 characters ([bsimpson], 2015), common practice for posts longer than a couple paragraphs is to add a "too long, didn't read" (commonly shortened to TLDR or TL;DR followed by a colon) section above the post which quickly summarizes the issue for less patient readers (Heinzman, 2021). This means that users will likely frame more complex issues in terms of only prescient details. Though they may enjoy the keto diet or believe it has good benefits, a brief explanation of an issue might leave out such details and simply appear as a user blaming or disparaging the diet.

### **Cognitive Dissonance, Confirmation Bias and Patient Experience**

Cognitive dissonance theory (Festinger, 1962) posits that people are motivated to maintain consistency between their attitudes and behaviors. This leads to confirmation bias, or the tendency for individuals to seek out information which confirms their existing beliefs (Nickerson, 1998). On social media, this can manifest as a user blocking, downvoting, or otherwise removing from view content which contradicts their personal beliefs while positively engaging with content which affirms their beliefs (Knobloch-Westerwick, Mothes, & Polavin, 2020; Moravec, Minas, & Dennis, 2018; Jeong, Lee, & Ceran, 2019).

Meppelink et al. (2019) argue that the plethora of online health information available to internet users may facilitate confirmation bias. They point to previous studies which have shown that parents who have exempted their children from vaccination cite the internet as their main source whereas parents who chose to vaccinate their children do not (Jones, et al., 2012; Martin & Petrie, 2017). The efficacy of the keto diet, though it does not enjoy mainstream medical support for all of the many reasons people begin the diet (Joshi, Ostfeld, & McMacken, 2019), is different from entirely false myths about vaccine-related risks as it has real medical applications for severe, chronic conditions (Wessel, 2017). Still, the concerns brought up by Meppelink et al. (2019), in regard to people with little to no medical experience being capable of posting and spreading false health information online, may still be relevant to the keto community and cause dieters to trust bias-confirming information over advice from medical providers.

Another possible confounding issue in this dynamic is medical practitioners' biases. Studies have shown that overweight patients are likely to experience discrimination from doctors due to commonly held biases about overweight people, and that doctors on average spend less time with overweight patients (Washington, 2011; DiGiacinto, Gildon, Stamile, & Aubrey, 2015; Sabin, Marini, & Nosek, 2012). Overweight women are especially likely to experience negative treatment by their doctors (Merrill & Grassley, 2008). Because many users of r/Keto are seeking to lose significant amounts of weight, it's possible they've experienced discrimination from doctors with negative biases toward them. This may push them to seek out online communities like r/Keto where they

can feel heard and experience the social and hedonic benefits online health communities often offer (Keeling, Khan, & Newholm, 2013).

### **Social Media and Echo Chambers**

A possible danger of turning to social media for advice is the potential to be caught in an “echo chambers” (Jamieson & Cappella, 2008). Social media (Kaplan & Haenlein, 2010) refers to “Internet-based applications... that allow the creation and exchange of User Generated Content” (p. 60-61). In addition to generating content, social media allows users to generate an online identity, controlling and curating both their personal presentation (Schau & Gilly, 2003) and the content they consume (Villi, Moisander, & Joy, 2012; May, Chaintreau, Korula, & Lattanzi, 2014). Along with active choices by the user, algorithms play an increasingly significant role in content curation (Berman & Katona, 2020; Saurwein & Spencer-Smith, 2021).

The term “echo chamber” (Jamieson & Cappella, 2008) originally referred to the conservative media establishment create “a bounded, enclosed media space that has the potential to both magnify the messages delivered within it and insulate them from rebuttal” (p. 76). This term, however, has now become a potent metaphor which “[encapsulates] widespread fear that the use of social media may limit the information that users encounter or consume online, thus failing to promote a shared experience of free-flowing information” (Kitchens, Johnson, & Gray, 2020). Users and algorithms work together to create a stream of content consistent with the user’s beliefs and interests, minimizing cognitive dissonance.

However, Kitchens et al. (2020) argue that the idea of an “echo chamber” is largely reactionary as it portrays “not the creation of an observable outcome, but rather the absence of an idealized one” (p. 1621). While there are many functional definitions of social media echo chambers, “there is no unanimous consensus on the effects of echo-chambers in public discourse, or even on their very existence” (Morales, Monti, & Starnini, 2021).

Morales et al. (2021), in a study of three subreddits, r/The\_Donald, r/HillaryForAmerica and r/hillaryclinton during the 2016 presidential election, did not find evidence of echo chambers. In fact, they found that “these groups tend to interact more across than among themselves” (p. 10). The researchers used similar variables and methods to studies which had found evidence of echo chambers on Twitter (Garimella, Morales, Gionis, & Mathioudakis, 2018) and Facebook (Bakshy, Messing, & Adamic, 2015) but found that the environment on Reddit was totally different. The researchers note, “Given these results, it is possible that the organization of social media as a social network (e.g., Twitter and Facebook), rather than a social forum such as Reddit, fosters the creation of echo chambers” (p. 10).

Cinelli et al. (2020), in a content analysis of one billion pieces of content created by one million users on Facebook, Twitter, Reddit and Gab found that “while Facebook and Twitter present clear-cut echo chambers in all the observed dataset, Reddit and Gab do not” (p. 1). The researchers attribute this difference to algorithms employed by Twitter and Facebook which show users news content based on their preferences, something which Reddit and Gab do not do. Additionally, groups on Twitter and Facebook tended to

be heavily polarized toward either the far right or left whereas communities on Reddit and Gab did not cover the whole political spectrum and tended to have more moderate leanings. So, while Reddit is made up of various subreddits which cater to single topics, it does not “cluster” users in the same way that Twitter and Facebook do (Cinelli et al. 2020, p. 5).

Finally, a study of a “climate skeptic” community on Reddit found that while controversial and ideologically dissonant posts had very low vote scores, they received more engagement in the form of comments than ideologically consistent posts (Oswald & Bright, 2021).

These findings lead me to wonder how the ideology implicit in a post on r/Keto will affect the engagement a post receives. In the r/Keto community, a place specifically created for people who follow the keto diet and believe in its benefits, could the framing the keto diet as beneficial or harmful affect the type of engagement they receive? Will ideologically inconsistent posts--for example posts with negative framing of the keto diet--lead to lower upvote scores but more comments like in the climate skeptic community? Does praising the keto diet before making an inquiry lead to higher vote scores but potentially less engagement? Is there an echo chamber effect present due to users downvoting and thereby hiding any content which does not bolster their pro-keto ideology, or will this subreddit also foster lengthy conversations between users with differing opinions?

**RQ2:** Does framing of the keto diet in a post affect community engagement and reaction?

## **Platform Affordances**

Reddit's platform affordances may also influence the way users frame their experiences when posting on r/Keto. Affordances (Norman, 1999) refer to "the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used." Davis & Chouinard (2016) apply this definition to social media platforms, claiming that the structures of platforms similarly "*request, demand, allow, encourage, discourage, and refuse,*" certain behaviors "and do so through variations in *perception, dexterity, and cultural and institutional legitimacy*" (p. 246, italics in original).

Reddit has many properties which Davis and Chouinard (2016) would define as requests. Requests are highly suggested features of a platform which are not required but can affect a users' experience on the platform. A profile picture is an example of a request, as a user without one can still navigate the platform but will likely feel pressure to upload one to improve their interactions with others. I would argue that creating a Reddit account is a request made by the Reddit platform. Unlike Facebook and Instagram, the site can be browsed and searched without the user being logged into an account. If a user goes to reddit.com, they'll be shown a dashboard containing all of the most upvoted content on Reddit that day. However, if the user wants to interact with others, post content, or see a more personalized feed, they'll have to create an account. Once an account is created, Reddit users can personalize their account by adding a profile picture and header image or, instead of a profile picture, creating a Reddit avatar. On r/Keto, users can also add a "user flair," which is grey highlighted text which appears

under their username. Users of r/Keto use this to share their goal weight, current weight and starting weight or sometimes the length of time they've been on the keto diet.

Reddit also has features which “encourage” (Davis & Chouinard, 2016). Platforms encourage users to engage in certain behavior by implementing devices which make that behavior easier. One property of Reddit which encourages users is its “story algorithm”:

The number of votes and submission time of links have the biggest impact on how stories rank on the platform. Reddit also ranks items by the number of votes they accumulate, as well as the age of the post compared to others. This is what makes the front page always appear fresh to a new user... after the first few minutes of the post going live, the initial reactions are crucial to its future survival. If the post instantly achieves upvotes right after posting, more users will be likely to see the post... The first few votes will most certainly be enough weight to decide if the post survives or sinks. For instance, the algorithm will process the first five votes with the weight of 50 votes. This is due to how recent the post went live. Reddit takes away points for a vote if it's older, regardless if it was positive or negative. This is a way to continuously push new content (JungleTopp, 2020).

This algorithm encourages users to engage in more active discussion with other users.

Additionally, Reddit's “karma” feature encourages users to make posts they feel will perform well. The amount of karma a user has is visible on their profile and when other users hover over their username with their cursor. Users with more karma are allowed to post and comment more often. Some subreddits also require that users have a certain amount of karma to join (Kotlyarenko, 2021).

Karma is earned when posts and comments made by a user receive upvotes.

However, the amount of karma a user can or will receive on a given post or comment is unclear:

Reddit uses an algorithm to calculate Karma and doesn't disclose exactly how it works. Allegedly, the more upvotes a link or comment gets, the less Karma each upvote is worth. That means a comment with 15K upvotes isn't necessarily going to give you 15K of Comment Karma (Kotlyarenko, 2021).

Even with its murkiness, Reddit's karma feature definitely encourages users to post things they feel will perform well and to engage often.

Reddit's algorithm also "discourages" (Davis & Chouinard, 2016) users from interacting with posts which receive less engagement and fewer positive votes. The platform does not delete underperforming posts, but if a user uses the platform's default post and comment sorting mechanism, "Hot," they will be less likely to see underperforming or unpopular posts. Comments can also receive votes which affect a users' karma, so a user is discouraged from posting something irrelevant or controversial by the karma feature.

Another important aspect of understanding a platform's affordances is understanding users' "perception" and "dexterity." "Perception refers to what a subject knows about the artifact, and dexterity refers to what a subject can do with that artifact" (Davis & Chouinard, 2016, p. 245). From personal experience, I can relay that Reddit does not immediately explain its platform to users when they make an account. A new user's profile will state that they have zero karma both on the main profile page and a small icon in the upper-right corner of the screen, but unless one looks at r/Help, the role of karma is not immediately clear. Because of this, I want to note that a user who makes an account in order to ask a question on a subreddit might do so without first learning how their post's performance could affect their future Reddit experience. So, because of a lack of perception, the karma feature may encourage or discourage more seasoned users than new users.



More perceptive users may also know that the side bar of a subreddit typically contains rules, an FAQ, and/or a link to guidelines which users are expected to read before posting ([CorrectScale], 2022). With this perception, more knowledgeable users have the dexterity to make a post which follows the subreddit's guidelines and will likely suffer less negative feedback as a result. A new user, however, who does not have this perception, might post without scrolling down and viewing the entire sidebar. This could result in their post receiving a lower vote score or even being removed by a moderator for not following community guidelines.

Finally, the cultural and institutional legitimacy of a platform refers to mechanisms which attempt to keep the platform safe, functional and enjoyable but are also subject to the will of individuals. Davis and Chouinard (2016) give the example of Facebook's age policy, which requires users be over 13 to make an account. Of course, younger users can lie about their age and make an account anyway. Therefore, these mechanisms may appear to "refuse" or "allow" behavior but actually just discourage or encourage.

One aspect of Reddit which attempts to foster cultural and institutional legitimacy is moderation. When someone creates a subreddit, they become the top moderator of that community (Reddit, 2021). Moderators can recruit other moderators, and people interested in volunteering their time to a subreddit can make formal requests through the platform. While Reddit does have a number of guidelines for their moderators ([CorrectScale], 2022), moderators are ultimately unpaid volunteers who are often self-selected or selected by other volunteers.

On r/Keto, the community guidelines box has six rules: “Read The FAQ Before Posting,” “Stay on Topic / No Cheat Posts,” “Be respectful and accurate,” “No Low Effort Posts,” “No Self Promotion / Spam,” and “No Giving or Soliciting Medical Advice” (“r/Keto,” 2010, all grammatical and capitalization errors retained). On just a cursory glance at the medical flair, it’s clear that the last rule is loosely enforced, if at all. In fact, moderators frequently comment on posts asking for medical advice with medical advice. So, while the sidebar refuses medical inquiries, in actuality, they are allowed.

Because this is a study specifically of r/Keto’s medical “flair,” I will explain its function in more detail. A “flair” is essentially a tag which users can add to their post so it can be more easily categorized in the subreddit (Diaz & Mellon, 2021). A flair can also be added retroactively by a moderator after a post has been published. The subreddit’s flairs are pre-determined and can be found on the right-hand side bar of the subreddit. Clicking a flair will bring the user to an archive of all of the posts with that flair. Posts are automatically sorted by “Hot,” which sorts posts by newness and upvote score. Other sorting options include “New,” which sorts according to the time it was posted, “Top,” which shows you posts by total number of upvotes regardless of newness, and “rising,” which shows recent posts with high amounts of engagement (Salihefendic, 2016). Users of r/Keto looking to connect with others using the keto diet for medical purposes or to attain and share medical advice can use the medical flair to easily do so, despite the subreddit’s rules outlawing medical advice sharing.

While it would be interesting and beneficial to the understanding of Reddit and its affordances to include a research question which compares keto communities on

Facebook, Twitter, Instagram, and other social media networks to Reddit's r/Keto, doing so is outside of the scope of this thesis. However, this discussion of platform affordances in relation to r/Keto hopefully presents some interesting implications for future study.

### **Low Carb, High Fat Diets and Distrust**

An important part of this study is situating r/Keto amongst other online medical and diet communities. As is summarized in the first section of this literature review, high-fat diets have often existed contrary to government issued health guidelines (Nestle & Jacobson, 2000; La Berge, 2008), which still encourage limiting fats (USDA, 2020). So, the keto community may not be able to align as easily with mainstream medicine as other online medical communities have been able, potentially creating distrust of medical providers. For this reason, I want to briefly discuss Sweden's low carb, high fat (LCHF) movement and the disinformation associated with its leaders.

In Sweden, LCHF social media communities have engaged in “dogmatic conflict between dieters and representatives from the National Food Agency (NFA)” (Holmberg, 2015). Much of this conflict happens on the “blogosphere” where opinion leaders freely express ideas without traditional media or governmental intervention. Opinion leaders (Lazarsfeld, Berelson, & Gaudet, 1944) are individuals who consume media and then interpret it for others in their circle of social influence, creating a “two-step” flow of information from mass media to opinion leaders to the general public.

Holmberg (2017), in a thematic analysis of online LCHF information, explains that influencers with real medical credentials but who function as “non-mainstream experts” are the most effective in this arena. Gunnarsson and Elam (2012) deem this trend

“science popularism.” While popularism (Bucchi, 2012) has historically referred to “the transmission of officially sanctioned versions of ready-made science to lay audiences,” science popularism (Hilgartner, 1990) refers to “a two-stage model where scientists first produce the genuine scientific knowledge that [popularizers] subsequently disseminate through simplified accounts.” Gunnarsson and Elam (2012) argue that LCHF popularizers in Sweden portray themselves as “the true guardian of science tasked with exposing [NFA] experts for not living up to conventional standards of scientific praxis.” Kopczyńska and Bachórz (2018) argue that in post-socialist societies, cultural food anxieties concerning food shortages and monotonous food diets have been replaced by “uncertainty, distrust, and lack of control” due to the introduction of large supply chains in these societies (p. 7). Especially in highly nationalistic post-socialist countries like Sweden with high levels of “nostalgia,” “food distrust is parallel to general distrust toward abstract systems, faceless others, institutions and impersonal rules” (p. 9-10). Kopczyńska and Bachórz (2018) add that “The ongoing individualization of food patterns reflecting the contemporary cultural disintegration generates profound fears of broken social ties and disappearing food communities” (p. 10). This may explain how so much community was able to form around the LCHF diet and why that community is so distrustful of government and industry. For reference, a 2011 poll found that at least 5% of the Swedish population had adopted a LCHF diet (Radowitz, 2012).

Smith (2018) finds a similar trend in the United States, arguing that the popularity of the low-carb Paleo diet and its many predecessors such as *Eat Fat Grow Slim* (Mackarness & Mackenzie, 1958) is due to an “irrational fear of modern food” caused by

“distance from food production” (p. 41). However, it should be noted that Sweden’s LCHF movement is heavily context dependent. Popular LCHF diets specifically harken back to a time when the Swedish population was healthier and recommend low-carb Swedish foods (Kopczyńska & Bachórz, 2018).

Holmberg (2015) draws parallels between the LCHF diet movement and anti-vaccine movement in Sweden as both center around distrust in governmental health bodies. The anti-vaccine movement has been extremely prevalent in Sweden, also popularized by bloggers and online opinion leaders (Kata, 2012; Dubé, Vivion, & MacDonald, 2015; Karvonen & Wedel, 2019).

To draw a relevant comparison, Joe Rogan, mentioned earlier as an important opinion leader for the keto diet, has been criticized recently for spreading misinformation related to the Covid-19 vaccine (Stecula & Motta, 2021). He has also promoted the use of unsubstantiated treatments like ivermectin to his audience (Huang, 2021). Joe Rogan’s podcast, *The Joe Rogan Experience*, was the number one most listened to podcast globally on Spotify in 2021 (Spangler, 2021).

This brings me to my third inquiry. Does a post which mentions having visited a doctor or an intent to visit a doctor put the post at odds with the community’s values? Or, like other online medical communities, do r/Keto members generally respect the opinions of doctors and use existing medical information to make meaning of their experiences?

**RQ3:** Does a post mentioning having visited or intending to visit a doctor affect community engagement and reaction?

## **Advice-Seeking Behaviors**

A users' choice to seek advice from a community illustrates their perception of their audience's ability to provide support (Cutrona & Russell, 1990; Yeo & Chu, 2017). The ways in which users solicit advice can also be part of their personal verification process. In a series of in-depth interviews with users of an online medical forum for diabetes, Brady et al. (2016) found that situational comparison (i.e., people describing similar perspectives and experiences) was a key factor in participants' trust of information, as was "conventional biomedical information and advice." Additionally, the presence of advice seeking is also an important analytic tool for understanding how social capital flows through a social network (Jason, et al., 2021). Many studies have argued that, on social media, social capital often manifests itself as engagement (Xu & Saxton, 2019; Warren, Sulaiman, & Jaafar, 2015; Kim & Kim, 2021). In a study of an online sexual health forum, Yeo and Chu (2017) identified four types of advice soliciting method: request for opinion or information, request for advice, situation comparison, and problem disclosure (p. 757). Do some methods of seeking advice earn posts more social capital in the form of engagement? Does deferring to a community's expertise, asking for advice, make a post more favorable? Does a post asking about community members' experiences potentially allow for the hedonic conversations described by Keeling et al. (2013) where users talk at length about being on the keto diet? Do more generalizable posts (Mamykina, Nakikj, & Elhadad, 2015) which ask for information or opinions rather than advice for an individual situation earn more social capital via engagement?

**RQ4:** Does a post's advice-seeking method affect community engagement and reaction?

## **Methods**

A calendar year of posts were retrieved and coded between December 25, 2021 and January 25, 2022. The first post in the data set was made on November 12, 2020. This was the first post I was able to retrieve in the medical flair archive, either because the medical flair had not existed previously or because the subreddit is set to delete posts older than this date. The last post in the data set was made November 28, 2021. However, during the collection period, three posts were deleted by the original poster. This means that the text of the post itself disappeared, but the comments and votes were still visible. Despite the reactions still being available, those posts were removed from the total as there was no way for the posts to be coded again for inductive variables. Additionally, three posts were made by users who deleted their account before or during the coding process. This means that the posts and the engagement received are still visible but there's no way to know which, if any, comments were made by the original poster as comments from users with deleted accounts, whether or not they were the original poster, simply show up as being made by "u/deleted." Reddit archives posts older than six months, so posts made in July and earlier could not receive new comments or votes. However, posts made between August 2021 and November 2021 could still receive new votes and comments during the coding period.



Originally, a survey was created to run alongside this content analysis to investigate user demographics, beliefs, and behaviors. However, the moderators of r/Keto were not comfortable with a survey being posted on the platform. I attempted to gain a snowball sample for the survey by posting on a related discord server and several other subreddits, but only received five total survey responses. For this reason, I chose to discontinue the survey portion of this study and instead add more inductive categories to my content analysis. While a content analysis cannot speak to the internal thought processes of posters on the platform and their personal sense of identity, it can identify common themes in posts and larger trends in engagement, thereby illuminating characteristics and values of the larger community and the “keto identity” as it applies to large keto communities.

The objective of this study is to understand how statements of intent to maintain the keto diet, framing of the keto diet, a described relationship with a doctor, and advice-soliciting methods contained in a post impact community reaction and engagement. The initial four deductive categories were chosen based on conversations between myself and my thesis advisor. Revisions were made to the coding process as trends became clear in order to make categories as mutually exclusive as possible.

During the coding process, a no a priori method was used to find and code emergent themes (Thomas, 2006). Similar to past thematic content analyses of social media content (Pila, Mond, Griffiths, Mitchison, & Murray, 2017; Harshbarger, Ahlers-Schmidt, Mayans, Mayans, & Hawkins, 2009; Murray, et al., 2016), reoccurring themes were identified and then applied to the full sample of posts. After coding all 247 posts for the

initial four deductive categories, I created four more inductive categories based on emergent themes and coded the data again. The categories were: cholesterol (as a post topic), motivation to try or maintain the keto diet, framing of other non-ketogenic diets mentioned in the post, and length of adherence to the keto diet.

### **Initial Deductive Categories**

#### **Maintenance of Keto Diet**

To investigate **RQ1**, the stated intent to maintain the keto diet within a post was coded to reflect whether or not the post implied a person was currently adhering to the keto diet, whether or not they claimed to plan to continue, or, if it was stated in post that the poster was not on the keto diet, whether or not the post contained an interest in starting the diet. This led to five classifications of intent: *Post implies user is currently on the keto diet and plans to continue; Post implies user is currently on the keto diet but may stop; Post implies user is not currently on the keto diet but wants to start; Post implies user is not currently on the keto diet and does not want to start; unclear or irrelevant.*

The word “implies” is used here as a post’s described intent was sometimes manifest, or explicitly stated, but could also be latent, or implied by the nature of the post. For example, a post which explained a problem and then asked for advice to overcome it without quitting keto implies an intention to continue the keto diet. A post in which a user discloses a problem and asks whether or not they should continue the diet implies they are currently on the diet but may stop.

### **Framing of Keto Diet**

To investigate **RQ2**, the framing of the keto diet was coded into four categories: *praise*, *blame*, *mixed*, and *not present*. This category had to do specifically with the way the post framed the keto diet. Posts in the *praise* category might simply include a statement of adoration for the diet, or an explicit description of positive effects the user attributed directly to being keto. The *blame* category was similar, with posts either outright disparaging the diet or blaming the diet for negative effects. A *mixed* frame meant the post praised the keto diet in some way but also blamed it for negative effects or stated both positive and negative effects. A post coded with *not present* did not praise or blame the keto diet. These posts were often requests for information without any framing of the diet. Posts coded as *not present* might also contain praise or blame for related topics like intermittent fasting or specific food items but not the keto diet specifically.

### **Relationship with Doctor**

To investigate **RQ3**, this category was constructed similarly to the intent to maintain or begin the keto diet category, the original five codes being: *Post mentions user has visited a doctor and post is made in light of information learned*; *Post mentions user has visited a doctor but post seeks an alternative opinion*; *Post mentions user has not yet visited a doctor but intends to in the future*; *Post mentions user has not yet visited a doctor and does not intend to*; *unclear or irrelevant*. A sixth code was added during the coding process to record posts in which it was stated that a doctor had been visited and another visit was planned. This code was: *Post mentions user has visited a doctor and has another upcoming appointment*. These six codes were used to classify relationships

with doctors described within a post, including whether or not the doctor had been visited before the making of the post and whether or not the user intended to follow the advice received.

### **Advice-Seeking Method**

Finally, to investigate **RQ4**, the advice-seeking or information-sharing method contained in a post was coded using categories created by Yeo and Chu (2017) in their study of a sexual health advice Facebook group. Their study identified four types of advice soliciting method: *request for opinion or information*, *request for advice*, *situation comparison*, and *problem disclosure* (p. 757). The request for opinion or information code is for posts which make general inquiries while the request for advice code is used for posts in which a user intends to change their own behavior, often using the words “should,” “could,” or “would” in the question. The situation comparison code, while also pulled from Yeo and Chu (2017), is also influenced by findings by Brady et al. (2016) that users tend to trust those whose experiences they can relate to. This category requires that posts disclose a user’s own situation and ask for others’ experiences, not just the latter. The problem disclosure code is for posts which describe a problem without any sort of direct inquiry for the community. I’m also using two information-sharing codes from the study by Yeo and Chu (2017), “*experimental storytelling*,” for posts which contain anecdotes but no inquiry and “*announcements*,” which for the purposes of this study will be posts which share news, studies, and other information without a request for advice or feedback.

After the first round of coding, I added a second advice-seeking method column to my coding sheet as many posts employed two major methods of advice-seeking. Also, some experimental storytelling posts would include links to articles or medical information in addition to a lengthy anecdote, so those were sometimes simultaneously recorded as well. However, posts could not be both advice-seeking and information-sharing for the purposes of this study, as an interrogative anecdote generally led to a *situation comparison* and an anecdote without an inquiry constituted *experimental storytelling*, and both codes needed to be mutually exclusive. Posts marked as *problem disclosure* also could not receive a second advice-seeking method as this code was specifically defined as not being interrogative. Posts which did not employ a second advice-seeking method or information-sharing method received a “0” in the second column.

### **Engagement**

Engagement was recorded in terms of *total upvotes*, *percentage positive upvotes*, *total comments*, *OP comments*, *AutoModerator comments*, and *total community comments*. Because Reddit allows users to see not only how many total positive upvotes a post received but also the percentage of total votes which were positive, I recorded both metrics separately. The *total comments* code is the total number of comments the post received. The *OP comments* code records how many comments were from the original poster (OP), and the *AutoModerator comments* code records how many comments were from the subreddit’s AutoModerator, a bot which responds to posts based on certain

keywords with links and online resources. The *total community comments* code subtracted comments by the original poster and comments from the AutoModerator.

## **Inductive Categories**

### **Cholesterol**

Posts in this category were defined by the presence of cholesterol as a main topic or concern of the post. For this category, the two codes were either *present* or *not present*. If the post did not mention cholesterol at all or wasn't primarily concerned with cholesterol, i.e., if cholesterol was just passingly mentioned, the post was coded *not present*. If cholesterol was the main topic of the post, regardless of context, the post was coded *present*. This theme was chosen because cholesterol seemed to be one of the main topics which caused posters to seek alternative medical advice after visiting a doctor.

### **Moral, Medical or Weight Loss Motivation**

Posts generally contained one or two of the following reasons for beginning the keto diet. The first was a *moral* decision, ditching “unhealthy” food, attempting to better oneself, remedying a period of “letting oneself go,” etc. Many posts framed the keto diet as the moral opposite to a carbohydrate-rich, standard diet. The second common reason for beginning the keto diet was to remedy a specific *medical* condition, be it diabetes, high blood pressure, fatty liver, or any other chronic condition which benefited from reduced carbohydrate consumption. The third code in this category was *weight loss*. The fourth code in this category was *mixed moral and medical*, for posts which had both moral and medical motivations present, the fifth was *mixed moral and weight loss*, and

the sixth was *mixed medical and weight loss*. Initially there was a seventh category of *mixed: all*, but this code was never used.

### **Framing of Non-Ketogenic Diets**

This category codes for the presence of non-ketogenic diets in the post and how they're framed, either *good*, *neutral*, *bad*, *mixed*, or *not present*. Another diet, like paleo, for example, could be mentioned as a possible positive healthy alternative to keto, creating a middle ground in the strict keto/non-keto dichotomy created by the presence or lack of ketones on which the diet is founded. This category also codes vague "old" or "previous" non-keto diets described in relation to keto. Posts also sometimes describe a "keto-esque" or "keto-ish" diet because the post described users who were not meticulously tracking their macros or were including foods in their diet which wouldn't normally be acceptable, like fruit. For the purposes of this study, I'm including those not-quite-keto diets as non-keto diets and coding for their framing as I am interested in posts which describe breaking the keto and non-keto dichotomy. Basically, this category seeks to understand how a post frames deviation from the rather restrictive diet and how the community reacts to that framing.

### **Length of adherence to ketogenic diet**

This category logged, if mentioned in the post, how long the user claimed to have been on the keto diet. This number was recorded regardless of whether or not a post described the user still being on the diet at the time the post was being made because the deductive maintenance of diet category already recorded their present adherence. The

codes for this category were: *“Less than a month, one to six months, seven months to a year, over a year to two years, more than two years to five years, and over five years.*



## Results

### Frequency of Deductive Variables

Out of the five codes for the maintenance of keto diet category (Table 1), the most common code was *post implies user is currently on the keto diet and plans to continue* (n=142, 57.72%), followed by *post implies user is not currently on the keto diet but wants to start* (n=30, 12.20%), *post implies user is currently on the keto diet but may stop* (n=16, 6.50%), and *post implies user is not currently on the keto diet and does not want to start* (n=1, 0.41%). *Unclear or irrelevant* posts accounted for 23.17% (n=57) of the total posts.

For the framing category (Table 2), *not present* was the most common (n=134 54.57%), followed by *praise* (n=48, 19.51%), *blame* (n=37, 15.04%), and *mixed* (n=27, 10.98%).

For the relationship with doctor category (Table 3), the most common variable was *post mentions user has visited a doctor and post is made in light of information learned* (n=57, 23.17%), followed by *post mentions user has not yet visited a doctor but intends to in the future* (n=21, 8.54%), and *post mentions user has visited a doctor but post seeks an alternative opinion* (n=18, 7.32%). Both the *post mentions user has not yet visited a doctor and does not intend to* and *post mentions user has visited a doctor and has*

*another upcoming appointment* codes only accounted for one post each (n=1, 0.41%).

*Unclear or irrelevant* posts accounted for 60.16% (n=148) of the total posts.

Finally, the advice-seeking method category (Table 4) contained 285 total codes, with 207 posts only having one advice-seeking or information-sharing method and 39 posts having two methods of advice-seeking or information sharing. The most common method of advice-seeking method was *Request for opinion or information* (n=109, 38.25%), followed by *situation comparison* (n=86, 30.18%), *request for advice* (n=52, 18.25%), and *experimental storytelling* (n=24, 2.46%). Both the *problem disclosure* and *announcement* codes accounted for seven posts (2.46%) each.

Table 1. Maintenance of Keto Diet

Code	Description	<i>n</i>	%	Selected example*
Post implies user is currently on the keto diet and plans to continue	Poster is on the keto diet and plans to continue. This is often implied. Selected example shows adherence to the keto diet being stated and plans to continue being implied.	142	57.72	<p><b>Keto Victory!</b></p> <p>I wanted to share with you all that I got some blood work done a couple weeks ago and everything was good, and ketone levels were good. I was honestly so afraid of going to the doctor for years because I was scared they'd tell me I was pre-diabetic. I decided to go after starting keto as part of my decision to start taking my health seriously, so I'm not sure what my pre-keto blood work looked like. I'm just so glad they told me everything was normal and there was no mention of diabetes!</p> <p>(Post made 02/09/2021)</p>
Post implies user is currently on the keto diet but may stop	User is currently on the keto diet but may stop depending on the experience they're having or the advice they receive from commenters.	16	6.5	<p><b>tired [sic] keto for a few months and my LDL cholesterol went up. should i still continue with keto?</b></p> <p>yeah so the title says it all. i've been trying keto for a few months. i mostly keep to having eggs for breakfast and chicken and vegetables for lunch and dinner. but my recent health report indicates that my LDL cholesterol is</p>

				slightly elevated. should i be continuing with keto?  (Post made 12/01/2020)
Post implies user is not currently on the keto diet but wants to start	Poster is not currently on the keto diet due to quitting at some point or never beginning. They plan to begin the keto diet in the future.	29	12.2	<p><b>Keto and Diabetes</b></p> <p>I'm 65 years old, carrying 182 lbs on a 5'8" frame. Ideally, I would like to lose around 20 lbs.</p> <p>I have Type II diabetes, which I control through medication and long acting insulin (~20 u of basaglar every night). My fasting blood sugar is about 80-120 in the morning. I would like to embark on a keto journey. I am concerned about ketoacidosis (yes, I have read the FAQ).</p> <p>Does anyone have any first hand experience with keto for diabetics and can let me know how it's going?</p> <p>(Post made 02/09/2021)</p>
Post implies user is not currently on the keto diet and does not want to start	Users state that they are not on keto or no longer on keto and do not plan to start/restart.	1	0.41	<p><b>Hey guys</b></p> <p>Hey guys, I was here mainly because of my journey that started with eating gluten-free. I stayed away from other grains but eventually like everyone I have had slip-ups and fell off the wagon...My grandad died of Chron's when I was quite young</p>

				<p>and I recently found out my auntie has it too and manages it by staying on a vegan diet...So I am going onto SCD [selective carbohydrate diet] going forward. I might try paleo for a bit as it [sic] should be very low impact on my gut. Thanks for the journey...</p> <p>(Post made 07/01/2021, some details cut for brevity).</p>
Unclear or irrelevant		57	23.17	<p><b>What ailments/diseases has keto helped with?</b></p> <p>I know keto has helped put a lot of diabetes into remission, but I am also very curious to hear from you guys first hand what other ailments, or autoimmune disorders, have improved, or maybe even disappeared after transitioning to the keto lifestyle?</p> <p>(Post made 01/15/2021)</p>
Total		246	100	

\* Bolded portion of example is title

Table 2. Framing

Code	Description	<i>n</i>	%	Selected example*
Praise	User attributes a positive experience or benefits directly to the keto diet.	48	19.51	<p><b>Total NSV [Non-scale victory] - my resting HR has gone from 92 to 68</b></p> <p>The first thing I noticed when I began Keto in September was my heart rate slowing. My HR used to jump from 90 to 112 just walking from my computer to the bathroom. The last few days, my resting HR has been sub 70, for the first time since I graduated high school in 2006. I'm so happy :)</p> <p>(Post made 01/11/2021)</p>
Not Present	No direct praise or blame for the keto diet.	134	54.47	<p><b>I stopped keto for a month and getting headaches and tingling almost numb feeling</b></p> <p>Hey everyone I have been on keto for a good 6 months and last month I started eating carbs and then eating more and more. It's been 2 days I got back on it but for the last month I am feeling throbbing headaches and the sensation of tingles / numbness but it's not really numb so not sure what to call it only on the left side of my face and my chin.</p> <p>I called the doctor going for blood test tomorrow and an appointment next week. But</p>

				<p>I was thinking it only started right after I stopped keto has anyone else experience any side effects when stopped keto Thanks for the help</p> <p>(Post made 12/03/2020)</p>
Blame	The keto diet is blamed for negative effects the user is experiencing.	37	15.04	<p><b>Unavoidable headaches</b></p> <p>Please help. I have done keto before several times and I want to get back into it now that my baby is older and I'm not worried about drops in milk supply. I can't seem to keep the headaches at bay, and I've tried just about everything. Lots of electrolytes, drinking more water, making sure I eat enough calories, sleep etc no matter what though I am getting headaches every day. How long will this last and is there anything I can do to prevent them? Is taking painkillers round the clock ok?</p> <p>(Post made 06/18/2021)</p>
Mixed	Both praise and blame for the keto diet are present.	27	10.98	<p><b>Hypothyroidism &amp; keto. Cant tolerate optimal dose of Levothyroxine anymore.</b></p> <p>TL;DR - I have hypothyroidism. A Levothyroxine dose that brings my TSH within the reference range causes symptoms of overmedication - very high BP,</p>

				<p>sleeplessness, body shaking, extreme anxiety, very fast heart rate, fear of heart attack and stroke and full blown panic attacks. When I miss a few doses and reduce my Levo dose, I feel great, calm, relaxed and have excellent sleep but my TSH goes up. This has been the case since I have been on a low carb keto diet for the last 18 months. I like my keto lifestyle and want to continue it, as it has helped me lose weight, cure my fatty liver and prediabetic conditions. I exercise and run regularly and in a good health otherwise.</p> <p>M/46</p> <p>(Post made 11/16/2020)</p>
Total		246	100	

\* Bolded portion of example is title



Table 3. Relationship with Doctor

Code	Description	<i>n</i>	%	Selected example*
Post mentions user has visited a doctor and post is made in light of information learned	Poster visited their doctor and is posting in light of that experience. Advice or results from doctor are not being questioned. As shown by the example, a recently issued prescription can imply a visit to the doctor.	57	23.17	<p><b>How to adjust for prednisone?</b></p> <p>I'm sick but trying to maintain ketosis anyway. Due to breathing problems, I've been put on prednisone. I know steroids can mess with blood sugars and make it hard to maintain ketosis. Any tips? Also, what are some good keto recipes for when your stomach is upset?</p> <p>(Post made 01/23/2021)</p>
Post mentions user has visited a doctor but post seeks an alternative opinion	Poster is seeking alternative advice after going to the doctor.	18	7.32	<p><b>Doctor wants to put me on statin, I have normal BMI, doing keto for 5+ years and recently 16:8 IF</b></p> <p>Cholesterol 259  Triglycerides 76  HDL 60  LDL 184  Trig/HDL Ratio 1.26</p> <p>I'm sort of freaking out, I never really got blood work before and my first result has my Dr telling me he wants to put me on Statin right away but I really really don't want to. My triglycerides and HDL ratio is less than 1.3 isn't that good?</p>

				<p>I was fasting for 18+ hours before I took the test. I've heard fasting can increase your cholesterol.</p> <p>(Post made 03/01/2021)</p>
<p>Post mentions user has not yet visited a doctor but intends to in the future</p>	<p>Poster states that they have plans to visit their doctor or an upcoming appointment.</p>	21	8.54	<p><b>Diverticulitis flare up 1 week into Keto</b></p> <p>Started keto on 1/24 and by Saturday 1/30 I had my first ever flare up of Diverticulitis. Other family members have had it, so I am familiar with the symptoms, and have started a psyllium husk / Metamucil regimen to help resolve it. Before I go to my primary care and get a definitive diagnosis, any other tips to manage it? Any idea on how long it usually takes to go away?</p> <p>(Post made 02/01/2021)</p>
<p>Post mentions user has not yet visited a doctor and does not intend to</p>	<p>This category is for posters who explicitly state they are not planning to visit a doctor. In the example, the poser makes it clear they feel their doctors will not understand or be able to help them.</p>	1	0.41	<p><b>Can you guys help me find out the cause of this problem that only happens to me on keto?</b></p> <p>Good day everyone! So, a bit of context: I had absolutely 0 problems with keto until a couple months ago when I had a major diarrhea scenario and, stupidly, didn't hydrate myself. Electrolytes went bonkers and I was feeling pretty bad. After hydrating myself back tho, keto just stopped being the</p>

				<p>same. Most awful symptoms went away except my current issue: sometime after I eat or drink my ketoade I get this weird sensation on the region of my right eye/forehead. It's not pain, kinda like a burning feeling but not exactly? I don't know How to describe it properly. Anyway, it's very mild and the only thing It accomplished was making me shit my pants in horror that I had some brain problem. So that fear made me stop keto. I went low carb (50-100) for a month and behold, the sensation was completely gone. I got curious and decided to go back to keto, 2 weeks now, and the feeling has returned... The difference being that i'm ketosis again and drinking ketoade. Does anyone have any clues? Maybe I should stop drinking ketoade? I appreciate the help cause I live in a small town and no doctors here really understand or approve keto.</p> <p>(Post made 06/13/2021)</p>
Unclear or irrelevant	This category ranges widely in its content but provided is an example of someone who seems to have multiple diagnosis but consulted an online article rather than a	148	60.16	<p><b>Blepharitis, psoriasis, acne and keto</b></p> <p>I suffer from all three conditions and I've noticed since starting keto my symptoms have gotten worse.</p>

	<p>medical professional, so both their intention to visit a doctor and history with medical professionals is unclear.</p>			<p>I saw an article online about how a keto diet may exacerbate scalp psoriasis in some people (it was based on results from lab mice fed MCT), but I've also heard many people have cleared their acne with the diet. I've tried cutting out dairy as I've had issues with it in the past but it's been a couple weeks now and I haven't noticed any improvement.</p> <p>Does anyone have any experience with this? I am losing weight on keto and my anxiety is the best it's ever been, but the skin I have to live in is making me miserable.</p> <p>(Post made 02/03/2021)</p>
<p>Post mentions user has visited a doctor and has another upcoming appointment visit again soon</p>	<p>Doctor was visited recently concerning the topic of the post and a follow-up is scheduled</p>	1	0.41	<p><b>Keto for a toddler because of medical condition. Any advice?</b></p> <p>We were told by our doctor last week that our 2-year old needs to transition to a ketonic diet due to his severe epileptic seizures. We have tried different types of medication, but they have not had enough effect. So the next step is to try keto, as it has shown to have a positive effect on many epilepsy patients.</p> <p>My husband and I (who have both done low carb in the past) will do keto as well, as it's difficult to explain to a toddler why mum</p>

				<p>and dad gets to eat other foods than him..          (Plus we are well aware of the health benefits this will have on us as well.)          Are there any parents out there who put their toddler on keto? Any advice you can share with us?          Edit: For the record we do have an appointment coming up at the hospital where they will help us plan out his diet. Just wanted to hear what experiences other parents might have to share as well.</p> <p>(Post made 10/14/2021)</p>
Total		246	100	

\* Bolded portion of example is title

Table 4. Advice-seeking Model

Code	Description	<i>n</i>	%	Selected example*
Request for opinion or information	User is asking for opinion or information in general.	109	38.25	<p><b>Why does the Keto diet reduce inflammation?</b></p> <p>I'm now on a 6 months keto diet and I finally archived to write black numbers at my asthma test. Also my Immunglobulin E markers went down by 20%. Why is that keto reduces inflammation? Is it because of ketosis itself or because of the food that I'm eating ( or not eating )</p> <p>(Post made 11/22/2021).</p>
Request for advice	User is asking for advice which will affect their behavior personally. "Should" is usually present.	52	18.25	<p><b>Never enough magnesium</b></p> <p>I've been on and off keto / low carb/ omad for a few years now. Now it's been about 2 months that I've been strict keto. Problem is that when I go keto I can't seem to keep enough electrolytes in me.</p> <p>Now I eat more than 10-15g of salt a day and supplement 1g of elemental magnesium (from bisglycinate or threonate, spread evenly during the day) but every morning I feel I'm at risk of cramping.</p> <p>Things are even worse when I run (i don't now as I'm recovering from a tendinitis) as I</p>

				<p>do 10k three times a week and of course sweat a lot. How much magnesium should I really get? Just afraid of going to high and risk lowering my blood pressure too much.</p> <p>(Post made 12/06/2020)</p>
Situation comparison	<p>User shares a situation and asks for a comparison. As can be seen in the first example, situation comparison requires situation disclosure from the poster. I've included a second example of someone disclosing their experience with diabetes and asking for a comparison. Even though they haven't tried keto, they offer a lot of personal information in exchange for advice. If they had simply asked for diabetic people's experiences with keto without explaining their own situation, this would be a Request for opinion or information.</p>	30.18	2.46	<p><b>Experience with keto and MS?</b></p> <p>I just started keto (I'm talking today, just started). Not really doing it for weight loss (though that would be a pleasant side effect), but more for overall health. I've recently been diagnosed with MS, and have heard and read a bit that this sort of food lifestyle may be beneficial for people in my situation. Does anyone here have any insight or personal experience? Thanks in advance, I can already tell this is a supportive, welcoming community!</p> <p>(Post made 11/12/2020).</p> <p><b>Keto and Diabetes</b></p> <p>I'm 65 years old, carrying 182 lbs on a 5'8" frame. Ideally, I would like to lose around 20 lbs.</p>

				<p>I have Type II diabetes, which I control through medication and long acting insulin (~20 u of basaglar every night). My fasting blood sugar is about 80-120 in the morning. I would like to embark on a keto journey. I am concerned about ketoacidosis (yes, I have read the FAQ). Does anyone have any first hand experience with keto for diabetics and can let me know how it's going?</p> <p>(Post made 02/09/2021)</p>
Problem disclosure	Poster discloses an issue but does not ask for any type of advice. Note in the selected example that even though question marks are in the title, nowhere in the post is there an explicit request for information, opinions, advice, or a situational comparison.	7	2.46	<p><b>Panic that dissapears from eating raspberries or just berries ?????</b></p> <p>I don't understand what issue i am having But i feel panic . Mild feeling in my mind . The feeling goes away temporary when i eat a bunch of berries especially raspberries seem to help why is this since it can ' t be because of nutrition :( . It is easy to say just eat more raspberries troughout the day but the thing is i have to eat like 200 grams orherwise my teeth hurt . My stomach and hearth feels like it twitching ☹️</p> <p>(Post made 01/10/2021)</p>



Experimental storytelling	User tells a story about their experience on the keto diet, a personal victory or journey, etc.	24	8.42	<p><b>NSV [non-scale victory] less joint inflammation!</b></p> <p>This is my first time fully committing to keto. After pregnancy, I was the heaviest I've ever been, 307lbs. I've always been over weight. I have autoimmune diseases that cause moderate to severe joint inflammation and pain. Im on medications for it and find they don't do much. Since starting keto last month (with a good number of cheat meals this past week because of moving with a 4 month old) I'm down to 294, but I don't need my daily pharmacy's worth of anti-inflammatories to move around!! I can get away with my CBD and one general ibuprofen. This is the best I've physically felt in years. It's incredible being able to get on the floor to play with my baby and not be in excruciating pain, cracking and popping every time I move.</p> <p>(Post made 11/23/2020)</p>
Announcements	User shares information, news, or another type of announcement and does not seek an opinion.	7	2.46	<p><b>Allulose is amazing!</b></p> <p>Guys, I'm not kidding. It's like a fucking natural miracle drug.</p> <p>About a month ago, I posted about how allulose is like <u>Ex-Lax</u>. I stopped using it</p>

				<p>for a while, but I recently found out that not only does it not spike your blood glucose, it can actually make your blood glucose <u>go down</u>. I'm not the only one who's experienced <u>this</u>.</p> <p>I found out that the Ex-Lax effect is basically the allulose blocking the metabolism of certain carbohydrates. Here's an excerpt from the Wikipedia <u>article</u>: Allulose is a weak inhibitor of the enzymes <math>\alpha</math>-glucosidase, <math>\alpha</math>-amylase, maltase, and sucrase.[2] Because of this, it can inhibit the metabolism of starch and disaccharides into monosaccharides in the gastrointestinal tract.[2] Additionally, allulose inhibits the absorption of glucose via transporters in the intestines.[2] For these reasons, allulose has potential antihyperglycemic effects, and has been found to reduce postprandial hyperglycemia in humans.[2][9]</p> <p>No only does it block metabolism of carbs, it can lower cholesterol (if you care about such trivialities, that is):</p> <p>Through modulation of lipogenic enzymes in the liver, allulose may also have antihyperlipidemic effects.[2][9]</p> <p>The 2nd link above cites a bunch of studies of the antihyperglycemic effects of allulose, but there's another study that shows that it</p>
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				can protect the <u>beta cells</u> in the pancreas as well. (Post made 04/21/2021)
Posts with only one advice-seeking method	No second advice seeking method	207		
Total	Total advice-seeking methods recorded	285	100	

\* Bolded portion of example is title

### Frequency of Inductive Variables

Out of the two codes for the cholesterol category (Table 5), 28 posts (11.38%) had cholesterol as a main topic and 218 posts (88.62%) did not.

For the moral, medical or weight loss motivation category (Table 6), 65 posts (26.42%) had a motivation and in 181 posts (73.58%) there was no motivation present. *Medical* (n=33, 50.77%) was the most common motivation, followed by *mixed medical and weight loss* (n=12, 18.46%), *weight loss* (n=8, 12/31%), *mixed moral and weight loss* (n=6, 9.23%), *moral* (n=5, 7.69%), and *mixed moral and medical* was the least common with only one post (1.54%).

For framing of non-ketogenic diets category (Table 7), 48 posts (19.51%) mentioned an alternative diet and 198 posts (80.49%) did not. The most common code was *bad* (n=19, 39.58%), followed by *neutral* (n=16, 33.33%), *good* (n=11, 22.92%), and *mixed* (n=2, 4.17%).

Finally, 124 posts (50.41%), mentioned a length of adherence to the keto diet (Table 8) and 122 posts (49.59%) did not. The most common length of time was *one to six months* (n=59, 47.58%), followed by *less than one month* (n=35, 28.23%), *over a year to two years* (n=11, 8.87%), *seven months to a year* (n=9, 7.26%), *over two years to five years* (n=8, 6.45%), and *over five years* (n=2, 1.61%).

Table 5. Cholesterol

Code	Description	<i>n</i>	%	Example*
Present	Cholesterol is a main topic or concern of the post	28	11.38	<p>tired keto for a few months and my LDL cholesterol went up. should i still continue with keto?</p> <p>yeah so the title says it all. i've been trying keto for a few months. i mostly keep to having eggs for breakfast and chicken and vegetables for lunch and dinner. but my recent health report indicates that my LDL cholesterol is slightly elevated. should i be continuing with keto?</p> <p>(Post made 12/01/2020)</p>
Not present	Cholesterol is either not mentioned at all or not a main topic or concern of the post	218	88.62	
Total		246	100	

\* Bolded portion of example is title

Table 6. Motivation

Code	Description	<i>n</i>	%	Example*
Moral	Post includes a vague moral reason for wanting to start keto, e.g. “health,” “wellness,” etc.	5	7.69	<p><b>Keto Victory!</b></p> <p>I wanted to share with you all that I got some blood work done a couple weeks ago and everything was good, and ketone levels were good. I was honestly so afraid of going to the doctor for years because I was scared they’d tell me I was pre-diabetic. I decided to go after starting keto as part of my decision to start taking my health seriously, so I’m not sure what my pre-keto blood work looked like. I’m just so glad they told me everything was normal and there was no mention of diabetes!</p> <p>(Post made 02/09/2021)</p>
Medical	Post includes a medical motivation for trying keto	33	50.77	<p><b>Can low-carb/Keto affect blood work?</b></p> <p>I’m going to get blood work done in a week, the reason I’m doing Keto is to try and stop the hair loss I’m having from suspected PCOS; I’m still trying to figure out what’s going on with my body. NOTE: I’m by no means doing Keto for health or weight loss, literally just to try and do something to help my hairloss/potential PCOS</p>

				<p>I've been doing lowcarb/Keto for the last 2 weeks, but I was wondering if this will affect my blood work and if I should stop till I get the bloods done so they can more accurately reflect my levels when eating how I normally would?</p> <p>I'm trying to get to the bottom of whether my issues are related to some kind of deficiency, hormones, thyroid, PCOS, all of that. BONUS QUESTION: if anyone knows exactly what I should ask to be looked at in the bloods do let me know, thanks!</p> <p>(Post made 02/09/2021)</p>
Weight loss	Post includes a weight loss concerned motivation for trying the keto diet	8	12.31	<p><b>Losing Weight While on Humira</b></p> <p>Hey all! I'm new to reddit and also looking into starting keto. I'm curious to see if anyone on here happens to be taking the immunosuppressant, Humira (or similar biologic), and if you've noticed a change in your metabolism since going keto? Losing weight or more difficult despite diet change?</p> <p>I'm wanting to try keto to lose about 10ish pounds which I've gained while on Humira for the last 7 months, and feel like the medication has really altered how my body stores fat and overall slowing of metabolism</p>

				<p>(which I've read is a side effect). Currently on 40mg injection every 2 weeks for uveitis. If anyone has experience with this please share! Thanks! 😊</p> <p>(Post made 03/07/2021)</p>
Mixed moral and medical	Post includes both a moral and medical motivation for trying the keto diet	1	1.54	<p><b>Experience with keto and MS?</b></p> <p>I just started keto (I'm talking today, just started). Not really doing it for weight loss (though that would be a pleasant side effect), but more for overall health. I've recently been diagnosed with MS, and have heard and read a bit that this sort of food lifestyle may be beneficial for people in my situation. Does anyone here have any insight or personal experience? Thanks in advance, I can already tell this is a supportive, welcoming community!</p> <p>(Post made 11/12/2020)</p>
Mixed moral and weight loss	Post includes both a moral and weight loss concerned motivation for trying keto	6	9.23	<p><b>Blood work before keto - unexpected results? need help for interpretation</b></p> <p>Hello! I did keto ~3,5 years ago and went very well for me. In the last 2 years I've been eating a lot of junk food and got around ~118kg (195cm height - 22 yrs old) and now</p>



				<p>i want to go back to keto to regulate my weight and fix my lifestyle...</p> <p>(Post made 03/30/2021, cut for brevity)</p>
Mixed medical and weight Loss	Post contains both a medical and weight loss concerned motivation for trying keto	12	18.46	<p><b>Keto and Diabetes</b></p> <p>I'm 65 years old, carrying 182 lbs on a 5'8" frame. Ideally, I would like to lose around 20 lbs.</p> <p>I have Type II diabetes, which I control through medication and long acting insulin (~20 u of basaglar every night). My fasting blood sugar is about 80-120 in the morning. I would like to embark on a keto journey. I am concerned about ketoacidosis (yes, I have read the FAQ).</p> <p>Does anyone have any first hand experience with keto for diabetics and can let me know how it's going?</p> <p>(Post made 02/09/2021)</p>
Not present	No motivation is present in the post	181		
Total		65	100	

\* Bolded portion of example is title

Table 7. Framing of Non-ketogenic Diets

Code	Description	<i>n</i>	%	Example*
Good	Non-ketogenic diets are framed as positive	11	22.92	<p><b>keto help-for me, no issues. for my wife, hair loss. how to prevent?</b></p> <p>Me and my wife have tried keto and love the diet and lifestyle and results, however for her, she starts to notice rapid hair loss. when she switched back to low carb (60-80g a day) the hair loss stopped, and grew back. quite noticeably, i may add.</p> <p>Is there something specific that would prevent this so she could do keto? im open to any suggestions. it works fine for me, i dont notice any negative side effects.</p> <p>thanks in advance :)</p> <p>(Post made 02/25/2021)</p>
Neutral	Non-ketogenic diets are present in the post but not framed in a positive or negative way	16	33.33	<p><b>I got the keto rash and checked other posts but can't find any consensus</b></p> <p>So after three weeks I got the dreaded keto rash and started eating carbs again. It's a bummer because I was really enjoying it a lot but my skin was too itchy and bumpy pretty much everywhere but my face.</p>

				<p>Five years ago I started keto intuitively (I didn't know keto was a thing, I just knew I needed to stop eating carbs but veggies) and I ended up in ER because a nurse at my school's health center thought it was scabbies and gave me a treatment which aggravated the whole thing. It's only now that I'm actually making the connection! I remember thinking that my pee smelled funny and then I started having the keto rash.</p> <p>I tried Keto few years ago (two I believe) and nothing happened..it was smooth sail for many months. I believe that I was mostly paleo at the time. This time I had been eating a lot of carbs until I said enough and bam, the keto rash. I tried black seed oil to no avail. Should I try Dandelion tea? I think I will go back to keto more progressively. Is there any "cure" or method which seems to be working for the majority?</p> <p>(Post made 02/03/2021)</p>
Bad	Non-ketogenic diets are present in the post and are framed as negative	19	39.58	<p><b>Early Diabetes and Keto</b></p> <p>Hi all,</p> <p>I'm 40/M. I did a period of keto last year and lost some weight (30lbs) and felt good. I went back to a bad diet and ate junk over christmas</p>

				<p>and put some weight back on but recently started feeling really terrible. The Dr has just told me I have early diabetes. I don't want to go down that road. If I get back on keto do I have a chance of turning this around? Give me good news (!!!)</p> <p>(Post made 02/10/2021)</p>
Mixed	<p>Non-ketogenic diets are present in the post and have both positive and negative frames</p>	2	4.17	<p><b>Increased inflammation on keto</b></p> <p>I have been on keto for a few months now and I have lost a little weight, but the primary benefit I've experienced is a marked decrease in my anxiety.</p> <p>However, it hasn't all been good. My acne has increased considerably and my psoriasis has gotten much worse too, which leads me to believe this diet is CAUSING inflammation rather than decreasing it in spite of what I've read.</p> <p>I tried cutting out dairy for almost a month as an experiment to see if that was the trigger and it didn't make any difference.</p> <p>I have been looking into the Mediterranean/keto diet to maybe see if that would help as I tried Mediterranean a while ago and it did seem to calm down my psoriasis but I didn't enjoy any weight loss like I have on keto. I think I eat very similarly</p>

				<p>to the Medi-keto diet anyway though with lots of fish, greens, olive oil, etc. I'm kind of at a loss here. :(</p> <p>If anyone has any advice or similar experiences I'd be really grateful if you could share! I don't want to give up on this diet as my husband has had such success with it and my decreased anxiety is a huge help, but the constant onslaught of adult acne and my bleeding scalp psoriasis is extremely uncomfortable and is really messing with my self esteem.</p> <p>(Post made 02/22/2021)</p>
Not present	No non-ketogenic diets are present in post	198		
Total		48	100	

\* Bolded portion of example is title

89

Table 8. Length of Adherence

Code	Description	<i>n</i>	%	Example*
Less than a month	Post states that user has been on the keto diet for less than a month	35	28.23	<p><b>Walking after keto</b></p> <p>Hello. Before I started keto, I was walking at least 10 km a day. I'm in my second week on the diet and after coming from walking for the last 2 days, I have an irritating pain in my legs. All my leg muscles hurt like salt spilled wounds. Have you experienced the same pain after keto diet or while ketosis?</p> <p>(Post made 07/09/2021)</p>
One to six months	Post states that user has been on the keto diet for one to six months	59	47.58	<p><b>Stop liver dumping?</b></p> <p>I am a type one diabetic, on an insulin pump. I have been doing keto for almost five weeks now.</p> <p>My blood sugars start to spike every morning around 3:30am. Which causes my pump to kick in and up my insulin dosage. I can only assume that this the result of my liver dumping glucose.</p> <p>Does anyone have any practical advice on how to stop liver dumping?</p> <p>(Post made 07/10/2021)</p>

Seven months to a year	Post states that user has been on the keto diet for seven months to a year	9	7.26	<p style="text-align: center;"><b>Less pooping days</b></p> <p>I've been keto for 9 months (OMAD for 4 months) and have gotten used to pooping less, averaging 4-5 times a week.</p> <p>I take magnesium supplements (250mg), the rest I try to get from food I eat. And I also include fiber (vegetables and nuts) in my meals.</p> <p>Longest I went without pooping is 4 days. Now seems I will break it and go to 5 days?</p> <p>I am posting to ask if anyone has the same experience? I am not in pain or feeling any different. Even seems like there is nothing to push out LOL.</p> <p>I had my doctor prescribe me laxatives just in case. Might take them tomorrow if still got nothing.</p> <p style="text-align: right;">(09/25/2021)</p>
Over a year to two years	Post states that user has been on the keto diet for over a year to two years	11	8.87	<p style="text-align: center;"><b>Being on Keto has no longer made me lactose intolerant</b></p> <p>I use to always have to take lactaid when I was younger up to the age of 24. I've been on keto for 2 years and messed up a few months ago and binged on bad food. One of those foods being ice cream. I ate an entire pint and</p>

				<p>expected to shit my brains out, but no. Nothing. Anyone else with a similar story?</p> <p>(Post made 11/10/2021)</p>
Over two years to five years	Post states that user has been on the keto diet for over two years to five years	8	6.45	<p><b>Low Body Temperature Anyone?</b></p> <p>So I have been on keto (on w/ breaks) for about 5 years. My body temperature has lowered over time. When I was overweight my average temp was about 99.1f. Now it is around 96f.</p> <p>I feel great. My basic thyroid numbers are fine. I'm not super concerned. Just wondering if anyone else has this going on.</p> <p>(Post made 07/28/2021)</p>
Over five years	Post states that user has been on the keto diet for over five years	2	1.61	<p><b>Doctor wants to put me on statin, I have normal BMI, doing keto for 5+ years and recently 16:8 IF</b></p> <p>Cholesterol 259 Triglycerides 76 HDL 60 LDL 184 Trig/HDL Ratio 1.26</p> <p>I'm sort of freaking out, I never really got blood work before and my first result has my Dr telling me he wants to put me on Statin right away but I really really don't want to. My</p>



				<p>triglycerides and HDL ratio is less than 1.3  isn't that good?  I was fasting for 18+ hours before I took the  test. I've heard fasting can increase your  cholesterol.</p> <p>(Post made 03/01/2021)</p>
Not present	No length of adherence is present in post	122		
Total		124	100	

\* Bolded portion of example is title

## Relationships Between Deductive Categories and Engagement

### Maintenance of Keto Diet

A one-way ANOVA was conducted to compare the effect of a post's description of intent to maintain the keto diet on total upvotes, positive upvote percentage, total comments, total OP comments, total Automoderator comments, and total community comments in four cases: *post implies user is currently on the keto diet and plans to continue*; *post implies user is currently on the keto diet but may stop*; *post implies user is not currently on the keto diet but wants to start*; *post implies user is not currently on the keto diet and does not want to start*. No statistically significant difference was found between a post's description of intent to maintain the keto diet and total upvotes [ $F(3,185) = 0.398$ ], positive upvote percentage [ $F(3,185) = 1.81$ ], total comments [ $F(3,185) = 0.819$ ], total OP comments, [ $F(3,185) = 1.40$ ], total Automoderator comments [ $F(3,185) = 3.74$ ], and total community comments [ $F(3,184) = 0.683$ ].

### Framing

A one-way ANOVA was conducted to compare the effect of framing on total number of upvotes when a *praise*, *blame*, or *mixed* frame was present or *not present*. Framing did have a significant effect on total upvotes at the  $p < .05$  level for two or more conditions [ $F(3,242) = 11.808$ ,  $p = < .001$ ]. Tukey's HSD Test for multiple comparisons found that the mean value of total upvotes was significantly different between *praise* and *not present* ( $p < .001$ , 95% C.I. = [39.45, 107.47]), *praise* and *blame* ( $p < .001$ , 95% C.I. = [34.23, 122.70]), and *praise* and *mixed* ( $p < .001$ , 95% C.I. = [27.12, 124.40]). There was

no statistically significant difference between *not present* and *blame* ( $p=.986$ ), *not present* and *mixed* ( $p=.999$ ), or *blame* and *mixed* ( $p=.999$ ).

Based on the results of the one-way ANOVA, an independent samples t-test was performed to compare found that posts with a *praise* frame and all other frames. The t-test found that posts with a *praise* frame had more total upvotes ( $M = 83.98$ ,  $SD = 167.21$ ) than all other frames ( $M = 9.27$ ,  $SD = 28.93$ )  $t(244) = 5.96$ ,  $p<.001$ .

The one-way ANOVA test comparing the effect of framing on percentage of positive upvotes when a *praise*, *blame*, or *mixed* frame was present or *not present* also found that framing did have a significant effect on total upvotes at the  $p<.05$  level for two or more conditions [ $F(3,242) = 4.913$ ,  $p = .002$ ]. Tukey's HSD Test for multiple comparisons found that the mean value of positive upvote percentage was significantly different between *praise* and *not present* ( $p=.001$ , 95% C.I. = [3.32, 18.36]), and *praise* and *blame* ( $p=.026$ , 95% C.I. = [0.92, 20.48]). There was no statistically significant difference between *praise* and *mixed* ( $p=.108$ ), *not present* and *blame* ( $p=1$ ), *not present* and *mixed* ( $p=.981$ ), or *blame* and *mixed* ( $p=.992$ ).

Again, an independent samples t-test was conducted and found that the posts with a *praise* frame had a significantly higher percentage of positive upvotes ( $M = 85.48$ ,  $SD = 17.92$ ) than all other frames ( $M = 74.85$ ,  $SD = 17.92$ )  $t(244) = 3.84$ ,  $p<.001$ .

No statistically significant difference between frames effect on total comments [ $F(3,242) = 0.64$ ], total OP comments [ $F(3,242) = 2.18$ ], total Automoderator comments [ $F(3,242) = 1.07$ ] or total community comments (total comments – (OP comments +

Automoderator comments) [ $F(3,240) = 0.03$ ] was found by a one-way ANOVA at the  $p < .05$  level.

### **Relationship with Doctor**

A one-way ANOVA was conducted to compare the effect of a post's description of a relationship with a doctor on total number of upvotes, positive upvote percentage, total comments, total OP comments, total Automoderator comments, and total community comments in four cases: *post mentions user has visited a doctor and post is made in light of information learned*; *post mentions user has visited a doctor but post seeks an alternative opinion*; *post mentions user has not yet visited a doctor but intends to in the future*. The *post mentions user has visited a doctor and has another upcoming appointment* code and *post mentions user has not yet visited a doctor and does not intend to* code were excluded as they only represented one post each. Posts coded as *unclear or irrelevant* were also excluded as this code accounted for a large number of posts for different reasons.

Between the remaining three codes, no statistically significant difference was found by the one-way ANOVA for a post's stated relationship with a doctor and total number of upvotes [ $F(2,92) = 2.53$ ], positive upvote percentage [ $F(2,92) = 2.30$ ], total number of comments [ $F(2,92) = 1.18$ ], total OP comments [ $F(2,92) = 1.61$ ], total Automoderator comments [ $F(2,92) = .496$ ] or total community comments [ $F(2,92) = 1.00$ ] at the  $p < .05$  level.

To test how the presence of any discussion of doctors generally affected engagement, a t-test was used to compare the effect on engagement of all posts coded *unclear or*

*irrelevant* and all posts with a code which implied a doctor was mentioned, regardless of whether the post implied a visit, intent to visit, and/or intent to follow the advice of a doctor. Posts in which a doctor was mentioned ( $M=39.756$ ,  $SD=120.54$ ) had significantly more total upvotes than posts marked *unclear or irrelevant* ( $M=13.32$ ,  $SD=40.74$ ),  $t(244)=2.47$ ,  $p<.001$ . Additionally, the independent samples t-test found that posts marked *unclear or irrelevant* ( $M=3.80$ ,  $SD=3.96$ ) received significantly fewer OP comments than posts in which a relationship with a doctor was mentioned ( $M=5.45$ ,  $SD=6.28$ ),  $t(244)=2.52$ ,  $p<.001$ . There was a mildly significant effect on total comments with posts which mentioned a doctor ( $M=20.02$ ,  $SD=19.44$ ) receiving slightly more total comments than posts marked *unclear or irrelevant* ( $M=17.68$ ,  $SD=17.01$ ),  $t(244)=.999$ ,  $p=.058$ . There was no significant effect on positive upvote percentage,  $t(244)=1.35$ ,  $p=.486$ , total AutoModerator comments,  $t(244)=1.28$ ,  $p=.065$ , or total community comments  $t(242)=-0.126$ ,  $p=.878$ .

### **Advice-seeking Method**

In order to conduct a one-way ANOVA on the advice-seeking and information-sharing methods, new codes were created for posts with more than one advice-seeking or information-sharing method. As stated in the methods section, advice-seeking and information-sharing categories were mutually exclusive, so a post could have two advice-seeking methods or two information-sharing methods but could not have one of each. Problem disclosure was also a mutually exclusive code within the advice-seeking method category because it was by nature not interrogative, so therefore could not be paired with an interrogative method.

The original four codes for advice-seeking methods were: *request for opinion or information*, *request for advice*, *situation comparison*, and *problem disclosure*. The two information sharing codes were: *experimental storytelling* and *announcements*. The newly created codes were: *request for opinion or information and request for advice*, *Request for opinion or information and situation comparison*, *request for advice and situation comparison*, and *experimental storytelling and announcements*.

The most common advice-seeking or information-sharing method (Table 9) was *request for opinion or information* (n=80, 32.52%), followed by *situation comparison* (n=63, 25.61%), *request for advice* (n=28, 11.38%), *experimental storytelling* (n=23, 9.35%), *request for opinion or information and request for advice* (n=15, 6.10%), *request for opinion or information and situation comparison* (n=14, 5.69%), *request for advice and situation comparison* (n=9, 3.66%) *problem disclosure* (n=7, 2.85%), *announcements* (n=6, 2.44%), and *experimental storytelling and announcements* (n=1, 0.41%).

A one-way ANOVA was conducted to compare the effects of these new advice-seeking and information-sharing methods codes on total upvotes, positive upvote percentage, total comments, total OP comments, total Automoderator comments and total community comments. Because the code for *experimental storytelling and announcements* only accounted for one post, it was removed from the sample. The advice-seeking and/or information-sharing method did have a statistically significant effect for two or more conditions on total upvotes ( $F[8,236] = 8.37, p < .001$ ) and positive upvote percentage ( $F[8,236] = 3.26, p = .002$ ).

Tukey's HSD Test for multiple comparisons found the mean value of total upvotes was significant different between *request for opinion or information* and *experimental storytelling* ( $p < .001$ , 95% C.I. = [-184.88, -74.08]), *request for advice* and *experimental storytelling* ( $p < .001$ , 95% C.I. = -202.99, -71.21), *situation comparison* and *experimental storytelling* ( $p < .001$ , 95% C.I. = [-186.70, -72.61]), *problem disclosure* and *experimental storytelling* ( $p < .001$ , 95% C.I. = -242.17, -40.03]), *request for opinion or information* and *request for advice* and *experimental storytelling* ( $p < .001$ , 95% C.I. = [-217.20, -61.78]), *request for information and opinion* and *situation comparison* and *experimental storytelling* ( $p < .001$ , 95% C.I. = [-219.40, -60.66]), and *request for advice* and *situation comparison* and *experimental storytelling* ( $p < .001$ , 95% C.I. = [-228.57, -44.45]). No significant difference was found between the two information-sharing codes, *experimental storytelling* and *announcements* ( $p = .184$ ).

An independent t-test found that *experimental storytelling* resulted in higher upvote scores ( $M = 142.96$ ,  $SD = 193.03$ ) than all other advice seeking methods ( $M = 11.57$ ,  $SD = 48.16$ )  $t(244) = 8.11$ ,  $p < .001$ .

Tukey's HSD Test for multiple comparisons also found a significant difference in effect for positive upvote percentage between *request for opinion or information* and *experimental storytelling* ( $p < .001$ , 95% C.I. = [-30.99, -5.66]) and *request for opinion or information* and *request for advice* and *experimental storytelling* ( $p = .004$ , 95% C.I. = [4.18, 39.71]). No significant difference was found between *experimental storytelling* and *request for advice* ( $p = .210$ ), *situation comparison* ( $p = .177$ ), *problem disclosure* ( $p = .651$ ),

*announcements* ( $p=.849$ ) *request for opinion or information and request for advice* ( $p=.383$ ), or *request for advice and situation comparison* ( $p=.773$ ).

An independent t-test found that posts using the *experimental storytelling* method have higher positive upvote percentages ( $M = 90.34$ ,  $SD = 12.48$ ) than all other advice seeking methods ( $M = 75.55$ ,  $SD = 17.59$ )  $t(244) = 3.93$ ,  $p<.001$ .

No statistically significant difference between effect was found for total comments ( $F[8,236] = 0.51$ ), total OP comments ( $F[8,236] = 0.52$ ), total Automoderator comments ( $F[8,236] = 1.16$ ), or total community comments ( $F[8,234] = 0.40$ ).



Table 9. Combined Advice-Seeking and Information-Sharing Methods Frequencies

Code	<i>n</i>	%
Request for opinion or information	80	32.52
Request for advice	28	11.38
Situation comparison	63	25.61
Problem disclosure	7	2.85
Experimental storytelling	23	9.35
Announcements	6	2.44
Request for opinion or information and request for advice	15	6.10
Request for opinion or information and situation comparison	14	5.69
Request for advice and situation comparison	9	3.66
Experimental storytelling and announcements	1	0.41
Total	246	100

## **Relationships Between Inductive Variables and Engagement**

### **Cholesterol**

A one-way ANOVA was conducted to compare the effects of cholesterol being *present* as a post's topic and posts in which cholesterol was *not present* as the main topic on total upvotes, positive upvote percentage, total comments, total OP comments, total Automoderator comments, and total community comments. No statistically significant differences were found for total upvotes [ $F(1,244) = 1.723$ ], positive upvote percentage [ $F(1,244) = 2.02$ ], total comments [ $F(1,244) = 0.06$ ], total OP comments [ $F(1,244) = 0.64$ ], total AutoModerator comments [ $F(1,244) = 0.01$ ] or total community comments [ $F(1,242) = 0.00$ ].

### **Motivation**

A one-way ANOVA was conducted to compare the effect of a post's declared motivation for following the keto diet on total upvotes, positive upvote percentage, total comments, total OP comments, total Automoderator comments, and total community comments. The six motivation variables in this category were: *moral*, *medical*, *weight loss*, *mixed moral and medical*, *mixed moral and weight loss*, and *mixed medical and weight loss*. No statistically significant differences were found for total votes [ $F(5,59) = 0.29$ ], positive upvote percentage [ $F(5,59) = 1.24$ ], total comments [ $F(5,59) = 0.82$ ], total OP comments [ $F(5,59) = 0.22$ ], total Automoderator comments [ $F(5,59) = 2.03$ ] and total community comments [ $F(5,59) = 1.18$ ].

An independent-sample t-test comparing the effect on engagement of all posts marked as having no motivation with all posts marked as having a motivation found that

posts with a motivation (M=47.51, SD=119.11) received significantly more upvotes than posts without any type of motivation mentioned (M=15.35, SD=64.00),  $t(244)=2.71$ ,  $p<.001$ . Posts with a motivation (M=24.25, SD=20.29) also received significantly more total comments than posts without a motivation (M=16.59, SD=16.74),  $t(244)=.006$ ,  $p=.006$ . Finally, posts with a motivation present (M=7.00, SD=6.55) had more comments from the original poster than posts without a motivation (M=3.55, SD=4.07),  $t(244)=4.93$ ,  $p<.001$ .

### **Framing of Non-ketogenic Diets**

A one-way ANOVA was conducted to compare the effects of different frames of non-ketogenic diets mentioned in posts on total upvotes, upvote percentage, total comments, total OP comments, total Automoderator comments, and total community comments. Framing of non-ketogenic diets was coded as either *good*, *neutral*, *bad* or *mixed*. Posts coded as *unclear* or *irrelevant* were removed from the test. The framing of non-ketogenic diets had a mildly significant effect on total OP comments ( $F[3,44] = 2.74$ ,  $p=.054$ ). No significant difference was found between the effect of framing of non-ketogenic diets and total upvotes [ $F(3,44) = 0.58$ ], positive upvote percentage [ $F(3,44) = 1.02$ ], total comments [ $F(3,44) = 1.20$ ], total Automoderator comments [ $F(3,44) = 2.74$ ], and total community comments [ $F(3,43) = 0.46$ ].

Tukey's HSD Test for multiple comparisons found that the mean value of total OP comments was mildly different between *good* frames and *mixed* frames ( $p=.071$ , 95% C.I. = [-19.77, 0.59]). No significant difference was found between *good* and *neutral*

frames ( $p=.430$ ), *good* and *bad* frames ( $p=.171$ ), *neutral* and *bad* frames ( $p=.939$ ), *neutral* and *mixed* frames ( $p=.296$ ), or *mixed* and *bad* frames ( $p=.426$ ).

An independent sample t-test found that posts with a *good* frame of non-ketogenic diets ( $M=1.91$ ,  $SD=1.51$ ) had significantly fewer comments from the original poster than posts with a *neutral* frame of non-ketogenic diets ( $M=4.88$ ,  $SD=4.50$ ),  $t(25)=-2.10$ ,  $p<.001$ .

### **Length of Adherence**

A one-way ANOVA was conducted to compare the effects of different lengths of time a post described a user being on the keto diet on total upvotes, positive upvote percentage, total comments, total OP comments, total Automoderator comments, and total community comments. The six time length variables in this category were *less than a month*, *one to six months*, *over six months to a year*, *over a year to two years*, *over two years to five years*, and *over five years*. Length of adherence did have a significant effect on total upvotes [ $F(5,118) = 2.54$ ,  $p=.032$ ] and total Automoderator comments [ $F(5,118) = 2.92$ ,  $p=.02$ ] at the  $p<.05$  level for two or more conditions. No significant differences were found between effects of variables on upvote percentage ( $F[5,118] = 1.46$ ) total comments ( $F[5,118] = 0.81$ ), total OP comments ( $F[5,118] = 1.45$ ), or total community comments ( $F[5,117] = 0.325$ ).

Tukey's HSD Test for multiple comparisons found that the mean value of positive upvote percentage was significantly different between *over two years to five years* and *less than a month* ( $p=.017$ , 95% C.I. = [15.05, 247.52]), *over two to five years* and *one to six months* ( $p=.033$ , 95% C.I. = [5.88, 229.36]), *over two to five years* and *over six*

*months to a year* ( $p=.044$ , 95% C.I. = [2.35, 290.57]), *over two years to five years* and *over a year to two years* ( $p=.032$ , [7.77, 283.39]).

No significant difference was found between *over two years to five years* and *over five years* ( $p=.659$ ). No significant differences were found between *less than a month* and *one to six months* ( $p=.989$ ), *over six months to a year* ( $p=.999$ ), *over a year to two years* ( $p=.999$ ), or *over five years* ( $p=1$ ). No significant differences were found between *one to six months* and *over six months to a year* ( $p=.969$ ), *over a year to two years* ( $p=.961$ ), or *over five years* ( $p=1$ ). No significant difference was found between *over six months to a year* and *over a year to two years* ( $p=1$ ) or *over five years* ( $p=1$ ). Finally, no significant difference was found between *over a year to two years* and *over five years* ( $p=1$ ).

Tukey's HSD Test for multiple comparisons also found that the mean value of total AutoModerator comments was significantly different between *over two years to five years* and *less than a month* ( $p=.007$ , 95% C.I. = [1.51,15.05]), *over two to five years* and *one to six months* ( $p=.004$ , 95% C.I. = [1.85,14.86]), *over two to five years* and *over six months to a year* ( $p=.050$ , 95% C.I. = [0.01, 16.80]), *over two years to five years* and *over a year to two years* ( $p=.044$ , [0.14, 16.20]).

No significant difference was found between *over two years to five years* and *over five years* ( $p=.451$ ). No significant differences were found between *less than a month* and *one to six months* ( $p=.1$ ), *over six months to a year* ( $p=.1$ ), *over a year to two years* ( $p=.1$ ), or *over five years* ( $p=1$ ). No significant differences were found between *one to six months* and *over six months to a year* ( $p=.1$ ), *over a year to two years* ( $p=.1$ ), or *over five years* ( $p=1$ ). No significant difference was found between *over six months to a year* and

*over a year to two years* ( $p=1$ ) or *over five years* ( $p=1$ ). Finally, no significant difference was found between *over a year to two years* and *over five years* ( $p=1$ ).

An independent samples t-test was conducted to test the effect of the *over two years to five years* length of adherence against all other lengths of adherence. The test found that posts which mentioned *over two years to five years* of adherence ( $M=151.13$ ,  $SD = 284.34$ ) had significantly more total upvotes than other lengths of adherence ( $M=24.41$ ,  $SD=77.11$ ),  $t(122)=3.43$ ,  $p<.001$ . Posts which mentioned *over two years to five years* of adherence ( $M=30.25$ ,  $SD=33.05$ ) also had significantly more comments than other lengths of adherence ( $M=19.08$ ,  $SD=15.83$ ),  $t(122)=1.77$ ,  $p=.001$ . Posts which mentioned *over two years to five years* adherence ( $M=9.88$ ,  $SD=1047$ ) had significantly more OP comments than other lengths of adherence ( $M=5.11$ ,  $SD=5.04$ ),  $t(122)=2.37$ ,  $p<.001$ . Finally, posts which mentioned *over two years to five years* of adherence ( $M=8.63$ ,  $SD=24.40$ ) had significantly more AutoModerator comments than posts which mentioned other lengths of adherence ( $M=0.30$ ,  $SD=0.51$ ),  $t(122)=3.88$ ,  $p<.001$ .

## **Crosstabulations**

### **Relationship with Doctor and Cholesterol**

Out of the 28 posts (11.38% of total posts) in which cholesterol was *present* as a main theme, nine (32.14%) were coded as *post mentions user has visited a doctor but post seeks an alternative opinion* (Table 10). Eight of the posts (28.57%) coded as *post mentions user has visited a doctor and post is made in light of information learned*. Three posts (10.71%) were coded as *post mentions user has not yet visited a doctor but intends to in the future*. Five posts (17.86%) were coded as *unclear or irrelevant*. Out of the 18

posts (7.32% of total posts which mentioned a relationship with a doctor) coded as *post mentions user has visited a doctor but post seeks an alternative opinion*, 9 (50%) also had cholesterol as a main topic.

### **Motivation and Advice-seeking Method**

Out of the 65 posts in which a motivation was present, a 30.3% (n=10) of the posts coded as *medical employed situation comparison* as their method of advice-seeking (Table 11). *Situation comparison* was also the most common advice-seeking method for the *medical and weight loss code* (n=4, 33.3%) and the *moral and medical code* (n=1, 100%).

### **Framing and Advice-seeking Method**

Because both the *praise code* and *experimental storytelling code* had statistically significant effects on the amount of total upvotes and positive upvote percentage a post received, a crosstabs chart was created to compare how often they occurred together (Table 12). Out of 23 total posts coded as *experimental storytelling*, the majority (n=18, 78.3%) had a *praise* frame. Three posts (13.1%) were marked as frame *not present*, and two posts (8.7%) had a *mixed* frame. There were no experimental storytelling posts with a *blame* frame.

### **Motivation and Relationship with Doctor**

Out of the 65 total posts in which a motivation was present (Table 13), 33 posts were coded as *medical*. Out of these 33 posts, 18 mentioned a relationship with a doctor. The majority of the posts with a *medical* motivation and a relationship with a doctor (n=10, 55.6%) were posts coded as *post mentions user has visited a doctor and post is made in*

*light of information learned*. Posts which had a *medical and weight loss* motivation and mentioned a relationship with a doctor (n=8) also had a clear majority of posts coded as *post mentions user has visited a doctor and post is made in light of information learned* (n=6, 75%).

### **Framing of the Keto Diet and Framing of Non-ketogenic Diets**

Because the *good* framing of non-ketogenic diets had a significant effect on total OP comments when compared to *neutral* framing of non-ketogenic diets, I decided to compare this category to the framing of the keto diet category (Table 14). None of the posts which framed other diets as *good* were coded as having a *praise* frame for the keto diet. Of the 11 posts which framed other, non-ketogenic diets as *good*, posts marked as *not present* in regard to frames of the keto diet were the most common (n=5, 45.5%), followed by frames which cast *blame* on the keto diet (n=4, 36.4%), and finally *mixed* frames of the keto diet (n=2, 18.2%). Of the 16 total posts which had *neutral* frames of non-ketogenic diets, the majority were marked as *not present* when it came to a frame of the keto diet (n=13, 81.3%), with *praise*, *blame*, and *mixed* frames of the keto diet only accounting for one post each (n=1, 5.6%).



Table 10. Relationship with Doctor x Cholesterol

	Cholesterol present as main theme	Cholesterol theme not present	Total
Post mentions user has visited a doctor and post is made in light of information learned	8	49	<b>57</b>
Post mentions user has visited a doctor but post seeks an alternative opinion	9	9	<b>18</b>
Post mentions user has not yet visited a doctor but intends to in the future	3	18	<b>21</b>
Post mentions user has not yet visited a doctor and does not intend to	0	1	<b>1</b>
Post mentions user has visited a doctor and has another upcoming appointment	0	1	<b>1</b>
Unclear or irrelevant	8	140	<b>148</b>
<b>Total</b>	<b>28</b>	<b>218</b>	<b>246</b>

Table 11. Motivation x Advice-seeking Method

	Moral	Medical	Weight loss	Moral and medical	Moral and weight loss	Medical and weight loss	Total
Request for opinion or information	3	4	4	0	0	3	14
Request for advice	0	2	2	0	2	1	7
Situation comparison	1	10	1	1	0	4	17
Problem disclosure	0	1	0	0	0	0	1
Experimental storytelling	1	6	1	0	2	3	13
Announcements	0	1	0	0	0	0	1
Request for opinion or information and request for advice	0	3	0	0	1	1	5
Request for opinion or information and situation comparison	0	2	0	0	1	0	3
Request for advice and situation comparison	0	4	0	0	0	0	4
Experimental storytelling and announcements	0	0	0	0	0	0	0
<b>Total</b>	<b>5</b>	<b>33</b>	<b>8</b>	<b>1</b>	<b>6</b>	<b>12</b>	<b>65</b>

Table 12. Advice-seeking Method x Framing

	Praise	Not Present	Blame	Mixed	Total
Request for opinion or information	12	54	10	4	80
Request for advice	0	16	7	5	28
Situation comparison	12	33	8	10	63
Problem disclosure	0	3	3	1	7
Experimental storytelling	18	3	0	2	23
Announcements	0	6	0	0	6
Request for opinion or information and request for advice	2	8	3	2	15
Request for opinion or information and situation comparison	2	6	5	1	14
Request for advice and situation comparison	2	5	0	2	9
Experimental storytelling and announcements	0	0	1	0	1
Total	48	134	37	27	<b>246</b>

Table 13. Motivation x Relationship with Doctor

	Moral	Medical	Weight loss	Moral and medical	Moral and weight loss	Medical and weight loss	Total
Yes, post mentions user has visited a doctor and post is made in light of information learned	1	10	2	0	3	6	22
Yes, post mentions user has visited a doctor but post seeks an alternative opinion	0	4	0	0	1	1	6
No, post mentions user has not yet visited a doctor but intends to in the future	0	3	0	0	1	1	5
No, post mentions user has not yet visited a doctor and does not intend to	0	0	0	0	0	0	0
Yes, post mentions user has visited a doctor and has another upcoming appointment	0	1	0	0	0	0	1
Unclear or irrelevant	4	15	6	1	1	4	31
<b>Total</b>	<b>5</b>	<b>33</b>	<b>8</b>	<b>1</b>	<b>6</b>	<b>12</b>	<b>65</b>

Table 14. Framing of Non-Ketogenic Diets x Framing of Ketogenic Diet

	Good	Neutral	Bad	Mixed	Total
Praise	0	1	8	0	9
Not Present	5	13	7	0	25
Blame	4	1	0	1	6
Mixed	2	1	4	1	8
Total	11	16	19	2	<b>48</b>

## Discussion

### Community Membership and Identity on r/Keto

To answer **RQ1**, a post's stated intent to continue, start or discontinue the keto diet had no statistically significant effect on engagement when different maintenance of diet intent variables were compared. This was surprising, as scholars interested in other restrictive diet cultures such as veganism have found that purity and devotion are important aspects of community membership (Giraud, 2021), which was a significant aspect of identity as defined by Tajfel (1972) and Turner (1985). However, keto does not seem to have the same moral backing which veganism does. Therefore, those who transgress, go on and off the diet frequently or use it only short-term, are not breaking a moral code of the community. In fact, when creating inductive variables for this study, I originally planned to code posts as either "diet" or "lifestyle," hoping to separate posts which stated one was "on keto," framing keto as a diet rather than a lifestyle, as opposed to being "keto," implying keto was a significant part of their identity. However, posts frequently used both types of phrasing and clear solely "diet" and "lifestyle" frames were infrequent. Because the waters were so quickly muddied, I chose to discontinue the category and instead create the "length of adherence" and "motivation" categories. This might mean that followers of the keto diet, even those who intend to follow it long-term as a treatment for a chronic issue, only view the diet as something they "do" rather than

something they “are.” Whereas mentioning one is vegan or vegetarian, two diets with a moral and ethical component, might earn one social capital, discussing the keto diet probably would not have the same benefit.

Based on the literature review, the ketogenic diet does not have the same central myth that veganism or paleo, another diet which gained popularity around the same time as keto (Pitt, 2016), have. As stated in the literature review, both veganism and vegetarianism in general have an external ethical and political motivation of protecting animals and the environment (Chuck, Fernandes, & Hyers, 2016). Plant-based and “raw” forms of veganism and vegetarianism also have a more internal, health-related motivation of being “natural” and only putting “natural” foods in the body (Rosenfeld & Burrow, 2017). Paleo is similar, as it claims to offer dieters a return to the way our reportedly healthier paleolithic ancestors ate (Obert, Pearlman, Obert, & Chapin, 2017). The paleo diet has been compared to Atkins because it is similarly low-carbohydrate (Cambeses-Franco, González-García, Feijoo, & Moreira, 2021), however this similarity stems from the paleo diet’s intent to remove all processed, “modern” foods from the diet rather than an attempt to target a specific macronutrient. In contrast, the ketogenic diet’s origins lie in treating severe epilepsy (Freeman & Vining, 1999; Peterman, 1925). If one fails to maintain the keto diet, they are not betraying any type of ethical motivation or moving away from achieving an idealized form of human existence.

In the literature review, it was established that the norms dictating community membership are created by the people an individual perceives as peers. While many posts in the r/Keto medical flair did imply an intent to remain on the keto diet (57.72%),

42.28% of posts implied that the diet had not yet been tried or implied an intent to potentially quit the diet and 23.17% contained no implication of intent at all, so actually consistently being on and continuing the diet full time might not be a highly valued social norm. It's likely that there is no equivalent moral value in the community for having been on the keto diet for five years the same way there is moral value in being vegan for five years to the vegan community. This idea is supported by the fact that 47.58% of posts which included a stated length of adherence to the keto diet were coded as being in the one to six months range, and the second most used code, less than a month, accounted for 28.23% of posts with a stated length of adherence. Knowing that Reddit's platform discourages users from posting potentially unlikeable statements, seeing the number of posts which contain lower lengths of adherence points to length of adherence not being a factor which bars a user from community membership. Of course, these posts do not constitute a representative sample of r/Keto users, and further research would need to be done to get an idea of the average user's length of adherence to the keto diet. It's possible that people who have been on the diet longer are more experienced and therefore do not need to ask medical questions as often as those who are new.

The length of adherence category did have a significant effect on the total amount of upvotes and comments a post received when the length of adherence in the post was over two years to five years. These posts also had a higher number of comments from the original poster. Part of the increased engagement on these posts might be due to Reddit's algorithm which prioritizes posts receiving more engagement (JungleTopp, 2020). It



might also show that while shorter lengths of adherence aren't disliked by the community, the community does find longer lengths of adherence valuable.

Furthermore, to argue there is not necessarily a clear “keto” identity does not mean there is not a community one can have membership in and receive social capital from. To answer **RQ4**, one type of advice-seeking method did have a statistically significant effect on engagement: experimental storytelling. This type of information sharing method often positively framed the keto diet, which, to answer **RQ2**, did have a statistically significant effect on engagement when compared to other types of framing. Duffy and Ling (2020), in a study of news-sharing behavior on social media, found that “phatic news sharing,” or the sharing of positive news, is commonly practiced on social media as a type of gift giving and an attempt to create social cohesion. The authors add that sharing health-related information might also be an act of “care” for friends and family members in individuals’ social media network (p. 81). The sharing of a personal anecdote (experimental storytelling) which frames keto positively, then, might be both a social act to create cohesion within the community and an act of care for other members of the community. The community’s response to this act of gift-giving is positive engagement, which was established as a type of social capital in the literature review (Xu & Saxton, 2019; Warren, Sulaiman, & Jaafar, 2015; Kim & Kim, 2021), seemingly meaning that this gift is well-received. The sharing of positive personal anecdotes being met with significant positive feedback points to the fact that the r/Keto community might gain more from the hedonistic benefits described by Keeling et al. (2013) which allow individuals to talk at length about an experience they cannot otherwise easily share. This

also points to findings by Kianpour (2021) that the Telegram group “Our Keto Lives” acted as an important social resource for keto dieters, especially those who were living with others not on the diet.

Furthermore, because Reddit allows users to remain anonymous, the fact that the sharing of positive personal news was met with positive engagement support findings by Centola (2010) that social capital can flow through social media networks and be impactful on relationships even when users are anonymous.

Finally, another interesting aspect of experimental storytelling having a significant effect on engagement is that vivid personal narratives are more likely to effect behaviors and belief. A study by Ricketts (2014), vivid narratives allow an audience to internalize information more easily and to identify with the people involved in the narrative, “triggering insights such as: ‘I see how that could happen to me...I’d better take action.’” While the author is mostly looking at narratives which teach people about risk prevention, I believe that this “relevance gap” closing form of communication, as the author refers to it, could be present here on r/Keto. Dieters might not feel personally connected to the diet’s restrictive guidelines, the new foods they have begun to eat, or the science behind the keto diet, but they may identify very closely with the real stories being shared by other, regular people on the subreddit. The fact that the users posting stories are not influencers with curated aesthetics but rather anonymous voices to whom other users can relate—or even insert their own experiences—might be what explains this intense positivity and excitement in the form of positive engagement.

## **Mainstream Medicine and r/Keto**

To answer **RQ3**, a post's stated intention to visit a doctor did not significantly affect the engagement a post received when individual variables were compared against one another. However, posts which mentioned a doctor in any capacity did receive higher upvote scores and slightly more comments than posts which did not clearly mention a doctor.

Excluding posts marked as unclear or irrelevant, posts which mentioned having visited a doctor and being made in light of information learned were the most common type of post in the doctor relationship category. The second most common type of post were ones in which an intent to visit a doctor in the future were described. This shows that individuals seeking advice from r/Keto are not doing so because they do not trust their doctor. Interestingly, only 18 posts were coded as describing having visited a doctor and posting to get an alternate opinion from the community. Half of these posts contained cholesterol as a main topic. I created the cholesterol as main topic category after noticing this trend, as many posts described doctor's warning the poster that they had dangerously high cholesterol levels, despite the poster feeling fine. On one hand, this makes sense, as high cholesterol generally does not cause noticeable symptoms and must be discovered through blood tests (Chen & Zieve, 2020). So, if keto is producing visible positive benefits for an individual, such as weight loss or decreased inflammation, and their elevated cholesterol was not, their experience would suggest the opposite of their doctor's recommendation, creating cognitive dissonance (Festinger, 1962) and leading them to seek information which confirms their bias (Nickerson, 1998) on r/Keto.

One deficit, I would argue, of keto's community being so decentralized is that the dietary guidelines are met in significantly different ways. Popular news sources and blogs routinely refer to three types of keto diets: clean, lazy, and dirty (KetoLogic, 2019; Clarke, 2021; Finnerty, 2021). Clean keto requires grass fed meats, lots of fiber, and healthy, low-inflammation fats. Dirty keto has no such requirements, allowing for cheap sources of fat such as butter and bacon to be staples of a dieter's keto pantry. The definition of "lazy" keto varies slightly between sources, but basically suggests a diet which primarily aims clean but allows "dirty" foods for the sake of convenience and cost. Understanding the effect of dietary cholesterol on cholesterol blood levels is outside of the scope of this paper, but "dirty" keto seems to allow for more consumption of high cholesterol foods than the stricter "clean" keto. Again, I cannot argue whether or not the keto diet is healthy for individuals with high cholesterol, but I will suggest that the decentralized online keto community could benefit from collaboration with nutritionists and doctors who could create more specific dietary guidelines for people looking to try the high-fat ketogenic lifestyle and who might not be able to recognize changes in their cholesterol levels.

This study did not categorize the types of comments posts received outside of whether they were posted by the original poster, AutoModerator, or a community member. I think that categorizing the type of information users provided in response to advice-seeking posts would be beneficial to understanding how well the community moderates itself. Furthermore, looking into the types of responses received by posts seeking an alternative opinion would help to support or challenge findings by Meppelink

et al. (2019) that the significant access to medical information provides leads to the spread of misinformation and allows for confirmation bias. I can only speak anecdotally on this point, but posts which contained cholesterol as a main topic often received comments citing medical studies and medical journal articles which argued that there is still a significant amount of ongoing debate around whether or not cholesterol is harmful. Though the debate does exist in peer-reviewed literature (Palca, 1990; Rosser, et al., 1993; Zhong, 2019), I believe it should not override the advice of a doctor who has personally examined an individual. It may be the case that the phenomenon described by Meppelink et al. (2019) is present on r/Keto as well.

It's interesting that after request for information or opinion, situation comparison inquiries were the most common type of advice-seeking method. This is in line with findings by Brady et al. (2016) which found that situation comparison is an important method of verification for users of medical forums. However, as discussed above, experience can be misleading. People with high cholesterol levels might have a positive experience of the diet despite those high levels. So, again, there is potential for the type of well-meaning misinformation spread described by Meppelink et al. (2019).

### **Framing of Non-ketogenic Diets and Engagement**

One final interesting finding of this study was that posts which framed non-ketogenic diets in a neutral way had significantly more comments from the original poster than posts which framed other diets as positive. A crosstabulation revealed that the majority of posts with neutral frames of other diets were marked with *not present* in relation to the keto diet (72.22%). Many posts which framed non-ketogenic diets positively were also

marked as *not present* in relation to framing of the keto diet (45.45%), but 36.36% blamed the keto diet and 18.18% had mixed frames. None praised the keto diet. In contrast, one post which framed non-ketogenic diets as neutral praised the keto diet (5.55%), one blamed the keto diet (5.55%) and one had a mixed frame of the keto diet (5.55%). The posts with neutral framings of non-ketogenic diets may have had more questions, leading the original poster to respond more often to comments or elaborate more in the comment section, whereas posts which praised non-ketogenic diets seemed to on average already have clear opinions about the keto diet.

If, as I stated before, the ketogenic diet is something people “do” rather than something people “are,” and it is framed in individuals’ minds as something which takes active effort rather than an identity one can slip into, it makes sense that posts which prove positive outcomes are achievable would do well on the subreddit. Users likely prefer these hope-inspiring messages because they affirm that the effort being put into those users’ diets is worthwhile. Furthermore, users following the keto diet for medical reasons likely want to believe that the diet will alleviate their condition. Seeing posts which ask for advice, even when those posts have no blame or any other frame present, still implies that the diet is not entirely intuitive, easy, and immediately curative. Therefore, any post which is not a positive anecdote praising the keto diet has the possibility to cause users cognitive dissonance and potentially invalidate their effort.

Because of this “effort” aspect, while the keto diet might not have a clear individual embodiment, it does seem to have a community identity. This is evident in the presence of clear values and a clear flow of social capital through the community. Because the keto

diet is an effort-intensive method people do to manage conditions or improve their health, being a member of the keto community might be more akin to participating in other intensive, niche health endeavors such as Crossfit or Ultramarathoning (Kang, Rice, Hambrick, & Choi, 2019; Kurtoğlu-Hooton, 2021). A study by Nur Kurtoğlu-Hooton (2021) of Facebook running communities found that those communities also provided important social capital to members who were, offline, participating in a very individualistic sport. In the group, members were able to “enact individual and collective identities” by having conversations about running (pointing to a hedonic effect Keeling et al. (2013) described), ask questions, and participate in virtual events in which they could compete against other group members from geographically distant locations. The author of the study notes that very few of these runners knew each other outside of the group, a similar dynamic to the meaningful but mostly online and anonymous relationships on r/Keto.

### **Future Research Implications**

While a post’s stated intent to maintain the keto diet did not have a statistically significant effect on engagement for posts with a medical flair, there might be areas within the online keto community where maintenance and length of adherence are significantly important. For example, keto opinion leaders and influencers might be held to a higher standard of maintenance and how long they have been following a ketogenic diet might affect their credibility. Understanding what increases a keto influencers credibility might also help to illuminate the “keto” identity—for example, is the ideal keto influencer thin, very muscular, very clear-headed, or actively managing a chronic

illness? Do they have a medical background or are they entirely self-taught from experience with the diet? Another study could look at other flairs on the subreddit, such as “Success Stories” to see if there are consistent themes which increase engagement, thereby illuminating aspects of the keto identity and keto group values.

Another interesting area of further study is popular sources of information about keto. While the original guidelines created by Wilder (1921) are still generally in use today, it would be interesting to survey people following a ketogenic diet about whether or not they’ve read these original guidelines or have learned the macronutrient ratios through other sources such as r/Keto, other internet communities, or any of the many keto influencers which exist on every social media platform.

### **Implications for Health Communicators**

The keto diet is difficult. People who begin the keto diet for any reason undoubtedly have to do research, make major changes to their diet and lifestyle, and forgo foods they may deeply enjoy. Whether or not the keto diet ends up benefitting their overall health, their attempting the diet should be viewed as a serious exertion of effort and agency over their own health. One sentiment I saw in posts on r/Keto was dieters complaining that their doctors didn’t recognize how much healthier they’d gotten since starting the diet and not congratulating them on their success. As an example, here is a quote from a post on the r/Keto medical flair with 299 upvotes:

I had a virtual appointment with my primary care doctor yesterday that left me so irritated I'm going to start looking for a new doctor. After my last labs in October he was very concerned about my high triglycerides and scheduled a follow up 3 months later with new lab work... That pushed me to reconsider a keto diet because it had been successful for me 6 or 7 years ago for weight loss and it cut out the problem foods for triglycerides... I tried to explain about my dietary changes and how that had



improved my weight and triglycerides that he was so concerned about and I was exercising more and felt way better. He didn't listen and his only comments on my new labs were "Your LDL is too high. If it is still high in another 3 months I want you to consider statins" ([RoamingBison], 2022).

Evidenced by the number of medical inquiries which blamed the keto diet for negative side effects, the keto diet is clearly not for everyone. Some might even be unknowingly elevating their cholesterol levels or worsening their health in ways they can't easily recognize. However, I want to argue based on the team-like nature of the keto community that necessary conversations which steer patients away from the keto diet for whatever reason should acknowledge that the patient made a significant effort to improve their health and that health is clearly important to them. People who struggle with their weight are especially likely to have experienced being seen as not caring about their bodies and not taking care of their health. Therefore, talking about their attempting the keto diet as carelessly jumping on a fad diet or actively harming their health is likely to discourage them from putting effort into their health in the future. A health communicator's aim, instead, should be encouraging that person to keep trying, just on a different path. In fact, the by putting so much thought and effort into their diet, a person might be transitioning into a "healthy" identity like those discussed in the literature review (Tung, Tsay, & Lin, 2015). Commending and reinforcing this identity could therefore make them more likely to have healthier diets and more active lifestyles long-term.

Furthermore, it should be acknowledged that the keto diet is uniquely restrictive compared to other low-carb diets. People who resort to the keto diet may believe that keto

is a necessary last resort because nothing else has or will work. Here is another post from r/Keto which shows a significant need for empathy and understanding from a provider:

I'm a 20 year old female at 197 lbs. I've been doing keto since February and i know i'm not eating enough fat or protein because i'm not entirely sure how much of everything i'm supposed to be eating. I don't know what foods to eat to get enough. I struggled with BED my whole life and now that i have a diet i can't get myself to eat enough calories. I'm afraid if i eat the proper amount for keto that i'll gain weight back and then get discouraged and quit :/ How can i ease myself into eating a regular amount of food everyday? I want to do things the healthy way as opposed to my normal binge/purge habits. I don't want to see the scale go above 200 again ([quietbitch123], 2021).

While this post does not imply this person sees “keto” as an integral part of their self-identity, the weight they've lost as a result of doing keto clearly is a new aspect of their self-identity which they are desperate to keep. I would argue the same could be said for dieters who are experiencing other positive effects such as reduced knee pain, inflammation, more regular menstrual cycles, etc. Even if their doctor has significant concerns about the diet, the patient's desire not to return to identifying as someone who has chronic pain, a limp, a higher weight, or other condition alleviated by keto might outweigh their willingness to trust their medical provider. Therefore, necessary conversations about the potential dangers of keto should begin with an understanding and acknowledgement of how the keto diet has changed this person's experience of their life and body. Alternatives offered in place of keto should work to maintain any positive effects which are significant to the patient and their identity.

### **Limitations**

Because this study did not investigate the tone and demeanor of responses to inquiries, there is a blind spot regarding the tone of responses and whether certain frames

or information-sharing techniques led to more positive or negative responses from commenters. Additionally, this study did not consider the karma posters had or other information present on their profile which might have added to their credibility on the Reddit platform.

## **Conclusion**

The subreddit r/Keto, despite explicitly banning the soliciting or giving of medical advice, hosts a significant number of medical inquiries and discussions. These discussions are easily found using the subreddit's medical flair. Posts which ask medical questions use a variety of advice-seeking methods, the two most frequent being requests for information or opinions from the community and situation comparisons in which posts describe a situation and ask if anyone has experienced anything similar.

While online medical forums and communities have been able to establish new medical knowledge by aggregating such user testimonials (Mao, et al., 2013; Benton, Ungar, Hill, Hennessy, & Mao, 2011; Sampathkumar, Chen, & Luo, 2014), experiences can be misleading. Following the keto diet can potentially create noticeable positive effects for dieters while also causing unnoticeable negative effects, such as raising their cholesterol levels (Chen & Zieve, 2020). Like all online forums, r/Keto is susceptible to the danger of misinformation (Meppelink, Smit, Fransen, & Diviani, 2019). This is because the internet allows users to search until they find medical information which supports their biases. Especially in the case of cholesterol, there are articles which support the notion that high cholesterol levels are unhealthy and articles which argue cholesterol is misunderstood (Palca, 1990; Rosser, et al., 1993; Zhong, 2019). Because

multiple opinions exist from credible, peer-reviewed sources, users of r/Keto have the ability to disregard their doctor in favor of information which confirms their biases.

Posts which ask the r/Keto community for alternative opinions after visiting a doctor do not receive significantly different levels of upvotes or comments from posts which trust their doctor's opinion, plan to seek a doctor's opinion in the future, or do not plan to seek a doctor's opinion. While Joe Rogan, credited with being an important opinion leader for the keto diet, might have controversial views on mainstream medicine (Stecula & Motta, 2021), the r/Keto community does not seem to have an adversarial relationship with mainstream medicine. In fact, posts which clearly mentioned a doctor in any capacity—whether or not they intended to follow the advice given by that doctor and regardless of whether the doctor had been visited or a visit was only planned—had significantly more upvotes and comments than posts which did not mention a doctor at all. Therefore, though some keto opinion leaders might distrust mainstream medicine to some degree, it is not an integral part of the “keto identity.”

A “keto identity,” if there is one, was not found by this study. The keto diet does not have the same moral or mythical qualities of other popular diets like veganism, vegetarianism, and the paleo diet (Chuck, Fernandes, & Hyers, 2016; Cambeses-Franco, González-García, Feijoo, & Moreira, 2021). Additionally, whether or not posts in the medical flair implied an intent to remain on the keto diet, quit, or start did not have a significant effect on engagement. What did have an effect on engagement was praise for the keto diet and the sharing of personal anecdotes, as posts with these features received more total upvotes than other types of posts. Posts which claimed a user had been on the

keto diet for over two years to five years also saw a positive effect on engagement. While the keto community might not have a clear identity which adherence to is met with praise, the community does seem to respond positively to the successes of its members. This shows, like other studies, that social capital is able to flow in this online community despite the ability of members to remain anonymous (Centola, 2010). This means that r/Keto can be a useful resource for those looking to create relationships and receive social support (Keeling, Khan, & Newholm, 2013). However, r/Keto should by no means be a replacement for advice from a doctor. To preserve the positive benefits users can receive from r/Keto while reducing harms, more strict moderation might be necessary than Reddit's current volunteer-based system (Birman, 2018).

The purpose of this study was to situation r/Keto amongst other similar medical, weight loss, and social media communities. The literature review established that Reddit was less likely to radicalize users than other social media sites like Facebook and Twitter (Morales, Monti, & Starnini, 2021; Cinelli, Morales, Galeazzi, Quattrociocchi, & Starnini, 2020). In terms of r/Keto's similarity to other weight loss and medical forums, r/Keto seems to offer a similar ability to foster relationships and exchange social capital while suffering from similar levels of susceptibility to misinformation. Despite Reddit's history of hosting unsavory subreddits (Høiland, 2019; Grover & Mark, 2019), r/Keto seems to be a community where users are able to post personal anecdotes about their own lives and support others' successes.

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