IT'S TRENDING: THE ROLE OF SOCIAL MEDIA
IN INCREASING ADOLESCENT HEALTH
LITERACY

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ABSTRACT

This body of work aspires to explore the avenues by which medical professionals can leverage adolescents' current and historic high social media usage to increase their health literacy. In order to accomplish this, several types of health literacy and the ethical implications of inadequate health literacy are discussed, specifically with adolescents in mind. Next, trends in media and social media usage by adolescents and its effects on this population are determined, and examples of interventions using these means in the literature are analyzed. Finally, the work discusses my personal experience using social media to disseminate health information, challenges our collaborative faces, and future directions for our project.

Dedicated to my loving family

and all the children I hope to serve during my lifetime.

ACKNOWLEDGMENTS

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CHAPTER 1: THE SOCIAL DETERMINANTS OF HEALTH:

EDUCATION ACCESS AND QUALITY

The social determinants of health have become a popular topic of discussion and intervention in recent years. In brief, this concept is hinged on how certain factors, i.e., the surroundings into which we are born, live, and grow, and their drivers, impact the health of communities[1]. Our environments shape our habits and behaviors significantly more than the time we spend receiving medical care in clinics and hospitals. It is estimated (and possibly overestimated) that medical care is responsible for only 10-15% of avoidable mortality in the US[1]. The effectiveness of the classical care model practiced in clinical medicine, with its strict bend toward diagnostics and treatments, is overwhelmingly overshadowed by the effect of behavior and habits on health. Evidence shows that social factors shape these health behaviors. In summation, the social determinants of health effectively demonstrate the limits of medical care in determining which people become sick and how well they recover[2] . This fact in itself makes a case for medical care providers to become versed in the effect of these determinants on the health of the communities they serve and develop creative avenues of intervention.

Education access and quality are social determinants that help us understand how intertwined education is with community health. Studies have shown that people with higher education levels live longer and healthier lives than their less-educated counterparts. In the US, educational attainment dictates several socioeconomic factors that drive health behaviors. The type of work, working conditions, and work-related resources a family unit has exerts a strong influence over the living environment, diet,

and exercise options they can access, among many other things. There are several different theoretical pathways through which education can influence health outcomes. According to Braveman and Gottleman, in their review of current knowledge on this social determinant, the most widely accepted of these pathways is that access to a quality education promotes healthier outcomes simply because education increases health knowledge and health literacy. Education also allows learners to develop coping and problem-solving skills that will ultimately help them better understand their health and equip them with the skills needed to cultivate health-promoting behaviors. This, in turn, decreases participation in behaviors that negatively impact health[2].

Although education primarily exists in schools and at home (in other words, outside of the clinical setting), medical professionals who seek a multifaceted approach to practicing medicine can still play an essential role in securing high-quality educational opportunities for the communities they serve. For one thing, there may be opportunities to lobby for equitable education through the legislature since health literacy is very closely related to basic literacy skills, i.e., reading, comprehension, and mathematical skills. These skills fundamentally dictate the capacity to which patients can obtain and understand health information.

Yet, health literacy requires more than these building blocks. This is because health information has traditionally been written for comprehension by highly literate individuals and medical professionals. This, in effect, makes the vast majority of this knowledge inaccessible to the general public. It is estimated that most Americans read at an eighth to ninth grade level[4]. It follows then that navigating such circuitous healthcare is a nearly impossible feat for the average healthcare user. In the early 2000's it was

estimated that 90 million American adults lacked the literacy skills needed to use our healthcare system[3].

The issue of limited health literacy is tied strongly to the bioethical principles of justice and autonomy. In their article on health inequality, Volandes and Paasche-Orlow assert that our healthcare system's immense complexities present an injustice against those who are most vulnerable to poor health outcomes. They contend that even those legislative measures that have been put into place to increase healthcare users' autonomy, such as shared decision-making and informed consent, have further complicated healthcare without addressing the issue of limited health literacy. Patients are still involved in discussions surrounding care goals and provided with consent forms full of information that they don't truly understand. The concern for autonomy is warranted, especially considering the fragmented relationships between many marginalized populations and the institution of medicine. Still, attempting to address this dynamic while neglecting limited health literacy is comparable to painting a lemon without making sure the car engine is functional, and the brakes are intact. Volandes and Paasche-Orlow put it best:

"The autonomy of healthcare users with limited literacy is thwarted if the forms intended to preserve their autonomy are inaccessible" [4].

Rees, expanding the relationship between health literacy and autonomy in an opinion piece on Volandes and Paasche-Orlow's article states:

"[…]*The need for these programs* (interventions that increase health literacy) *is even more urgent because people have a right to make those decisions autonomously; they have a right to understand their healthcare options fully. Yet even this conception of autonomy is inadequate"* .[3]

Rees explains that in a complete conceptualization of autonomy, health literacy is not simply a means to the end of informed consent. Instead, increasing health literacy should foster healthcare users' ability to utilize the healthcare system in a way that aligns with their innermost values and desires. In the ideal actualization of the term, individuals can use health literacy to foster behaviors that enhance their self-determination and make decisions that reinforce their priorities. Rees all but affirms that **genuine autonomy in healthcare can help communities figure out the best way to develop healthier behaviors**. He posits that, like healthcare, health literacy is a fundamental human right.

In addition to the bioethical implications of limited health literacy, the literature shows that limited health literacy has emerged as a decisive risk factor for disparities and worse health outcomes, independent of education and race[4]. This is likely because health literacy can be tied to behaviors and decision-making regarding one's and one's family's health. Consequently, it has also been related to increased incidence of chronic disease and suboptimal preventative health measures. Indeed, this adds to the already compelling reasoning for medical professionals to take limited health literacy seriously and decide something about this injustice.

Along with their critique, Volandes and Paasche-Orlow do provide methods that they believe can help us begin to solve this problem. They suggest that we

turn the system on its head. Instead of assuming that all healthcare users are highly literate, we should embrace the opposite; most healthcare users have limited literacy. This mind frameshift will allow for a restructuring of how health information and health systems are presented. Moreover, the authors uphold that to procure genuine autonomy for healthcare users, we should focus more on comprehension than the performative measures (aforementioned) we have been using. Once the information we are sharing with healthcare users has been simplified, we should then implement measures to assess our target audience's understanding of (1) the information we are trying to communicate, (2) how this information applies to the individual healthcare user and (3) an understanding of how this healthcare user can utilize the system to achieve his/her desired health outcome.

An overhaul of our healthcare mind frame, as the authors propose, would be ideal. Yet, a more hands-on approach in the meantime might involve clinicians creating initiatives that aim to increase health knowledge and improve health literacy within target patient populations. Interestingly enough, the authors suggest using technology models that target populations might be familiar with to communicate health information and health systems knowledge. They believe that these avenues will foster communication and are efficacious among healthcare users with limited health literacy[4].

CHAPTER 2: ADOLESCENTS AS A TARGET POPULATION FOR HEALTH

LITERACY INTERVENTIONS

Adolescents are a prime population to target for interventions seeking to increase health literacy. For one thing, exploration and self-discovery are two notable hallmarks of adolescence and young adulthood. During these life stages, young people become more curious about their bodies and the world and people around them. It is typically during adolescence and that high-risk behaviors and experiences are sought out as young people seek to establish independence from caregivers. Often, habits and behaviors pertaining to health, for example, dietary and exercise habits, sexual practices, and substance use, are established during adolescence. In 2015, the Youth Risk Surveillance System estimated that 18% of adolescents engaged in binge drinking. 21% were engaging in risky sexual behavior. 80-85% were not eating the recommended servings of fruits and vegetables, while 51% did not engage in the recommended amount of physical activity[7]. There is ample evidence in the literature that demonstrates the relationship between developing these habits during adolescence and adverse health outcomes in adulthood. Engaging in risky health behaviors such as alcohol use can impact the brain as it develops during these tender years. For example, the developing prefrontal cortex's (responsible for attention, executive decision making, and planning) sensitivity to nicotine has been well studied. Too, adolescents who use nicotine habitually put themselves at risk to sustain cognitive impairment as adults. Similarly, a study found a correlation between low hippocampal volumes and the age of onset and duration of alcohol use[7]. The hippocampus plays a significant role in learning and memory.

In adolescence, long-term decisions regarding health behaviors are often driven by temporary circumstances such as emotion and social pressures. Despite this, autonomy in medicine allows adolescents the right to participate in discussions and (even begin to make decisions in some cases) regarding their care. This is evident in the fact that children as young as 12 can receive testing and treatment regarding their sexual health without parental consent in certain states. For this reason, adolescence presents a crucial time point of intervention for health care providers seeking to increase health literacy. This benefits the individual at this particular life stage and sets the scene to help them become healthier adults who will pass healthier habits onto their children. In this way, well-targeted interventions to increase adolescent health literacy can have a trickledown effect and ultimately foster healthier communities. The question that begs to be asked is what is known about the health literacy of adolescents? What methods can be used to reach those adolescents with limited health literacy?

CHAPTER 3: HEALTH LITERACY AND THE ADOLESCENT

I have often found the concept of health literacy indistinct and vague. According to the Patient Protection and Affordable Care act of 2010, Title V, health literacy is defined as "the degree to which an individual can obtain, communicate, process and understand basic health information and services to make appropriate health decisions[5]." This statement is concise and well written, but it does not guide the practical application of these goals. What does health literacy look like in the everyday lives of healthcare users? Understanding this will help medical professionals develop better-targeted interventions to increase specific populations' health literacy. Nutbeam, 2006 in his consideration of health literacy and its application during the 21st century, calls this definition narrow. He contends that it focuses solely on achievement, such as reading medication bottles, participating in informed consent, and broadly being able to utilize the healthcare system. This approach fails to consider the different types of literacy and what they enable us to do. He weighs three different types of health literacy. Functional health literacy is most comparable to traditional definitions of health literacy, such as the CDCs. It focuses on the essential reading, writing, and arithmetic skills that allow healthcare users to achieve the competencies mentioned above. Nutbeam notes, however, that a focus on this type of health literacy alone is lacking. This approach does not teach healthcare users to consume, interpret, and apply health information in a genuinely autonomous way and aligns with their core values [6]. Patients are traditionally told what is good and what is bad for their health from the perspective of medicine and taught to comply. However paternalistic this approach may sound; it is essential to point out that

this approach is still valuable and has utility. In practice, medical professionals should work with healthcare users to individualize their usage of the system as much as possible and in alignment with the user's goals, however increasing functional health is essential and effective in encouraging individuals to become more compliant with strategies that seek to improve public health such as vaccination and preventative health screenings. They benefit both those individuals and their communities.

Interactive or communicative health literacy focuses on the healthcare user's ability to engage with health care knowledge. This type of health literacy focuses on developing self-confidence in acting independently on health advice individuals may receive from various sources[6,7]. Initiatives that seek to increase interactive health literacy must create a supportive environment where healthcare users are encouraged to actively participate in their understanding of health knowledge, using social skills to apply it to both novel and developing situations regarding their health[7].

Nutbeam's third type of health literacy, critical health literacy, is arguably the most advanced and least explored in conventional efforts to increase health literacy. Critical literacy allows individuals to take the information they have analyzed and interacted with and apply it towards political and social action to address the social determinants of health. Helping individuals increase this type of health literacy involves education that improves their ability to investigate and act on political and organizational structures[6].

A newer form of health literacy, media health literacy, has been defined in discussions on adolescent health literacy. Media health literacy requires an adolescent to be able to accomplish the following:

"Identify health-related media, critically analyze the information being presented, recognize the impact of this information on health behavior and finally act or to intend to act on the message presented for oneself and/or society[7]".

Thus, an adolescent with media literacy would be able to derive information from the media being presented, such as advertisements from a cigarette manufacturer, and be aware of the bias that may be present in such media. I.e., this company may not present all the adverse health effects of cigarette and tobacco usage since their ultimate goal is to sell a product.

Electronic health (eHealth) literacy is another type of literacy that focuses on health information obtained from electronic sources. This form of health literacy builds on the aforementioned foundational literacy skills and traditional forms of health literacy while adding several more layers of complexity. Nevertheless, the premise is similar to the overarching concept: assessing (to address) the gap between the information provided and how much of that information is accessible to its intended audience. Electronic health literacy takes this battle to the world wide web. eHealth literacy requires context-specific competencies such as information literacy (knowledge of how information is stored and can be accessed on platforms), computer/technology literacy (being able to use and have access to quality technology, and scientific literacy (knowledge of how scientific

information is generated, research is conducted and the ability to withdraw relevant data)[13]. Measures to assess these two forms of health literacy include the Electronic Health Literacy Scale (eHEALS) developed by Norman and Skinner (2006)[7] and the Newest Vital Sign (NVS)[13].

A systematic review of studies researching the relationship between health literacy and health behavior in adolescents found a correlation between media and functional health literacy and health-promoting behaviors. In interventions that focused on these health literacy types; adolescents had increased health-related information-seeking skills and participated less in negative health behaviors such as alcohol and smoking. Unfortunately, as Fleary et al. comment, none of the studies addressed all the aforementioned forms of health literacy. They stress that there is still much more research to do on interventions to study the link between health literacy and health behavior in adolescents. Still, they maintain that due to the increase in adolescents using media for health information, interventions should target increasing media health literacy in this population. They also suggest that both media and critical health literacy be taken seriously as essential life skills and be included in school curriculums and clinical settings accordingly [7]. This is a sentiment that I support whole-heartedly.

CHAPTER 4: SOCIAL MEDIA TRENDS OF ADOLESCENTS

How adolescents use social media, their perspectives on its impact, and the evidence-based benefits and risks of adolescent social media use are essential areas to explore in considering targeting this population for health interventions that utilize media. In the United States, adolescents and young adults are the largest consumers of social media. In 2013, According to the Pew Research Group, over 95% of teens used the internet daily. 67% of those who had social media accounts said they logged on at least once a day[8]. A similar report done in 2018 found that these numbers are increasing. Of the 743 adolescents aged 13-17 surveyed from randomly selected US households, 95% had or had access to a smartphone, an increase from 73% of teens who had said this less than five years earlier. 45% stated that they were online "almost constantly," again a drastic increase from the 24% who said this in previous surveys [8,9]. The Pew group did find differences in media usage amongst participants across gender lines. 39% of teenage boys stated that they were online almost constantly, compared with half of the adolescent girls surveyed stating this claim. Similarly, there were differences in usage across race and ethnicity, with 54% of Hispanics and 41% of whites claiming near-constant internet usage[8,9].

The 2018 report also demonstrated that teens have differing views regarding social media's overall effects on their lives. Most (45%) showed neutrality regarding its effects, while 31% described social media today as having primarily positive effects. The reasoning for this included its ability to help teens connect with family and friends while also providing the opportunity to meet new people with similar interests. The wealth of

easily accessible knowledge on social media was also cited as a positive, with one participant stating:

"My mom had to get a ride to the library to get what I have in my hand all the time. She reminds me of that a lot." (Girl, age 14)

Teens also referred to the ability to express themselves and seek help from the communities they form as another positive aspect of social media:

"It has given many kids my age an outlet to express their opinions and emotions and connect with people who feel the same way." (Girl, age 15)

"We can connect easier with people from different places, and we are more likely to ask for help through social media which can save people." (Girl, age 15)

In contrast, 24% of teens surveyed described social media's effect as primarily negative due to concerns of cyberbullying, unrealistic standards, adverse impact on relationships, and peer pressure[9]. In truth, the teens' assessment of the risks and benefits of social media is spot on with those discussed in the literature.

The evidence-based benefits of media use have been identified as engaging, highly individualized entertainment. In conjunction with this, they hold the potential to expose adolescents to new ideas and interactive learning experiences. Social media has been used for many noble causes, including calls for youth to participate in social action

and civic engagement to better their communities. Another benefit, as mentioned by one of the teens in the Pew Research Group report, is that as adolescents engage with people worldwide, they can be exposed to the experiences and perspectives of people who live lives different from what they know, namely marginalized groups. The American Academy of Pediatrics Council on Communications and Media cites the integrative support networks that have emerged on social media platforms as potentially essential benefits, especially for children who suffer from chronic disease, disability and especially those who have one or more marginalized identities or are members of stigmatized communities, i.e., those who have a mental illness, identities including but not limited to, children who have a mental illness, children of color and also those who identify as LGBTQIA. Children who identify with these groups are often able to find supportive communities on social media platforms in which they are connected to resources, gain insight and interact with peers in a way that helps decrease their fear of stigma. However, as the teens in the Pew report pointed out, adolescents who use social media, especially those who regard it as a significant source of knowledge and support, run the risk of experiencing adverse effects, including misinformation, bullying, peer pressure, and unhealthy influences that encourage poor health behaviors such as self-injury, disordered eating, risky sexual behaviors, drug use, and alcohol use. Delays in seeking conventional resources, such as seeing a psychiatrist or therapist to treat depression, have also been observed[17]. There are also tangible physical effects of media usage on adolescents. Studies have demonstrated a link between high media usage, obesity, and cardiovascular disease. Moreover, adolescents with high social media use and those who slept with mobile devices exhibited a greater risk for sleep disturbances[17].

Social media's dynamic nature with new platforms geared toward specific media types is what makes it a potentially practical resource for health education amongst adolescents. Aforementioned, today's social media is designed to encourage interaction, sharing of information, and network expansion. "Social media combines the power of interpersonal persuasion with the reach of mass media" [17]. In theory, these tendencies of social media users to share, interact, and network allow health care providers a window into the world of adolescents, their vices, and social pressures they may face. This window offers health care providers the opportunity to engage with adolescents, gain their trust on their turf, and address unhealthy behaviors that may escape caregivers or are missed during routine health screenings.

As appealing as this opportunity may sound, the nature of social media can present a formidable challenge to those seeking to use it as a means of learning about, engaging with, and educating younger healthcare users. It requires them to keep up with the technology and trends of the various popular platforms and present their target audience with evidence-based health information that is interactive, engaging, and easy to understand.

People with limited health literacy are more likely to trust health information from social media, blogs, friends, and celebrities than the information given by healthcare professionals[10]. The quality and credibility of these sources are often lacking. This finding communicates two possibilities. Health care users who do not trust health information from those credentialed to give it may not be equipped to analyze and understand this information. Yet, another possibility exists. This sector may simply not trust medical professionals, and understandably so. This prospect presents another

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convincing reason for medical professionals to use social media to communicate health information and increase their target population's health literacy. Using social media as a platform to provide health knowledge and teach skills could potentially garner trust between medical professionals and traditionally hard-to-reach high-risk populations such as adolescents, in part due to its relatively informal nature[16].

CHAPTER 5: SOCIAL MEDIA AND WEB-BASED

INTERVENTIONS IN THE LITERATURE

Examples of social media use for these purposes in the literature are few. Those that do exist appear somewhat dated. Many of the studies took place in the early to mid-2000s and include social media sites such as Myspace, which reached its peak between 2005-2008. Many also do not have data on interventions using newer, more popular social media platforms such as Instagram, Snapchat, and TikTok.

Norman and Skinner designed the eHealth Literacy Scale (eHEALS) in 2006. This scale was initially developed studying youth aged 13 to 21 due to their internet and social media consumption and their familiarity with information technology systems and tools[11,12]. It is important to note that this tool has been used in several studies in the literature to measure adolescents' electronic health literacy. This is interesting since it is essentially a survey that asks users questions regarding their perceived health literacy and their comfort level in identifying and using "high quality," "helpful" electronic health resources. In my opinion, this data should be carefully interpreted since it does not give information that would help us appraise an individual's functional or critical health literacy. Still, this tool is valuable, because as its creators point out, knowing how comfortable adolescents are identifying, interpreting, and applying health information on the web and is helpful for clinicians looking to determine which of their patients would derive the most significant benefit from the web and social media-based health interventions. It effectively demonstrates one's communicative and media health literacy. In the interpretation of studies using this measure, I sought to keep this in mind.

The Newest Vital Sign (NVS) comes closer to an objective measure and assesses functional and interactive health literacy. This tool developed by Pfizer is based on an ice cream container nutrition label. Patients are given the label and asked six objective questions. Solving them requires basic reading, mathematical and problem-solving skills. The tool claims that providers can use these scores to ascertain whether patients have limited or adequate health literacy.

There are limited interventional studies that can be found in the literature. One such study done by Ghaddar et al., sought to examine the relationship between exposure to credible online health resources and health literacy in adolescents. This study consisted of 261 high school students in South Texas (freshmen-seniors) who were predominantly Hispanic and economically disadvantaged. At baseline, 56% of the students being studied had heard of and/or had been exposed to MedlinePlus (an online health information service curated by the United States National Library of Medicine). These students had used the resource as a part of their curriculum. 52% of all the students had adequate health literacy as measured by the eHEALS and NVS tools. Notably, exposure to MedlinePlus was associated with high eHEALS scores. In other words, these students were more comfortable seeking health information online and were confident in their ability to apply this information to new and evolving health situations. Additionally, students who had been exposed to MedlinePlus were also more likely to have adequate health literacy based on NVS scoring as well [16]. The results of this study imply that when adolescents are exposed to credible online health information resources, their health literacy and comfort with using these resources increases.

The researchers' exciting observation was that many of the students in the study also served as translators for caregivers with limited English fluency in healthcare settings and used online health-seeking behaviors to help family members. This presents another case for a focus on interventions that increase the health literacy of adolescents. Such strategies benefit this population and future generations and potentially impact the health of caregivers and older family members.

In "Friending Teens," a systematic review on the use of social media to interact with adolescents and young adults, the authors found that studies that used social media to provide health information tended to positively impact their audiences, namely by encouraging behavior change[13]. Specifically, in an intervention using Myspace, one study saw a significant reduction in online displays of risky sexual behavior after study participants interacted with "Dr. Meg" (a web profile created for a fictional adolescent medicine physician). During these interactions, subjects were provided with internet-based information about risky online practices and resources regarding STIs and safe sex. The odds of subjects removing all references to sex from their social media page after their interaction with Dr. Meg was 4.2 times higher in the intervention group than the control group (95% CI, 1.3-14.2)[14]. These subjects may have still participated in these behaviors and just refrained from referencing them on social media. These results are still significant since studies show that adolescents who reference drug use and sex often, in addition to not practicing online safety by having their profiles set to private, are at increased risk for online- victimization and sexual assault. We have all heard stories of college applicants having offers rescinded after the ghosts of social media posts past are dug up by admissions boards or the general public.

In addition to changing the display of these behaviors, researchers have successfully used social media interventions to decrease risky adolescent behaviors. One such study implemented an internet-based smoking cessation treatment program called "Stomp Out Smoking" (SOS), which was targeted to adolescents aged 12-18 across the state of Connecticut. Over the 24-week study period, subjects were given direct, credible information on smoking, its health risks, as well as pharmacotherapy that could be used for smoking cessation. Participants were also able to interact with this information by completing quizzes, interactive modules, journaling, and creating quit plans and quit notes. Additionally, SOS participants could ask private questions via direct messaging that would be answered quickly by experts. They were also able to interact with peers by utilizing discussion boards and watching videos of adolescents from diverse backgrounds discuss their journey to quitting. Notably, this intervention was hosted on a website that only participants had access to, not a social media platform. Though the study incorporated videos detailing the experiences of a diverse group of adolescents, study participants themselves were not racially diverse as 90% of participants self-identified as Caucasian. In terms of gender, there was a 50-50 split. It does not appear that researchers collected any other demographic data that might speak to study participants' socioeconomic diversity or health literacy. The results showed that the adolescents primarily accessed interactive web pages versus those that were purely informational. Specifically, the discussion group and quit plan (which were portions of the website that allowed participants to create community with each other and communicate with experts) were the most frequently accessed pages. The private ask an expert feature was the least used. There was a significant difference between males and females utilizing the site,

which has not necessarily been reproduced in other studies, but interestingly enough, is what I have encountered in my personal experience (which will be discussed in further detail towards the end of this work) in using social media as a health literacy tool[15].

In terms of behavior change, researchers found that SOS participation led to a reduction in the average number of days smoked when compared to brief office interventions alone (p=0.006). Ultimately these findings speak to the potential of internet-based interventions to produce health behavior change in adolescents. They also suggest that interventions that involve interactive methods and foster community may be more effective than providing direct information only when it comes to adolescents[15].

CHAPTER 6 :MEDICINE FOR THE CULTURE

Medicine for the culture was born out of a question about my health in May of 2020: "Which type of exercise, cardio, or strength training is more effective at lowering cholesterol?" I was able to quickly find the answer to my question using UpToDate and other evidence-based references. I was able to do this because I have been taught how scientific information is generated and how to interpret data as a medical student. Medical information is written for an audience with a similar educational background to mine. Though I had not done any formal research regarding health literacy and credible resources then, I knew from anecdotal experience that most healthcare users, especially those who belong to minority and marginalized identities, often have a deep distrust of the institution of medicine. This is in part due to a long history of medical experimentation and disenfranchisement of these communities.

Consequently, the primary source of information for those who distrust the system is usually a family member, friend, or google. Using Google to find health information is not bad per se but can be harmful if users are not equipped with the tools necessary to identify credible sources. Since the start of the COVID-19 Pandemic in March of 2020, I have viewed countless media communications; Instagram posts, videos on YouTube and WhatsApp, and TikTok's spreading information, often misinformation regarding COVID-19. This line of thinking led four other colleagues and me to start an Instagram page with a linked Facebook account to disseminate credible health information to the Black minority community that would be straightforward and easy to understand. Our target age group was 13-40years.

We wanted to create an open, safe and reliable space that would present the facts to the people without them having to interpret graphs or read complex medical jargon. In this way, we hope that this space will help Black people better advocate for themselves and their loved ones in healthcare settings. Moreover, we felt that as medical students who also happened to be Black women in America, we could begin to minister to the deeply damaged relationship between the Black community and the institution of medicine while highlighting Black excellence. As 4th-year medical students, we had already decided what medical specialties we wanted to pursue: internal medicine, psychiatry, pediatrics, and obstetrics & gynecology. This diversity has allowed us to cover a broad range of diseases, including those disproportionately affecting the Black community. We intended to accomplish the latter goal with a multipronged approach.

We would include facts, historical facts, and statistics that we hoped would communicate both the relevance of each topic to our target audience and acknowledge and validate the emotion and tensions at the root of the distrust. To create a less formal environment amongst our followers, we use topic names and relevant cultural references that we know are. We have also incorporated the expert knowledge of Black medical professionals, advocates, and community resources in our content. As an illustration, during our series on Acne entitled "Spotted," we discussed the importance of using sunscreen, even for those who are darker-skinned, and collaborated an informational video covering skincare basics with a notable Black dermatologist.

Thus far, our posts have been largely focused on providing direct information. Topics related to adolescents have ranged from understanding COVID-19 (and updates) in kids, emotional eating, sexually transmitted diseases, and healthy relationships for

adolescents. Naturally, there have also been relevant topics covered by the other content creators in our collaborative. In October of 2020, we decided to transform our initiative into a scholarly project. This allowed us to each received credit for the dedicated time we spent creating content for the page. It also allowed us to begin to collect data that we hoped would quantify our reach and help us brainstorm ways to make Medicine for the Culture better. We started using SmartMetrics, which keeps track of various parameters, including engagement rates and demographic data monthly. Based on our advisor's advice, we also began posting one question before and after each week of content (pre- and post-poll questions) that sought to assess whether or not our followers had achieved one primary learning objective for the week.

Our current data shows that our engagement rate has been steadily declining since the beginning of the data collection period (Sept 2020). Engagement rate is the number of likes and comments divided by the total number of followers. We initially set a monthly engagement rate of 5% (notably above the average Instagram engagement rate of 3%). As of February 2021, our rate was 4.63%.

| Average Post Engagement Rate + Interactions Per Month		
Month	Engagement Rate (%)	Total Interactions (Likes and Comments)
September	7.63%	39
October	6.72%	324
November	6.12%	437
December	5.32%	299
January	4.94%	830
February	4.63%	432

Table 1. Average Post Engagement and Interactions

Our increasing number of followers over time has most likely has contributed to this downtrend. Still, our data shows that when we cover hot button topics, our engagement increases. For instance, in January of 2021, we covered the COVID-19 vaccines, explaining how they worked, myth-busting, and discussing the vaccines' effects on several populations, including pregnant women and children. We felt that this was a pertinent topic when the vaccine was about to be distributed in the United States.
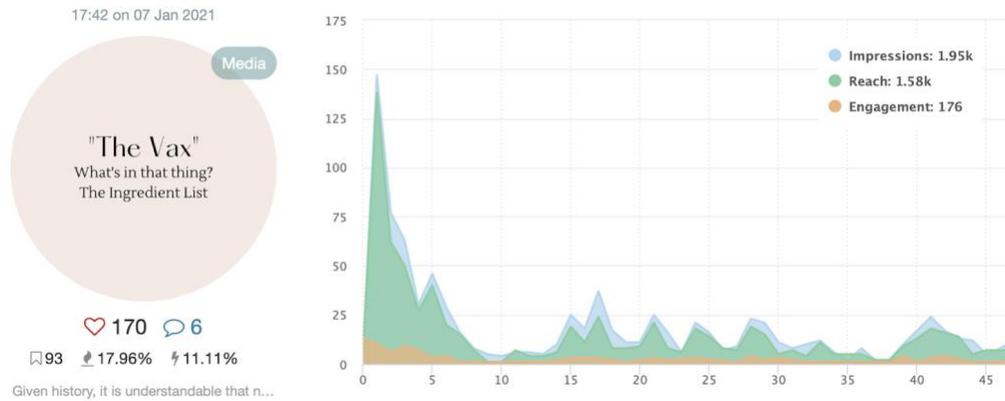
**Figure 1.** Engagement, Reach and Impressions for COVID-19 Series

Specifically, this post (January 7, 2021) has the second all-time highest engagement of all our content in this format. It detailed the ingredient list of the COVID-19 vaccine. It reached 1,580 people with 176 engagements and 93 saves.
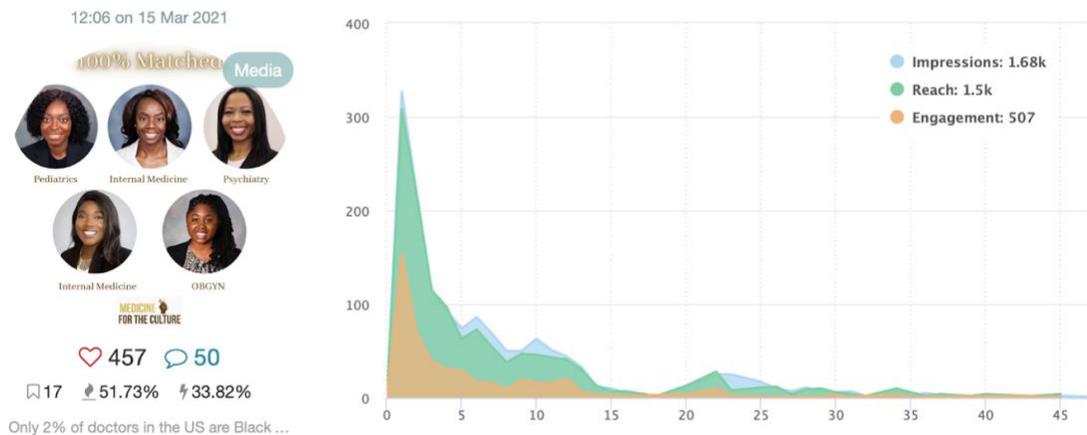
Figure 2. Engagement, Reach and Impressions for Match Day Post.

The post with the most interactions and engagements (March 15, 2021) detailed my colleagues and me successfully matching into our respective medical specialties. It reached 1,500 people with 507 engagements. Of note, this post displayed our faces compared to prior posts, which primarily show text information about various health topics. We postulate that we may increase engagement by shifting the balance of our content towards more information videos and posts in which we are featured and away from our traditional text-dominated content.

Demographics by Age

Age 45-54
2.3%

Age 35-44
9.7%

Age 13-17
1.0%

Age 18-24
21.9%

Age 25-34
63.8%
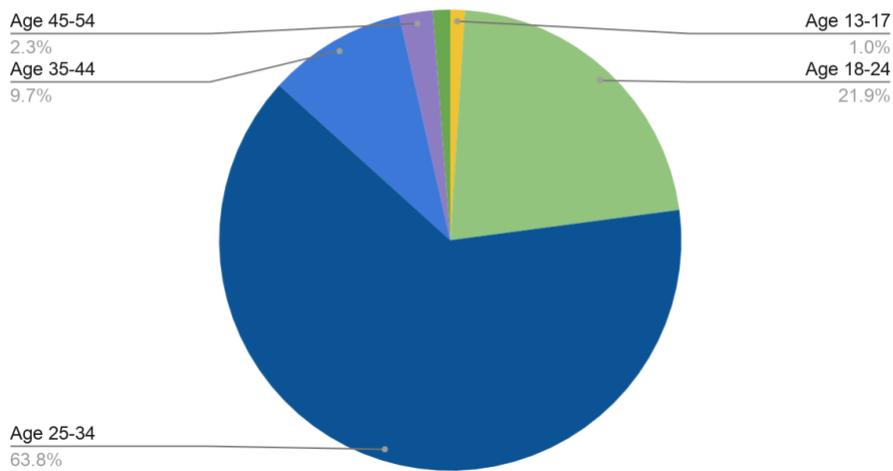
Figure 3. Demographics By Age

According to SmartMetrics, our followers are primarily between the ages of 25 and 34 (63.8%) The second largest age group were followers between the ages of 18 and (21.9%). Notably, only 1.0% of our follower count reached followers aged 13-17. Over one-third of our followers (37.43%) are from the Philadelphia area. The second and third largest demographic is in New York, New York (10%), and Los Angeles, California (6.62%).

As of March 22, 2021, Medicine for the Culture has amassed a total of 982 followers. Our follower count has steadily increased over time, with significant jump on January 10, 2021, and March 15, 2021, when we posted content on the COVID-19 vaccine and Match Day, respectively.

Total Followers

Total count of followers during selected timerange.
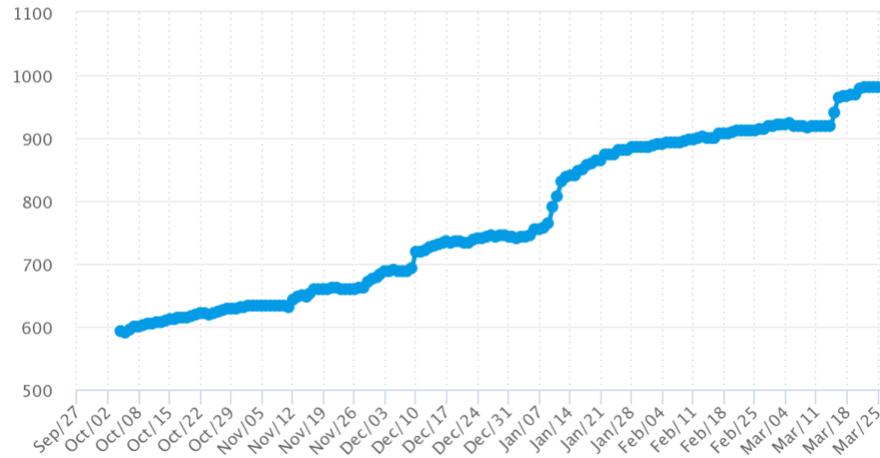
Figure 4. Trend in Total Followers From October to March 2020

Our pre- and post-poll data were still being collected and generated when this thesis was completed but preliminarily show inconsistent trends between the pre- and post-poll percentages. We hypothesize that this variability may be related to variability in who is answering these questions and whether or not they have viewed the posts at either time point.

CHAPTER 7: DISCUSSION AND AREAS FOR

FURTHER EXPLORATION

Based on several polls asking about the aesthetic, post lengths, ease of language, and relevance of topics covered, our followers seem to find our content helpful thus far. Still, we have and continue to encounter certain obstacles. Aforementioned, using social media as means to disseminate health education requires our team to keep up with current trends and emerging opportunities to engage with influencers (especially adolescent influencers) to increase our reach and engagement. This area still needs improvement, as demonstrated by the small number of followers between ages 13-17. We have also had to keep up with changing algorithms of the platforms we use to maintain our content's visibility on our followers' feeds. Instagram used to run based on a chronological feed. In 2021, the algorithm has evolved to include interest (users are shown posts similar to those they have already liked or interacted with), relationship (users are shown posts by accounts they have some sort of relationship with such as family, friends; also assessed by engagement with previous posts first), and among other things. Additionally, as we returned to the usual medical school workload in mid-2020, we found that creating quality content became more difficult. Finding the time to meet as a team required scheduling gymnastics at times.

Even though our demographic data does not include race, it is evident to us that we are not quite reaching our target population based on the types of accounts that make up most of our following (mainly college students and healthcare professionals). One possible solution would be to canvas Black businesses in areas where our target

demographic lives, for example, North Philadelphia, where Temple University Hospital (TUH) is located. We might also consider leaving fliers at primary care offices and posting them in the elevators of TUH. We are also in the very early stages of creating and selling merchandise to cover potential advertising costs.

We still plan to collect pre- and post-poll data but might consider setting more straightforward objectives for each week's posts and basing questions on these objectives to create more uniformity in our assessments. In addition to this, as we approach the beginning of the next phase of our medical training, we plan to transition to a more video-based approach to disseminating knowledge and increasing functional health literacy. We might also brainstorm strategies to foster community amongst our followers using our Instagram and/or Facebook pages as a base. We believe that this will save us time and boost our engagement rates. We plan to seek grant funding to sustain our data collection and expand our team to include interns and research assistants.

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