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CommonHealth, a journal of the College of Public Health at Temple University, is a peer-reviewed, open access journal for rapid dissemination of high-quality research and scholarship related to all aspects of public health. The Editorial Board includes faculty and student representatives from across the College's departments. Membership of the Board aligns with the CPH's mission to promote transdisciplinary collaboration and develop the next generation of leaders in research, scholarship, service, and innovation. The journal serves as a training opportunity to prepare students for successful engagement with the broader academic community.

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*Common*Health

A Journal of the College of Public Health at Temple University

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INTRODUCTION TO THE SPECIAL ISSUE
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How You See Me Matters

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Vice President for Public Affairs, Temple University

As a Black person, much of my personal and professional life has been consumed with the question of how and why the health of Black people is adversely impacted by race and racism. Whether it is living in poverty with limited food options, attending worn-out schools, or holding lower-paying jobs with more difficult working conditions, racial oppression causes chronic stress and trauma. Persistent stress and trauma are associated with physical disease, anxiety, depression, and overall compromised health, contributing to a cycle of inequity perpetuated by systemic racism. This is not to say that most Black people in the U.S. live in poverty; in fact, we do not. But because of racism, a disproportionate share does. In 2020, 8.2% of White people in the United States lived in poverty compared to 19.5% of Black people.

However, poverty and its traveling partners noted are not the only sources of chronic stress for Black people. Regardless of socio-economic class, Black people live with the threat that any encounter can, without provocation, lead to emotional or physical violence, or even fatal conflict, because we are perceived as a threat or a problem.

Neuroscience tells us that the pain from social exclusion and the pain from physical injury or illness travel the same neural pathways. So, whether we have been punched in the face or excluded from an opportunity because of systemically racist practices, we experience the same pain. The bottom line – images, messages, and actions, whether they are direct or indirect, that signal that we are left out, not worthy, or viewed as "lesser than," cause real pain. These experiences of marginalization and exclusion register as pain in the brain, which we experience throughout the body and psyche -- including elevated systolic blood pressure, increased anxiety, and low self-esteem.

And research shows that when we do get sick, African American patients receive a lower quality of care than their white counterparts, despite presenting with comparable medical conditions, insurance, income, and age. This disparity in quality of care is linked to higher death rates among African Americans and despite changes in medical school curricula, racial disparities in health outcomes persist. Although medical schools began adding cultural competency to their curricula in the early 2000s, researchers have confirmed that racial health disparities are due in part to the biases and prejudices of healthcare providers. Add to this a severe shortage of culturally competent psychiatrists who are highly trained to understand and deal with trauma, and interactions with medical personnel tend to be characterized by mistrust, misdiagnoses, and mistreatment.

The root problem of disparities has always been the self-interest of those with power. Even though humans are nearly 100% the same genetically, through the ages individuals embraced a false story that paleness equaled superiority. Worth, value, and opportunities were provided based on how someone looked in a way that placed certain individuals and communities at a disadvantage and gave others an advantage in a variety of areas including education, employment, criminal justice, and health care. Americans justified slavery and the discrimination that followed by saying that Black people were inherently inferior and were not entitled to the same opportunities and resources as their white counterparts.

Racial equity is about correcting this false belief in the superiority of one race over another. The racially-marked social hierarchy flowing from this false belief has been used for centuries to justify discrimination. Racial equity strives to create opportunities for those who have historically been denied access to societal institutions. While progress certainly has been made, a false belief in racial superiority continues to impact the overall quality of life for most Black people, even today.

Here is why. Although the Thirteenth Amendment abolished slavery in 1865, discriminatory laws and policies continued to exclude Black people from access to educational opportunities, employment, housing, and healthcare throughout the next century. While the letter of the law changed in the mid-1960s to prohibit discrimination in education, employment, and housing, engrained racism still lurks behind present-day struggles.

Black families that were, by law, denied equal opportunities for housing and employment until the mid-1960s ended up, for the most part, clustered in urban areas with higher rates of poverty and lower property values. It is not surprising that Black families have lagged behind their white counterparts in terms of earnings and net worth ever since. This is largely because schools in wealthy communities, of which Black people were rarely a part, had the most resources, and schools in the poorest communities, in which Black people were disproportionately overrepresented, had far less. Access to education is one of the primary tools for upward mobility. We know that the higher the quantity and quality of our education, the better positioned we are for jobs in terms of working conditions and pay. This, in turn, may shape societal factors such as poverty and crime, as well as individual factors such as health, emotional wellbeing, and quality of life.

The good news is that opportunities to make a difference abound.

First, recognize that how you see me matters. Reject the notion that one group of people is superior to another based on the color of their skin--an idea that has been used for centuries to justify unequal treatment. Embrace the notion that the worldview (the traditions, history, and value system) of any cultural group – whether European/white, African/Black, Asian, Hispanic, or Native American – is just one among many. While there are differences in worldviews there also are commonalities, and none is better, universal, or the standard. None is entitled to supersede the variety of other perspectives in which people proudly center themselves. All people are entitled to the highest level of health and well-being as a basic human right.

Finally, think about how you can leverage your strengths and abilities to make changes in your sphere of influence. You do not need to do everything. You can do just one thing in your local community. As an educational institution, Temple University's faculty, staff, and students address the issue of inequity in hundreds of ways that positively impact thousands of people: from after-school and summer academic enrichment programs, scholarships, and job placements to a nurse-managed integrative primary care health center and anti-racism research and training. As public health practitioners and healthcare providers, you each play a role in working toward better health for all people. Racial equity requires work at every level and in every space. It also requires people coming together across disciplines and geographic spaces to find solutions. As young people demonstrate in the street and advocate for change with elected officials, we must expect the same commitment to racial equity among administrators and practitioners in hospitals, health departments, and schools. Explore what racial equity work means for you as an individual…and then act.

ORIGINAL RESEARCH ARTICLE
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Developing and Delivering a Comprehensive Vaccine COVID-19 Program: RapidVax

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RapidVax was developed in January 2021 to increase COVID-19 vaccination rates across Temple University's College of Public Health (CPH) and communities in Philadelphia, including vaccine-hesitant individuals and marginalized groups with limited access to health services. To address the problems of access to vaccination, the CPH clinical team started to vaccinate the clinical-oriented faculty, staff, and students (N = 1,542, with 28.5% of ethnic minorities). As the vaccine rollout proceeded, the need to engage minorities and marginalized groups, as well as improve community access to vaccinations was recognized. A grant from the Philadelphia Department of Public Health allowed the RapidVax project to be scaled up as an interprofessional collaboration between nursing, social work, pharmacy, and public health practitioners, promising to achieve community immunity and decrease disparities in COVID-19 vaccination. Emphasizing community engagement, evidenced-based message design, communication distribution via social media sites and at community events, RapidVax was successfully implemented in Philadelphia communities. The project resulted in the delivery of vaccines to 2,685 individuals, 74.9% of whom were people of color and 16% of whom were homeless. The program was deployed in multiple locations, including the CPH-run Vaux clinic, offering regular hours for unscheduled walk-ins. Pop-up clinics were also offered in partnership with community organizations both within community center locations and public outdoor spaces. Next steps include continuing to build trust with communities through the CPH Vaux community clinic, enhancing community partnerships, and increasing social media engagement and community outreach to increase the vaccination rate among vaccine-hesitant and unvaccinated people.

Keywords: *RapidVax, COVID-19, COVID-19 vaccination, health disparities, vaccine hesitancy, vaccine intervention.*

Introduction

The SARS-CoV-2 crisis has highlighted social and economic inequalities in the United States. People from ethnic minority populations, those who are older, and those with economic disadvantages are at higher risk of both COVID-19 morbidity and mortality[1,2]. Individuals working at 'essential' jobs (e.g., grocery store staff, home health aides) have been crucial to all Americans during the pandemic but often have limited access to health care and live in crowded conditions[3]. Despite the availability of three effective SARS-CoV-2 vaccines, infection rates among individuals in rural areas, younger people, and those with conservative political beliefs have skyrocketed primarily due to vaccine hesitancy[4].

The World Health Organization EURO Vaccine Communications Working Group proposed the "3 Cs" model to explain vaccine hesitancy: 1) *Confidence*: trust in the effectiveness and safety of vaccines; 2) *Complacency*: perceived risks of vaccine-preventable diseases; and 3) *Convenience*: physical locations at which vaccination can happen[5,6]. Vaccine hesitancy research has mostly emphasized parents making decisions for children[7]. Less is known about adults making decisions for themselves[4]. Eleven months after the introduction of effective SARS-CoV-2 vaccines in the United States (US), vaccination rates in the US lag behind those in Europe, Canada, and many Asian countries. In the US, only 64% of the population eligible for vaccination is fully vaccinated, 76% have received at least one of two doses[8]. In a 2021 survey of Americans, Ruiz and Bell reported that 14% of respondents were unlikely to accept a COVID-19 vaccine and 23% were unsure [4]. More recent numbers indicate that number has decreased,[8] but the Kaiser Family Foundation, which has been tracking vaccine refusal throughout the epidemic, shows 21% of adults still report not being vaccinated, including 14% who report they will never be vaccinated, 3% who report they will only be vaccinated if their employer mandates it, and 4% who report they are still "unsure".[9] As of February 2022, the proportion of fully vaccinated people living in the US outnumbered the unvaccinated.[10] And while racial disparities nationwide are no longer significant[10], Philadelphia continues to show a gap in vaccination rates. Of those fully vaccinated ages 12+, 72% are White and 66% are Black/African American.[11] Unlike early phases of the COVID-19 vaccine rollout in which only certain segments of the population were eligible, COVID-19 vaccines are now widely available to all.[12] Thus, in the US, insufficient levels of vaccination to achieve community immunity and persistent disparities in uptake are mostly attributable to vaccine hesitancy and refusal rather than limited supply.[4,13,14] However, attention to demographic characteristics only tells us *who* is vaccine-hesitant and fails to reveal *why* vaccine hesitancy persists. Polling from the Kaiser Family Foundation suggests that personal connection to COVID-19 and fear of the Delta variant were the largest predictors of the vaccination increase in late summer 2021[15]. However, distrust of healthcare, research, and the government were continued barriers to COVID-19 vaccination despite the increase in vaccination. This underscores the importance of attentiveness to emotional and perceptual drivers of vaccine hesitancy when promoting vaccine uptake.[16]

Throughout the COVID-19 pandemic, communities of color have been disproportionately impacted in terms of health, social, and economic factors[1,2]. Native Americans were most likely to contract, suffer complications, or die from COVID-19, followed by Hispanics and Black Americans.[1, 2] Despite being at increased risk, the history of medical racism in the US has overshadowed minorities' risk perceptions, affecting their willingness to interact with and trust the healthcare system.[13, 16] Vaccine hesitancy stemming from this mistrust has highlighted the need for transparency, empathy, and community-engaged strategies based on effective communication, cultural and linguistic competency, and partnership with community organizations, which are significant predictors of COVID-19 public health intervention effectiveness[17,18]. Building trust necessitates understanding nuances in communities' perceptions, doubts, and fears related to the COVID-19 vaccines, leading to more vaccine confidence in target communities[18].

To address the twin issues of disparities in access and vaccine hesitancy, we developed a community-based vaccination program called RapidVax. The program's first objective was to create a workflow to vaccinate the Temple University College of Public Health (CPH) essential faculty, students, and staff. The second objective was to adapt the knowledge base and system infrastructure to execute mass vaccination of the general population and reach vaccine-hesitant individuals or those with difficulty accessing health services.

Objective 1: Proof-of-Concept Test of the RapidVax Protocol

Materials and Method

Using an interprofessional team of faculty and students in nursing, kinesiology, social work, public health, and health rehabilitation sciences, the CPH proposed a proof-of-concept test of the RapidVax protocol. The protocol used the principles of Lean and Six Sigma[19] to provide an efficient vaccination workflow to meet the challenges for COVID-19 mass vaccination, taking into consideration Health Insurance Portability and Accountability Act (HIPAA), reporting to the Department of Health, logistics of social distancing, and a minimum 15-minute post-vaccination observation period. The protocol was initially developed in January 2020 to deliver vaccines to CPH members who met Philadelphia's 1A criteria, which outlined who was eligible for vaccination such as teachers or front-line workers, and to test whether it could provide the necessary workflow to safely achieve vaccination rates of 50 individuals per hour. This workflow included needing space for registration, vaccination, making appointments for second shots, and the 15-minute observation period. The advantages of the RapidVax protocol are its flexibility, mobility, and cost-effectiveness. The program does not require huge spaces, such as a convention center, and can be implemented in community spaces, such as churches. The workflow can be scaled up or down to accommodate the size of the population and the available space.

The CPH's information technology team and the health information systems management faculty collaborated with clinical affairs to develop the scheduling, registration, recording and reporting of dose delivery with smart forms. Individuals across the CPH who met the 1A category requirements were invited to self-schedule using a publicly available sign-up tool (SignUpGenius). The invitation included a fact sheet and "frequently asked questions" (FAQ) handout about the Moderna vaccine, which at that time was the vaccine of choice to administer outside of a health care facility because it did not require storage in an ultra-cold freezer and was understood to be more stable at room temperature. Once scheduled, individuals were sent a link to a smart registration form created using REDCap, a HIPAA compliant tool used by universities for research and clinical trials.[20] The smart form captured the demographic information required by the Philadelphia Department of Public Health, among other variables. All individuals were assigned a unique identifier as a master index to link information from different forms.

Upon checking in for vaccination, individuals logged into a second smart form via a secured iPad to complete registration, health screening, contraindication checking, and vaccination consent. Once registered, individuals proceeded to a vaccination station where they were physically distanced from others and were vaccinated. After vaccination, individuals proceeded to the check-out station, where they received a vaccination card and a follow-up appointment if needed. They then sat physically distanced for a 15-minute observation.

Results

The RapidVax protocol successfully vaccinated 50 individuals an hour on average while maintaining social distancing, showing a proof of concept. Out of all individuals invited for vaccination, data are available for 1,542 people who received both doses. They were predominately female (n = 1,030, 70.9%), and ranged in age from 12 to 88 years, with a mean age of 34 years. Most were Caucasian (n = 932, 61.6%), followed by Asian (n = 179, 11.6%), Black (n = 111, 15.2%), Native American (n = 6, 0.4%), and other (n = 21, 1.3%); 5.6% reported their ethnicity as Hispanic. To understand more about the RapidVax protocol, we monitored vaccine recipients' satisfaction and intent to complete vaccination. All vaccinated individuals received a self-administered, anonymous survey two days post-vaccination via Qualtrics with three waves of invitations to complete the survey. We received and analyzed 640 surveys.

Vaccine recipient ratings of the RapidVax process were high. Recipients estimated that the average time to complete registration and receive the vaccine was under 10 minutes, and the time from registration to injection was just under 5 minutes. Ratings for staff efficiency, friendliness, and feeling well cared for ranged from 9.40 to 9.76 on a 1 to 10 scale, with higher values reflecting stronger agreement with each sentiment. Overall experience was rated very highly with a mean of 9.5. About 92.8% of recipients indicated that they chose to receive the vaccine to protect family, friends, and community followed by to protect oneself (81.2%), return to normal life (77.4%), and meet their workplace's requirement (67.3%).

Of note, 65.5% indicated they trusted the safety and effectiveness of the vaccine, and 60.3% indicated trust in the vaccine provider (i.e., the CPH). Almost all (n = 632, 98.8%) indicated an intent to return for the second injection. Recipients were asked if they had experienced a list of 11 possible side effects with the option to provide others not specified within the survey or choose no side effects. The most common side effect was a sore arm, followed by fatigue, headache, and muscle pains. Only 24 (5.4%) participants reported no side effects. See Table 1.

Table 1.
Moderna Side Effects Reported by RapidVax Recipients across the Temple University College of Public Health (N = 640)

Symptoms	Cases	Percent
Sore arm	417	93.5
Strange feeling in your arm	57	12.8
Chills	64	14.3
Fever	31	7.0
Headache	110	24.7
Fatigue	169	37.9
Nausea or stomach upset	33	7.4
Muscle or body aches	93	20.9
Shortness of breath	3	0.7
Runny nose	24	5.4
Sore throat	17	3.8
Other (specify):	26	5.8

Objective 2: Scale-Up Plan and Implementation

The next phase of RapidVax included a three-pronged approach to engage the community, develop and implement tailored messaging, and deliver the vaccine. The community deployment of the RapidVax protocol was first performed on February 10, 2021, at the headquarters of the Philadelphia Housing Authority (PHA), the fourth-largest housing authority in the US that provides affordable housing for residents with limited incomes. We vaccinated 265 individuals, with an average of 88 individuals an hour. We tested the workflows again on February 13, when the team vaccinated 137 essential workers from the community at the CPH's fixed medical site, located in Vaux High School at 2300 Master Street in North Philadelphia. In all, CPH partnered with PHA to offer vaccination to every senior in public housing by the end of April 2021. To advance this strategy and expand to other communities, a team from CPH submitted an application to the Philadelphia Department of Public Health to fund RapidVax, which included proposed core clinical, community engagement, and communications teams. This application was approved on April 19, 2021.

Engaging the Community

To achieve the RapidVax mission to make COVID-19 vaccines and relevant evidence-based information accessible to Philadelphians, and operationalize community engagement strategies,[21] our community engagement team enlisted a diverse set of community leaders from community-based and faith-based organizations in Philadelphia. Since the project's onset, RapidVax has collaborated with over 25 organizations. Representatives met monthly with the RapidVax team to review the project's progress, generate ideas for new partnerships, and execute outreach and vaccination events in diverse settings, such as churches, supermarkets, and at existing community events such as health fairs or block parties. The purpose of this committee was to provide information on specific community needs, how best to engage each community, and how to maximize the success of RapidVax efforts by engaging diverse perspectives. The representatives from these organizations were recruited largely through the CPH's Office of Community Engaged Research and Practice and its existing network, however more partnerships were developed through networking at vaccination and outreach events. When recruiting partners, we considered population of interest, program activity, and partner availability. We prioritized those who served communities with historically low vaccination rates, such as ethnic racial minorities, people who are homeless, and people with substance use disorder. Other crucial criteria for partnership included an organization's availability to contribute consistently, and organizations with different skills and resources to support vaccination efforts.

The wealth of skills and resources from the stakeholder committee was critical to planning vaccination and/or outreach events. Many event attendees, especially those who were vaccine hesitant, may not have attended a vaccine event by choice. However, by partnering with organizations that had recognition and trust in their community, and that offered incentives (e.g., food, entertainment, gift cards) at events, we attracted more community members. Depending on available resources, some stakeholder organizations served as physical sites for vaccination clinics and outreach events. When recruiting partners with a physical location, it was necessary to consider social distancing, workflow configurations, accessibility, and safety. Importantly, because of the flexibility in the RapidVax workflow, we were able to adapt our setup to each location based on space and resources. For example, we purchased tents to set up physically distanced chairs for outdoor observation periods, as weather permitted. Partners without a physical site contributed in other ways, including conceptual and logistical planning at stakeholder meetings or advertising for events throughout their networks.

Community members were also hired and trained as RapidVax Ambassadors to educate Philadelphians about COVID-19 and available vaccines during outreach and vaccination events. Eight ambassadors worked an average of 15-20 hours per week and ranged in age from 18 to 60 years. Five of the ambassadors were women, four were Black, three were Asian and one was a recent immigrant from Saudi Arabia. Ambassadors were recruited via an online job application through recommendations from the stakeholder committee, networking at project events, and a job fair that had computers on site for interested persons without internet or technology at home.

All applicants were interviewed and asked about their interest in the project's goal (COVID-19 vaccination), as well as their experience in community engagement with diverse populations, including community service and customer service positions. An interactive six-hour, three-part training was developed to provide ambassadors with adequate knowledge about COVID-19 vaccines, vaccine hesitancy, interpersonal communication, and cultural competency. Once trained, ambassadors were able to utilize their training and successfully employ their experience as community residents to empathetically address other residents' concerns about vaccines and correct misinformation.

The consistent attendance of RapidVax at events throughout Philadelphia allowed the community-engagement field team to build trust with residents of various communities. For example, RapidVax worked with non-profit community development organizations, police districts, and health and social services organizations to promote and provide vaccination to Philadelphians across in-person and online sites, such as festive events at local parks and on local radio shows. RapidVax also successfully partnered with organizations providing services for those who are homeless and/or have substance abuse disorder, as well as advocacy groups providing services for those with food insecurity and unemployment during the pandemic. Thus, we were able to distribute vaccines in economically distressed areas that are typically challenging to reach.

Developing and Implementing Evidence-Based Tailored Messaging

Understanding Vaccine Hesitancy Among Philadelphians and Perceptual Mapping

To understand the drivers of vaccine hesitancy and inform the RapidVax communication strategy, a cross-sectional survey of vaccine attitudes was conducted among Philadelphians aged 18 years or older. From March to September 2021, surveys were administered in person at community-based events, or online via Qualtrics through Facebook ads in under-vaccinated Philadelphia ZIP codes. The survey assessed demographic information, experiences with COVID-19, beliefs about COVID-19 and vaccines, and trust in healthcare and research. Vaccinated and unvaccinated participants completed the survey, and unvaccinated participants were asked to indicate their intent to receive a COVID-19 vaccine on a 0-10 scale (i.e., 0= "definitely do not want to receive a vaccine", 10= "definitely do want to receive a vaccine"). We classified unvaccinated respondents who rated intent between 0-5 as vaccine hesitant, ratings between 6-10 were classified as not hesitant. The Temple University Institutional Review Board approved this research (protocol number 28139).

Across in-person and online surveys, 688 responses were collected. Roughly one-third of respondents (n = 210, 33.8%) reported being unvaccinated. Among the unvaccinated respondents, 89.5% (n = 188) reported their hesitancy status; 58.5% (n = 110) were vaccine hesitant and 41.5% (n = 78) were not hesitant. Comparing demographics in those hesitant and not hesitant using Chi Square, race (p=.30), ethnicity (p=.20), gender(p=.13), education (p=.32), income (p=.94), and health insurance (p=.55) were not significantly different. However, mean age ($p < .001$) and age groups were significantly associated with vaccine hesitancy. For example, 72.5% of unvaccinated people aged 18-39 years reported vaccine hesitancy ($p < .001$).

Using these data, the RapidVax communication team conducted perceptual mapping and vector message modeling analyses to produce three-dimensional displays (i.e., maps) of how groups perceive relationships among a set of attributes to inform message strategy to move people towards a decision[22] (for more information on these methods, see https://sites.temple.edu/turiskcommlab). Combining perceptual mapping with segmentation analysis allowed an understanding about trust in healthcare and research among vaccinated and unvaccinated Philadelphians to create a messaging strategy to address vaccine hesitancy. The team identified subgroups within the total sample who had different concerns about the vaccines and addressed *why* people may be hesitant rather than only focusing on *who* is hesitant. Analyses revealed seven themes underlying vaccine hesitancy (e.g., minorities' suspicions about COVID-19 information, mistrust in government, and the perception that health messages keep changing). See Supplement A for themes and suggested strategies.

Dissemination of RapidVax health communication materials

The RapidVax communication team conducted a communication needs assessment with our key stakeholders prior to implementing community-based clinics. Each community partner's needs, such as use of existing communication channels and their specific vaccine concerns, were assessed to inform a targeted, culturally and linguistically tailored messaging strategy for each group. This helped identify the most effective means of disseminating vaccine information to their community members (e.g., social media posts, flyer distribution, banners).

We used perceptual mapping results to create RapidVax communication materials (i.e., a "Communication 101" document that provided sample messages and ways to answer questions about vaccines, and fact sheets about the vaccines including side effects, vaccine myths, and the reasons to be vaccinated). Community partners and the RapidVax community engagement and communication teams used these resources when talking with people about vaccination. Before clinics, the community engagement and communication teams held community-based events to deliver education materials, address concerns about the vaccines, and build camaraderie with the community. They would engage attendees and observe their behaviors to inform the best education approaches, including which fact sheets to use as visual aids during conversations about vaccination.

To broaden the project's reach, a website (sites.temple.edu/rapidvax) was created to centralize information, host freely accessible targeted communication materials, highlight community partners, and display a calendar of RapidVax clinics. We also utilized Facebook ads that targeted ZIP codes surrounding locations of clinics to promote our presence. Twenty-one separate ads were placed one to two weeks every day before an event, resulting in 1,806,608 ad views, 544,868 reaches to unique Facebook profiles, 600 post clicks to our website or a registration form, and 475 post reactions (e.g., likes, comments, shares). Finally, RapidVax established Twitter and Instagram accounts to connect with our community partners and the broader Philadelphia community, posting information about current vaccination clinics and other vaccine-specific messaging.

Delivery of Vaccine

To accommodate individual preferences, we stocked all three available vaccines (Moderna, Pfizer, Janssen and Janssen) whenever possible and offered them at all clinics. Offering choices and accommodating individual preference for a specific vaccine brand alleviated stressors among vaccine-hesitant individuals. Many individuals expressed gratitude for this opportunity to express their agency. Equally important was the ability of clinical and non-clinical staff to speak knowledgeably about the different brands of vaccines, their different dosing regimens, and the interval between first and second dose or the first dose and, ultimately booster. The clinical team developed redundant systems to double-check administration workflows to ensure quality, safety, and specific forms to document vaccine risks, variation in dosing, and consents for adults, teens, pediatric populations, and boosters.

Table 2 represents the RapidVax weekly vaccine distributions by demographic information at the community level, from February to November 12, 2021.

RapidVax successfully vaccinated 2,685 individuals during its community campaign, 66.44% of whom were Black and 21.15 % of whom were White; 9.45% reported their ethnicity as Hispanic.

The percentages of males (50%) versus females (49.42%) vaccinated by RapidVax was in line with national datasets[10]. Thirty-six percent (36.69%) of the population vaccinated by the RapidVax team were aged 60 years or older. Full demographic information is included in Table 2.

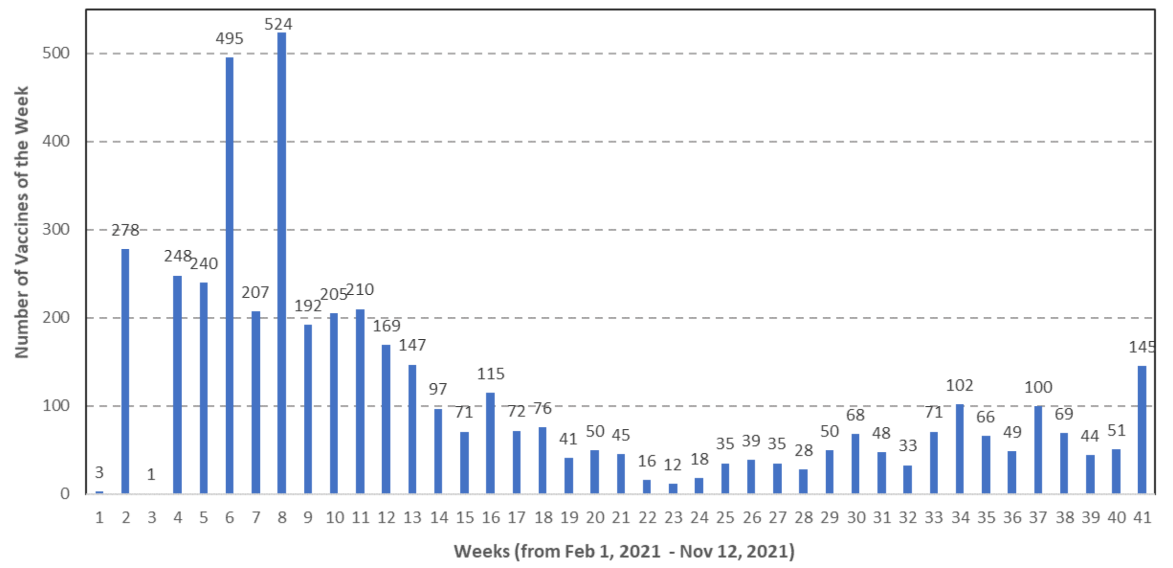
Table 2.
RapidVax's Vaccine Distributions at the Community Level by Demographic Constructs from 02/01/2021 to 11/12/2021

Demographic constructs	**N**	**Percent**
Race		
American Indian/Alaska Native	14	0.52
Asian	94	3.50
Black or African American	1784	66.44
Other	117	4.36
White	568	21.15
Native Hawaiian	3	0.11
No responses	105	3.91
Ethnicity		
Latinx	254	9.45
Not Latinx	2249	83.76
Prefer not to answer	169	6.29
No responses	13	0.48
Gender		
Female	1327	49.42
Male	1342	50
Non-binary/third gender	5	0.19
No responses	11	0.41
Age		
5 to 11	6	0.22
12 to 18	112	4.17
19 to 30	297	11.06
31 to 40	374	13.93
41 to 50	383	14.26
51 to 60	510	18.99
> 60	985	36.69
Unknowns	18	0.67
Total:	*2685 Unique Individuals*	

Figure 1 illustrates the trends in willingness and enthusiasm for vaccination. More individuals were vaccinated in Week 6 and Week 8 (April 2021) than in the following weeks. The vaccination rates dropped markedly during Weeks 22 and 23 (July 2021), potentially in response to Philadelphia lifting its mask mandate, leading many to believe the pandemic was over. The vaccination rates increased again in Week 34 (September 2021), potentially due to the surge of the Delta variant and looming mandates for vaccination within the city.

Figure 1.

Weekly Numbers of Vaccines Distributed by RapidVax from 02/01/2021 to 11/12/2021. The Y-axis represents the number of doses, and the X-axis represents weeks.



Implications and Next Steps

RapidVax has demonstrated efficacy and effectiveness in increasing COVID-19 vaccination rates across Temple University's CPH and communities in Philadelphia. With the emphasis on community engagement, evidenced-based message designs, and vaccine deliveries, RapidVax has vaccinated close to 5,000 individuals. Through this exercise, CPH reestablished trust in the community via consistent presence at a formerly closed clinic (Vaux), providing education and vaccinations four days a week, in addition to pop-up clinics in communities across Philadelphia. This trusting relationship with the community has played a paramount role in getting hard-to-reach individuals vaccinated.

RapidVax focused on engaging with Philadelphians who were most likely to have vaccine hesitancy (e.g., racial and ethnic minorities, people who are homeless, those with substance use disorders) and those with access issues to obtain a vaccination (e.g., house-bound seniors, individuals working irregular hours, individuals with transportation problems). Our three-pronged strategy of developing tailored communications, engaging communities with appropriate messaging, and providing vaccination at easily accessible sites, was successful. We continue, however, to examine which components of the communication plan were the active ingredient in this success. For example, individuals' engagement with Facebook ads targeting ZIP codes surrounding clinic locations was low, with only 600 post clicks to the RapidVax website or registration form out of 1,806,608 impressions. This finding indicates the need to identify effective communication elements and channels, which will further tailor our social media engagement and enhance our communication strategies.

A potential cost-effective method to increase social media engagement would be to design Facebook and other social media ads based on the seven themes from the perceptual mapping results (see Supplementary A). The map-informed communication materials (e.g., the Communication 101 document and fact sheets about COVID-19 vaccines) are freely accessible on the RapidVax website, yet Facebook users who did not click on the ads may not have seen those evidence-based documents. Designing and testing which type of ads increase the engagement rate would allow us to better understand the effective communication elements needed with our vaccine-hesitant audiences and inform future social media engagement strategies. The effectiveness of communication materials that assist community partners and communication staff during community events also needs to be further assessed. As the number of unvaccinated individuals shrinks, the need for micro-targeting communication materials and delivery strategies will become paramount.

Other crucial next steps include continued presence in the community, maintaining existing community partnerships, and observing best practices in engagement to maintain sustainable trusting relationships. This will allow us to demonstrate the genuine motives of the CPH and create a solid foundation to advance community-based projects in the future. As many Philadelphians have actively initiated creative ways to support their communities in vaccination, connecting people with complementary missions to form creative partnerships, offering skills training, and connecting them with CPH members with similar interests are potential next steps.

Conclusions

RapidVax achieved its goal of extensive outreach into minority and marginalized communities in Philadelphia; 74.9% of those we vaccinated at the community level were people of color. Working with an organization that serves the homeless and provides substance disorder treatment, we were able to vaccinate 412 individuals who would not have otherwise received vaccinations. The program also vaccinated 1,175 seniors in public housing and approximately 2,000 essential workers. The flexibility of the workflows also allowed RapidVax to be one of the first to offer boosters and pediatric vaccinations. Importantly, RapidVax demonstrates the value and importance of interprofessional collaboration between clinical disciplines such as nursing, social work, and pharmacy, along with public health professionals, to provide comprehensive services of tailored information and vaccination.

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Conflicts of Interest

There is no conflict of interest.

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Statement of Contributions

Laura A. Siminoff wrote and edited all manuscript sections, was the principal investigator on the grant that funded RapidVax, developed and analyzed the college surveys, and provided overall oversight of the project. Susan VonNesson-Scanline was the Co-PI on the grant that funded RapidVax, was the clinical lead, wrote clinical sections, and edited the manuscript. Huanmei Wu led the health informatics component of the project, wrote the data analytics section, and edited the manuscript. Briana T. Richardson led community engagement, wrote the community engagement sections, and edited the manuscript. Patrick J. Kellly assisted with writing the communication section and the collection and analysis of that data. Sarah Bauerle Bass wrote the communication section, edited the manuscript, and directed the communication messaging data collection and analyses.

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Analysis of Timely Access to Healthcare and Difficulty Procuring Specialist Care Among Children With and Without Anxiety or Depression Disorders

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Background: *To examine timely preventive care access and specialist care among children with and without anxiety or depression disorders.* ***Methods:*** *The population of interest was extracted from the National Survey of Children's Health 2011/2012 (NSCH 2011/12) data set. The sample included children (0-17 years old) and their caregivers who completed the survey. Data were analyzed from February 2011 to June 2012. Outcome variables included reports for missed or delayed care, and problems procuring specialist care based on parental response to interview questions. Covariates included child demographics, insurance status, caregiver education, household employment, and poverty levels.* ***Findings:*** *A total of 85 412 records were extracted from the NSCH 2011/12 data set. The covariate-adjusted odds (also adjusted using the sampling weight methods suggested by the NSCH) of having delayed or missed care for a child with anxiety or depression were 2.22 (95% confidence interval [CI], 1.80-2.73, p<0.001) times higher than a child without anxiety or depression. In a subsample of 24 869 records, the covariate-adjusted odds of the caregiver reporting problems procuring specialist care for a child with anxiety or depression were 2.11 (95% CI, 1.72-5.58, p<0.001) times higher than a child without these diagnoses.* ***Conclusions:*** *Children with anxiety or depression are less likely to obtain timely preventive care and have problems procuring specialist care. These findings highlight a disparity that requires the attention of healthcare providers and outreach programs.*

Keywords: *Healthcare utilization, anxiety, depression, caregiver*

Introduction

Nearly 1 in 5 children in the US have a mental health disorder, with an estimated annual cost of $247 billion for mental illness-related treatments, services and decreased productivity [1]. Yet, fewer than half of these affected children received the necessary care they need [2,3]. Anxiety and/or depression are the most common mental health disorders. In the U.S., 7.1% of children have been diagnosed with anxiety and 3.2% of children have been diagnosed with depression [4]. Among them, only about 20 percent with anxiety and 40 percent with depression are getting treatment [5].

Diagnosis of Anxiety or Depression and Preventive Care Utilization

Some studies exploring the relationship between diagnoses of anxiety or depression and primary care utilization among adults have found that those with anxiety or depression use primary care services less than those individuals without these disorders [6,7]. On the other hand, other studies conducted on different populations, show the opposite relationship [8-11]. For example, a study examining the relationship between depression and healthcare utilization of 3 481 elderly patients seen in a primary care practice in the last 12 months actually found patients with depression had an increased outpatient service utilization[11]. To our knowledge, no studies have examined the relationship between having a diagnosis of anxiety or depression and children's access to medical care.

While there is no research published specifically involving children with anxiety or depression and their utilization of vision care, there is some research describing general factors associated with vision care utilization [12,13]. For example, a study of 11 015 Canadian adolescents in 2007-2008 found that a lack of vision care insurance, being male, their parents not owning the residential home, reading fewer than three hours weekly, and not having diabetes were all associated with not utilizing vision care [12].

Some studies also demonstrated that children with severe mental illness received dental care less often than children without it [14]. Poor utilization of preventive dental health care services also highlights the importance of helping those with mental illness get the care they need to reduce long-term adverse events. This is especially the case in children, as shown in an article published using the NSCH 2011/12. The study found that children who had unmet dental needs had a higher mean number of days of school missed in the past year due to injury/illness than those who did not have unmet dental needs[15].

Socio-demographic Factors and Preventive Care Utilization

Aside from the child's mental illness, there are a variety of other factors that have been shown to be associated with the utilization of preventive health care [16-24]. Many studies found that the child's age, race, household socioeconomic and educational levels, and insurance plans were associated with the utilization of care. Specifically, younger children, non-Hispanic Black and Hispanic children, those in non-English speaking home, living in low-education or low-income households, or were uninsured had higher odds of not receiving either family center care or pediatric primary care[16-18,25-27]. Even with the trend in the US toward more equal health care opportunities for all, these findings point to potential racial/ethnic and sociodemographic co-factors or confounding relationships that may exist in the association between children with anxiety or depression and their utilization of preventive healthcare services.

Even though a large amount of research has examined differences in health care access in certain subgroups of children with special health care needs (for example, those with asthma, or autism spectrum disorders)[28,29], little is known about health care access among children with and without anxiety or depression disorders. In this study, we used data from the 2011/2012 National Survey of Children Health (NSCH 2011/12) to determine if children with diagnosed anxiety or depression have delayed or missed preventive healthcare services, and if their parents/caregivers reported difficulty procuring the specialist care they need for them. Second, we also explored if socio-demographic factors of children and their caregivers may independently associate with health care access in children with anxiety or depression disorders .

Methods

NSCH Survey Design

The current study used the publicly available, de-identified NSCH 2011/12, which was conducted by the Centers for Disease Control (CDC)'s National Center for Health Statistics between 2/28/11 and 6/25/2012 and was designed to assess the well-being of children aged 0-17 and their families. The 2011/12 survey was collected via cross-sectional phone interview of households with at least 1 individual aged 0-17 years in which parents, family, and household residents (who reported knowledge of the health and healthcare of the sample child) answered questions about the child's and their own health. Household demographics were collected, and the family was screened for survey eligibility. If a child under 18 was living in the house, the survey was completed. The interviewer selected a child who was either the sole child in the house (under 18), or a randomly selected child, if there was more than one child. From there, the study questions were directed at the selected child [30].

The NSCH is funded and directed by the Health Resources and Services Administration Maternal and Child Health Bureau, and is conducted by the U.S. Census Bureau. This study collects myriad child health and healthcare factors including child and family demographics, child health status, child development status, insurance coverage, preventive and specialty care use, family health and activities, parental health, and neighborhood characteristics. Data are randomly sampled from all residential addresses in the United States, and released data is stripped of all identifying factors. Since only de-identified data were used, the Temple University institutional review board determined that the present study was exempt.

Study Sample

The study sample is children (0-17 years old) and their parents/caregivers who completed the 2011/2012 NSCH survey (sample size=95 677). Surveys with missing data about exposure questions (has a doctor or other healthcare provider ever told you that your child has depression or anxiety even if they do not have the condition now) or outcome questions (1. During the past 12 months/Since his/her birth, was there any time when your child needed preventive care, including: medical, dental, or vision, but it was delayed or not received? 2. During the past 12 months/Since his/her birth, how much of a problem, if any, was it to get the care from the specialists that your child needed?) are excluded from the analysis. The final analytic sample includes 85 412 eligible children; among them, 24 869 reported the need to get the care from the specialists.

Data Measures

The first dependent variable was delayed or non-received preventive care and was defined using a combination of the questions "During the past 12 months/Since his/her birth, was there any time when your child needed health care but it was delayed or not received?" and "What type of care was delayed or not received?". Those answering "yes" to delayed/not received care and reporting that the delay was "medical, dental, or vision" care were considered to have a positive outcome.

The second dependent variable was firstly based on two filter questions: "During the past 12 months/Since his/her birth, did your child see a specialist, or did you or a doctor think that [he/she] needed to see a specialist?" Those answering "yes" to these two filter questions were further asked the answer to "During the past 12 months/Since his/her birth, how much of a problem, if any, was it to get the care from the specialists that your child needed?". The outcome was compressed into two classes: "big problem" and "small problem" were combined into "positive for problem", and the other choice "not a problem". This was done because an inadequate number of respondents reported they had a "big problem".

Besides child's mental health status (any reported anxiety or depression disorder), we selected child and household characteristics as covariates that have established associations with child's different mental health status and healthcare access[16-20]. These covariates in the model include a child's biological age, sex (Male/Female), race (White/Black/Other. Other includes American Indian/Native American, Alaska Native, Asian, Native Hawaiian, Pacific Islander, and other answers. Multiple responses were allowed; if so, a primary category to White/Black was assigned when either White/Other or Black/Other were chosen), ethnicity (Hispanic/Non-Hispanic), insurance status (have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicaid: Yes/No), caregiver's highest education (Less than high school, High school graduate, More than high school), household employment status (Was anyone in the household employed at least 50 weeks out of the past 52 weeks: Yes/No) and poverty level (Percentage levels used to calculated minimum annual income a household needed to receive certain welfare benefits based on Federal Poverty Guidelines).

Statistical Analysis

The 2011/2012 NSCH survey has sampling strata and weighting. This was the same sampling frame as the National Immunization Survey (NIS) conducted by the CDC, and was carried out directly following the NIS in sampled houses. Weighting was calculated beginning with the base sampling weight being set to the inverse probability of the phone number being selected. Certain adjustments were independently made to the base weights of the landline and cell phone strata prior to their being combined. Population control totals used for weighting data were derived from the 2011 American Community Survey. After weighting, data estimates are representative of all non-institutionalized children 0-17 years old in the US [30].

All analyses were adjusted using the correct sampling methods provided by the NSCH. Summary data of relevant variables (dependent variables: care delayed/not received, how much of a problem was it to get care; independent variable: mental health disorder; co-factors: child demographics, insurance status, caregiver's highest education, household employment status and poverty level) included N/percent for categorical variables and mean/standard deviation for continuous variables. Univariate and multivariable analyses were used to determine the relationships between child mental health status and healthcare access. It was decided a priori that a child's age, gender and race would be included in the final analysis as well as any covariate with a univariate p-value less than or equal to 0.20. Both research questions were addressed by using multivariable logistic regression. The interaction term between each covariate and child's mental health status was examined and retained in the final regression model if p-value less than 0.05. In all analyses, complex survey design including weight and strata (state and phone line type) provided in the NSCH public use dataset were considered, and two-sided p-values < 0.05 were deemed statistically significant. All analyses were performed in R complex survey package.

Results

Of the 85 412 eligible children aged <18 years in the 2011/2012 NSCH, 6 404 were diagnosed with anxiety or depression. The distribution of study population characteristics both in total and stratified by presence/absence of anxiety or depression were shown in Table 1. The overall proportion of children having missed/delayed care was relatively low for the population (6.0%

weighted) and was similar to the proportion of children without anxiety or depression (5.5% weighted), but the proportion of children with anxiety/depression having missed/delayed care was more than double (12.8% weighted). Problems with obtaining specialist care were a much more prevalent factor than missed/delayed care, occurring in 23.8% (weighted) of 24 869 eligible children who needed to see a specialist in the past 12 months. That proportion was, as with missed/delayed care, similar in those children without anxiety or depression (22.1% weighted), but higher in children with anxiety/depression (36.2% weighted). Similar distributions of population characteristics were found between children diagnosed with and without anxiety/depression.

Table 1.
Sample Characteristics and Study Variables[a] Under Two Outcomes

Outcome 1: During the past 12 months/Since his/her birth, was there any time when your child needed preventive care, including: medical, dental, or vision, health care but it was delayed or not received?

Characteristic[a]	**Total (N=85 412)**	**Child with Anxiety or Depression (N=6 393)**	**Child with no Anxiety or Depression (N=79 019)**
Delayed/Missed, No. (% weighted)			
Yes	4 419 (6.0)	709 (12.8)	3 710 (5.5)
No	80 993 (94.0)	5 684 (87.2)	75 309 (94.5)
Child Sex, No. (% weighted)			
Male	44 053 (51.2)	3 572 (55.5)	40 481 (50.9)
Female	41 257 (48.8)	2 817 (44.5)	38 440 (49.1)
Child Race, No. (% weighted)			
White	61 507 (66.2)	4 904 (73.0)	56 603 (65.7)
Black	8 532 (14.7)	463 (11.3)	8 069 (15.0)
Other	13 109 (19.1)	916 (15.7)	12 193 (19.3)
Child Ethnicity, No. (% weighted)			
Hispanic	11 100 (23.0)	700 (16.9)	10 400 (23.4)
Non-Hispanic	72 613 (77.0)	5 603 (83.1)	67 010 (76.6)
Child Insurance Status, No. (% weighted)			
Yes	81 551 (94.3)	6 175 (95.3)	75 376 (94.2)
No	3 727 (5.7)	213 (4.7)	3 514 (5.8)
Child Age, Mean (SD) weighted	9.60 (4.59)	12.35 (3.67)	9.40 (4.59)
Caregiver's Highest Education, No. (% weighted)			
Less than High School	11 742 (20.9)	1 007 (21.4)	10 735 (20.8)
High School Graduate	27 897 (32.7)	2 131 (33.4)	25 766 (32.6)
More than High School	40 917 (46.4)	2 888 (45.2)	38 029 (46.5)
Anyone in household Employed, No. (% weighted)			
Yes	73 573 (84.4)	5 050 (76.4)	68 608 (85.0)
No	10 097 (15.6)	1 260 (23.6)	8 865 (15.0)
Poverty level[b], No. (% weighted)			
<=100%	11 230 (21.2)	1 186 (26.6)	10 044 (20.8)
(100%-133%]	5 935 (9.8)	558 (10.8)	5 377 (9.7)
(133%-150%]	1 114 (1.9)	111 (2.1)	1 003 (1.9)
(150%-185%]	4 985 (7.5)	412 (8.4)	4 573 (7.4)
(185%-200%]	1 870 (2.9)	154 (2.4)	1 716 (3.0)
(200%-300%]	12 854 (16.7)	937 (14.5)	11 917 (16.9)
(300%-400%]	11 271 (12.4)	709 (10.9)	10 562 (12.5)
>400%	28 282 (27.6)	1 857 (24.4)	26 425 (27.8)

Table 1 (Continued)

Outcome 2: During the past 12 months/Since his/her birth, how much of a problem, if any, was it to get the care from the specialists that your child needed?

Characteristic	Total (N=24 869)	Child with Anxiety or Depression (N=3 173)	Child with no Anxiety or Depression (N=21 696)
Problems Getting Care, No. (% weighted)			
Yes	5 109 (23.8)	972 (36.2)	4 137 (22.1)
No	19 760 (76.2)	2 201 (53.8)	17 559 (77.9)
Child Sex, No. (% weighted)			
Male	13 134 (53.3)	1 721 (53.8)	11 413 (53.3)
Female	11 710 (46.7)	1 451 (46.2)	10 259 (46.7)
Child Race, No. (% weighted)			
White	18 685 (70.2)	2 431 (73.4)	16 254 (69.7)
Black	2 261 (12.9)	231 (10.4)	2 030 (13.2)
Other	3 442 (16.9)	460 (16.2)	2 982 (17.1)
Child Ethnicity, No. (% weighted)			
Hispanic	2 865 (19.1)	359 (16.0)	2 506 (19.5)
Non-Hispanic	21 625 (80.9)	2 775 (84.0)	18 850 (80.5)
Child Insurance Status, No. (% weighted)			
Yes	24 233 (96.6)	3 096 (96.8)	21 137 (96.7)
No	616 (3.3)	76 (3.2)	540 (3.3)
Child Age, Mean (SD) weighted	10.18 (4.71)	12.25 (3.81)	9.89 (4.75)
Caregiver’s Highest Education, No. (% weighted)			
Less than High School	3 067 (16.8)	481 (18.2)	2 586 (16.7)
High School Graduate	7 969 (32.0)	1 055 (35.2)	6 914 (31.6)
More than High School	12 755 (51.1)	1 468 (46.6)	11 287 (51.7)
Anyone in household Employed, No. (% weighted)			
Yes	21 629 (85.1)	2 502 (77.4)	19 127 (86.1)
No	2 868 (14.9)	635 (22.6)	2 502 (13.9)
Poverty level[b], No. (% weighted)			
<=100%	2 805 (17.5)	577 (24.1)	2 228 (16.5)
(100%-133%]	1 515 (8.9)	256 (10.7)	1 259 (8.7)
(133%-150%]	290 (1.6)	45 (1.3)	245 (1.6)
(150%-185%]	1 266 (7.4)	212 (9.0)	1 054 (7.2)
(185%-200%]	492 (2.3)	77 (1.9)	415 (2.4)
(200%-300%]	3 484 (15.2)	442 (14.0)	3 042 (15.4)
(300%-400%]	3 273 (12.9)	365 (12.3)	2 908 (13.0)
>400%	9 577 (34.1)	954 (26.7)	8 623 (35.2)

[a] All missing data <1% of total No.

[b] Based on DHHS poverty guidelines

Delayed or Missed Preventive Care in Children with Anxiety or Depression

Factors considered in univariate analysis for this research question are shown in Table 2. Multivariable logistic regression (Table 4) showed that anxiety/depression (adjusted Odds Ratio [aOR], 2.22 [95% confidence interval [CI], 1.80-2.73]), black race (aOR, 1.33 [95% CI, 1.09-1.62]), older age of the child (aOR, 1.04, [95% CI, 1.02-1.06]), and higher education level achieved by the caregiver (aOR for high school graduate, 1.25, [95% CI, 1.00-1.56]; aOR for more than high school, 1.43, [95% CI, 1.15-1.79]) were associated with missed/delayed care for the child in the past 12 months. In contrast, being insured (aOR, 0.24, [95% CI, 0.19-0.30]) and having incomes exceeding 200% of the federal poverty level (aOR for 200%-300%, 0.75, [95% CI, 0.58-0.96]; aOR for 300%-400%, 0.49, [95% CI, 0.36-0.67]; aOR for >400%, 0.25, [95% CI, 0.19-0.32]) were associated with less missed/delayed care for the child in the past 12 months.

Table 2.
Factors independently associated with missed/delayed care by weighted univariate logistic regression

Characteristic	**Missed/ Delayed (N=4 419)**	**Not Missed/Delayed (N=80 993)**	**cOR (95% CI)[a]**	***P* Value[b]**
Children with Anxiety or Depression, No. (% weighted)				
No	3 710 (85.6)	75 309 (93.7)	1 [Reference]	-
Yes	709 (14.4)	5 684 (6.3)	2.51 (2.11-2.99)	<.001
Child Sex, No. (% weighted)				
Male	2 236 (51.6)	41 817 (51.2)	1 [Reference]	-
Female	2 177 (48.4)	39 080 (48.8)	0.98 (0.86-1.12)	.81
Child Race, No. (% weighted)				
White	2 864 (58.0)	58 643 (66.7)	1 [Reference]	-
Black	583 (20.2)	7 949 (14.4)	1.62 (1.35-1.93)	<.001
Other	865 (21.8)	12 244 (18.9)	1.33 (1.11-1.59)	.002
Child Ethnicity, No. (% weighted)				
Non-Hispanic	3 658 (75.5)	68 955 (77.1)	1 [Reference]	-
Hispanic	682 (24.5)	10 418 (22.9)	1.09 (0.91-1.31)	.34
Child Insurance Status, No. (% weighted)				
No	707 (20.1)	3 020 (4.8)	1 [Reference]	-
Yes	3 702 (79.9)	77 849 (95.2)	0.20 (0.16-0.24)	<.001
Child Age, Mean (SD), yr, weighted	10.32 (4.64)	9.55 (4.58)	1.04 (1.02-1.05)	<.001
Caregiver's Highest Education, No. (% weighted)				
Less than High School	815 (23.8)	10 927 (20.7)	1 [Reference]	-
High School Graduate	1 393 (32.9)	26 504 (32.7)	0.88 (0.72-1.06)	.18
More than High School	1 933 (43.3)	38 984 (46.6)	0.81 (0.67-0.97)	.02
Anyone in household Employed, No. (% weighted)				
No	884 (20.8)	9 213 (15.3)	1 [Reference]	-
Yes	3 455 (79.2)	70 118 (84.7)	0.69 (0.58-0.81)	<.001
Poverty level[c], No. (% weighted)				
<=100%	989 (30.0)	10 241 (20.6)	1 [Reference]	-
(100%-133%]	535 (16.3)	5 400 (9.4)	1.20 (0.95-1.52)	.12
(133%-150%]	108 (3.3)	1 006 (1.8)	1.23 (0.78-1.93)	.37
(150%-185%]	394 (10.8)	4 591 (7.2)	1.02 (0.79-1.32)	.86
(185%-200%]	156 (3.6)	1 714 (2.9)	0.85 (0.58-1.24)	.41
(200%-300%]	828 (17.5)	12 026 (16.7)	0.72 (0.59-0.89)	.002
(300%-400%]	418 (8.5)	10 853 (12.6)	0.46 (0.35-0.61)	<.001
>400%	648 (10.0)	27 634 (28.8)	0.24 (0.20-0.29)	<.001

Abbreviation: -, not applicable. cOR, crude odds ratio.

[a] Shown are crude odds ratio estimates and 95% CIs from weighted univariate logistic regression

[b] *P* values for differences compared to reference

[c] Based on DHHS poverty guidelines

Problems Procuring Specialist Care in Children with Anxiety or Depression

Factors considered in univariate analysis for this research question are shown in Table 3. Multivariable logistic regression (Table 4) showed that anxiety/depression (aOR, 2.11 [95% CI, 1.72-2.58]), race (aOR for black, 1.45 [95% CI, 1.18-1.78]; aOR for other race, 1.51 [95% CI, 1.22-1.86]) were associated with problems procuring needed specialist care for the child in the past 12 months. In contrast, being insured (aOR, 0.36 [95% CI, 0.25-0.51]), and having higher education level achieved by the caregiver (aOR for high school graduate, 0.71, [95% CI, 0.56-0.89]; aOR for more than high school, 0.77, [95% CI, 0.62-0.79]), and being above 200% of the federal poverty lines (aOR for 200%-300%, 0.69, [95% CI, 0.54-0.88]; aOR for 300%-400%, 0.71, [95% CI, 0.54-0.95]; aOR for >400%, 0.48, [95% CI, 0.38-0.61]) were associated with less problems procuring needed specialist care for the child in the past 12 months.

Table 3.
Factors independently associated with problems procuring specialist care by weighted univariate logistic regression

Characteristic	**Problem (N=5 109)**	**No Problem (N=19 760)**	**cOR (95% CI)^a**	***P* Value^b**
Children with Anxiety or Depression, No. (% weighted)				
No	4 137 (81.6)	17 559 (89.9)	1 [Reference]	-
Yes	972 (18.4)	2 201 (10.1)	2.00 (1.67-2.39)	<.001
Child Sex, No. (% weighted)				
Male	2 688 (53.7)	10 446 (53.2)	1 [Reference]	-
Female	2 416 (46.3)	9 294 (46.8)	0.98 (0.86-1.12)	.76
Child Race, No. (% weighted)				
White	3 348 (60.0)	15 337 (73.4)	1 [Reference]	-
Black	630 (16.9)	1 631 (11.6)	1.78 (1.48-2.14)	<.001
Other	1 007 (23.1)	2 435 (15.0)	1.88 (1.56-2.27)	<.001
Child Ethnicity, No. (% weighted)				
Non-Hispanic	4 224 (74.7)	17 401 (82.9)	1 [Reference]	-
Hispanic	803 (25.3)	2 062 (17.1)	1.64 (1.35-1.98)	<.001
Child Insurance Status, No. (% weighted)				
No	283 (7.4)	333 (2.0)	1 [Reference]	-
Yes	4 823 (92.6)	19 410 (98.0)	0.26 (0.19-0.36)	<.001
Child Age, Mean (SD), yr, weighted	10.09 (4.76)	10.20 (4.70)	0.99 (0.98-1.01)	.49
Caregiver's Highest Education, No. (% weighted)				
Less than High School	847 (24.5)	2 220 (14.5)	1 [Reference]	-
High School Graduate	1 524 (29.5)	6 445 (32.8)	0.53 (0.43-0.66)	<.001
More than High School	2 444 (46.0)	10 311 (52.7)	0.52 (0.43-0.63)	<.001
No	847 (21.1)	2 021 (13.0)	1 [Reference]	-
Yes	4 179 (78.9)	17 450 (87.0)	0.56 (0.46-0.67)	<.001
Poverty level^c, No. (% weighted)				
<=100%	902 (25.4)	1 903 (15.0)	1 [Reference]	-
(100%-133%]	466 (13.9)	1 049 (7.4)	1.11 (0.84-1.46)	.46
(133%-150%]	83 (1.6)	207 (1.5)	0.60 (0.38-0.95)	.03
(150%-185%]	351 (10.0)	915 (6.6)	0.89 (0.66-1.19)	.43
(185%-200%]	110 (2.1)	382 (2.4)	0.51 (0.33-0.78)	<.001
(200%-300%]	760 (14.1)	2 724 (15.6)	0.53 (0.42-0.66)	<.001
(300%-400%]	620 (11.4)	2 653 (13.4)	0.50 (0.39-0.65)	<.001
>400%	1 380 (21.5)	8 197 (38.1)	0.33 (0.27-0.41)	<.001

Abbreviation: -, not applicable. cOR, crude odds ratio.
[a] Shown are crude odds ratio estimates and 95% CIs from weighted univariate logistic regression
[b] *P* values for differences compared to reference
[c] Based on DHHS poverty guidelines

Table 4.
Factors associated with missed/delayed care, and problems procuring specialist care by weighted multivariable logistic regression

	Missed/delayed care (N=85 412)		**Problems procuring specialist care (N=24 869)**	
Characteristic	**aOR (95% CI)[a]**	***P* Value[b]**	**aOR (95% CI)[a]**	***P* Value[b]**
Children with Anxiety or Depression				
No	1 [Reference]	-	1 [Reference]	-
Yes	2.22 (1.80-2.73)	<.001	2.11 (1.72-2.58)	<.001
Child Sex				
Male	1 [Reference]	-	1 [Reference]	-
Female	1.01 (0.87-1.17)	.89	0.93 (0.80-1.08)	.34
Child Race				
White	1 [Reference]	-	1 [Reference]	-
Black	1.33 (1.09-1.62)	.004	1.45 (1.18-1.78)	<.001
Other	1.15 (0.94-1.42)	.17	1.51 (1.22-1.86)	<.001
Child Ethnicity				
Non-Hispanic			1 [Reference]	-
Hispanic			1.13 (0.96-1.33)	.13
Child Insurance Status				
No	1 [Reference]	-	1 [Reference]	-
Yes	0.24 (0.19-0.30)	<.001	0.36 (0.25-0.51)	<.001
Child Age, yr	1.04 (1.02-1.06)	<.001	0.99 (0.98-1.01)	.29
Caregiver's Highest Education				
Less than High School	1 [Reference]	-	1 [Reference]	-
High School Graduate	1.25 (1.00-1.56)	.05	0.71 (0.56-0.89)	.003
More than High School	1.43 (1.15-1.79)	.001	0.77 (0.62-0.97)	.03
Anyone in household Employed				
No	1 [Reference]	-	1 [Reference]	-
Yes	0.92 (0.76-1.13)	.45	0.85 (0.68-1.05)	.13
Poverty level[c]				
<=100%	1 [Reference]	-	1 [Reference]	-
(100%-133%]	1.12 (0.87-1.44)	.39	1.22 (0.92-1.62)	.17
(133%-150%]	1.05 (0.74-2.06)	.85	0.81 (0.50-1.30)	.37
(150%-185%]	0.97 (0.66-1.67)	.81	1.12 (0.82-1.54)	.47
(185%-200%]	0.87 (0.59-1.28)	.49	0.73 (0.47-1.12)	.15
(200%-300%]	0.75 (0.58-0.96)	.02	0.69 (0.54-0.88)	.003
(300%-400%]	0.49 (0.36-0.67)	<.001	0.71 (0.54-0.95)	.02
>400%	0.25 (0.19-0.32)	<.001	0.48 (0.38-0.61)	<.001

Abbreviation: -, not applicable. aOR, adjusted odds ratio.
[a] Shown are adjusted odds ratio estimates and 95% CIs from weighted multivariable logistic regression
[b] *P* values for differences compared to reference
[c] Based on DHHS poverty guidelines

Discussion

Anxiety or depression disorders in children is an increasingly recognized problem. The study has shown that children with early behavioral problems or symptoms of anxiety or depression were at greater risk for becoming more isolated over time, receiving peer rejection and friendship and suicide [34-38]. These children need proper treatment plans for their conditions as well as timely preventive health care visits. In the current study, we found that children with anxiety or depression had significantly higher odds of missed/delayed preventive care and parental reporting of problems procuring specialty appointments. There may be several explanations for these findings. First, parents/caregivers of children with anxiety/depression may place a higher priority on obtaining treatment for their child's mental health condition than accessing preventive care services. Second, specialist care providers have limited appointment times, making it more difficult to find a time when all parties are available [39]. Finally, children and adolescents with anxiety/depression increase parental stress and perceived family dysfunction [40,41]. In addition, children with worsening symptoms are even more difficult to take to doctor appointments and it may affect parents' ability to access all types of medical care.

Health insurance coverage of children is an important determinant of access to health care. Of note, we found that uninsured children were highly associated with both missed/delayed care and parental reporting of problems procuring specialty appointments. Uninsured children have out-of-pocket costs associated with their care. Well care may not be seen as a priority when it has associated costs, and specialist care is very expensive when not partially covered by insurance [39,44].

The Federal Poverty guidelines are calculated based on yearly income and the number of individuals living in the household. Lower percentages indicate less income per person per household [42]. Children living in households with incomes at or above 200% of the federal poverty level (FPL) have decreased odds of missed/delayed care or problems procuring specialist care than children living in households with incomes below 100% of the FPL. With each increase in income per person per household, families have more resources available to access pediatric preventive care. However, since FPL can be an ultimate determinant in whether someone is eligible for Medicaid coverage, and Medicaid eligibility levels vary by state, further research using geographic data on FPL to subsides health insurance coverage for planning within health care access systems are warranted.

Caregiver's education played a significant role in the odds of a child having missed delayed care [45]. A study conducted using the National Health Interview Survey found that child healthcare utilization increased with increased maternal education [31]. Contrary to this and other research findings, our results suggest that children with anxiety/depression and more educated caregivers have higher odds of having missed preventive care appointments than children with less educated caregivers. Although the links between caregiver's education and the odds of a child having missed delayed care are quite surprising, it sheds light on the need to conduct further research to fully detect and address this relationship in the expected direction.

Regarding reporting problems to care, the opposite association existed for caregiver's education. Higher caregivers' education was associated with fewer problems accessing specialty care for children. Scheduling specialty appointments most often require a referral from a primary care provider, and some specialties have a shortage of qualified physicians [39]. This increased complexity, and lower availability of providers may make it more difficult to schedule appointments. Individuals with higher levels of education may live in areas with more access to specialty care, or have a greater understanding and tolerance of the process of navigating the complex specialty systems.

Mean child age was significantly associated with the odds of a child having missed or delayed care. Given that required childhood vaccinations are clustered in the earlier years and are administered less frequently as the child ages, this association is to be expected [46]. As the child ages, and fewer vaccinations are administered, well visits may be perceived as less important to parents. Problems procuring specialty visits, however, did not have a significant association with child age. This is consistent with other studies [47].

The child's race was significantly associated with both missed/delayed care and parental reporting of problems procuring specialty appointments. Specifically, compared to Whites, Black children had significantly higher odds of having missed/delayed care or problems getting specialist care. Children of a race other than Black/White, also had higher odds of problems getting specialist care. This finding confirms another study that children of minority races, especially black children, are less likely to visit a doctor's office for any reason [48]. In our data, both the uninsured rate and the unemployment rate for Black/Other children are significantly higher as compared to Whites, which may further suggest that other socioeconomic factors may be at play and need to be addressed.

Our findings have both important clinical and policy implications. Children with anxiety or depression disorders may be very vulnerable and resistant to communication, yet have many additional healthcare needs that other children may not. To lessen any health disparity that may occur, preventative health and specialist pediatricians could work in conjunction with child psychologists and mental health providers to provide joint comprehensive care to children who have a higher chance of missing or delaying the care that they need. In addition, many other socio-demographic factors, for example, racial and health insurance coverage, were found to bear importance on health care access. Even though these differences did not fully explain issues to health care access, policymakers should be attentive to these disparities and strive to refine and implement plans through which these disparities may not unequally influence health care access anymore.

Strengths and Limitations

The strengths of this research are the use of the National Survey of Children's Health, which has a very large sample size and is weighted to be nationally representative. The survey implements random digit dialing as a method of contacting potential enrollees, which has the benefit of including non-listed numbers that may be missed using other phone survey methodologies. Since the NSCH is cross-sectional in design, there are no long follow-up periods where enrollees can be lost. Upon completing the survey, all the data that is needed and available for a particular subject has already been collected. This allows for prevalence to be determined for the selected outcomes. As a result, the NSCH has a high capability to be representative of the population compared to other research designs. Because of this, the present study is generalizable to all populations.

This study has several limitations. First, outcome variables were defined as binary due to the low frequency of individuals perceiving a "big problem" getting their child the care that they need (1.7%). As a result, the outcome was made to be "any problem" vs "no problem" which may result in a less nuanced interpretation of results. Second, since NSCH was conducted using telephone methodology, none of the children's anxiety and depression diagnoses was clinically confirmed, they were merely based on caregivers' self-reported answers with the aid of screen questions to help them understand their children's health conditions. In addition, some anxiety and depression diagnoses may not apply to very young children. Third, the NSCH has a relatively poor response and completion rate. As a result, certain populations may be underrepresented in the sample. Weighting was used as a method for correcting any underrepresentation, but it cannot be known if certain populations are under or not represented in the study. Fourth, since the NSCH is a phone survey and asks patients/caregivers to remember as far back as a year about their activities of daily living, survey respondents may feel pressure to give favorable answers, or answers that present their child and how they care for them in a positive light. Fifth, parents/caregivers struggling the most with their lives and their children may not have gotten to the doctor to get their child diagnosed or may not remember the particularities if they are concerned with more pressing issues. This, again, will result in the underreporting of issues a child/parent has. Finally, there is a potential for recall bias in the study design [30].

Conclusions

Children with anxiety or depression, in addition to other, previously known sociodemographic differences, need ongoing preventive care as well as additional care from specialists, yet they are less likely to obtain timely preventive care and have problems procuring specialist care. These findings highlight a disparity that requires the attention of healthcare providers and outreach programs. Recent efforts by some primary care offices in economically depressed areas to co-locate mental health services is one potential solution to improving access to preventive care [49,50], but more creative approaches to care delivery should be developed to help improve healthcare for all children.

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Conflicts of Interest

All authors have indicated they have no relationships to disclose.

Statement of Contributions

Dr Wu contributed to the conception and design of the study, supervised data collection, was involved in the interpretation of the data analyses, drafted the initial manuscript and critically reviewed and revised the manuscript for important intellectual content.

Mr Paoletti contributed to the conception and design of the study, collected the data, was substantially involved in the interpretation of the data analyses, and drafted the initial manuscript.

Dr DeLago contributed to the conception and design of the study, and critically reviewed and revised the manuscript for important intellectual content.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Anti-Racism Training for Healthcare Professionals: A Critically Appraised Topic

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Context *There is documented presence of racism in healthcare, resulting in negative health outcomes for minoritized people. While there is a focus on anti-racism and anti-bias training for providers, it is unknown whether these programs are successful. Therefore, the clinical question is "Does anti-racism training among healthcare professionals increase knowledge of racism in healthcare?"* ***Methods*** *PubMed was searched in July of 2021 using a specific Boolean phrase of (racism*[tiab] OR "anti racism"[tiab] OR "racism"[MeSH Terms]) AND (train*[tiab] OR educat*[tiab]) AND (("health personnel"[MeSH Terms] OR ("health*"[All Fields] AND "personnel"[All Fields]) OR "health personnel"[All Fields] OR ("healthcare"[All Fields] AND "professional"[All Fields]) OR "healthcare professional*"[tiab] OR "healthcare provider*"[tiab] OR physician*[tiab] OR "athletic trainer*"[tiab] OR "physical therapist*" OR dentist*[tiab] OR "dental hygienist*"[tiab] OR doctor*[tiab] OR "medical professional*"[tiab] OR "medical provider*"[tiab] OR nurs*[tiab] OR "physician assistant*"[tiab])). For inclusion, a study had healthcare professionals who completed anti-racism training and self-assessment surveys providing measurable outcomes. Only articles from the previous 5 years were considered. Titles were reviewed for relevance, followed by abstract and full text, when needed. The STROBE checklist for cross-sectional studies and the PEDro scale were used for appraisal.* ***Results*** *The search yielded 274 articles. Of those, 259 were eliminated based on title and 12 were eliminated based on reading the full text. Three were selected for inclusion. The first study utilized a clinical workshop developed to decrease the likelihood of clinicians expressing bias and stereotypes in interactions with patients of color. The participants used Likert scales to rate the effectiveness of the training, with 5 being most effective. The average scores for survey items included 4.8/5 for "information relevance and delivery", 4.8/5 for "introduction to culture", and 4.7/5 for "introduction to communication". In the second study, cultural awareness training was aimed at increasing clinicians' ability to provide culturally safe care using authentic personal stories. The average percentage of improvement was 27% for "attitude toward minorities", 23.8% for "inclusion of other in self", and 23.8% for "interaction closeness." The third study deployed an 8-hour training adapted to an online setting. Results demonstrated scores of 4.5/5 for "found training valuable", 4.3/5 for "training will improve clinical care", and 3.9/5 for "ability to create inclusive environment post-training". The STROBE scores for these articles were 18/22, and 20/22, respectively, while the PEDro score of Kanter et.al was 9/11* ***Conclusion*** *There is consistent self-reported evidence that anti-racism training may be beneficial to clinicians. It is important to note that these studies were only conducted on the provider side, there is a need for information collected from the patient's experience post-training. Due to the consistent, limited quality of evidence, a SORT score of B is recommended.*

Keywords*: Cultural competence, professionalism, bias*

Introduction/Clinical Scenario

Racism is the phenomena that maintains or exacerbates avoidable and unfair inequalities in power, resources, or opportunities across racial, ethnic, cultural, or religious beliefs.[1] There are several ways that racism can be expressed, including emotions, beliefs, and actions. It can be internalized into one's beliefs, into their interpersonal interactions, or instilled in institutions and systems. [2] Some forms of racism are subtle and unintentional, while others may be more overt. These different forms of racism can affect people of color personally, professionally and systemically. Racism exists in healthcare and subsequently has impacted generations of people of color's health through many facets such as mistrust, provider bias, and decreased access[1]

Racism is well documented within many healthcare systems.[1,2,3,4] For example, unconscious bias and perceived racism can affect patient-provider communication, and also may affect future engagement between people of color and their providers.[4] Structural implications can manifest in many ways such as allocation of resources, promotion practices, or referral procedures.[3] The effects of racism(e.g., medical mistrust) on the health status of people of color has been explored and documented.[3,4] Mitigating these effects is the next hurdle for healthcare providers, having a basic understanding of racism at all its levels may help. [3] Anti-racism training may need to start with addressing understanding.

Anti-racism training can come in many forms, such as decreasing provider microaggressions, improving provider responsiveness and emotional rapport, and empathy.[5] Examining specific programs and their efficacy in dismantling racism may be key to building a more equitable and fair health system.[5,6] Therefore, the purpose of this Critically Appraised Topic (CAT) was to determine if anti-racism training can improve the general understanding of racism among healthcare providers.

Focused Clinical Question

Does anti-racism training among healthcare professionals increase knowledge of racism in healthcare?

Search Strategy

Using a Population, Intervention, Control, and Outcomes (PICO) strategy, the PubMed electronic database was searched in July 2021. The search was limited to publication dates between 2016- 2021. The Boolean phrase used for the search was : (racism*[tiab] OR "anti racism"[tiab] OR "racism"[MeSH Terms]) AND (train*[tiab] OR educat*[tiab]) AND (("health personnel"[MeSH Terms] OR ("health*"[All Fields] AND "personnel"[All Fields]) OR "health personnel"[All Fields] OR ("healthcare"[All Fields] AND "professional"[All Fields]) OR "healthcare professional*"[tiab] OR "healthcare provider*"[tiab] OR physician*[tiab] OR "athletic trainer*"[tiab] OR "physical therapist*" OR dentist*[tiab] OR "dental hygienist*"[tiab] OR doctor*[tiab] OR "medical professional*"[tiab] OR "medical provider*"[tiab] OR nurs*[tiab] OR "physician assistant*"[tiab])). Articles were included if the subjects were healthcare providers who completed an anti-racism training with measurable self-reported outcomes, such as surveys. Articles were excluded if the subjects were not healthcare providers (i.e. technicians). Articles were excluded if the training was not primarily focused on racism or if it was not interactive with others.

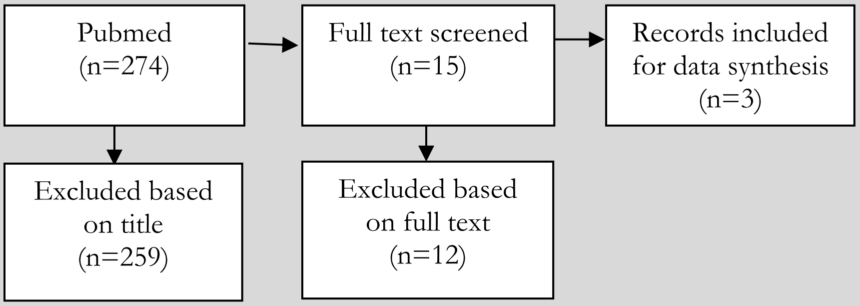
Evidence Quality Assessment

The STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) checklist was used to assess the quality of the studies included. The STROBE was selected for use because it can assess cohort, case-control, and cross-sectional studies that utilizes descriptions of 22 specific items that should be included in observational studies.[7] The PEDro scale was used to assess one study due to it being a randomized control trial.[8]

Results of Search: Summary of Search, Best Evidence Appraised, and Key Findings

In total, the search yielded 274 articles, with 259 ruled out by title. The full text was used to rule out 12 more, based on outcome measures and participants. A summary of the search results can be seen in Figure 1. Each of the three articles included used some form of post-training assessment to determine the effectiveness of an anti-racism training for healthcare professionals. The articles included in Table 1 met the inclusion criteria and were selected to be included in the CAT. All studies included showed improvement in understanding of racism in healthcare by healthcare providers who participated in anti-racism training.

Figure 1.
Summary of Search Results



Results of Evidence Quality Assessment

Two studies included in the CAT were appraised with a STROBE checklist.[5,6,9] The Knox et al.[6] study received a score of 18/22 (82%). The Kerrigan et al.[9] study received a score of 20/22 (91%). The Kanter et al.[5] study was assessed using the PEDro scale and was given a score of 9/11.This study utilizes a control group, while the others do not.[5] One study was not forthcoming about their attempts to address potential bias or the study design.[6] While Kanter et al. offer detailed information of participant demographics, the remaining studies did not.[6,9]

Clinical Bottom Line: Strength of Recommendation

There is consistent evidence supporting that anti-racism training gives healthcare providers an improved understanding and awareness of racism in healthcare. The post-training assessments repeatedly illustrated improved awareness of the existing racism in our healthcare system, as well as individual roles that healthcare provider play in that racism. One study compared post training responses with a control group and found significant improvements when compared to the control.[5] The remaining 2 studies found self-reported improvement among all subjects, after the training.[6,9] This awareness is beneficial to clinical practice and patient interaction. All three studies included in this appraisal met 82% or more of the items on the STROBE checklist. The included studies, consisting of high quality quantitative and qualitative data, were assigned a Level 2 study quality by the Strength of Recommendation Taxonomy (SORT) standards.[10] With outcome consistency across studies, this allows a SORT rating of B.[10]

Implications for Practice, Education, and Future Work

There is a documented presence of racism in healthcare, and the ongoing discovery of many negative effects that it has on people of color's health status. Theories such as a decreased perception of pain among people of color, have been used to justify inhumane and immoral treatment.[11] This running history of inhumane treatment has led to cultural acceptance of hardship and medical mistrust.[12] Microaggressions and unconscious bias in cross-race patient/provider interactions can affect compliance, understanding and trust, and adversely affect future care.[13] A medical duty exists to correct these inequities.

Integrating anti-racism training into healthcare has shown promise as the first step toward an equitable system with less health disparities.[3] Healthcare providers have expressed an improvement in their understanding after participating in anti-racism training sessions. They have also expressed, through narrative response, a desire for cultural education and encouraging or mandating active attendance at anti-racism training sessions.[6,9] While more than 90% completed their trainings when it was made mandatory, only 50-75% completed the same trainings when it was optional.[6] Kerrigan et al. note the importance of providing protected time for healthcare providers to complete the mandatory training. The study notes that they may improve clinical care as well as the ability to create inclusive environments with improved attitudes toward minorities.[5,6]

Knox et al. implemented an 8-hour online workshop for medical providers and students, with a post-training survey to assess self-improvement.[5] Kerrigan et al. had a similar study design with a 7-hour in-person workshop for a large number of providers, with a self-assessment survey post-training.[9] While the outcomes are beneficial to determining how to best carry out these trainings, as well as perception and self-noted improvement, it must be noted that these do not illustrate measured differences in racist behavior or changes to practice. Kanter et al. attempted to address this in their study by comparing the post-training survey results after a 5.5 hour in-person workshop, to a control group. They were successful in showing improvement in several topic areas when compared to the control, solidifying that anti-racism training is helpful in the fight to educate and mitigate racism in healthcare.[6]

The importance of utilizing an outside program that is established and specialized in anti-racism training should be noted. Having trained professionals carry out the anti-racism training sessions in the included studies, whether in person or virtually, was well-received by the healthcare providers.[6,9] The effectiveness of the trained professionals may play a role in the receptiveness of the training and should be taken into account when choosing an anti-racism training program.[6.9] Participants have expressed the importance of creating a safe learning environment that integrates interpersonal sessions that encourage vulnerable and intimate interaction.[5,6,9] When these sessions effectively deliver personally applicable information to healthcare providers, it may encourage further inquiry into anti-racism education and mitigation.[9]

Future research needs to examine effective implementation strategies for anti-racism training in healthcare systems, as well as how to create ongoing and evolving trainings that encourage continuing education. Additionally, future research should examine whether improved understanding translates to behavioral change in healthcare workers. Healthcare systems should utilize patient centered outcomes to assess the efficacy of these trainings. Future studies should be conducted over a longer period and should examine the long-term retention of knowledge among healthcare providers and the impact of ongoing anti-racism training among healthcare providers.

CAT Kill Date: July 2016

CATs have a limited life and should be revisited approximately 5 years after publication.[14]

Conflicts of Interest

The authors have no conflicts of interest to disclose.

Statement of Contributions

This project was completed as a doctoral capstone project, with Kaitlyn as the main author. Her committee members (Tierney,Russ) and chair (Mansell) contributed to the idea and editorial process.

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Operating Bias? Racial and Ethnic Inequities in Surgical Specialties

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Differences in quality and rates of health, health care, morbidity, and mortality among patients of varying racial or ethnic groups, or health care inequities are unfortunately pervasive in the surgical literature and among surgical specialties. This commentary provides a brief review of this literature to bring attention to and discuss ways in which racial health inequities might be addressed within the surgical environment. They may result from any combination of patient, societal, system, and provider-related factors. Inequities exist in relation to health care access, treatments, and post-operative outcomes. Potential ways to better address and rectify racial and ethnic inequities are through continued research into causes of inequities, as well as establishment, implementation, and adherence to standardized, objective treatment guidelines. Significant and continued efforts are needed in order to develop better understanding of and potential solutions for reducing these inequities.

Keywords: *Racial/ethnic inequities, inequities in surgery, surgical specialties*

Background

Health care disparities or inequities are defined as differences in quality and rates of health, health care, morbidity, and mortality among patients of varying racial or ethnic groups.[1–4] Health care inequities exist among patients across surgical subspecialties, including general, oncologic, vascular, gynecologic, colorectal, and endocrine surgery, among others. Many factors contribute to the pervasive racial and ethnic inequities in surgical care. Inequities within the field of surgery is of particular importance because they have been shown to contribute to poorer health outcomes and lesser quality of life for patients who belong to racial and ethnic minority groups.[1] This commentary provides a brief review of this literature to bring attention to and discuss ways in which racial health inequities might be addressed within the surgical environment.

Inequities in Access to Surgical Care

Lack of equitable access to surgical care is a significant source of inequities for racial and ethnic minority groups. Factors that contribute to inequities in access to care include patient health literacy, educational status, income status, insurance status, language barriers, and cultural beliefs.[5] For example, Saha et al. utilized data from a national telephone survey and found that Black and Hispanic patients prefer to see physicians of their own race due to personal and language preference.[6] They also found that Black patients would delay medical treatment in order to see a practitioner of their own race,[5,6] indicating potential distrust of the medical system, poor physician-patient communication, poor patient health-literacy, poor physician understanding of cultural expectations, or implicit biases. Patients may also receive differing treatment recommendations based upon their race: Shah et al. reported that Black patients with pancreatic cancer were recommended to undergo surgical resection less often than White patients.[7] Furthermore, Black patients for whom surgical resection was recommended were less likely than White patients to actually then undergo surgical resection.[7]

Socioeconomic status also plays a role. Black and Hispanic patients are more likely to reside in zip codes with associated lower mean income levels and utilize Medicaid at higher rates than White patients.[5] Patients with Medicaid insurance have been shown to have increased environmental stress, delayed access to care, and limited availability of health resources, all of which can lead to poor health outcomes.[5] Additionally, racial inequities in the treatment of patients with a variety of resectable gastrointestinal cancers is significantly related to patients' socioeconomic status: lower socioeconomic status patients are substantially less likely to undergo surgical resection of their cancer, and patients of lower socioeconomic status had significantly shorter overall survival than patients of higher socioeconomic status.[8] For example, for patients with rectal cancer specifically, patients with higher socioeconomic status (e.g. higher income, higher education level, and private insurance) had better access to treatment in academic and higher volume hospitals, which were associated with improved overall postoperative survival for these patients.[9]

Access inequities are also related to hospital-specific factors. Black patients have been shown to be more likely to be treated at low-volume hospitals or by low-volume surgeons, both of which provide less advanced and lower quality surgical care.[10–12] For example, it has been shown that Black and Hispanic patients undergoing thyroidectomy or parathyroidectomy are more likely to be treated by low-volume surgeons (<25th percentile, 1-4 operations per year), which are associated with higher rates of complications.[10] Black patients with ovarian cancer are also less likely to be operated on by high-volume surgeons (≥10 cases/year) or undergo important ovarian-cancer specific procedures (e.g., hysterectomy, colon resection, and lymphadenectomy), which are more likely to be performed by high-volume surgeons.[11] These patients are also 20% less likely to receive care concordant with National Comprehensive Cancer Network (NCCN) treatment guidelines.[11] Racial and ethnic minority patients are over-represented in lower-quality hospitals, which leads to poorer outcomes in their population of patients undergoing cardiac surgery.[13] When it comes to emergency surgical procedures, Black patients have increased likelihood of postoperative death due to being treated more frequently at hospitals with higher mortality rates.[14] Hospital factors that contribute to higher mortality rates include an urban setting and a larger number of beds, both of which have been shown to be associated with poorer outcomes.[14] This suggests that these hospitals may have a lack of resources which, in turn, disproportionately impacts racial and ethnic minority patients' access to needed health care. Structural racism likely plays a role in these health access inequities as a deeper seeded societal construct in the form of historical residential segregation that has led to poorer access of minority groups to high-volume hospitals and surgeons.[15,16] These access issues ultimately lead to worse post-operative and survival outcomes.

Inequities in Treatment and Outcomes

Racial and ethnic minority groups are subject to receiving different, and sometimes inferior, treatment recommendations, which can lead to worse health outcomes. Minimally invasive surgery has become the standard of care over open surgery for many intra-abdominal operations[12] due to decreased postoperative pain, earlier return to work and normal activities, decreased incidence of postoperative complications, improved patient satisfaction, shorter length of hospital stay, and reduced hospital costs compared to open surgical approaches.[12,17] Black, Hispanic, and Asian patients are less likely to undergo minimally invasive surgery with regards to inguinal hernia repair, cholecystectomy, appendectomy, colectomy, and gynecologic surgery.[12,18] Black patients are less likely to have minimally invasive surgery for uterine fibroids and have overall poorer outcomes compared to White patients.[19] The inequities for patients undergoing minimally invasive surgery may stem from access to surgeons or facilities with these capabilities or implicit bias of providers in offering minimally invasive techniques.

While peripheral arterial disease disproportionately affects Black and Hispanic patients, Black patients are less likely to receive preventative vascular screenings and limb-saving interventions such as angioplasty and lower extremity bypass.[2,20–23] Black patients are also more likely to have long-term graft failure after bypass procedures, undergo initial or eventual amputation, and have amputations at higher levels on the extremities.[20–23] Amputations lead to decreased independent functionality, psychosocial distress, decreased economic status, and lower quality of life for patients.[21,22] Consequently, limb salvage should always be the ultimate goal for patients. These inequities in surgical treatment may be related to access to surgeons or facilities with these capabilities or implicit bias of providers in offering limb-salvage techniques, but have significant consequences for patients.

Treatment and outcome inequities may also be related to delayed patient presentation. For example, Black and Hispanic patients are more likely to present with acute hernia complications, leading to emergent surgery which results in higher rates of in-hospital death and longer post-operative length of stay.[1] These inequities can be related to poor access to or quality of preventative care, treatment of disease-specific risk-factors, patient health literacy, and income and insurance statuses. Compared to White patients, Black patients experience longer wait times between diagnosis of pancreatic cancer and surgery[7] which can lead to cancer advancement and poorer outcomes.

Black patients have also been shown to have higher readmission rates following colorectal surgery despite adjustment for social determinants of health, longer post-operative length of stay with or without the presence of complications, and higher complication rates.[4,24,25] After bariatric surgery, Black patients experience poorer outcomes such as longer operative time, longer length of hospital stay, increased rates of readmission, reoperation, reintervention, renal failure, pulmonary embolism, venous thromboembolism, and mortality.[26,27]

In sum, racial and ethnic minority groups sometimes receive different levels of surgical treatment when compared to White patients. This includes surgical options, surgical techniques, and preventative interventions. Ultimately, these inequities in surgical care lead to poorer health outcomes and lessened quality of life for the minority patients.

Potential Solutions to Reduce Inequities

Clinical practice guidelines are an opportunity to eliminate variations in care while improving health outcomes and are one way to reduce racial and ethnic inequities in health care.[28] The success of guidelines and standardization cannot be understated: utilizing the standardized enhanced recovery after surgery (ERAS) pathway after colorectal surgery eliminated inequities in post-operative length of stay between Black and White patients.[29] Bristow et al. also showed that patients with ovarian cancer who received equivalent care regardless of race or ethnicity, had similar outcomes.[11] Together, these studies bring forward the importance of and potential for standardization of care, guideline creation, and guideline adherence and their potential impact in reducing race and ethnic-based variations in surgical care.

Cultural humility and implicit bias trainings are another way to work towards lessening health care inequities. Cultural humility is an ongoing endeavor of learning, experiences, and self-reflection that providers can be trained in in order to strive towards better understanding their patients, and their experiences, preferences, needs, and cultures.[30] Providers must also recognize that there is always going to be more for them to ask, learn, and challenge in order to aim towards providing equitable, high-quality health care.[30] It may also help health professionals to recognize their own implicit biases which are peoples' unconscious biases that alter their actions.[31] These unconscious biases can result in unintentional stereotyping or discriminatory behaviors.[31] Teaching providers about and helping them to identify their own implicit biases can aid in lessening their impact in patient care and outcomes. Sarwer et al. discusses addressing patient and provider biases in relation to bariatric surgery, noting that it is a significant barrier to utilization of this safe and efficacious treatment for obesity, especially for racial and ethnic minority groups.[32] They suggest that education about such weight-biases can lead to improved awareness and more equitable surgical treatment.[32] Cultural humility and implicit bias training can be incorporated during medical training and in continuing medical education during practice. It may help to produce more well-rounded, understanding, and equitable health care providers.

Furthermore, more broad social changes could potentially impact overall racial and ethnic inequities which would carry over into surgical care. Such social changes could include increased access to health insurance which would increase access to health care services, continued efforts towards value-based reimbursement for care, continued efforts to diversify the medical and surgical professions, anti-poverty programs, and increased social protections for racial and ethnic minority groups.

Conclusion

Racial and ethnic inequities in surgical care are widespread and multifactorial. Beyond recognizing these inequities, it is crucial to develop better understanding of why they exist and how to address them. While this review is not exhaustive of all the examples of inequities within surgery, it highlights notable examples. Significant attention should be paid to the modifiable factors, many of which may overlap, such as implicit bias, health care access, and socioeconomic status. Potential solutions for reducing racial and ethnic inequities in surgical care involve provider recognition and self-reflection as well as guideline creation, dissemination, adoption, and adherence. These actions only begin to scratch the surface of what is needed to reduce these inequities and improve care.

Conflicts of Interest

The authors have no relationships to disclose.

Statement of Contributions

Dr. Kling and Dr. Taylor were involved in concept development. Dr. Kling was responsible for writing the manuscript. All authors were responsible for critical review and editing of the manuscript.

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Basic Needs Insecurity Affects Student Success and Physical and Emotional Health: How Can We Address It on College Campuses?

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Introduction

College students' basic needs insecurity is a prevalent, and increasingly publicized, consequence of increasing access to higher education without expanding systemic resources.[1] Because basic needs insecurity is a social determinant of health, it results in health inequity and is a campus and public health issue.[2] This is a call to action for all of us—individually and collectively—to address this systemic inadequacy.

Basic needs include access to nutritious and sufficient food, safe and secure housing, healthcare, affordable technology and transportation, personal hygiene needs, and childcare and associated needs.[3] Basic needs insecurity (BNI) occurs when there is no structural ecosystem (i.e., multiple systems) in place to ensure students' basic needs. It is critical to recognize that BNI is not a personal characteristic or failure but rather a structural failure that requires a creative and inventive approach, especially in higher education. The concept of an ecosystem may be familiar to public health practitioners since it is a similar framework to Bronfenbrenner's Social-Ecological Model.[4] Like The Hope Center for College, Community, and Justice at Temple University's framework, Bronfenbrenner's model allows researchers to consider the relationship between and within the various ecological systems to assess needs and help guide public health recommendations.[5]

The Hope Center has measured food and housing insecurity and homelessness at colleges and universities across the United States for many years.[6] Their most recent report found that nearly three in five college students experienced basic needs insecurity in 2020.[7] In addition, without support, these students are less likely to enroll in college and more likely to stop out of college.[7] Structurally minorized students such as students of color, parenting students, first-generation students, Pell Grant recipients, part-time students, and LGBTQ students reported an even higher rate of BNI.[7] These statistics should not only be a wake-up call to higher education leaders but to society, specifically those working in public health, because BNI has been linked to educational challenges and poorer physical and emotional health. Without addressing basic needs, students are not able to focus on their education. We must set them up for success.

BNI and College Student Success

The considerations of ancillary impacts on college student success have been increasingly evaluated over time. Researchers have noted that college student success can be impacted by the transition from high school to college (i.e., college readiness).[8] College readiness requires academic achievement, knowledge about college (e.g., financial aid, potential majors), cognitive strategies for classes, and "noncognitive" factors (e.g., interpersonal and intrapersonal skills).[8(p1)] Despite this significant life transition, secondary and post-secondary institutions have done little to close this divide—the onus is on student and/or parent(s).

In addition, the influence of BNI on college student academic achievement, persistence, and attainment has only been realized in just over the last decade. In their 2008 report, Goldrick-Rab and Roksa detailed the apparent gap between ambition and reality in college degree attainment, particularly those at community colleges and from socioeconomically disadvantaged families.[9] In 2020, the numbers show we have made little headway for students, specifically ages 25 to 29 years in the United States attending college, with 39% of students ultimately earning bachelor's degrees or higher and 50% of students completing an associate degree or higher.[10] In addition, the growing cost of college requires most students to obtain students loans (i.e., 66% of students apply for federal financial aid).[11] Still, the poor chance of college completion perpetuates the cycle of income inequality, which researchers have linked to individual health and well-being.[12]

Social mobility can be improved significantly by getting a college degree.[9] However, income inequality, educational opportunities, and social mobility are inextricably linked, and the considerable increase in the income divide over the last several decades has had substantial impact on college access and improved social mobility.[13] Now, with the decreasing federal and state funding for college education and high cost of college, the increasing necessity of a college degree is becoming a barrier to social mobility.[9] This can be further complicated by BNI and its implications on physical and emotional health.

BNI and Physical and Emotional Health

Educators have become more aware of the impact of trauma on education recently.[14] In 1998, Felitti et al. published *The Adverse Childhood Experiences (ACE) Study*, which described ACEs and their effect on health risks later in life.[15] The researchers' purpose was to analyze the longitudinal relationship between participants' ACEs and medical and public health issues. They interpreted ACEs as abuse (i.e., psychological, physical, sexual) and household dysfunction (i.e., substance abuse, medical illness, violence against mother, family imprisonment). Fifty-two percent of participants reported one or more ACEs, and over 6% reported four or more ACEs. They also found that "Both the prevalence and risk (adjusted odds ratio) increased for smoking, severe obesity, physical inactivity, depressed mood, and suicide attempts as the number of childhood exposures increased."[14(p249)] Later, the frequency and probability of alcoholism, illicit drug use, increased number of sexual partners, and sexually transmitted disease increased with increased ACEs.[14] Finally, Felitti et al. (1998) found a strong, positive relationship between increased ACEs exposure and multiple risk factors for the leading causes of death in adults (e.g., ischemic heart disease, cancer, chronic lung disease, skeletal fractures, liver disease, self-rated health), which established a "strong and cumulative" effect of ACEs on health status as an adult.[14(p251)]

While early research focused on the physical long-term health outcomes of ACEs, current research has focused on both mental and physical long-term health outcomes. Davidson

(2018) discussed how childhood trauma (i.e., ACEs) can affect brain development leading to delays in physical, emotional, and social development which may impede learning.[16] The statistics are staggering; adults with childhood trauma are:

- 15 times more likely to attempt suicide,
- 4 times more likely to abuse alcohol,
- 4 times more likely to inject drugs,
- 3 times more likely to use antidepressants,
- 3 times more likely to be absent from work, and
- 3 times more like to experience depression.[14,15(p6)]

Although, prior research on ACEs has generally dismissed the intersectionality of economic status, race/ethnicity, and gender.[16] Mersky et al. (2021) found that if each of these demographic factors was analyzed independently, then the results obtained will be misleading but consistent with previous literature. Taking an intersectional approach to examining ACEs diminishes the effect of gender and demonstrates that economic status affects racial/ethic differences.[16] As a result, it is critical that researchers examine these factors together "substantiating a basic premise of intersectionality theory that inequities are more fully expressed when social categories are treated in an interlocking configuration."[16(p7)]

Recent research has also found that families reporting ACEs were much more likely to experience household food insecurity.[17] For example, the rate of exposure to three or more ACEs in a food insecure home was one in four children compared to one in twenty-five children in a food secure home.[17] In addition, food insecurity gets worse as ACEs increase, although Jackson et al. (2019) found this may be affected by the parents' physical and mental well-being. As a result, they recommended policies and supports go beyond food assistance and should "integrate programming that addresses intersecting adversities, such as family and community violence, incarceration, and discrimination."[17(p673)]

As children grow older and enter college, research shows racial disparities in basic needs insecurities.[7] Indigenous (75%), Black (70%), and American Indian or Alaska Native (70%) students experience food insecurity, housing insecurity, and/or homelessness at a much higher rate than white students (54%).[7] There are mechanisms that have shown promise in addressing the trauma of ACEs, including social and emotional learning and trauma-informed practices.[13]

Researchers in social epidemiology have illustrated that the most significant causes of mental health concerns in populations are systemic (e.g., poverty, social exclusion).[13] Unfortunately, they can not easily evaluate these variables during experiments, and when included, mental health variables are often missing.[18] To address this, college administrators should promote a systemic mental health program that approaches all mental health concerns (i.e., diagnosed and undiagnosed at varying degrees) in a manner that promotes social justice causes based on current evidence. Recently, scholars have addressed mental health social justice issues including, but not limited to, access, basic needs insecurity, and the emotional impact of marginalization, including psychiatric imperialism and combating stigma.[19,20]

The coronavirus (COVID-19) pandemic has clarified the already existing and persistent link between a public health emergency, food insecurity, and mental health concerns.[21] Even as social mobility has stagnated, the issues of health disparities, BNI, and social justice have intensified in the wake of the pandemic. Colleges and universities and the government have worked to address these concerns by implementing emergency aid, the child tax credit, economic impact payments, pausing student loan payments, improving access to the Supplemental Nutrition Assistance Program (SNAP), free COVID testing and vaccinations, shifting many services online (e.g., mental health support, parenting support, telehealth, classes, conferences), and establishing a White House initiative to advance educational equity, excellence, and economic opportunity through Historically Black Colleges and Universities (HBCUs).[22,23] Although not all supports may remain post-pandemic, there have been calls from student and policy advocates for many, if not all, of them to be available or improved long-term.[24] Further mechanisms may be proactive in addressing emotional health in higher education, such as social support, addressing barriers, educating incoming students, training faculty, creating a culture of self-care, advocating for policy change, and incorporating social and emotional learning and trauma-informed practices.[13] But what about addressing BNI?

How to Address BNI on College Campuses

Preparing for Success

Addressing BNI on college campuses can begin before students step foot on campus. Nagaoka and Holsapple (2017) advocated for aligning 12th grade of high school to the first year of college to boost student success, especially for students from low-income backgrounds or structurally minoritized communities.[25] This process can occur by high school and college personnel collaborating to co-design, co-deliver, and co-validate instruction.[25] In addition, developing noncognitive factors is necessary for college success, and the models with most favorable outcome in doing this are dual enrollment and early college.[25]

Some have argued that the responsibility of college student success should sit with colleges.[25] To this end, many colleges have instituted bridge programs, learning communities, orientation programs, and college success courses and counselors to assist with student success. Although, characteristics of the college can impact student success in almost every way, which is why an emerging sense of belonging will look different for a student at a 4-year university and a 2-year community college.[25]

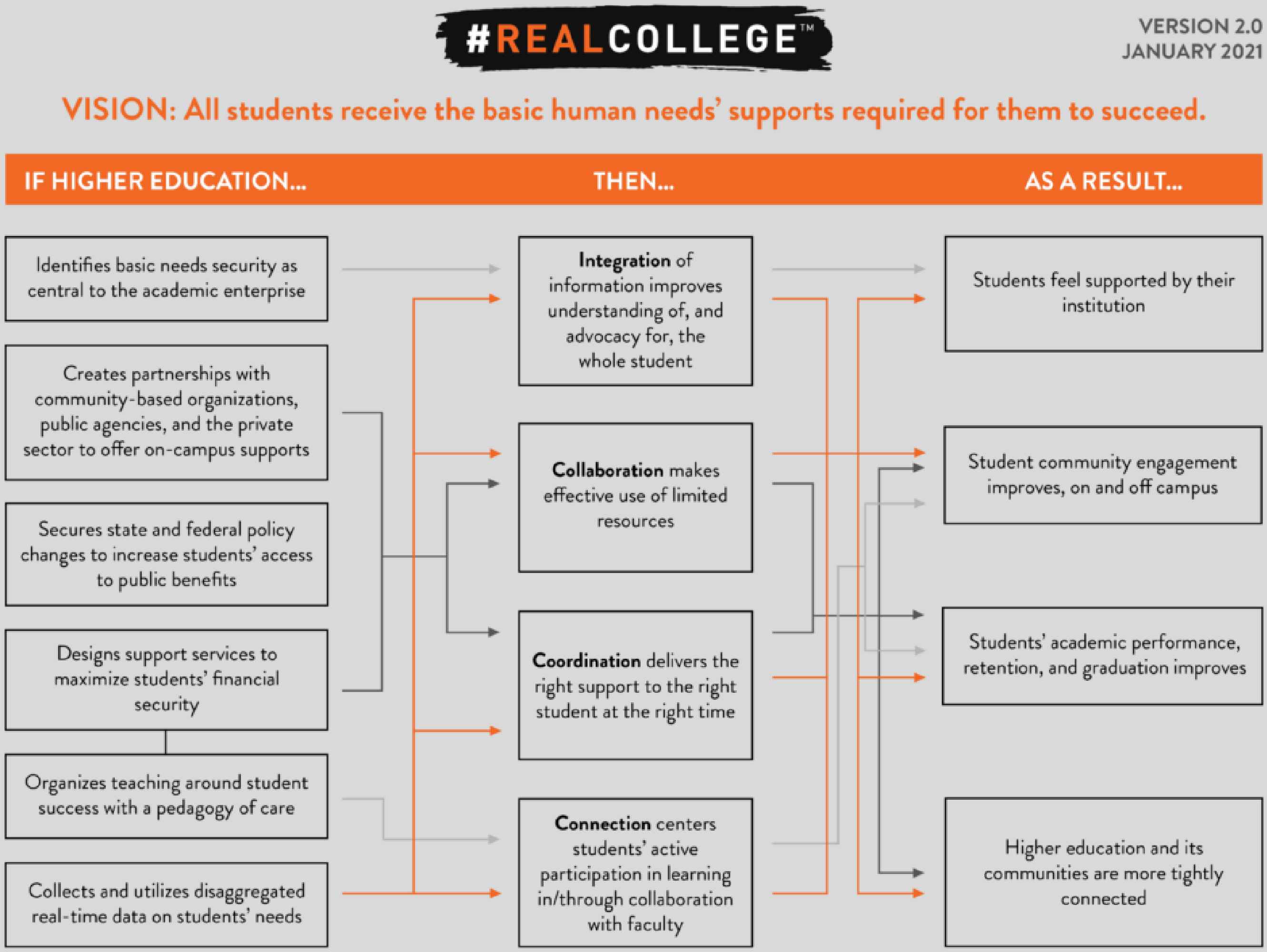
Developing an Ecosystem to Support Basic Needs

Due to the significant distress of basic needs insecure college students and the lack of systemic initiatives to assist students with this need, The Hope Center has developed the #RealCollege conceptual framework (see figure 1).[3] This framework helps us understand how to improve student access, persistence, and degree attainment in higher education. The foundation of this framework is that students must have their basic needs met before they can learn (see the works of Abraham Maslow and Benjamin Bloom), essentially that they must "Maslow before they can Bloom."[26] The Hope Center takes this one step further by encouraging an ecosystem that provides multiple layers of support to students. This allows individuals throughout the campus and nearby community to break down systemic silos, develop partnerships, and collaborate on solutions. The resulting ecosystem provides students with the sustenance to thrive academically, economically, physically, and mentally.

The Hope Center made several federal and state policy recommendations to improve college student BNI in their most recent #RealCollege 2021 annual survey report.[7] In addition, they recommended that colleges create new or expand existing emergency aid programs, discuss basic needs with students at enrollment, increase student awareness of BNI supports, destigmatize the use of public benefits, gather data on basic needs on their campus, and streamline student supports via a one-stop center.

When the whole student is not valued and embraced, their academic success, which strongly correlates with economic stability and other life outcomes, is put at risk.[3] As public health scholars, you chose a profession of caring and support. We must come together to prepare students for success and advocate, research, communicate, and assist each other with building ecosystems for basic needs security on college campuses. By doing that, we can improve multiple measures of long-term health, which in turn creates a healthier community—the very heart of public health.

Figure 1. *#RealCollege Conceptual Framework*



Note: The Hope Center for College, Community, and Justice. The #RealCollege Theory of Change. https://hope4college.com/theory-of-change/. Published 2021. Accessed December 20, 2021. Used under Creative Commons License (https://hope4college.com/wp-content/uploads/2022/03/Creative-Commons-license-for-Hope-Center-reports-and-publications.pdf).

Conflicts of Interest

Nicole L. Hacker is employed by The Hope Center for College, Community, and Justice.

Statement of Contributions

Nicole L. Hacker was the sole contributor to this op-ed.

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