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Mitigating Covid-19 Infection Rates and Increasing Vaccination Rates for Children Ages 5-11:
A Content Analysis of How Two Hospitals' Use of Effective Social Media Engagement Helped
to Influence a Healthier Public

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Submitted in Partial Completion of the
Requirements for Departmental Honors in Communication Studies

Bridgewater State University

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Abstract

The Covid-19 outbreak initiated an international public health crisis, altering our public's dependency on health organizations' communication strategies and tactics. Immediate crisis communication and public health efforts were needed to mitigate panic and infectious disease across the globe. The digital marketing strategies utilized for social media began to reflect the value of accurate and timely information spread in correlation to a healthier targeted public for large health organizations. The significance of this thesis in the field of communications directly correlates to the health belief model, which is used to observe the motivation and decision-making processes that influence an individual's choice to seek medical intervention. This Quantitative Analysis approach will use qualitative and quantitative research studying two out-of-state hospitals from leading health organizations and analyze their promotional success and failures concerning pediatric Covid-19 rates, specifically children ages 5-11. After analyzing the hospital's social media engagement metrics, data comparisons will be drawn to establish a correlation between effective communication and a healthier, informed, and motivated public through increased engagement as a factor for these health outcomes. I will begin by analyzing three chosen social media platforms: Instagram, Facebook, and Twitter. My analysis will compare Children's of Alabama with records of high pediatric Covid-19 infection and Boston Children's Hospital with lower records of pediatric Covid-19 infection rates. This will lead to an informed analysis focusing on which hospital's social media accounts are most engaging, resulting in their public being well-informed and motivated to act as a healthier public when reflected in their infection rates.

Keywords: Covid-19, Vaccine, Health Belief Model, Infection rates, social media, Engagement

Introduction

Starting in December 2019, the World Health Organization (WHO) informed the public of the initial alarming reports of a virus named SARS-CoV-2, with earliest cases linked to Wuhan, China. What had originated from small clusters of “pneumonia of unknown cause”, quickly shifted to a rapid spread of the highly contagious acute respiratory disease caused by this virus later termed Covid-19 by the Center for Disease Control (CDC).^{1} In January 2020, the WHO Director-General declared the novel coronavirus outbreak a public health emergency of international concern; therefore, this highest level of alarm alert corresponded with the United States record spikes in Covid-19 cases globally. By March 11, 2020, the WHO officially categorized the outbreak of Covid-19 as a pandemic, alluding to the severity of its risk to our country’s public health. The infectious rates were higher than ever; however, the public was susceptible to risk as they awaited timely and accurate information from public officials and health organizations. Two years later, the United States along with the rest of the world have endured the consequences of this virus, forced to adapt, and contain the spread of the infectious disease. Due to research and the quick development of vaccines, the way in which this critical information was distributed to the public proved to directly affect the spread of infection rates. More recently, the discussion of approving vaccinations for children has been of top priority for hospitals, to ensure pediatric patients are also protected from the spread of Covid-19.

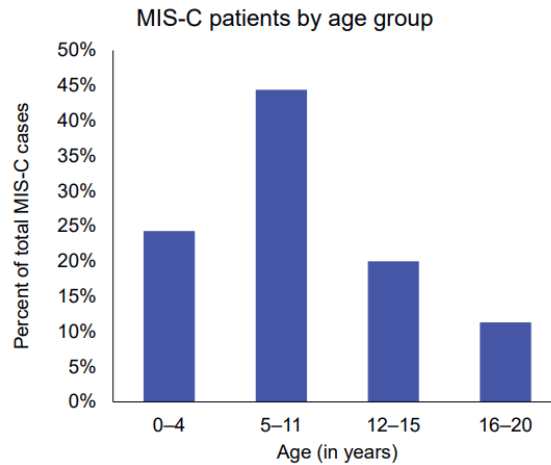
Health experts have expressed concerns regarding the significant health risk for children during the Covid-19 pandemic. Vaccine distribution efforts were primarily focused on adults in the early stages of the pandemic, targeting the most vulnerable and susceptible to hospitalization. However, alarming data showing large populations of pediatric infections and health complications connected to the virus exposed the need for vaccine approval within this age group

as well. ^{2} Research documented by Yale Medicine noted that there are approximately 17 million children in the United States between ages 12 to 17 who became eligible for the Pfizer vaccine in May. Well above that number, the CDC documents 28 million children between the ages of 5 and 11 years old in the United States who are also at risk. Out of that population, 2 million children have been diagnosed with Covid-19, leading many to experience a range of mild to serious illness and hospitalizations (CDC). Data has proven that children are just as likely to be infected with the virus. As of October 2021, children ages 5 through 11 years have experienced more than 8,300 Covid-19 related hospitalizations and nearly 100 deaths, ranking as one of the top 10 causes of death for children in this age range. According to the U.S. Food and Drug Administration (FDA), that makes up 39% of cases in individuals younger than 18 years of age (FDA). Medical experts hope approval for this age group will spur more parents to have their eligible children get the shots; therefore, benefiting the community at large (Macmillan, 2022).

Multisystem Inflammatory Syndrome (MIS-C)

^{3} Health complications linked to the virus include multisystem inflammatory syndrome (MIS-C). This condition has been proven to cause body parts to become inflamed, including the heart, lungs, kidneys, brain, skin, eyes, and gastrointestinal organs. ^{4} Dating back to the start of this pandemic, more than 2,300 cases of MIS-C have been recorded in connection with Covid-

19, leaving children with underlying medical conditions at heightened risk for serious illness just as we have seen with adults.



Note: Adapted from ^{4} “CDC Covid Data Tracker.” *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, <https://covid.cdc.gov/covid-data-tracker/#mis-national-surveillance>.

^{5} According to the National Library of Medicine (NLM), Children by age 5 are ready to start learning in a school setting. The first few years of a child's development focus on learning the fundamentals. The physical and behavioral development during these early years is crucial for a child's natural progression as their brain develops. Considering that secondary transmission from young school children occurs both in the household and in the school setting, the loss of in-person learning has been linked to cause many more adverse social and emotional outcomes. In response, the motivation behind vaccine approval and distribution among this age range by the ^{6} FDA reflects the urgency needed for vaccines to provide children the opportunity to protect themselves if they choose. Within the 5–11-year-old range, there are many key stages for adolescent development that are worth preserving. Furthermore, this data proves the need to alleviate Covid-19 restrictions for students through the administration of this vaccine to avoid

more serious health complications to be brought on as a result from this disturbance to critical time lost in the classroom.

On October 26th, 2021, the FDA and Center for Biologics Evaluation and Research (CBER) held a meeting to discuss a request to amend Pfizer-BioNTech's Emergency Use Authorization (EUA) for administration of their Covid-19 mRNA vaccine to children 5 through 12 years of age (FDA). ^{7} Influenced by the unmet need of prevention methods for this age group, Pfizer-BioNTech unveiled their support of a 10ug dose level administered as a series of 2 doses, 3 weeks apart for children ages 5 years of age and less than 12 years. With evidence supporting all safety data expectations and 90% efficacy data, the ^{7} FDA's presentation found immunobinding success criteria were met for 5 to < 12-year-olds, and the two-dose series was highly protective against the Delta variant. This data serves as the foundation for the purpose of this thesis paper, to further observe how this information was relayed and utilized to ensure the public, specifically pediatric populations, were targeted correctly. Here, the health belief model can be applied to understand both the limitations and successes of health organizations and hospitals to improve the public's overall feelings towards protecting their health and holding the belief to protect their children against Covid-19 through this vaccine. The final decision, as included in a factsheet issued by the FDA, states that the Pfizer-BioNTech Covid-19 Vaccine was authorized for use under an Emergency Use Authorization (EUA) for, "active immunization to prevent coronavirus disease 2019 (Covid-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in individuals 5 years of age and older".

Literature Review

Social media has taken over the world as a massive marketing machine powering business and large organizations to operate and interact with its public. ^{9} According to the Coalition for Public Relations Research Standards, “Engagement is defined as some action beyond exposure and implies an interaction between two or more parties. Social media engagement is an action that typically occurs in response to content on an owned channel” (David Geddes 2014). Social media engagement metrics correlate as empirical research used to conclude a public's actions. These actions taken by individuals exposed to the content, in the form of a media graphic, video, boomerang, or a basic picture, can be used as evidence in concluding whether a social media campaign was effective.

As mentioned in the journal piece by Linjuan Rita Men and Wan-Hsiu Sunny Tsai, there are many perceptual, attitudinal, and behavioral outcomes of an organization revealed through public engagement on social networking sites. The journal states, “Much different from traditional media controlled by organizations, social media are user-centered, allowing individual users to play the role of gatekeepers (Muntinga, Moorman, & Smit, 2011) ^{10}. Users not only engage with organizations through liking, commenting, and sharing, but also proactively create content for organizations within their personal social networks” (Men & Tsai, 2014) ^{10}. Ultimately, these platforms have offered insight into the new and effective ways engagement should be created, distributed, and measured; furthermore, leading to the influence it will have on the public.

One way to measure this response would be to interpret engagement levels on social media. Consequently, this data provides a look into the behavioral patterns of public health practices for a community at large. While still adapting to the ever-changing trends of digital platforms, the Covid-19 pandemic certainly stands as an exemplary public health crisis detailing

the detriment of misinformation and irresponsible digital marketing. Following verification measures from professionals, health organizations have been able to utilize social media as a catalyst for improving the overall health of its public. This persuasive power lends to great potential for health organizations to use this engagement with patients, families, and communities at large to generate interest and stay engaged.

Methods

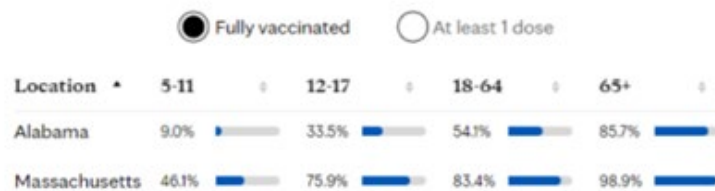
In order to comprise the data, posts from every Monday were documented after October 1st, 2021, and analyzed for the quantitative portion of this content analysis. October 1 marks the initial month that the vaccine was approved for 5–11-year-old children. The content was logged by date, and the following consecutive posts from October 1st were chronologically logged to be referenced. There was no bias in these selections to uphold the integrity of the data. The ending point for the content marks the last month of this research on April 1st, 2022.

The content being analyzed in this study will observe Boston Children’s Hospital and Children’s of Alabama. The Health Belief Model will be used as a guide to observe the power of influence in the decision-making process. The most effective strategies used by these hospitals will be broken down to uncover the power engaging social media content can have on transforming a public’s belief on Covid-19 information. This information on vaccinations for children ages 5-11 will be the focal point of the study, and social media content data will be documented and analyzed to conclude which hospital contributed to its public’s health outcomes most effectively. Boston Children’s Hospital, ranked #1 for Massachusetts, also stands as an internationally recognized pediatric hospital. Records point to a high vaccination rate, and significantly low infection rate among its population in Massachusetts. In contrast, Children’s of

Alabama, also ranked #1 in their state, serves a population with significantly lower vaccination rates and high infection rates among pediatric patients. ^{11} The breakdown of cases reported in

State COVID-19 vaccine rates by age

This chart shows the percentage of the population of each state that has received a vaccination, broken down by age group. Kids 5 and older can get the vaccine in the U.S.



Alabama by age revealed that 4.3 percent of that population account for 5–11-year-olds. Only 10.5 percent of children in the 5- to 11-year-old age group have received at least one dose of the vaccine. (Katrina Skinner, M.D., 2022). To redirect the significance of studying these two hospitals, the following chart documented by the ^{12} Mayo Clinic, breaks down the following percentage of the populations who are fully vaccinated from each of the selected states (Mayo Clinic).

Note: Adapted from “U.S. Covid-19 Vaccine Tracker: See Your State's Progress.” Mayo Clinic, Mayo Foundation for Medical Education and Research, <https://www.mayoclinic.org/coronavirus-covid-19/vaccine-tracker>.

For the purpose of understanding the differences between both states, Table 1 shown below provides a detailed breakdown of the two hospitals being observed based on their population size and social media audience. Based on this table, we are able to see the state populations reflected, as well as the total percentage of the population that has been infected with Covid-19. In addition, the audience for social media is also observed to serve as a focus point. Massachusetts has the larger population and social media following by far for all 3 platforms. Alabama has a

smaller population and a significantly lower social media following; however, its vaccination rate is noticeably lower by about 28% despite the 3.7% infection rate per population. The following hospitals were both recognized as top pediatric hospitals in their state, leading this content analysis into a deeper analysis on how these organizations outreach strategies are contributing to its public’s protection from infection.

Table 1: Population Data as of April 1st, 2022

Hospital	State Population	Covid infection rate per state (all ages)	% Of population that has been infected	Fully vaccinated	At least 1 dose	Instagram following	Facebook Following	Twitter Following
Boston Children’s Hospital	6,850,553	1,724,369	3.9%	78.4%	95%	61,8000	696,380	64,7000
Children’s Of Alabama	4,876,250	1,297,869	3.7%	50.8%	62.4%	11,6000	87,963	12,8000

Note: Adapted from By. ^{11} “Alabama Coronavirus Map and Case Count.” The New York Times, The New York Times, 1 Apr. 2020, <https://www.nytimes.com/interactive/2021/us/alabama-covid-cases.html>.

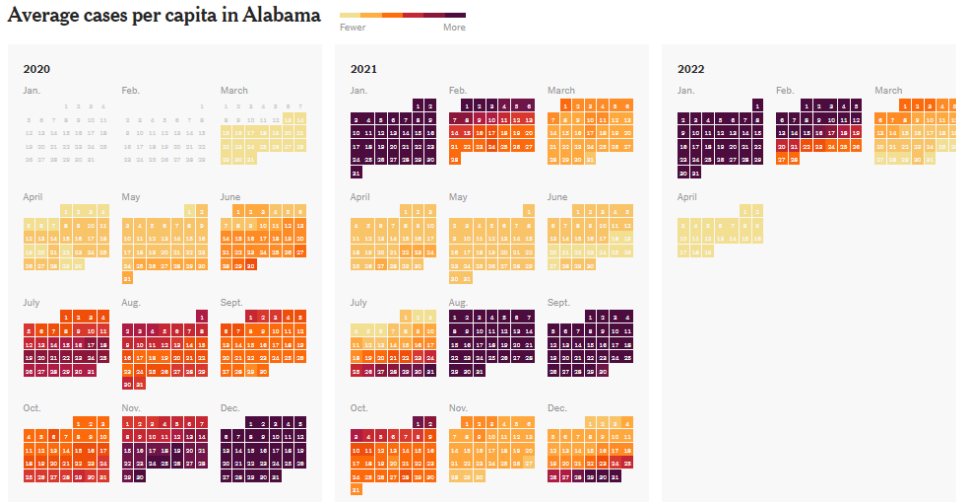
Measurement

Hospitals use of social media can be critical to influence case numbers, reaching large audiences with accurate and vital information. ^{13} According to Pew Research Center, Facebook, Instagram, and Twitter, were among the top social media platforms used by adults in the United States.

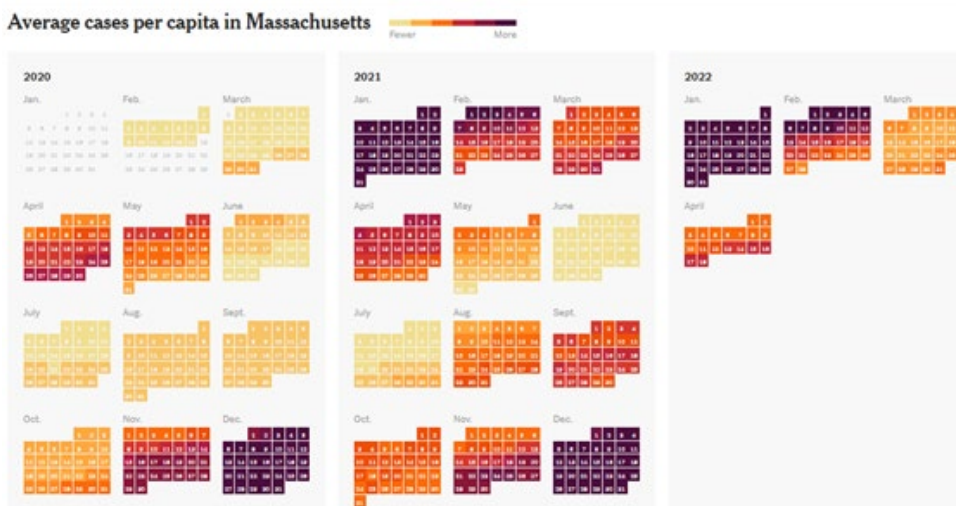
Based on the data reflected in the charts below, June 2021 reflected a period in which both states were in the same zone in terms of low case rates. In order to measure the long-term success of both hospitals’ social media engagement effectiveness, all social media posts

pertaining to Covid-19 from June of 2021 to present day April 2022 were collected. In terms of short-term sample data, all posts after October 1st, 2021, were compressed to twenty posts per platform. The purpose of this content analysis was to observe how the social media content performed following the initial emergency use authorizing for 5–11-year-old being eligible for the vaccine. The social media data will be used to compare active engagement effectiveness and its effect on the outcome for overall infection rates per state.

Average cases per capita in Alabama



Average cases per capita in Massachusetts



Note: Adapted from By. ^{14} “Alabama Coronavirus Map and Case Count.” *The New York Times*, The New York Times, 1 Apr. 2020, <https://www.nytimes.com/interactive/2021/us/alabama-covid-cases.html>.

Types of engaging content

Video: 54%
Images: 53%
Text-based posts: 30%
Stories: 26%
Live Video: 25%

Note: Adapted from “Building Your Social Media Marketing Strategy for 2022.” Sprout Social, 13 Apr. 2022,

Social media engagement can be analyzed in various ways. The basic metrics that are primary sources of data include: likes, comments, shares, and re-posts to name a few. Other important factors to consider are followers, views, and the frequency of posts; furthermore, the reach each hospital has on its public will directly affect the overall influence of action. The following breakdown by ^{16} Sprout Social reveals the types of content marketers say are the most valuable for social goals.

Table 2: Valuable Content Type

Statistics specifically about engagement reveal the social media strategies these hospitals should be utilizing. Just as observed in the Health Belief Model, the perception and awareness highlighted in the social media content is critical, leading to the decisions patients and their families are making regarding their health. For the purpose of this content analysis, all social media content was collected and conceptualized based on the type of engagement. two categories: active and passive posts. Some examples of active content are comments, shares, likes and other reactions. The passive categorized posts are more neutral, where clicks, views,

and hovers are accounted for when data mining. Both of these forms of engagement are equally important to understand; however, when it comes to increasing engagement and encouraging the spread of updated information, active engagement will help a page grow. The data reflected in the charts below represent the active engagement metrics for both hospitals since proven to be more effective than passive engagement.

Table 3 below analyzes both hospitals Instagram use. While Children’s of Alabama has a fraction of the following compared to Boston Children’s Hospital, their shallow engagement consisting of likes and impressions was comparable. Both hospitals use of Instagram were similar: Instagram is a platform where content is posted inconsistently and shallow engagement such likes on stories were the only form of engagement.

Table 3- Instagram

Hospital	Likes	Comments
Boston Children’s Hospital (out of 8 total posts)	5896	113
Children of Alabama (out of 26 total posts)	5372	80

Instagram was the least consistent platform in terms of observing frequent posting patterns. Boston Children’s Hospital does not post on a consistent basis. From June 2021, only eight total posts were collected relating to Covid-19 while Children’s of Alabama logged 26 total posts. This disparity between the two accounts made the data relevant, but not extremely telling in terms of contrasting health outcomes for the state population.

According to ^{17} Sprout Social, “Instagram leads in terms of engagement. People are actively engaging on Instagram by commenting, liking, and sharing at a rate 84 times more than Twitter, 54 times more than Pinterest, and 10 times more than Facebook” (Brent Barnhart).

Instagram is limited in ways users can interact with a post or an account. Users can leave likes and comments, visit links and profiles. The main themes in content were basic images, showcasing children in Boston Children’s Hospital with a clever and feel-goof caption. Children of Alabama on the other hand posts a lot of text-heavy graphics and images.

Table 4- Facebook

Hospital	Likes	Comments	Shares
Boston Children’s Hospital	3621	1022	761
Children’s of Alabama	1514	240	1047

Facebook uses a complex mix of engagement metrics, where over a billion users are active daily posting or simply viewing content. ^{18} An article by Kenny Knovak from 2018, breaks down Facebook content into two categories: active and passive posts. Some examples of active content are comments, shares, likes and other reactions. The passive categorized posts are more neutral, where clicks, views, and hovers are accounted for when data mining. Both of these forms of engagement are equally important to understand; however, when it comes to increasing engagement and encouraging the spread of updated information, active engagement will help a page grow.

The data above represents the active engagement metrics for both hospitals. While Children’s of Alabama has less of a following, their social media content clearly has a positive result on its audience with comparable number to Boston Children’s Hospital. Both hospitals utilized an identifiable posting frequency, averaging one post per day which remained consistent from June 2021 until April 2022. Boston Children’s Hospital appears to be more effective with the likes; however, it is interesting to note Children’s of Alabama with an increased number of shares despite their smaller audience.

According to Jason P. Richter “Hospitals that had a Facebook page were active on Facebook in the past 30 days and had more “likes,” had more patients willing to definitely recommend the hospital and had a higher overall satisfaction score.” When it comes to healthcare specifically, a ⁽¹⁹⁾WEGO Health behavioral intent study found that Facebook was the most popular platform. Research conducted shows 87% of study participants say they share health information via Facebook posts, and about 91% of participants said online communities play a role in their health decisions. The power is in the hands of these hospital organizations to re-define the relationship they have with patients and their families. Rather than throwing a post-up to benefit the hospital, the key to driving engagement should remained focused on the value the information or content brings to the public.

Table 5- Twitter

Hospital	Likes	Comments	Retweets
Boston Children’s Hospital	121	3	39
Children’s of Alabama	103	9	26

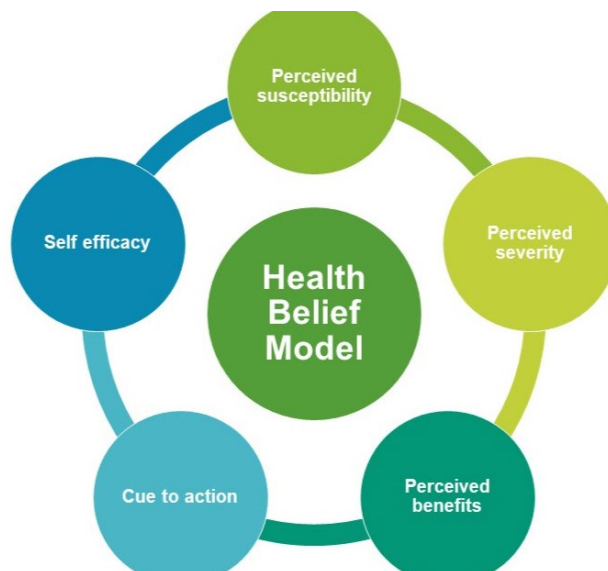
Twitter engagement is very similar to Facebook, and users engage with actions such as “like” (formerly the favorite), retweets, and replies. Boston Children’s hospital has a greater active engagement level with active retweet data.

Health Belief Model

Health organizations have a responsibility when using social media, to contribute to the public's access to critical public health information, education, and resources. Given the current topics focusing on the Covid-19 vaccine for pediatric patients ages 5-11 and safety protocol, the response and perception of a public can be heavily influenced by these digital marketing efforts proposed above. This process incorporates aspects of the health belief model, focusing on the

correlation between a human's belief system to act on a health concern and based on the initial action taken after exposure to social media.

A brief analysis of the health belief model focuses on the psychological analysis of the many patterns of individual behavior, in order to positively influence behavioral change. Ultimately, this theory analyzes the various motivations, influences, and factors involved in an individual's decision-making process in regard to their health and vulnerability to become susceptible to disease or illness. This theory focuses on the descriptive process and various components of one's personal desire to avoid disease or illness, and the desire to recover from possible side-effects of illness or health risks. Next, the Health Belief Model calls to incorporate the understanding of one's personal beliefs, relating to their ethnicity or culture, as well as one's ability to prevent or protect against the illness in the first place. A course of action paired with the behavior of an individual, will also be dependent on their personal perception of the benefits and barriers related to the proposed disease or illness prevention methods.



Source: "Health Promotion." *World Health Organization*, World Health Organization, <https://www.who.int/news-room/questions-and-answers/item/health-promotion>.

The health belief model focuses on the broader scale of understanding the physiological process involved in forming an opinion. Relating to a parent's decision to vaccinate their child against Covid-19, the parents or child's willingness to get the vaccine, there must first be acknowledgment and a desire for change to occur. The process includes observing perceived susceptibility of infection given medical history or doctor discretion, perceived outcome severity of potential exposure, as well as the many threats, barriers, benefits, and self-efficacy involved in the decision-making process. All of these factors lead to an individual recognizing the need to vaccinate their child to better their health and avoid illness. This process is crucial to open the individual up to become more receptive to advice from health professionals, or through effective social media marketing promotion. In terms of limitations, ^{21} this theory does not touch on analyzing the attitudes, beliefs, or other personal determinants that dictate a person's acceptance of a health behavior. Also, it does not suggest a strategy for changing the mind of a parent, but rather allows more knowledge and self-reflection to ultimately lead a person down the path of an eventual change in attitude. Again, this is an opportunity for hospitals to influence this decision and responsibly promote the vaccine for 5–11-year-old children by targeting their parents. A very apparent limitation of this theory focuses on the inequality among different minorities when it comes to the resources available. ^{21} "This theory assumes everyone has access to equal amounts of information to properly inform them on the risks" of continued tobacco use. Inequalities exist such as discrimination on the basis of gender, race, or socioeconomic status, specifically in hospitals. Without proper access to education, resources, or opportunity, the "cues to action" in many cases are not as effective; however, this theory does not measure the differing levels of education on the basis of initial promotion. In terms of overall success this theory measures against successful behavioral change, ^{21} "The individual constructs are useful,

depending on the health outcome of interest, but for the most effective use of the model it should be integrated with other models that account for the environmental context and suggest strategies for change.”

Four variables are analyzed within this theory: the first is an understanding or risk of susceptibility. As stated in the first journal titled, “A Meta-Analysis of the Effectiveness of Health Belief Model Variables in Predicting Behavior, Health Communication” written by Christopher J. Carpenter, {20} “the model argues people will be more motivated to act in healthy ways if they believe they are susceptible to a particular negative health outcome” (Carpenter 661). The motivation to change must first be sparked by the individual who recognizes their health may be at risk. The content that could fill this belief could be infographics or charts posted by the hospital showcasing alarming consequences of having a child be infected, with urgent messaging to vaccinate. The second variable focuses on the individual evaluation of the severity of the perceived health risk. This pattern of thought evolves from the simple understanding that there is heightened risk for susceptibility {20}. This theory uses each process in linear function to evaluate an individual’s ability to recognize the need for change or correction to apply the suggested healthy behavior preventing illness or disease. The third variable of the Health Belief Model evaluates an individual’s beliefs regarding their perception focused on if they will benefit from the suggested health behavior change. Once motivated to realize a need for behavior change, {20} “The individual must perceive that the target behavior will provide strong positive benefits. Specifically, the target behavior must be likely to prevent the negative health outcome” (Hyman et al., 1994). This type of content can include vaccination site information, hospital mask mandates, and other timely information. Lastly, the final variable intends to look into an individual’s perception of the perceived barriers that may or may not lead to sustainable efforts

tailored to begin the process of shifting health behavior. As the reading states, {20} “if people perceive there are strong barriers that prevent their adopting the preventative behavior, they will be unlikely to do so.” This theory uses a descriptive approach looking into an individual’s cognitive understanding and self-reflection based on their current health behaviors. This also included positing timely hospital updates, case numbers, and total vaccination rates to enforce that other people are acting.

The Meta-analysis of the Health Belief Model titled, “TABLE 1: Effect Sizes, Study Information, and Moderator Coding”, was conducted by Hunter and Schmidt’s (2004) {20} to evaluate the correlations between the HBM variables listed above, and their differing health behavior change outcomes ranging in behavior type. A few of the health behaviors evaluated here consist of the promotion to quit smoking, dental care, mammograms, condom use, exercise, and influenza vaccination, just to name a few. {20} Approximately half of these health behaviors within the meta-analysis were conducted as an outcome behavior serving as a treatment for illness, while the other half of the study focused on prevention behaviors of an illness. Overall, it is clear that these behaviors were centered around a focus of action to change the belief of a behavior, or an intent to recognize a need for change. The meta-analysis and overall health belief model {21} focus more on the definitive behaviors and psychological analysis that fall under the theory, rather than suggesting potential solutions for changing these behaviors.

Timeline

Hospitals use of social media can be vital to contribute to forming a person’s desire to change, influencing future behaviors once a psychological analysis has already been initiated. The following charts break down the messaging both hospitals used to provide an overview of

the various categories the content fulfilled message types. In order to comprise the data, twenty posts documented after October 1st, 2021, were analyzed. This timeline is used to observe a sample group of 20 pieces of content posted on both hospitals social media accounts following the initial month that the vaccine was approved for 5–11-year-old children as noted before. This content was logged by date, and 20 consecutive posts from October 1st were chronologically logged to be referenced. There was no bias in these selections to uphold the integrity of the data.

CHART 6- Health belief model messaging

Platform: Instagram

Start of content collection: October 2021

End of content collection: April 2022

Hospital	Message type (1)- Susceptibility	Message Type (2)- Severity	Message Type (3)- Benefits	Message Type (4)- Barriers	Message Type (5)- Cue to action	Message Type (6)- Self-efficacy
BCH (7 total posts)	2	2	0	1	2	0
CoA (26 total posts)	3	3	8	7	3	2

CHART 7- Health belief model messaging

Start of content collection: October 2021

End of content collection: April 2022

Platform: Facebook

Hospital	Message type (1)- Susceptibility	Message Type (2)- Severity	Message Type (3)- Benefits	Message Type (4)- Barriers	Message Type (5)- Cue to action	Message Type (6)- Self-efficacy
BCH	3	2	7	0	5	3
CoA (20)	6	3	2	3	6	0

Chart 8- Health belief model messaging

Platform: Twitter

Start of content collection: October 2021

End of content collection: April 2022

Hospital	Message type (1)- Susceptibility	Message Type (2)- Severity	Message Type (3)- Benefits	Message Type (4)- Barriers	Message Type (5)- Cue to action	Message Type (6)- Self-efficacy
BCH (20)	2	2	4	1	9	2
CoA (20)	2	2	7	0	9	0

Discussion

Using the Health Belief Model theory, the decision-making process was revealed to be highly influenced by social media use, particularly shown effective by Boston Children’s Hospital through their greater engagement metrics. The content distributed that called for low barriers and clear cues to action, were clearly most effective for targeting parents regarding their decision to vaccinate their 5–11-year-old child. This does not include other factors such as political state status or policy limitations. Boston Children’s Hospital was documented to have used more profound and active content, leading their audience to be more engaged and interactive with the media and information spread. Profound engagement consisted of content that focused on call to actions and did not focus on barriers per the health belief model. The engagement metrics for Covid-19 related posts focused on content centered around educating the public, putting a story and face behind a statistic to resonate with its audience.

Conclusion

The purpose of this study was to analyze how hospital organizations, such as Boston Children’s Hospital and Children’s of Alabama, utilized social media engagement strategies to create a healthier, informed, and motivated public regarding vaccinating their child against Covid-19. For a hospital such as Boston Children’s Hospital, the statistics proved active and profound engagement suggest that the low infection rates for Covid-19 in Massachusetts are a

result of a more educated public. For the 5–11-year age demographic, the state data can be broken down by referencing the child infection rate data. Effective strategies for hospitals should focus on engagement. This suggests that patients and their families trust the content being distributed, and their beliefs and actions are more closely connected to the hospital. As shown in the data in this content analysis, the more frequently a hospital posts, the greater the engagement and chance of an audience resonating with the information being provided; therefore, the engagement metrics will be more profound. This conclusion proves profound engagement from a hospital leads to a healthier and more informed public, resulting in lower Covid-19 infection rates. Furthermore, the likelihood of children ages 5-11 receiving a vaccine will increase and the infection rates will go down.

Limitations and Future Research

A limitation is that the findings of this research cannot be solely considered as a primary cause-effect for infection rates within this age group. While the social media reach and engagement level clearly indicates an influence on the health behaviors and beliefs of the hospital's public, other factors such as state policy, political status, and size must also be considered to make a full conclusion. Also, the vaccination status referenced in this content analysis focused on patients receiving 2 doses; however, other considerations such as booster shots and more for the immunocompromised must also be factored in for future research and conclusion. These findings could be generalized to a broader definition of fully vaccinated. In addition, all of the posts were not included in this analysis. This indicates room for future research to be conducted to continue the study's findings. These significant differences in social media enjoyment metrics between the two hospitals and the type of health belief model messages could lead to an all-encompassing conclusion for future work.

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