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Hello all and welcome to the second issue of the Virginia Journal of Public Health in our new Digital Commons platform.

In this, our (as usual) much-delayed Spring/Summer issue, we are pleased and proud to host posters from the combined Virginia Public Health Association/Virginia Rural Health Association meetings on March 26th. You'll find several interesting topics including health disparities and health equity, COVID-19, and diverse public health research. By all accounts, it was a fine conference and the scholarship of the posters reflects the same.

In addition to the VPHA/VRHA posters, we present five fine manuscripts on a wide variety of topics by a wide variety of public health scholars. A narrative literature review illuminates the relationship between climate change and inequality in low-income countries, finding that while first-world countries contribute the most to climate change, it is more vulnerable populations who suffer the resulting changes in communicable disease epidemiology, in addition to flooding and droughts. Similarly, another fine review illustrates the problem of oral health and its impact on pregnant women and their children in the United States. This particularly vulnerable population can benefit from interprofessional models of practice and care delivery that address oral health during the pre-and post-natal periods, as well as during pregnancy. And a final study using the Health Opportunity Index reveals the relationship between diabetes and social determinants of health in the Hampton Roads area. Surprisingly 64% of diabetes prevalence in this part of Virginia may be explained by years of schooling, employment, and income. Each of these three studies points public health practitioners to the importance of addressing social inequality and vulnerable populations as a matter of global health.

For this issue, COVID-19 practitioners and researchers finally found the time to write about their experiences: Authors of a third review find that learning modalities may be linked with mental health conditions during the SARS-CoV-2 pandemic among kindergarten through 12th graders. "In-person" learning appears to be associated with better mental health outcomes, while "hybrid" (in-person/on-line) learning appears promising. A nice study conducted among public health and human services providers in Richmond reveals the relationship between loneliness, substance abuse, and increasing mental health issues in general, with loneliness apparently driving the other two factors. These results are consistent with findings across the country regarding the psychological impact of social isolation in general, as well as that specifically associated with the pandemic. For those of you in practice, if you were wondering whether your individual experiences reflect a larger pattern of COVID-19-related assaults on mental health, these two studies will substantiate your feelings.

Last but certainly not least, Ben Barber's Policy Forum is devoted to an introduction of the "All of Us" database, and Kim Baskette has contributed experiences of researchers who are using this database now. Both VCU and UVA are engaged in the use of this collection of health data. Nationally, the AOU database has been used to explore hypertension in diverse populations and to revisit the debate over the "Latino Epidemiolocal Paradox." We are excited to see what the database will contribute to understanding population health and diversity in the Commonwealth. The VPHA and VJPH are thrilled to spotlight this game-changing database and policy-changing research.

Thank you as always to the 4VA Foundation (who pays the bills), JMU libraries (who does the technical work), and new and special thanks to Longwood University students and faculty who formatted manuscripts and gave us our new, scholarly-looking front page. We would like to recognize and thank Longwood University's Dr. Heather Lettner-Rust for facilitating that relationship. We look forward to future collaboration with the students.

Stay tuned to the VJPH for new and detailed submission guidelines; manuscript development "lessons;" and the Fall issue, which with luck, volunteer elbow grease, and YOUR submissions will be out in late September. Join us in shouting out the voice of public health in Virginia!

Happy writing,

Maria and Jen

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Virginia Journal of Public Health

National Institutes of Health
All of Us Special Section

All of Us
RESEARCH PROGRAM

150 YEARS APHA
AMERICAN PUBLIC HEALTH ASSOCIATION

All of Us at VCU Health: A Case Study

To help build the largest-of-its kind health database, Virginia Commonwealth University and VCU Health in 2020 joined a national project to better understand why people get sick or stay healthy. The All of Us Research Program at the National Institutes of Health is inviting 1 million or more people across the U.S. to partner in this effort and share their information to drive medical breakthroughs.

VCU Health was one of three sites chosen – and the only one on the East Coast – to roll out a new approach to recruitment for the program. VCU Health hopes to help as many as 1,000 people enroll.

"We're proud to contribute to this historic project," said F. Gerard Moeller, M.D., director of the C. Kenneth and Dianne Wright Center for Clinical and Translational Research and the VCU lead for All of Us. "As communities in Virginia work to combat the health disparities heightened by COVID-19, diverse representation in research has never felt more critical. All of Us will help find answers to some of our foundational health challenges."

NIH began national enrollment for All of Us in 2018, aiming to learn more about what prevention and treatments work best for people of different backgrounds, based on environment, lifestyle, family history and genetic makeup. Over the course of the program, anticipated to last 10 years or more, volunteers will be able to contribute information through surveys, electronic health records, wearable technologies and biosamples.

The data and samples will be accessible to researchers nationwide for use in thousands of studies on different health conditions. Results will help researchers develop precision medicine techniques to provide better patient care based on an understanding of the individual differences that influence health and disease.

All of Us has a special focus on including communities that have been underrepresented in research in the past, to support discoveries that reduce health disparities. That includes racial and ethnic minorities, sexual and gender minorities, rural residents, older adults and other groups.

As part of the partnership, VCU will support the secure transfer of electronic health records for participants at VCU Health who wish to share them. The records are a critical component of the All of Us dataset because they help researchers to get a more complete picture of participants' health, with information about diagnoses, medical visits, treatments and more.

Joining Moeller in leading VCU's involvement are Tamas Gal, M.B.A., Ph.D., the director of research informatics at the Wright Center, and Robert Winn, M.D., director of VCU Massey Cancer Center.

"I am excited to be a part of bringing All of Us to Virginia because I believe precision medicine is the future. The All of Us program will enable researchers to create treatments that take into account human differences, and it will enable providers to match the right treatment to each patient and their illness. A future where the treatment fits the patient is one I am happy to work towards. By adding the diversity of Virginia to the program, we are helping to ensure that innovative medical treatments are available and appropriate for everyone"

Leslie Bobb, MPH
CTSA Operations Manager
Wright Center for Clinical and Translational Research
Virginia Commonwealth University

To help cover the cost of the All of Us activities, the NIH awarded the Wright Center, as a Clinical and Translational Science Award hub, $346,000 to support the complex data infrastructure behind linking local records to a national database.

All of Us RESEARCH PROGRAM

All of Us is a service mark of the U.S. Department of Health and Human Services. Learn more about VCU's participation in the program at joinallofus.org/vcu or by emailing allofus@vcu.edu

Statements From the Field: VCU and UVA on All of Us

Dr. Dayanjan Wijesinghe, Associate Professor in VCU's Department of Pharmacotherapy and Outcomes Sciences: "All of Us provides a platform that enables comprehensive data driven hypothesis generation. The generated hypotheses can then be further validated using other data sets or via clinical studies. Being able to generate strong hypotheses using such curated data dramatically decreases the cost of research as well as the time to impactful results by allowing us to focus on stronger hypotheses while discarding weaker ones prior to undertaking any wet lab research."

Leslie Bobb: "VCU created an infrastructure that enables us to share EHR data from consented patients with the All of Us data warehouse."

Leslie Bobb: "Many of the patients and providers that engaged were from [VCU's Massey] cancer center and had an existing appreciation of the impact of clinical research. The patients were often interested in "giving back" after being educated and/or participating in clinical research through cancer treatment."

Leslie Bobb: "VCU is one of three institutions nationwide selected to participate in the All of Us-Lite pilot program. We were tasked with finding ways to promote outreach of the program without full site funding and responsibilities (such as consenting participants, collecting samples, etc)."

Leslie Bobb: "Throughout our [VCU's] outreach, two important factors were discovered; public perception/education about clinical research and provider buy-in/engagement."

Johanna Loomba, iTHRIV Director of Informatics: "With the support of the integrated Translational Research Institute of Virginia (iTHRIV), the University of Virginia joined the beta phase of Research Workbench in 2020. Since then, our research teams have utilized the tool for a number of public inquiries. VCU's participation in this new All of Us enrollment effort will result in our research teams having richer datasets to support important questions related to health in the Commonwealth."

*Thank you to Dr. Davanjan Wijesinghe and Leslie Bobb, who provided these statements on behalf of VCU, and Johanna Loomba, who provided a statement on behalf of UVA.

Precision Medicine & Public Health:

How the All of Us Program Can Make Us All Healthier

"So tonight, I'm launching a new Precision Medicine Initiative to bring us closer to curing diseases…to keep ourselves and our families healthier" (State of the Union, 2015). With that announcement by President Barack Obama, the Precision Medicine Initiative – since renamed the All of Us Research Program – was born. At first glance, precision medicine and public health seem incongruous, even contradictory. Fortunately, that is not the case. Precision medicine and public health can coexist, and even thrive together.

The All of Us program's goal is to accelerate the research and discovery of individualized medical treatments by recruiting 1 million Americans to share detailed health information (National Institutes of Health, 2015). It is the largest federal commitment yet to the concept of precision medicine, which is "an approach to disease treatment and prevention that seeks to maximize effectiveness by taking into account individual variability in genes, environment, and lifestyle" (NIH, 2015).

The precision medicine era has already delivered extraordinary results. Ramaswami et al., (2018) note that genomic screening has allowed people to better estimate their cancer risk based on certain gene mutations. It has allowed researchers to better understand why drugs work for some individuals but not others (Ramaswami et al., 2018). The All of Us Program promises to accelerate these discoveries and to save lives.

Precision medicine and public health seem incompatible. The former dives deeper into individuals' health to tailor individual treatments for individual diseases. The latter

slowly – often unglamorously – focuses on policies and behaviors that affect us all. Bayer and Galea (2017) have even argued that fervor for precision medicine may displace funding and attention from public health.

These fears are understandable but overstated. Khoury et al. (2016) ask whether "the same technologies that propel precision medicine can usher in a parallel era of 'precision public health' beyond treatment of sick individuals." They aptly note the irony that precision medicine, which is fueled by big data, requires a population-based approach.

In fact, precision medicine has concrete public health applications. Loomans-Kropp and Umar (2015) argue that researchers could use precision medicine to stratify populations more precisely for the purpose of cancer screening recommendations based on genetic and environmental factors. Ramaswami et al. (2018) write that accelerated genomic screenings of humans and pathogens could lead to better disease surveillance.

The All of Us program may prove particularly valuable for public health due to its collection of non-clinical data. For instance, Khoury et al. (2016) suggest that epigenetic changes due to non-clinical factors help explain population health disparities. The All of Us program and other precision medicine initiatives may strengthen this evidence base and help researchers identify public health interventions to eliminate these disparities.

While enthusiasm is warranted, caution is key. Precision medicine threatens to exacerbate health disparities. For instance, BRCA gene testing is usually covered by insurance. Those without coverage may be unable to access testing. Even those who can access BRCA testing may be unable to afford a preventive mastectomy should they test

positive for a mutation. The public health community must ensure that low-income and uninsured individuals are not left behind.

Moreover, Bayer & Galea warned in 2015 that precision medicine – even if made available to all – is unlikely to eliminate health disparities. The authors reiterated the Whitehall Studies of the British Civil Service findings, writing that "even when health care services were provided as a matter of right and the cost of care was no longer a barrier to treatment, a marked social gradient persisted…" They maintain that health outcomes between and within groups are driven by "social-structural factors that shape our lives" (2015).

The precision medicine era also magnifies longstanding questions about privacy and informed consent, particularly among populations that the federal government has harmed. These questions are especially significant as much of the value in precision medicine comes from data voluntarily supplied by populations that have historically been ignored or oppressed.

In conclusion, public health and precision medicine can flourish together. However, researchers, clinicians, and public health practitioners should not view precision medicine as a panacea. Close attention must be paid to ensure that the country seizes the opportunities presented by the All of Us program and other precision medicine initiatives while being mindful of its limitations and social implications.

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The Impact of Oral Health on Low-Income Pregnant Women Living in the United States

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Abstract

***Introduction*:** Oral health has a significant impact on pregnancy outcomes. Interprofessional collaboration can assist in bridging the gap between oral and systemic health and assist in optimizing the health of low-income pregnant women, infants, and children.

***Methods*:** A literature review was used to ascertain the impact of oral health on adverse pregnancy outcomes. Research sources used in this literature review were gathered from the U.S. National Library of Medicine at the National Institutes of Health, PubMed, the Centers for Disease Control and Prevention (CDC), Elsevier, Department of Medical Assistance Services (DMAS), the Office of the Surgeon General, and Google Scholars. Inclusion criteria were pregnant women.

***Results*:** Poor dental health during pregnancy can contribute to adverse pregnancy outcomes and to early childhood caries. Conversely, many systemic diseases can present oral signs and symptoms. Low-income women are disproportionately affected due to limited or no access to oral health care through their health insurance, or due to poor quality health care. The socio-ecological model was used to identify factors that affect oral health at the individual, interpersonal, organizational, and public policy levels.

***Discussion*:** Studies have shown that interprofessional collaboration with health care professionals and other non-dental professionals can improve pregnant women's oral health. The Virginia Department of Health provides guidance on prenatal care that includes oral health screening, education, and referrals that can mitigate the risk of oral and systemic diseases during pregnancy and the postpartum period.

Keywords: interprofessional collaboration, postpartum, oral health, systemic health, adverse pregnancy outcomes, low-income pregnant women, prenatal care

Introduction

The mouth is the gateway to the rest of the body. Recent literature shows that oral microbiome may be responsible for contributing to several serious health conditions from cardiovascular diseases, respiratory diseases, diabetes, and adverse pregnancy outcomes, such as low-birth weight, miscarriage, premature delivery and pre-eclampsia (Harris & Johns, 2018; Stephens et al., 2018; Yenen & Ataçağ, 2019). In contrast, diseases of the body can present as oral manifestations. This oral systemic health link is important for pregnant and postpartum women to understand so that they may mitigate the risk of any adverse health events. The primary dental concerns among pregnant women are periodontal disease and dental caries (Yenen & Ataçağ, 2019). The mouth is not included as part of the body when it comes to healthcare. Primary healthcare typically does not include oral health care for adults, and in the past few years health policies and practices have been more focused on medicine (Northridge et al., 2020).

The purpose of this report is to explain the impact of oral health during the pregnancy and discuss how interprofessional collaboration can address the important connection between oral and systemic health that must be understood in order to achieve a healthy pregnancy, birth and beyond, and specifically among low-income women. An article by Xu and Han discusses the significance of the link between poor oral health and adverse pregnancy outcomes (Xu & Han, 2022). The research presented in this article has given rise to mitigating the risks of adverse pregnancy outcomes by optimizing oral health (Xu & Han, 2022). This relationship is significant in understanding the association between overall health and its relationship with oral health. Through intervention of healthcare and dental professionals, there can be a symbiotic relationship with the mouth and the rest of the body to protect the health of pregnant women and

their developing children. The impact of this study determined that “there is a positive correlation between periodontal disease and adverse pregnancy outcomes” which shows the need for interprofessional collaboration among dental care professionals and medical care (Xu & Han, 2022).

The socio-ecological model can be used to identify the different factors that affect oral health care among low-income pregnant and postpartum women. At the individual level, a person’s socioeconomic status can be a risk factor for not receiving, or seeking, oral health care. The CDC (2021) notes that an adult is three times more likely to have untreated cavities if they have less than a high school education, 40% of people who smoke cigarettes have untreated cavities, those who are Mexican American or non-Hispanic Black are almost twice as likely to have untreated cavities compared to non-Hispanic White adults, and adults who have no private health insurance or have low-income are 40% more likely to have untreated cavities compared to those with private insurance or higher incomes. A person’s genetics, diet, and dental hygiene practices can also make them more susceptible to having poor oral health. At the interpersonal level, family and friends can impact a woman's oral health because if they are encouraged to maintain good oral hygiene and have that increased social support, then they are more likely to seek oral health care. Furthermore, the relationship between provider and patient is an important factor because the quality of care they receive and the relationship they have with their provider can impact whether a woman decides to listen to their provider’s advice or chooses to continue seeking health care. Northridge et al (2020) identified that at the organizational level, access to provider-and-system level supports, patient programs and services, and insurance and affordability can impact a person’s oral health. Policies that affect programs, such as Medicaid, can impact whether someone is able to afford or receive dental care through their insurance.

Access to oral health care for low-income pregnant and postpartum women is impacted by complex factors at different levels of the socio-ecological model. Therefore, it is necessary to have interventions that target changes at the individual, interpersonal, organizational, and public policy levels.

Methods

A literature review was used to ascertain the impact of oral health on adverse pregnancy outcomes. A literature review was conducted using key search terms “oral health,” “pregnant women,” ”low-income,” and “pregnancy outcome.” Research sources used in the literature review were the Centers for Disease Control and Prevention (CDC), Elsevier, Department of Medical Assistance Services (DMAS), the Office of the Surgeon General, U.S National Library of Medicine at the National Institutes of Health, and Google Scholars. Inclusion criteria were low-income pregnant and postpartum women. We used PubMed advanced search builder with the following MeSH terms: "oral health" AND "health" OR "oral health" AND "pregnancy" OR "pregnancies," and yielded 201 articles. The literature review was conducted during the month of January 2022. Studies that were published after 2018 were chosen for the literature review, with the exception of the Office of the Surgeon General article that was published in 2003.

Research articles that analyzed qualitative and quantitative data about the oral health care of pregnant and postpartum women with low-income and programs that use interprofessional collaboration between non-dental professionals and dental professionals were reviewed. Research articles that were excluded from the search included anyone who is not pregnant or in the postpartum period, men, all individuals with private health benefits that included oral health coverage, and people with a moderate-to-high socio-economic status. Articles pertaining to health care delivery were limited to the United States.

Results

There are twenty-nine states within the United States, including the nation's capital, who provide Medicaid benefits that include extensive dental services for pregnant women (NASHP, 2021). Medicaid dental coverage for pregnant women below the poverty rate is provided in Virginia through the FAMIS MOMS program with extended coverage to two months postpartum and up to one year for the baby (Virginia Medicaid, 2022). The state of Maryland also has passed a bill to provide postpartum dental benefits for one year, which became effective on April 1, 2022 (Maryland Department of Health, 2022). This type of coverage signifies the importance of oral health for the mother and child throughout the pregnancy and postpartum period.

The oral microflora during pregnancy may cause women to be faced with dental issues such as gingivitis, periodontal disease, dental related abscesses, cavities, tooth mobility, gingival tumors and tooth erosion (Stephens et al., 2018). Hormonal and physiological changes are reported to contribute to oral disease susceptibility (Saadaoui et al., 2021). These issues, if serious, can cause harm to the mother and her unborn child. Virulent strains of oral bacteria have been found in the placenta (Cobb et al., 2017). Poor dental health during pregnancy can contribute to premature birth, low-birthweight babies, preeclampsia, growth restriction of the fetus, and fetal death (Cobb et al., 2017). Pregnant women who have cavity-causing bacteria could transmit the bacteria after their delivery from their mouth to their baby's mouth, according to the CDC (2019). Early childhood cavities can occur if an infant comes in contact with this bacteria and other sugars, which can lead to the need for extensive dental care at an early age (CDC, 2019). Conversely, many systemic diseases can present as oral signs and symptoms. Oral symptoms can present as the first sign of some systemic diseases (Urse, 2014). For example,

diabetes mellitus, hepatitis C, and chronic liver disease cause changes to the oral mucosa (Urse, 2014). Leukemia can present as oral changes on the tongue and gingiva. Vitamin B deficiencies can be detected from clinical observation of the tongue (Urse, 2014). An oral component of the autoimmune disease, Sjogren's syndrome, presents in the mouth as xerostomia or "dry mouth" (Urse, 2014). These oral systemic connections can lead to diagnosis or prevention of disease (Urse, 2014).

Oral Health Disparities

In the United States, over 40% of low-income adults have untreated tooth decay; and according to the CDC article, Disparities in Oral Health, productivity and quality of life can be greatly impacted by untreated oral disease (2021). Many will not seek care unless it is an emergency due to lack of dental insurance, which means they tend to be Medicaid recipients or lack health insurance altogether (KFF, 2019). Visits to the Emergency Department (ED) at the hospital for primary care cause a rise in health care costs (Becker & Newsom, 2003). In 2017, dental related ED visits cost the nation $2 billion (Owens et al., 2021). Approximately two out of every five, or 42.2%, of dental related ED visits were Medicaid recipients (Owens et al., 2021). On a state level, the Health Services Cost Review Commission (HSCRC) reports that emergency room visits related to dental conditions cost Maryland Medicaid over $10 million per year (Maryland Dental Action Coalition, n.d.). Opioid addiction for untreated dental diseases prescribed in the emergency room is also a concern (Naavaal et al., 2021). Since many dental issues are addressed but remain untreated in the ED, treatment is postponed due to lack of dental insurance coverage or dental home (Naavaal et al., 2021). The population of concern are low-income pregnant women and new mothers because they have fewer healthcare options, receive poor care, or may not seek care at all. On a federal level, this issue has been introduced in the

United States Senate as the *Oral Health for Moms Act* through Medicaid expansion of access to oral care throughout pregnancy and postpartum (Stabenow, 2021).

Barriers to Accessing Dental Care

In Virginia, despite 93% of pregnant women reporting that their healthcare provider discussed the importance of oral health during pregnancy, only 31.5% of them had gone to the dentist in the past year (VDH, 2016). The Virginia Department of Health identified that out of the women who were screened, 41.6% had untreated dental caries (VDH, 2016). The pregnant women explained that some of the reasons they had difficulty seeking dental care were because they could not find a dentist who would treat pregnant women (10.6%), Medicaid was not accepted (11.7%), they thought dental care during pregnancy was unsafe (20.8%), and/or some could not afford to pay for dental care (23.5%) (VDH, 2016). This survey emphasizes the importance of educating pregnant patients about the risks of not partaking in oral health care and identifies the need to improve dental care access and coverage.

Risk factors such as language barriers, poor lifestyles choices, and unhealthy behaviors are more likely to cause pregnant mothers to consume more healthcare services and experience increased adverse events (Al Shamsi et al., 2020). Lack of oral health literacy among women of lower socioeconomic status may prevent them from seeking dental care (Lee et al., 2010). The high cost and questioned safety of dental treatment during pregnancy are also limitations (Lee et al., 2010). Dental insurance is not a part of medical insurance plans. The separate systems of medical care and oral health provisions in the U.S have contributed to pregnant women not receiving care or receiving poor quality care. Northridge and her associates (2020) explain that commercial dental insurance plans are mostly employer-provided benefits and include high yearly maximum benefit limits and high coinsurance rates that have decreased significantly over

time due to inflation, resulting in oral health care spending being higher than that of general health care due to out-of-pocket payments. Low-income populations, in addition to minority and underserved groups, are more likely to receive dental care through facilities, providers, and payment programs that provide support, clinical, and nonclinical services (Northridge et al., 2020). This includes the State Children's Health Insurance Program (SCHIP), Medicaid, school-based health centers, Federally Qualified Health centers (FQHCs), and academic dental institutions (Northridge et al., 2020). Northridge and her colleagues (2020) state that under the federal Medicaid law, it is optional to have adult oral health care benefits because they are not deemed as essential health benefits under the Affordable Care Act (ACA) in certain states. Therefore, oral health coverage is limited to emergency oral services in many states and Medicaid oral healthcare coverage greatly differs across states. Those who receive Medicaid are unlikely able to pay out-of-pocket for oral health care.

Providers of patient care tend to compartmentalize their roles. Dentists may have insufficient knowledge on the pregnant patient population and feel uncomfortable with treatment procedures (Lee et al., 2010). The American Dental Association states that it is now safe to treat women throughout pregnancy, with certain limitations (Mark, 2021). However, many dentists still feel uncomfortable treating pregnant women (Lee et al., 2010). Obstetricians are usually the first line of defense and feel more comfortable prescribing medications and dental treatment, yet they are not as likely to recommend dental care (Lee et al., 2010).

Discussion

Education, as it relates to oral-systemic health care for pregnant women, is beginning to expand, thanks to Medicaid grants for pregnant and postpartum women. Medicaid expansion does not change the fact that healthcare providers lack the proper education, are understaffed,

and lack the time to address oral-systemic health conditions with their patients. The Centers for Disease Control and Prevention (CDC) (2019) stated that they had partnered with the American Academy of Pediatrics (AAP) to create a program called "Protect Tiny Teeth," whose purpose is to provide communications resources about oral health to healthcare providers.This program provides talking points for the healthcare providers regarding oral health and includes videos and infographics about how to reach the target audience (CDC, 2019). This program emphasizes the importance of having conversations about oral health during the prenatal health care visit (CDC, 2019). Pediatric, maternity, and primary care providers can have access to this program for free, which could be beneficial in bringing awareness about the importance of oral health during the pregnancy and postpartum period to both healthcare providers and their patients.

Interpersonal collaboration between dental and non-dental professionals could help bridge the gap between the oral health and medical fields. George et al. (2019) analyzed programs that utilized non-dental professions such as midwives, community-based nurses, healthcare workers, vaccination health staff, health department employees, and field workers, to provide oral health education, assessments, screening, and/or provide referrals to dental services. Non-dental professionals who receive oral health training were beneficial in improving women's oral health and reducing dental caries in children (George et al., 2019). There are many opportunities for these non-dental professionals to provide information about oral health and referrals to dentists during the antenatal and postnatal periods since women frequently come into contact with them during these time periods. Women might not necessarily make it a priority to see a dentist during the pregnancy or postpartum period, which is why it is important for healthcare professionals and other non-dental professionals to receive oral health training so they can provide oral health education, conduct screenings, and make appropriate referrals. Providing

oral health training to staff working for the Women, Infant, and Children (WIC) program would be crucial in reducing oral health disparities because they work closely with low-income pregnant and postpartum women. Additionally, the VDH has provided comprehensive guidance to prenatal and dental providers through a publication, *Oral health During Pregnancy* (2016). This resource offers referral forms, educational resources for dissemination to pregnant women, photographs and infographics of oral conditions that may occur during pregnancy and state of prenatal oral care utilization within the state (VDH, 2016).

Conclusion

The Surgeon General's report on oral health, the *National Call to Action to Promote Oral Health,* was an important document in addressing the need for oral health, preventing disease and reducing dental health disparities (Office of the Surgeon General (US), 2003). Dental diseases, such as caries and periodontal disease, are mostly preventable but still contribute to the public health crisis (Cobb et al., 2017). Providing mothers with dental education throughout their regular OB/GYN appointments and through programs, such as the WIC program, can reinforce the importance of dental visits, screenings, and assessments during the prenatal period and postpartum. By educating health care providers and community health workers about oral-systemic health and pregnancy, providers in return, can educate the pregnant mothers at every prenatal and postpartum visit. It is important to target a range of health providers who are most likely to care for underserved and vulnerable populations with limited or no access to oral health care services (Northridge et al., 2020).

Several interprofessional models of oral-systemic health intervention currently exist to increase knowledge of the recognized link between the oral cavity and the rest of the body. The "Smiles for Life" program is an oral health curriculum designed by the Society of Teachers of

Family Medicine to give medical students a comprehensive oral-systemic approach to medical care (Alqahtani, 2016). Additionally, "Protect Tiny Teeth" offers free educational material about oral health to non-dental professionals. Collaborative relationships between oral health providers and medical providers using evidence-based practices are beginning to take hold. By adding a mandatory dental education component in medical school curricula, a systems change approach to collaborative care and advocacy for policy changes to connect dental and health care can impact public health on a monumental scale. Finally, encouraging legislation advocating for expanding the scope of practice of dental hygienists so that they may be incorporated into OB/GYN and pediatric practices. These types of programs and initiatives are imperative to increase the dental educational base of medical professionals and to improve the lives of women, infants, and children.

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Social Determinants of Diabetes in Hampton Roads, Virginia

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Diabetes is a major public health challenge, as the disease compromises health and increases the risk of developing other diseases such as cardiovascular disease, hypertension, and kidney disease (Healthy People US, 2020). Diabetes represents a significant cause of disability in the U.S. and in Virginia, with an estimated 10.9% of Virginians living with diabetes and its resulting disability (CDC, 2020). The 2019 age adjusted death rate per 100,000 people for diabetes in Virginia was 22.8% (U.S. Census, 2020). With the current coronavirus pandemic (COVID-19), diabetes has emerged as a major risk factor that has increased the mortality rate (Abdi et al., 2020). Disparities among chronic conditions within the United States that are also comorbidities of COVID-19 have influenced the way that the pandemic impacted marginalized populations. Thus, understanding the geographic and the social determinants and their impact is imperative to achieve health equity (Arasteh, 2020).

The distribution of diabetes varies widely across Virginia, with age-adjusted inpatient hospitalization and mortality rates showing some differences based on the different regions, with the urban regions, particularly the cities of Roanoke, Richmond and Norfolk, showing higher death and hospitalization rates than the surrounding areas (Center for Disease Control and Prevention, CDC, 2018). Recent research demonstrates the need to consider the social and economic factors that are the determinants of diabetes along with individual factors (Hill-Briggs et al., 2021). Using a multilevel approach for diabetes, interventions will have a much better outcome as social determinants play a significant role in diabetes-related health disparities (Jack, Jack & Hayes, 2012). Although the average crude rate of diabetes in Virginia is 10.9%, some of the census tracts report a much higher rate. Neighborhoods in places like Norfolk, Newport News, and Portsmouth in Virginia have a diabetes prevalence rate of around 25% (500 Cities Project, 2019).

Understanding the role of social determinants that affect the prevalence of diabetes is highly policy relevant, as evidence suggests that socioeconomic, psychosocial, and neighborhood factors influence clinical outcomes and behaviors in diabetes (Hill-Briggs et al., 2021; Jack et al., 2012). This study aims to understand the relationship between diabetes and social determinants of health, using the Virginia health opportunity index (HOI) to identify vulnerable populations at the census tract level in Hampton Roads, Virginia. This may eventually lead to identifying non-profits and healthcare initiatives addressing these needs with specialized programs and services.

Background

Diabetes is defined as a group of diseases that is characterized by high levels of blood glucose resulting from deficiencies in insulin production, insulin action on cells, or both. Diabetes Mellitus lowers life expectancy by up to 15 years, increases the risk of heart disease by 2 to 4 times, and is the leading cause of kidney failure, lower limb amputations, and adult-onset blindness (Healthy People U.S. 2020). Inherent risk factors are those which the individual has no control over, like gender, age, and genetic predisposition, as well as poverty, stress, and urbanization (CDC, 2020). Behaviors like unhealthy diets that include high fat and excess salt intake, physical inactivity, and smoking and alcohol use, may result in conditions which can then develop into or cause diabetes. Risk factors also include overweight and obesity, high blood lipids and glucose, and high blood pressure, and may be direct results of behaviors and lifestyle (CDC, 2020).

Diabetes in Hampton Roads and Virginia

It is estimated that 10.9% of Virginians live with diabetes and there is a disproportionately high prevalence in certain populations, with demographic variations (CDC, 2020). Women have slightly higher rates than men. Age plays a role in diabetes, with over 18% of the 65 years and above population having diabetes. Race is an important determinant, with Black and Hispanic people having higher rates than White or other groups (Cheng et al., 2019). Another social determinant is income, with those in poverty having double the prevalence of the total population (Jack et al., 2012). Education level also is a key factor, with much higher prevalence among those who have not graduated from high school, and decreasing prevalence as educational levels increase (Cheng et al., 2019; Hill-Briggs et al., 2021). Location within Virginia is also important, with only Northern Virginia showing lower prevalence when compared with the remainder of Virginia. As age-adjusted death rates due to diabetes is higher in the far Southwestern and Eastern districts of Virginia, rates almost double those of the Northern districts (CDC, 2020). About 237 census tracts in the Hampton Roads report a crude diabetes prevalence that is above the state average of 10.9% (500 Cities Project, 2019).

Socioeconomic Demographics of Hampton Roads

Virginia has a population of about 8 million, while the population in the cities of Hampton Roads are about; Virginia Beach- 437,994, Norfolk- 242,803, Chesapeake- 222,209, Newport News- 180,719, Hampton- 137,436, Portsmouth- 95,535, and Suffolk- 84,585 (U.S. Census, 2020). While there is a 37.4% minority population in Virginia, minorities comprise 47 % in the Hampton Roads (U.S. Census, 2020). Together, in these cities, the population of White people alone is 52%, while the population of Black or African American groups is about 33.4%. Asians in the seven cities comprise about 4%, while people of Hispanic or Latino origin comprise about 6.8%. In the 353 census tracts that form the seven cities, the population under the

age of 20 years is 25.5%, while the elderly population, above the age of 65 years, is about 12.4% (U.S. Census, 2020).

Education attainment, employment, and family income affect the socioeconomic status and thus the health of an individual (Assari, 2018). The poverty rate in Virginia is 10.7%. The poverty rate in Norfolk city is 19.7 %. In Hampton city it is 15.8%, while in Portsmouth it is 17.2%. Newport News has 15.2 % people below poverty rate, Chesapeake city has 9%, Suffolk has 10.8%, and Virginia Beach has 7.6% (U.S. Census, 2020). Most of the neighborhood in Norfolk is low-income, with the median household income being $49,146 (U.S. Census, 2020). Hampton city has a median household income of $54,550, while Portsmouth has $50,224, and Newport News has $51,884. Chesapeake city has a median household income of $75,790, Suffolk city has $70,664, and Virginia Beach has $74,186, which is more or less around the median income in the state. About 64.2% people above the age of 16 years are employed in Virginia. In comparison, Norfolk has 56.7% employed, while the other six cities have similar percentages. Only 21.3% population in Portsmouth has a bachelor's degree or higher. Hampton city has 26.8%, and 28% of the population in Norfolk has a bachelor's degree or higher, which is lower than that of Virginia, being at 38.2% (U.S. Census, 2020).

Health Opportunity Index

The Virginia Department of Health's health opportunity index (HOI) provides a composite measure of the social determinants of health – the social, economic, educational, demographic and environmental factors that relate to a community's well-being (VDH, 2019). HOI consists of 13 indicators and the score ranges from 0 -1, with higher scores signifying opportunity for better health (VDH, 2019). The HOI are organized into four profiles. These are

the community environmental profile, consumer opportunity profile, economic opportunity profile, and the wellness disparity profile.

The Community environment profile is a measure of the natural, built, and social environment of a community. It includes the air quality indicator, population churning indicator, population density indicator, and walkability indicator. The air quality indicator includes Environmental Protection Agency (EPA) measures of pollution, and measures of neurological, cancer, and respiration risk at the census tract level. The population churning index indicates the amount of population turnover within a community. The population density index is a measure of population density that takes into account the density levels most people in the community experience. Walkability index is a measure of how walkable a community is, based on residential and employment density, street connectivity, and public transit accessibility.

The consumer opportunity profile is a measure of the consumer resources available within a community. It includes the affordability index, education index, food accessibility index, and the material deprivation index. The affordability indicator is the proportion of a community's income spent on housing and transportation, and indicates how much income remains for other priorities, including food, health care, and social activities. The education index is the average number of years of schooling among adults in the community. The food accessibility index measures access to food by low-income people within a community. It measures the proportion of the low-income community that has a large grocery store within 1 mile in urban areas or 10 miles in rural areas. The material deprivation indicator is based on the Townsend material deprivation index and examines the private material resources available to households in a community. Four indicators make up the Townsend index, being overcrowding (more than two persons per room), unemployment, percentage of persons with no vehicle or car,

and percentage of persons who rent. The unemployment indicator is derived by determining the percentage of residents in a community between the ages of 16 and 64 who are unemployed. The higher the score, the more there is a lack of access to the resources in an area.

The economic opportunity profile is a measure of the economic opportunities available within a community. It includes the employment accessibility indicator, income inequality index, and the job participation index. The employment accessibility index is a measure of the number of jobs accessible to members of the community. The income inequality indicator or the Gini index is a measure of income inequality, measuring whether the income earned within a community is distributed broadly or concentrated within the hands of a small number of households. A Gini coefficient of zero indicates absolute neighborhood equality and a coefficient of one indicates complete diversity in income. The job participation index is the percentage of individuals 16-64 years of age active in the civilian labor force. The higher the index, the healthier the labor market.

The wellness disparity profile is a measure of the disparate access to health services within a community and includes the access to care index and segregation index. The access to healthcare index measures whether community members have access to a primary care physician and the means to pay for care. It includes the proportion of uninsured residents and the number of physicians within 30 miles of the community. The access to care index also measures the percentage of uninsured population at the census tract level based on the American Community Survey. The segregation index or the spatial dissimilarity index is a measure of whether and how much people of different racial and ethnic backgrounds live together in diverse communities.

The HOI are further aggregated into simple quintiles corresponding to “very low,” “low,” “average,” “high,” and “very high” opportunity levels by census tract (VDH, 2019). The HOI has

been utilized in Ohio to identify vulnerable communities based on their respective social determinants of health (Ogojiaku et al., 2020).

Methods

Secondary data was used for this study, that includes population data for the counties of Chesapeake, Hampton, Norfolk, Portsmouth, Suffolk, Virginia Beach, and Newport News. Demographic data points for the regions were obtained from the U.S. Census in 2020. Health outcome data related to diabetes were obtained from the CDC 500 Cities Project. The 500 Cities Project is a collaboration between the Robert Wood Johnson Foundation, and the CDC Foundation. The 500 Cities Project provides city and census tract-level small area estimates for chronic disease risk factors, health outcomes, and clinical preventive service use for the largest 500 cities in the United States. Data related to diabetes prevalence in the seven counties were abstracted. Diabetes prevalence data were linked to the HOI in Virginia using Microsoft Access. Using SPSS, data were modelled using multiple regression to find which of the HOI variables were predictive of diabetes. The crude diabetes prevalence rate was the dependent variable while the independent variables were average years of schooling, healthcare access, employment access, affordability index, air quality index, population churning index, food access index, income inequality index, job participation index, population density index, racial dissimilarity index, walkability index, and deprived areas/Townsend index.

Results

This study examined the diabetes prevalence in seven cities of Virginia, Hampton Roads for 353 census tracts. The predictive model included five variables, being years of schooling, population churning index, Townsend indicator, high employment access, and income inequality

index/Gini coefficient with a R^2 of 0.637 ($p < .001$). About 64% of the variability in the crude diabetes prevalence rate could be explained by these five variables. Table 1 shows the adjusted R^2 for the crude diabetes prevalence rate and the predicting variables in the seven Hampton Roads cities. Figure 1 shows the number of census tracts in each of the seven cities that have a crude diabetes prevalence rate over the Virginia average.

Table 1

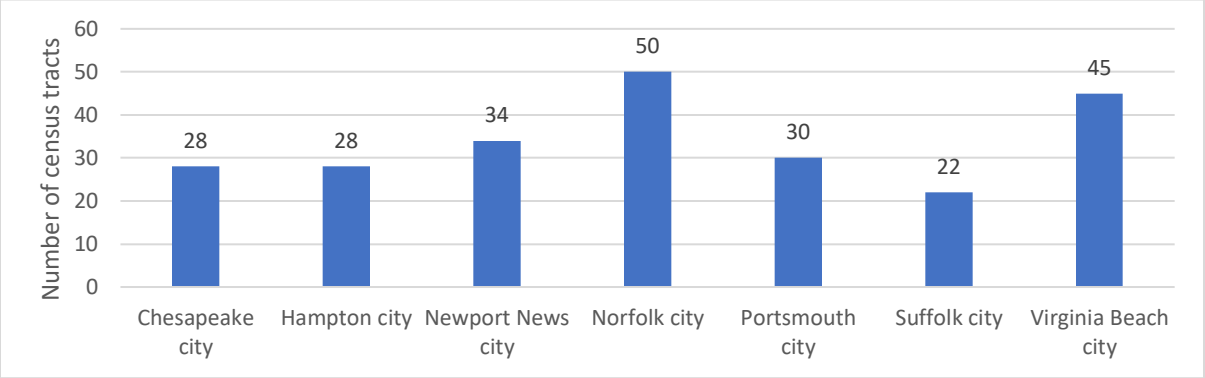
Multiple regression coefficients of crude diabetes prevalence rate in Hampton Roads, Virginia and Health Opportunity Index variables

Variable	B Coefficient	Standard Error
Constant	30.833*	2.408
years of schooling index	-29.249*	3.041
population churning index	12.464*	.972
material deprivation index/Townsend index	-9.062*	1.171
employment access index	-16.345*	4.480
income inequality index	-5.918*	1.689
Adj. R^2	0.637	
N	353	

*$P < .001$

Figure 1

Number of Census tracts with crude diabetes rate above Virginia average



Discussion

Social determinants of health are social-ecological factors affecting health outcomes. Factors include external or environmental socio-ecological influences on the individual, like education, working conditions, access to medical care, employment, and community infrastructure. Findings from this study corroborate the evidence in literature. Greater educational attainment has been linked with improved health outcomes because of a greater likelihood of socio-economic stability, with increased participation in preventive healthcare (Hill-Briggs et al., 2021). This study shows that average years of schooling is the strongest predictor of diabetes prevalence in a community. There is tremendous amount of evidence in the literature that shows that education level, employment, and family income affect socioeconomic status and therefore health (Assari, 2018; Hill-Briggs et al., 2021; Jack, Jack & Hayes, 2012). Transportation limitations in certain census tracts may require travel outside the local community to gain access to healthcare providers, jobs, or healthy foods (Walker et al., 2015). Material deprivation indicator that is based on the Townsend material deprivation index, examines the private material resources available to households in a community, indicators being

unemployment, percentage of persons no vehicle or car among others and overcrowding. Poor job access may lead to difficulties in job search and retention, in turn leading to poverty and income inequality. Owning a vehicle also play a significant role in employment.

Poor populations who are already at a disadvantage in adhering to a healthy diet will find it even more difficult to adhere to recommended food guidelines and this becomes even more crucial for people who are at risk for or living with a chronic disease such as diabetes, for which food intake and nutrition habits play a significant role in optimal disease management. When barriers to these socio-economic factors are present to individuals with diabetes, along with inadequate access to resources among such disadvantaged populations, it translates to fewer resources being available to overcome barriers, thus increasing the risk and prevalence of diabetes.

Thus, if these determinants were to be modified or the barriers to access removed there will be an effect on the diabetes prevalence. When the years of schooling and the Townsend indicators were increased by 10%, and then modeled with the data on crude diabetes prevalence, there was a consequent decrease in the rate of crude diabetes in most of the census tracts. This clearly demonstrates that along with individual factors, social determinants play a significant role in the prevalence of diabetes in an area. As more than half of the census tracts from the 353 census tracts record a crude prevalence rate above the average, it makes sense to focus on the social determinants of health in those neighborhoods and help to identify radical public health strategies that recognize these determinants. Using the predictive modeling in this multilevel analysis we can, establish links between health outcomes among individuals who share similar economic, social, and geographical characteristics.

Characteristics of minority neighborhoods need to be considered as to how and why minority populations continue to experience high rates of diabetes-related morbidity. Minorities comprise 47 % in the Hampton Roads. The highest crude prevalence rate of diabetes in Virginia is 25.4 and is in Norfolk city in the census tract 42 (500 Cities Project, 2019). Percentage of people below poverty in that particular census tract is an astounding 71.8%, with most of them being Black, (73%) (U.S. Census, 2020). The percentage of unemployed population over 16 years and below poverty rate is 74%. The second highest crude diabetes prevalence rate in Virginia, 24.3, in Portsmouth city. The percentage of population below poverty in Portsmouth city is 48%, with White being at 32% while Black race being at about 50% (U.S. Census, 2020). The census tracts of Newport News have a diabetes prevalence rate of 22% with similar demographics of the population. There seems to be a direct relationship between poverty, income inequality, education and employment access and the prevalence of diabetes.

The social determinants of health are thus interconnected with each other. Policies and programs that improve the consumer opportunity as well as economic opportunity will have an impact on the health outcomes of the population. This can be demonstrated by the hypothetical increase in the average years of schooling and the Townsend index resulting in a decrease in the predicted diabetes prevalence rate in the census tracts. The findings thus quantify the inequality in social determinants of health and demonstrates the existence of geographic disparity of social determinants of health among Hampton Roads residents.

Conclusion and Limitations

Diabetes in a vulnerable population is highly influenced by both individual and socioeconomic factors. Characteristics of neighborhoods, education level, income inequality, employment access and available resources provide serious considerations as to why the

prevalence rates are high. The findings of this study provide health professionals, as well as agencies and non-profit organizations, with a clear picture of how policies and programs can directly or indirectly contribute to the improvement of chronic diseases like diabetes, and efforts to increase years of education in these areas, as they manifest significant effects. Acknowledging the social factors that contribute to diabetes will allow for the identification of opportunities and programs that can intervene at the social and economic levels. This multilevel approach that includes social and economic interventions will greatly impact the health disparities in diabetes and involve multidisciplinary organizations in the community. Although the study has the limitation of using the crude diabetes rate for the population data for only seven cities in Hampton Roads, Virginia, it is important to understand the interconnectedness of the social factors of diabetes in vulnerable, minority populations and neighborhoods. This can influence future intervention studies that test the impact of social determinants of health on diabetes for effective interventions that combine individual and socioeconomic factors.

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Learning Modalities and Mental Health during the COVID-19 Pandemic:

A Literature Review

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Abstract

***Purpose*:** The study's purpose was to explore how students were learning during the COVID-19 pandemic and the potential mental health outcome(s) that different classroom learning modalities may have on kindergarten through 12th grade school (i.e., K-12) students given that some of them were learning remotely or in-person, while others were doing some form of hybrid.

***Methods*:** This study performed an extensive review of the literature, including health and educational sources from two government agencies and three school districts in southwest Virginia. The target population for the literature review was K-12 students in the United States, with a focus on the Commonwealth of Virginia.

***Findings*:** The literature reviewed suggests a possible link between some learning modalities and K-12 students' mental health during the COVID-19 pandemic. These include anxiety, depression, sense of helplessness, isolation, and others.

***Conclusion*:** While virtual instruction was more likely to lead to negative mental or emotional health, the literature implies a possible link between in-person learning and positive mental health for students, which may be attributed to social interaction and receiving mental health services at school. Hybrid learning was the least studied and may be a critical component in addressing the gaps described with virtual and in-person instruction.

***Recommendations*:** More research is needed in Virginia and across the U.S. to foster our understanding of the potential impact of different learning modalities on students' mental health to help gauge best practices with a focus on addressing students' mental health.

Keywords: mental health, COVID-19, K-12 school, learning modality, hybrid, virtual, in-person

Background

The COVID-19 pandemic created unprecedented challenges, especially for students attending kindergarten-12th grade schools (i.e., K-12). Since early 2020, reports of rising anxiety, depression, suicide ideations, eating disorders, sense of helplessness, isolation, and feeling burnt out among children and adolescents have been published (Children's Hospital Colorado, 2021; National Association of School Psychologists, NASP, 2021; Panchal et al., 2021). For most students, this was the first time they were exposed to new learning modalities other than the traditional in-person mode of instruction. Students had to learn new technology, coupled with social and emotional skills. These added stressors increase the risk of developing mental health challenges among K-12 students.

The 2019-2020 and 2020-2021 academic years were full of uncertainties and ever-changing instructional modalities. An NPR/Ipsos poll found that 43% of parents have switched between learning modalities since the beginning of the 2020-2021 school year (Kamenetz & Uzunlar, 2021). Lack of instructional consistency can lead to more chronic stress in children and adolescents. Chronic stress alters the brain's chemical and physical structure, leading to cognitive impairment in the prefrontal cortex. It affects attention, concentration, memory, and creativity (Terada, 2020).

While the available literature reveals the worsening of mental health among youth during the pandemic, there were nearly no studies on the effects of learning modalities on youth mental health, especially during a public health emergency. As such, the purpose of our study was to explore the potential impact of learning modalities during the COVID-19 pandemic on K-12 students' mental health, given that some of them were learning remotely or in-person, while others were doing some form of hybrid, with a specific focus on the Commonwealth of Virginia.

The study attempted to answer these questions: (1) What were the common classroom learning modalities being used by K-12 students during the COVID-19 pandemic?; (2) what was the historical trend of such learning modalities during the pandemic?; and (3) what mental health issues, if any, are linked to students learning during the pandemic as reflected in learning modalities (i.e., virtual/online, hybrid, and in-person/face-to-face)?

Mental health refers to an individual's emotional, psychological, and social well-being (Centers for Disease Control and Prevention, CDC, 2018). A student with good mental health should be able to focus during lessons, have positive self-esteem, have resilience to overcome obstacles, and be socially adaptable. Poor mental health can lead to mental illness or disorders that affect a person's feelings, behavior, and way of thinking (CDC, 2018; Panchal et al., 2021).

In order to understand the common classroom learning modalities used and their historical trend, we constructed a national and Virginia timeline for the period of March 2020 to May 2021. The common learning modalities were in-person, virtual/online (or remote), and hybrid. Table 1 and Table 2 present the timelines and trends of the modalities used in K-12 schools across the United States (U.S.) and Virginia in particular.

Table 1

*U.S. Timeline of School Closures and Trends of Learning Modalities in 2020**

Key Date	Description of Event	Learning Modality
February 11, 2020	American Federation of Teachers started requesting guidance from the federal government on how to handle the COVID-19 outbreak.	
Mid-February, 2020	Individual schools and districts in Washington and New York began brief closures, of a few days, to clean their facilities.	
February 25, 2020	CDC announced schools to start preparing for the coronavirus and should have plans ready for possibility of conducting classes remotely.	
February 27, 2020	First school closure due to possible exposure at Bothell High School, Washington state.	
February 29, 2020	First reported death from COVID-19 in the U.S.	
March 5, 2020	Northshore school district in Washington state became first district to shift to online learning for up to 14 days.	Virtual/online
March 11, 2020	• World Health Organization (WHO) declared COVID-19 a global pandemic. • More than 1 million students impacted by school closures in the U.S. • 10+ days later, all 50 states closed K-12 school buildings, as did nearly all colleges and universities.	Virtual/online Hybrid
Fall 2020	Schools provided a variety of learning modalities	In-person Virtual/online Hybrid

*Data sources: CDC, (2020); WHO (2021); Keith & Gharib (2020); Decker et al., 2021; Donohue & Miller (2020).

Table 2

*Virginia Timeline of School Closures and Trends of Learning Modalities for Academic Years 2019-2020 and 2020-2021**

Key Date	Description of Event	Learning Modality
March 12, 2020	Governor Ralph Northam declared state of emergency for Virginia, ordering all K-12 schools to close for a minimum of two weeks, effective the next day.	
Starting March 16, 2020	Schools assigned academic work through distancing learning.	Virtual/online Prepackaged course work (i.e., paper copies of packets) Hybrid In-person
March 23, 2020	Governor Northam signed Executive Order 53, ordering all K-12 schools (public and private) to close for the remainder of the academic year.	
June 9 – end of summer 2020	Governor Northam announced a phased process plan to slowly resume in-person classes for the summer and 2020-2021 academic year.	
Fall 2020	Learning modalities varied across school divisions/districts in Virginia.	Virtual/online Hybrid In-person
February 5, 2021	Governor Northam called on all K-12 school divisions to provide in-person learning options.	

*Data sources: Virginia Office of the Governor (2020a; 2020b; 2020c; 2021).

2020-2021 Virginia's Instructional Status

During the 2020-2021 academic year, while all of Virginia's 132 school divisions offered students a fully remote option of learning, other learning modalities were also used. Table 3 presents the different learning modalities utilized in Virginia during the 2020-2021 school year. As of September 8, 2020, the instructional options were *in-person* (all students have 4+ days of face-to-face instruction); *partial in-person* (while some students were meeting 4+ days a week for in-person instruction, others were doing hybrid or remote learning); *all hybrid* (all students were doing some in-person and some remote learning with none hitting the 4 days a week threshold); *partial hybrid* (some students were hybrid, not meeting the 4 days a week threshold);

and *fully remote (*majority of students were learning remotely, while some students may have attended in-person).

Table 3

*Virginia's Instructional Status by School Division for the 2020-2021 Academic Year**

Date	In-person	Partial in-person	All Hybrid	Partial Hybrid	Fully Remote
September 8	10	26	25	4	67
September 22	10	26	24	5	67
November 12	15	42	30	11	34
December 14	9	35	26	10	52
January 26	15	41	25	9	42
February 16	19	48	29	11	3
February 22	20	50	30	11	2
March 1	26	48	33	10	
March 8	31	48	33	9	
March 15	37	51	31	9	
March 22	38	50	34	7	
April 5	42	48	35	4	
April 19	53	43	29	5	
April 26	55	42	29	5	
May 3	58	42	27	4	

*Data Source: Virginia Department of Education (n.d.).

The disruption of schooling for K-12 students, which led to the introduction of new learning modalities, may affect students' social and emotional health, thereby warranting the need to understand the potential impact of these learning modalities on their mental health to inform best practices to protect and/or minimize the mental health effects on children during a national health emergency, including the post-pandemic era. This was the aim of the present study.

Methods

This paper stems from a 2021 faculty-student summer research fellowship at Hollins University that explored the potential impact of learning modalities during the COVID-19 pandemic on K-12 students' mental health, with a focus on the Commonwealth of Virginia. The target population for this literature review was K-12 students. The authors performed a review of the literature, including health and educational sources from the official websites of the Virginia Department of Health (VDH), Virginia Department of Education (VDOE), Roanoke City Public Schools, Roanoke County School District, and Salem City School District (hereinafter *other health and educational sources*) for reports on learning modalities and students' mental health.

We used a keyword search to find relevant research articles and other resources from credible sources (see Table 4 for a list of data collection sources used in this study). The keywords used in our search were: COVID-19 pandemic and learning modalities for K-12 students; COVID-19 pandemic and mental health among K-12 students; COVID-19 pandemic and learning modalities and mental health and K-12 students/education; and classroom dynamics. The inclusion criteria for the search included research articles published between May 2020-May 2021, and excluded articles not relevant to the study's focus.

Table 4

Data Sources/Databases

Data Sources/Databases	Websites
Google Scholar	https://scholar.google.com
Hollins University Library, One Search Engine	https://library.hollins.edu/
Virginia Department of Health (VDH)	https://www.vdh.virginia.gov/
Virginia Department of Education (VDOE)	https://doe.virginia.gov/
VDOE School Health Services	https://www.doe.virginia.gov/support/health_medical/index.shtml
VDOE State Snapshot: Virginia School Operational Status	http://www.doetest.virginia.gov/support/health_medical/office/reopen-status.shtml
Roanoke City Public Schools	https://www.rcps.info/
Roanoke County School District	https://www.rcps.us/
Salem City School District	https://www.salem.k12.va.us/
National Association of School Psychologists	https://www.nasponline.org/resources-and-publications/resources-and-podcasts/covid-19-resource-center
VDOE COVID-19 Resources for Virginia School Nurses	https://padlet.com/tracy_white/np3rseb1exi73hoe
VDOE: BACK TO SCHOOL!	https://padlet.com/tracy_white/hwgb0zk4ump1sn3a

In total, we reviewed 39 data sources–23 research articles; 6 videos; and 10 official websites as listed on Table 4. Out of the 23 full-text research articles reviewed, nine were included in this study. Further, out of the six videos reviewed, one was included. From the 10 official websites analyzed, four of their contents were included in this study.

Findings

The literature reviewed and other health and educational sources suggest possible connection between some of the learning modalities and K-12 students' mental health before and during the COVID-19 pandemic (pre-pandemic and intra-pandemic, respectively). Together, they help answer the study research questions: (1) what were the common classroom learning modalities being used by K-12 students during the COVID-19 pandemic?; (2) what is the

historical trend of such learning modalities during the COVID-19 pandemic (i.e., late March 2020 – May 2021); and (3) what mental health issues are linked to student learning during the pandemic as reflected in classroom dynamics (i.e., virtual/online, hybrid, and in-person)?

Pre-pandemic Mental Health

Prior to the pandemic, millions of children and adolescents struggled with mental health disorders. They included, but were not limited to, anxiety, depression, attention deficit disorder or attention deficit-hyperactivity disorder, obsessive-compulsive disorder, post-traumatic stress disorder, and eating disorders (Panchal et al., 2021).

Intra-pandemic Mental Health

Previous studies found an increase in anxiety, depression, serious suicidal ideations, poor cognitive health, combative behavior, the sense of helplessness, isolation, and feeling burnt out (NASP, 2021; Children's Hospital Colorado, 2021; Panchal et al., 2021; Golberstein et al., 2020). For example, on May 25, 2021, the Children's Hospital Colorado declared a state of emergency for the mental health of young people (The Associated Press, 2021). Hospitals were seeing a shift from low levels of anxiety and depression to attempting suicide. This shift has been exacerbated by isolation and pandemic stress (Children's Hospital Colorado, 2021; Magson et al., 2020; Adjemian et al., 2021).

Learning Modalities and Mental Health

For most students, the 2020-2021 school year was the first time they were exposed to learning through modalities other than in-person instruction. In addition to pandemic stress, students had to learn new technologies, as well as social and emotional skills. The potential consequences of these additional stressors include increased risk of developing mental illnesses, family conflict, poor academic performance, and lack of access to essential services.

Virtual/Online Learning

According to the CDC, children between the ages of 5 and 7 who received virtual instruction during the early phase of the pandemic had worsening mental or emotional health, spent less time outdoors, engaged in less physical activities, and decreased face-to-face interaction with friends compared to those who received hybrid or in-person instruction (Verlenden et al., 2021). It is important to note the decline in engagement of these activities are all known to increase the risk of developing depression and anxiety (Magson et al., 2020; Panchal et al., 2021; Verlenden et al., 2021).

Interestingly, parents of children receiving virtual instruction reported higher prevalence of their own emotional distress, difficulty sleeping, job loss, job security concerns, childcare challenges, and conflict between working and providing childcare (Magson et al., 2020; Verlenden et al., 2021). These stressors contribute to chronic stress in a family unit and reduce the well-being of parents, which can have a negative impact on the mental health of children and adolescents.

In-Person Learning

Little research has been conducted on the contribution of face-to-face learning to students' mental health. However, inferences can be made that in-person learning provides face-to-face interaction opportunities that virtual students seem to lack. These opportunities give students a sense of connectedness, decrease feelings of social isolation, and reduce the risk of developing anxiety and depressive disorders (Magson et al., 2020).

Also, schools play an important role in providing essential mental health services for children and adolescents. According to Golberstein et al. (2020), between 2012 and 2015, 57% of adolescents received some school-based mental health services.

Hybrid Learning

Hybrid learning has been the least studied of all learning modalities. Because little is known about the advantages and disadvantages of hybrid learning, one can only hypothesize about the impact it may have on students' mental health. In an article published in the CDC's Morbidity and Mortality Weekly Report, Verlenden et al. (2021) noted parents of children who received hybrid education reported their kids' mental or emotional health deteriorated during the pandemic. They reported similar results for parents of fully virtual students in terms of reduced times outdoors, physical interaction with friends, and physical activity (Verlenden et al., 2021). A decrease in the activities increases the risk that these children may develop depression and anxiety. However, this survey was conducted between October 8-November 13, 2020, which means students had only experienced hybrid instruction for a maximum of two months. As such, this information does not fully contribute to our understanding of the long-term impact this learning modality has had on students, and thus warrants further investigation.

Gaps in the Literature

The majority of studies on youth that have been published since the beginning of the COVID-19 pandemic focused on the effects of the pandemic on the mental health of children and adolescents. Little research has been conducted on the effects of the new learning modalities on mental health outcome(s) of K-12 students. Specifically, to our knowledge, no study has been conducted in Virginia that examines the connection between learning modalities and K-12 students' mental health outcome(s).

Conclusions

The literature reviewed for this study suggests the potential effects of some of the learning modalities on students' mental health. First, students who received virtual instruction were more likely to report worsening mental or emotional health due to a decline in face-to-face interactions, physical activities, self-esteem, and access to mental health care, as well as an increase of chronic stress within the family unit (Magson et al., 2020; Verlenden et al., 2021).

Also, the literature implies a possible connection between in-person learning and positive mental health outcomes for students, which may largely be attributed to the social connection/interaction with peers/friends and receiving mental health related services at school, such as counseling. However, this finding is not conclusive. Still, a related hypothesis is that students utilizing in-person instruction may have better access to the essential services schools provide, including mental and behavioral health services.

Hybrid learning has been the least studied of all the learning modalities and may very well be a critical component in addressing the gaps described with virtual and in-person instruction. Nonetheless, the limited research on hybrid suggest negative mental health or emotional outcomes for students who experienced it.

Our study's findings should be interpreted with caution because they are not based on a correlational research design, and thus cannot establish a relationship between any particular learning modality and mental health outcomes. Yet, the study fosters our understanding on the potential impact of learning modalities on students' mental health, and has implication for further research.

Recommendations

An important outcome of our literature review yields a number of recommendations for further research. While there is conclusive evidence that, since the beginning of the pandemic, the mental health of children and adolescents have deteriorated (Adjemian et al., 2021; Children's Hospital Colorado, 2021; Golberstein et al., 2020; NASP, 2021; NASP, 2020; Panchal et al., 2021), there are very limited studies on the impact of learning modalities on K-12 students' mental health.

The extensive review of the literature, including the official websites from VDOE and VDH, as well the three school districts in southwest Virginia, exposed a lack of data at the state and school district levels on the effects of the different learning modalities on students' mental health. Hence, more research is needed in Virginia and across the country to foster our understanding of the potential impact of different learning modalities on students' mental health in order to help come up with recommendations on best practices with a focus on addressing students' mental health.

Finally, evidence has shown that when students have "structures that allow for continuity in relationships, consistency in practices, and predictability in routines (Darling-Hammond et al., 2019, p.100)," their anxiety is reduced, and they support engaged learning. Therefore, classroom structures, whether online or in-person, should promote strong and positive student-teacher relationships that will act as continued support for students' mental health.

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The Association between Loneliness with Increased Mental Health Problems and Substance Use During the COVID-19 Pandemic in Richmond, Virginia

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Abstract

***Background*:** The COVID-19 pandemic caused significant psychological distress among U.S. adults leading to increased rates of adverse mental health symptoms and substance use. This study aims to evaluate the consistency of the association between loneliness and increased mental health problems and substance use in Richmond, Virginia during the COVID-19 pandemic.

***Methods*:** Data were collected in two phases: 1) internet-based surveys from August 2020 to March 2021 (N = 327) and 2) paper-pencil surveys from May to October 2021 (N = 225). Logistic regression was used to test the association between loneliness and increased mental health and substance use, while adjusting for sociodemographic factors and pre-existing mental health conditions.

***Results*:** Both survey populations reported a high prevalence of increased loneliness (46.7% - 68.8%), mental health problems (50.2% - 67.3%), and substance use (22.2% - 29.4%) since the COVID-19 pandemic. Increased loneliness since the pandemic was significantly associated with increased mental health problems (Online survey: AOR = 5.00, 95% CI = 2.56 - 9.97; Paper-pencil survey: AOR = 10.48, 95% CI = 4.18 - 28.59) and increased substance use (Online survey: AOR = 3.14, 95% CI = 1.58 - 6.60; Paper-pencil survey: AOR = 5.89, 95% CI = 1.97 - 19.71).

***Conclusions*:** The association between increased loneliness and increased mental health problems and substance use during COVID-19 in Richmond, Virginia was consistent across the two survey populations and similar to the rest of the U.S.

Keywords: COVID-19, pandemic, loneliness, mental health, substance use

Background

Mental Health Burden of COVID-19 Pandemic in the U.S.

The COVID-19 pandemic has resulted in significant psychological distress among U.S. adults. In June 2020, increased levels of adverse mental health symptoms, substance use, and suicidal ideation were reported by U.S. adults. Specifically, 31% reported symptoms of anxiety or depressive disorder, 26% reported symptoms of trauma and stressor-related disorder, 13% started or increased substance use, and 11% reported considering suicide in the last 30 days (Czeisler et al., 2020). In July 2020, roughly 50% of U.S. adults reported the COVID-19 pandemic had a negative impact on their mental health, and this trend persisted through March 2021, with 47% of adults reporting symptoms of anxiety and/or depression (Panchal et al., 2021; Kearney et al., 2021). Additionally, between September 2019 - 2020, there were over 87,000 reported fatal drug overdoses, a 28.8% increase from the previous year, and the highest number of fatal overdoses reported in the U.S. in a single year (Ahmad et al., 2022).

Loneliness: A Potential Contributing Factor of COVID-19 Related Psychological Distress

There are many factors that contribute to the increase in adverse mental and behavioral health consequences. One factor could be the increased loneliness due to the social distancing measures mandated to reduce the spread of COVID-19. Loneliness, defined as perceived social isolation, refers to feelings of distress due to perception that their social needs are not being met by the quantity or quality of social relationships. Loneliness has been associated with poor physical and mental well-being (Cacioppo & Cacioppo, 2014; Hawkley & Cacioppo, 2010).

Loneliness and Mental Health Since the COVID-19 Pandemic

Feelings of loneliness increased since the COVID-19 pandemic began. In May 2020, 50% of Americans felt isolated compared to 23% in 2018 (NORC Issue Brief 1, 2020). This

trend continued through August 2020 with roughly two-thirds of U.S. adults reporting social isolation and increased stress and anxiety since the beginning of the COVID-19 pandemic (NORC Issue Brief 2, 2020). Increased feelings of social isolation due to the COVID-19 pandemic were associated with increased mental health problems. Roughly 40% of Americans reported that the social isolation from the COVID-19 pandemic made them feel more anxious and depressed than usual (American Association of Retired Persons Foundation & United Health Foundation, 2020). More than half of older adults reported increasing loneliness since COVID-19 that was associated with worsening depression and anxiety (Kotwal et al., 2020). Additionally, loneliness from the COVID-19 pandemic was associated with higher levels of poor mental health symptoms in U.S. adults (Horigian et al., 2020; Lee et al., 2020; Hansel et al., 2022). U.S. adult studies of loneliness and mental health during the COVID-19 pandemic are summarized in Table 1.

Loneliness and Substance Use Since the COVID-19 Pandemic

Social isolation related to COVID-19 has also been associated with substance use during the pandemic. A study in Austria revealed that social isolation was associated with an increased risk of alcohol use disorder relapse during the pandemic (Yazdi et al., 2020). Furthermore, loneliness during the COVID-19 pandemic in New Zealand was linked to increased tobacco use (Gendall et al., 2021). In Canada, loneliness was found to be significantly associated with increased alcohol and cannabis use (Brotto et al., 2021). Finally, in the U.S., individuals under stay-at-home orders were more likely to increase alcohol consumption (Killgore et al., 2021), and increasing loneliness was related to increased substance use during the COVID-19 pandemic (Sharma et al., 2020). Thus, increased prevalence of loneliness during the COVID-19 pandemic

has been associated with poor mental health and substance use outcomes. U.S. adult studies of loneliness and substance use during the COVID-19 pandemic are summarized in Table 1.

Pre-existing Mental Health and Substance Use Burden in Richmond, Virginia

Mental health and substance use have been persistent problems in Richmond, Virginia, and the COVID-19 pandemic may be exacerbating these issues. In 2015, a large-scale community health needs assessment in Virginia identified behavioral health conditions and substance abuse among the top five leading health issues in the state (Virginia Hospital and Healthcare Association, 2015). Additionally, residents of Richmond, Virginia have repeatedly identified mental health and substance use as a top health concern in their community (Richmond City Health District, 2017; Seventh District Health and Wellness Initiative, 2015; Seventh District Health and Wellness Initiative - Datapalooza Results 2015; Bon Secours Richmond Health System, 2019). However, the psychological effects of the COVID-19 pandemic in Richmond, Virginia are still unclear.

Currently, most studies assessing the psychological impact of the COVID-19 pandemic have been conducted at the national level through online surveys and in mostly White populations. However, it is unclear if the same trends are present at the local level and in African American populations (Table 1). Thus, the aims of this study are to (1) assess the prevalence of increased loneliness, mental health problems, and substance use in Richmond residents and (2) evaluate the association between increased loneliness and mental health problems and increased substance use in Richmond residents via online and paper-pencil surveys. We hypothesize that (1) there will be a high prevalence of increased loneliness, mental health problems, and substance use, and that (2) there will be significant associations between increased loneliness and

increased mental health problems and substance use since the COVID-19 pandemic began in both survey populations in Richmond, VA.

Table 1. Summary of U.S. Adult Studies of Loneliness, Mental Health Problems, and Substance Use During the COVID-19 Pandemic

Author and Year	Sample Size	Location	Racial/Ethnic Distribution of Participants	Data Collection Dates	Data Collection Method	Covariates	Loneliness	Mental Health	Substance Use	Association-Loneliness and Increased Mental Health Problems	Association-Loneliness and Increased Substance Use
Kotwal et al (2020)	151	U.S. (San Francisco Bay Area)	70% White	April 8-June 23, 2020	Phone interviews, small number via email or mail	Age, gender, race, marital status, education, financial stress, pre-COVID self-reported anxiety, depression, pre-COVID self-reported medical conditions, functional impairment	Self-reported change in loneliness ("worse, about the same, or better") and 3-item UCLA Loneliness scale	Anxiety (GAD2), Depression (PHQ2), asked how worried they are about the pandemic	N/A	Positive	N/A
Hansel et al (2022)	296	U.S. (55% Louisiana)	86% White	April 7-July 26, 2020	Online survey	Age, race, gender, marital status, income, pre-COVID mental health, physical health, or alcohol problems	Asked if they experienced social isolation during the pandemic	Anxiety (GAD2), Depression (PHQ2)	Alcohol misuse (CAGE)	Positive	No association
Sharma et al (2020)	542	U.S.	Did not specify	April 2020	Online Survey	Age, gender, educational status, pre-COVID mental health problems	3-item UCLA Loneliness scale	N/A	Self-reported change in vaping, marijuana, tobacco, alcohol use	N/A	Positive
Lee et al (2020)	564	U.S. (Seattle, WA)	54.5% White	Jan 6-30, & April 21 – May 18, 2020	Online survey	Age, race, sex, education, sexual orientation, perceived social support (in January 2020), concern about social impact of COVID-19 pandemic (in April/May 2020)	3-item UCLA Loneliness scale	Anxiety and Depression (PHQ4)	N/A	Positive	N/A
Kantor & Kantor (2021)	1005	U.S.	76% White	March 29-31, 2020	Online survey	Age, race, sex, income, education, marital status, location, religiosity, media consumption, time spent outdoors, home size, shelter-in-place order, employment loss, hospitalized in the last 2 years	8-item UCLA Loneliness scale	Anxiety (GAD7), Depression (PHQ9)	N/A	Positive	N/A
Horigian et al (2021)	1008	U.S.	76% White	April 22-May 11, 2020	Online survey	Age, race, gender, education, number of people in the household, self-reported practices of communication via technology, social connectedness (SC-15)	20-item UCLA Loneliness scale	Anxiety (GAD7), Depression (CES-D-10)	Alcohol (AUDIT-10), Drug Abuse (DAST-10)	Positive	Positive

Methods

The Richmond, Virginia COVID-19 Needs Assessment (RVA CoNA) began development in March 2020 to inform community leaders and stakeholders of the most important issues facing Richmond residents and people who work in organizations that offer services to Richmond residents. Partners agreed to develop the RVA CoNA using a highly collaborative process to incorporate input from residents, community leaders, and academic members through every stage of the process.

Any English or Spanish-speaking adult aged 18 or older residing in the Richmond region was eligible for participation. Upon survey completion, participants were invited to participate in a raffle for one of twenty $50 gift cards. Additionally, all participants received a resource card with health, employment, childcare, utilities, food delivery services and a "COVID-19 Quick Information Guide." All participants were also given the option to connect with a community partner if they indicated that they wanted to discuss a need they identified on the survey. For the in-person surveys, participants were given a small gift bag with items (e.g., small water bottle, snack bars, children's books) that did not exceed $5. The Virginia Commonwealth University Institutional Review Board reviewed and approved all research processes and procedures.

A pilot version of the survey was developed and tested prior to large scale administration. Twenty-seven residents, ages 22-77 years, participated in the pilot survey and 17 completed the entire survey (17 out of 27). Women represented 16 of the 17 participants that completed the entire survey. The average age of all participants was 43 years and 88.2% of participants (N = 15) indicated Black/African American race. Respondent feedback was generally positive, and interest was expressed about receiving overall survey results and how they will be used for

additional planning and programing. Survey enhancements after the pilot study included revising suboptimal wording and length of specific survey items.

Data Collection

Data collection was conducted in two phases: 1) internet-based surveys using the REDCap platform from August 3, 2020 to March 23, 2021 and 2) paper-pencil surveys from May 22 to October 15, 2021.

During Phase 1, data collection was entirely online using the REDCap platform (Harris et al., 2009). Study data were collected and managed using REDCap electronic data capture tools hosted at Virginia Commonwealth University. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing (1) an intuitive interface for validated data entry, (2) audit trails for tracking data manipulation and export procedures, (3) automated export procedures for seamless data downloads to common statistical packages, and (4) procedures for importing data from external sources.

Internet-based recruitment and receipt of the survey link were conducted through (1) an informational flyer shared with a person who receives services from a community partner (e.g., food bank distribution), (2) an announcement in a community forum followed by a link shared by a general e-mail from the forum organizer to all forum participants, (3) a digital media post from a partner organization who received an IRB-approved text and flyer image via social media (e.g., Facebook, Instagram), or (4) when an individual received a survey link from a colleague or friend by word of mouth (e.g., text message or forwarded e-mail). Approximately 436 people started the online survey and of these, 75% completed the survey (N = 327). The distribution of survey participants is summarized in Table 2.

During Phase 2, data collection was conducted in-person in the Richmond community. Data collection teams consisted of a community resident who facilitated introductions with participants and an academic team member who conducted informed consent and administered the survey. In-person recruitment was conducted through community organization invitation via (1) pop-up tables at community events, (2) inviting residents who visited community resource centers, or (3) community walks with academic and community partners. Approximately 283 people started the paper-and-pencil survey and of these, 79.5% completed the survey (N = 225). The distribution of survey participants is summarized in Table 2.

Measures

Increased loneliness, increased mental health problems, and increased substance use since the beginning of the COVID-19 pandemic were measured as part of an instrument that measured changes as a result of the pandemic (Grasso et al., 2020). This section of items began with, "Since the COVID-19 pandemic began, what has changed for you or your family?"

Increased loneliness since the COVID-19 pandemic. An item asked about loneliness as, "Increased feelings of social isolation and/or loneliness" (Luchetti et al., 2020; Choi et al., 2021). This variable was measured as a binary categorical variable with responses of "Yes" and "No".

Increased mental health problems and substance use since the COVID-19 pandemic. Increased mental health was asked as, "Increase in mental health problems or symptoms (e.g., mood, anxiety, stress)." Increased substance use was measured as, "Increase in use of alcohol or substances" (Czeisler et al., 2020; Robillard et al., 2021). Both items were measured as binary variables with responses of "Yes" or "No".

Covariates

Anxiety and or Depression before the COVID-19 pandemic

This item, which was originally measured as two separate binary categorical variables (Miyakado-Steger & Seidel, 2019), was combined into one binary categorical variable. The anxiety and depression variables were combined due to literature showing high comorbidity rates of depression and anxiety disorders (Kessler et al., 1996; Hirschfeld, 2001) as well as previous studies that have analyzed them together as one variable (Czeisler et al., 2020; Panchal et al., 2021; Vahratian et al., 2021). *Loneliness* and *Stress* before the COVID-19 pandemic were measured as binary categorical variables, with responses of "Yes" or "No" (Hossain et al., 2020).

Age

Age was originally measured as a continuous variable and recoded to reflect a binary categorical variable with responses of 18-49 and 50-100 years old (Shi et al., 2020). Previous studies reported that younger age is related to increased mental health symptoms, substance use, and feelings of loneliness during the COVID-19 pandemic (de Bruin, 2020; Czeisler et al., 2020; Panchal et al., 2021; Kearney et al., 2021; NORC Issue Brief 2, 2020; American Association of Retired Persons Foundation & United Health Foundation, 2020; Hansel et al., 2022; Rumas et al., 2021).

Gender

Participants provided information regarding their gender identity using a five-level categorical item. Almost all participants provided responses in two categories: "Woman" and "Man", and 7-8 participants responded as either gender non-conforming/non-binary or "Other". Responses from these individuals were not included in the analyses. Gender was treated as a binary variable (Shi et al., 2020; de Bruin, 2020; Robillard et al., 2021). Prior research suggests

that women are reporting higher levels of COVID-19 pandemic-induced mental health problems (Kearney et al., 2021; NORC Issue Brief 2, 2020; American Association of Retired Persons Foundation & United Health Foundation, 2020; Hansel et al., 2022).

Marital Status

Participants responded to an item indicating marital status as an eight-level categorical variable. Responses were re-categorized into a binary variable ("Married and/or Living with partner" and "Single and/or divorced"). Previous studies have analyzed marital status as a binary categorical variable (Shi et al., 2020; de Bruin, 2020), and have found that marital status influences mental health outcomes.

Education

Participants responded to a seven-level item reflecting educational attainment: "None," "Less than High School," "High School Graduate or GED," "Some College (no degree)," "Vocational Training (business, trade or technical school)," "College Graduate (Associate's or Bachelor's Degree) or Greater," and "I choose not to answer." Responses were aggregated into two categories: "College Graduate or Greater" and "Some College or Less." Prior studies have analyzed education as a binary categorical variable (Shi et al., 2020; Robillard et al., 2021; de Bruin, 2020) and have demonstrated an association with mental health.

Race/Ethnicity

Participants responded to a seven-level categorical variable, which was recoded as a binary variable with responses of "White" and "Black and/or Other" (Robillard et al., 2021). Prior research has shown that communities of color are associated with increased mental health symptoms and substance use (McKnight-Eily et al., 2021, Czeisler et al., 2020, Panchal et al., 2021).

Financial Burden

Financial burden was asked as, “Before the COVID-19 pandemic, how much did you worry that your/your family's total income would not be enough to meet your/your family's expenses and bills?” Participants responded to a three-level ordinal variable (“A lot,” “A little,” “Not at all”), which was recoded as a binary categorical variable, measured as “No” and “Yes” (Center for Economic and Social Research at the University of Southern California, 2021; Kotwal et al., 2020). Evidence shows that individuals experiencing income insecurity reported increased rates of symptoms of anxiety and/or depression (Panchal et al., 2021).

Time Interval

Attitudes and behaviors may have evolved over the course of the pandemic. This variation was measured using an indicator of the number of days that had passed from the start of the survey for each participant. This time interval variable was treated as a continuous variable measured by subtracting the date the survey was taken from the study start date (August 3rd, 2020). A similar method was used in a previous study to account for the time passed since the pandemic was officially declared (Robillard et al., 2021).

Statistical Analysis

Unadjusted logistic regression tested bivariate associations between loneliness and mental health and substance use outcomes. Adjusted logistic regression accounting for the influence of the covariates was also used. Two models tested the associations between increased loneliness with increased mental health problems and increased substance use since COVID-19. All models accounted for the influence of sociodemographic factors, pre-existing mental health conditions, and time since the surveys began. All analyses were conducted in R - 4.0.3 (R Core Team, 2017).

Results

Online Survey Results

Descriptive Analysis

Three hundred and twenty-seven (327) people aged 18 - 90 years old (average age = 46.6, SD = 17.4; 80.1% female) participated in the online survey. Most participants identified as White (69.4%). Most participants were college graduates (76.8%). Roughly 57% were married or with a partner and about half (52%) reported no financial burden. Most participants reported increased loneliness (68.8%) and increased mental health problems (67.3%) since the COVID-19 pandemic. About one-third reported increased substance use (29.4%) since the COVID-19 pandemic (Table 2).

Logistic Regressions

Increased loneliness since the COVID-19 pandemic was significantly associated with increased mental health problems since COVID-19 (OR = 5.84, 95% CI = 3.51 - 9.85). This association remained significant after adjustment for covariates (AOR = 5.00, 95% CI = 2.56 - 9.97). Increased loneliness was also associated with increased substance use since COVID-19 (OR = 3.84, 95% CI = 2.08 - 7.59). This association remained significant after adjusting for covariates (AOR = 3.14, 95% CI = 1.58 - 6.60, Table 3).

Paper-and-Pencil Survey Results

Descriptive Analysis

Two hundred and twenty-five (225) people aged 20 - 80 years old (average age = 47.0, SD = 14.8; 70% female) participated in the paper-and-pencil survey. Most participants were identified as Black or Other Racial/Ethnic group (83.1%). Approximately 30.7% of participants in this sample were college graduates. Roughly 37.8% were married or living with a romantic

partner. Approximately 65% reported experiencing financial burden. Roughly half of participants reported increased loneliness (46.7%) and mental health problems (50.2%) since the COVID-19 pandemic. About one-fourth reported increased substance use (22.2%) since the COVID-19 pandemic (Table 2).

Logistic Regressions

Increased loneliness since the COVID-19 pandemic was significantly associated with increased mental health problems since COVID-19 (OR = 14.45, 95% CI = 7.59 - 28.75). This association remained significant after adjustment for covariates (AOR = 10.48, 95% CI = 4.18 - 28.59). Increased loneliness was also associated with increased substance use since COVID-19 (OR = 10.56, 95% CI = 4.71 – 27.10). This association remained significant after adjusting for covariates (AOR = 5.89, 95% CI = 1.97 - 19.71, Table 3).

Table 2. Summary Statistics

	Internet (N = 327)		Paper and Pencil (N = 225)	
	N	**%**	**N**	**%**
Since COVID-19:				
Increased Loneliness	225	68.8	105	46.7
Increased Mental Health Problems	220	67.3	113	50.2
Increased Substance Use	96	29.4	50	22.2
Before COVID-19:				
Stress	247	75.5	120	53.3
Anxiety and/or Depression	218	66.7	112	49.8
Loneliness	99	30.3	58	25.8
Gender				
Female	255	80.1	149	69.8
Male	65	19.9	68	30.2
Education				
College Graduate or Greater	249	76.8	69	30.7
Some College or Less	76	23.2	149	69.3
Marital Status				
Married/Partner	182	56.6	79	37.8
Divorced/Single	142	43.4	140	62.2
Race				
White	227	69.4	38	16.9
Black/Other	100	30.6	187	83.1
Financial Burden				
No	152	48.0	62	34.7
Yes	170	52.0	147	65.3
Age				
18-49	204	62.4	128	56.9
50+	123	37.6	97	43.1

Table 3. Unadjusted and Adjusted Estimates of Association between Increased Loneliness with Mental Health Problems and Substance Use Across Samples

	INTERNET				PAPER AND PENCIL			
	Increased Mental Health Problems		**Increased Substance Use**		**Increased Mental Health Problems**		**Increased Substance Use**	
	Unadjusted *OR* *(95% CI)*	**Adjusted *OR* *(95% CI)***	**Unadjusted *OR* *(95% CI)***	**Adjusted *OR* *(95% CI)***	**Unadjusted *OR* *(95% CI)***	**Adjusted *OR* *(95% CI)***	**Unadjusted *OR* *(95% CI)***	**Adjusted *OR* *(95% CI)***
Increased Loneliness Since COVID-19								
No	Reference		Reference		Reference		Reference	
Yes	**5.84 (3.51-9.85)**	**5.00 (2.56-9.97)**	**3.84 (2.08-7.59)**	**3.14 (1.58-6.60)**	**14.45 (7.59-28.75)**	**10.48 (4.18-28.59)**	**10.56 (4.71-27.10)**	**5.89 (1.97-19.71)**
Anxiety/Depression Before COVID-19								
No	Reference		Reference		Reference		Reference	
Yes	**4.88 (2.96-8.12)**	**2.80 (1.43-5.51)**	1.42 (0.85-2.44)	0.83 (0.43-1.59)	**7.16 (3.90-13.56)**	**3.94 (1.32-12.37)**	**9.52 (4.07-26.25)**	3.17 (0.87-12.92)
Loneliness Before COVID-19								
No	Reference		Reference		Reference		Reference	
Yes	**2.10 (1.23-3.67)**	0.84 (0.38-1.86)	1.16 (0.69-1.93)	0.93 (0.49-1.76)	**4.55 (2.34-9.32)**	1.02 (0.30-3.31)	**3.83 (1.90-7.81)**	1.43 (0.51-3.98)
Stress Before COVID-19								
No	Reference		Reference		Reference		Reference	

Yes	**7.91 (4.55-14.08)**	**3.99 (1.91-8.57)**	**1.85 (1.03-3.50)**	1.22 (0.58-2.62)	**5.10 (2.75-9.72)**	1.37 (0.48-3.86)	**7.47 (3.02-22.66)**	2.35 (0.62-10.17)
Age								
18-49	Reference		Reference		Reference		Reference	
50+	**0.16 (0.09-0.26)**	**0.25 (0.13-0.47)**	**0.23 (0.12-0.41)**	**0.30 (0.15-0.57)**	**0.46 (0.26-0.79)**	0.51 (0.20-1.23)	0.57 (0.29-1.11)	1.01 (0.39 -2.61)
Gender								
Female	Reference		Reference		Reference		Reference	
Male	0.69 (0.39-1.21)	0.67 (0.31-1.47)	1.21 (0.67-2.16)	1.16 (0.58-2.28)	0.76 (0.42-1.37)	0.60 (0.22-1.61)	1.01 (0.49-2.01)	1.38 (0.44-4.29)

Bolded estimates are significant at p<0.05

Table 3 (continued). Unadjusted and Adjusted Estimates of Association between Increased Loneliness with Mental Health Problems and Substance Use Across Samples

	INTERNET				**PAPER AND PENCIL**			
	Increased Mental Health Problems		**Increased Substance Use**		**Increased Mental Health Problems**		**Increased Substance Use**	
	Unadjusted	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**	**Unadjusted**	**Adjusted**
	OR (95% CI)	***OR (95% CI)***	***OR (95% CI)***	***OR (95% CI)***	***OR (95% CI)***	***OR (95% CI)***	***OR (95% CI)***	***OR (95% CI)***
Education								
College Grad or Higher	Reference		Reference		Reference		Reference	

Some College or Less	**0.37 (0.22-0.63)**	0.52 (0.23-1.16)	**0.37 (0.18-0.70)**	0.68 (0.30-1.47)	**0.49 (0.27-0.89)**	0.38 (0.13-1.04)	**0.51 (0.26-0.99)**	0.64 (0.24-1.69)
Marital Status								
Married/Partner	Reference		Reference		Reference		Reference	
Divorced/Single	**0.53 (0.33-0.85)**	0.65 (0.32-1.30)	**0.57 (0.35-0.93)**	0.73 (0.41-1.31)	0.62 (0.35-1.08)	1.11 (0.41-3.09)	**0.50 (0.26-0.96)**	0.39 (0.14-1.10)
Race								
White	Reference		Reference		Reference		Reference	
Black/Other	**0.46 (0.28-0.75)**	0.63 (0.30-1.31)	**0.42 (0.23-0.73)**	0.69 (0.35-1.35)	**0.40 (0.18-0.84)**	1.12 (0.29-4.16)	0.47 (0.22-1.04)	1.64 (0.51-5.64)
Financial Burden								
No	Reference		Reference		Reference		Reference	
Yes	1.44 (0.90-2.31)	1.22 (0.64-2.33)	1.22 (0.76-1.98)	1.41 (0.81-2.47)	1.16 (0.64-2.12)	0.47 (0.16-1.29)	1.40 (0.68-3.02)	0.82 (0.28-2.39)
Time Interval	1.00 (1.00-1.01)	1.00 (1.00-1.01)	1.00 (0.99-1.00)	1.00 (0.99-1.00)	1.00 (0.99-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.01)

Bolded estimates are significant at p<0.05

Discussion

To our knowledge, this was the first study to evaluate the association of loneliness with mental health and substance use at a community level in Richmond, Virginia during the COVID-19 pandemic using both internet-based and paper-and-pencil surveys. It was hypothesized that (1) there would be a high prevalence of increased loneliness, mental health problems, and substance use, and that (2) there would be significant associations between increased loneliness and increased mental health problems and substance use in both survey populations. The results supported our hypotheses. A large portion of Richmond residents were experiencing increased loneliness, mental health problems, and substance use during the COVID-19 pandemic. Additionally, increased loneliness was significantly associated with increased mental health problems and increased substance use in both internet and paper survey populations. Our hypotheses were further supported by the high degree of consistency in our results across the two survey samples, which had very different demographics.

Prevalence of Loneliness, Mental Health Problems, and Substance Use During the COVID-19 Pandemic

There was a high prevalence of increased loneliness, mental health problems, and substance use since the start of the COVID-19 pandemic in Richmond residents. The online and paper-and-pencil surveys found that roughly half of the participants reported increased loneliness and mental health problems, and roughly a quarter of participants reported increased substance use. The slightly lower prevalence of loneliness, substance use, and mental health symptoms among paper-and-pencil survey participants could be due to the later time frame of data collection, which is supported by a previous study showing a higher prevalence of mental health

symptoms closer to the initial COVID-19 lockdown (Brotto et al., 2021). The largely consistent results across the two different samples suggest that Richmond residents of various demographics experienced increased psychological distress due to the pandemic. These results are comparable to national rates of increased loneliness, mental health symptoms, and substance use during the COVID-19 pandemic (NORC Issue Brief 2, 2020; Horigian et al., 2020; Hansel et al., 2022).

Association Between Loneliness and Increased Mental Health Problems

There were significant positive associations between increased loneliness and increased mental health problems, which remained significant after controlling for sociodemographic factors, pre-existing mental health conditions, and time since the surveys began. Replication across two different survey samples produced similar outcomes, demonstrating the robust nature of the association between loneliness and increased mental health problems during the pandemic. These results align with national data (Kantor & Kantor, 2020) and previous research demonstrating that loneliness is a risk factor for a variety of mental health issues (Mushtaq et al., 2014).

Association Between Loneliness and Increased Substance Use

Similarly, after adjusting for covariates, increased loneliness was significantly associated with increased substance use. The online survey results were consistent with the replicated analysis in the paper survey population. These results are consistent with national data (Sharma et al., 2020) and prior research demonstrating that loneliness is a risk factor for substance abuse (Hosseinbor et al., 2014; Mushtaq et al., 2014; McDonagh et al., 2020).

Limitations

These results should be considered in the context of the following limitations. First, this study cannot conclude directionality of the associations due to the cross-sectional study design. Nevertheless, this study focused on the relationship between COVID-19 pandemic-related loneliness, mental health symptoms, and substance use. The goal of this preliminary study was not to conclude direction of causation, and future studies focused on this question are encouraged. Second, due to community partners' priorities to reduce participant burden, validated tools to assess loneliness, stress, depression, anxiety, and substance use were not used. The lack of standardized measures makes it challenging to compare these results with other studies. Nonetheless, our results are consistent with those in previously published studies. Third, we were unable to follow changes in behavior over time. Instead, participants reported perceived changes in substance use and mental health problems, which may be subject to recall bias. Longitudinal studies of these outcomes are necessary to determine whether these issues will persist in the years following the pandemic.

Future Directions and Practical Implications

Our study illustrated the role of loneliness related to mental health and substance use. There may be several underlying factors contributing to this relationship. For example, social support is associated with reduced loneliness (Czaja et al., 2021) and a lower risk of developing depressive symptoms (Rosenquist et al., 2010, Santini et al., 2014). The stress-buffering model posits that social support buffers the negative effects of life stressors, improving psychological well-being (Cohen & Wills, 1985). Another factor to consider is relationship stress. For instance, relationship strain is related to increased loneliness (Hawkley et al., 2008) and greater mental distress (Whisman & Uebelacker, 2006). The stress-exacerbation model suggests relationship

stress compounded with other life stressors overloads a person's coping capacity, causing increased negative emotional symptoms (August et al., 2007, Rodriguez et al., 2019). We tested whether relationship stress moderated the association between loneliness and increased substance use as well as increased mental health problems. However, no significant moderation was detected. Future studies should build on our results by exploring the role of social support and relationship stress on the associations between loneliness, mental health, and substance use since they may be important factors influencing these associations.

Data from this study suggest that future support for individuals with mental illness and/or engaged in substance use should consider the role of loneliness. Meaningful interventions to help with the prognosis and recovery of individuals with mental health and substance use disorders include screening for loneliness (Russell, 1996) and connecting lonely individuals with peer support and psychoeducation groups (Haslam et al., 2016; Chiu et al., 2017; Rönngren et al., 2018). Furthermore, these results suggest that addressing loneliness in different communities may benefit from the use of different outreach modalities. For example, some communities may benefit from in-person, hands-on activities related to loneliness. Other communities may benefit from virtual activities. This study demonstrates associations in the Black community that are also consistent with results identified in a White sample in the same region. Nevertheless, the psychological impact of the COVID-19 pandemic on the Black community remains understudied. More research needs to be conducted with this population to develop effective public health policies and strategies to promote mental wellness in the future.

Conclusion

This study provides important insight to the existing body of research examining the psychological impacts of the COVID-19 pandemic. To our knowledge, we are among the first to

use two samples to replicate the associations between loneliness and increased mental health and substance use. Further, this study was also conducted in a predominantly Black community, which is typically underrepresented in research. This study demonstrated that increased loneliness, mental health symptoms, and substance use are significant issues in the Richmond area and should motivate additional action from policymakers to support broad approaches to supporting psychological wellness throughout the COVID-19 pandemic and beyond.

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ADDRESSING THE DIGITAL HEALTH DIVIDE IN THE RURAL U.S.

Healthcare Providers' Perspectives on Telemedicine in Public Libraries

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University of Virginia School of Nursing

RESEARCH OBJECTIVE

Understand the perspectives of healthcare providers on telemedicine video visits in public libraries.

BACKGROUND

- **Rural residents have less access to telemedicine video visits**
  - Limited numbers have broadband and smartphones
  - Limited *digital inclusion* - skills to utilize the internet
- **Public libraries have potential to improve access to telemedicine for rural residents**
  - Broadband equipment and infrastructure
  - Librarians skilled in information access
  - Long history of contributions to public health
- **A hallmark of successful programs is collaboration with providers and/or health systems**
  - Implementation in the rural US is highly limited
  - A limitation may be related to providers' reluctance or lack of knowledge
- **This is the first study to evaluate the perspective of health care providers on telemedicine in public libraries**

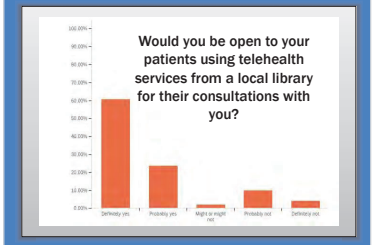
METHODS

- **Design:** Mixed Methods
- **Methodology**: Explanatory Sequential
- **Sample**: 50 Licensed Independent Providers (Quantitative) and 12 Nurse Practitioners (Qualitative)
- **Data Collection**: Internet survey sent to LIPs followed by 20-minute semi-structured interviews.
- **Analysis**: Descriptive
- **Human Subjects Protection:** Approved by UVA Institutional Review Board for Social and Behavioral Science

References available upon request from Pam DeGuzman: deguzman@virginia.edu

FINDINGS

Public Libraries Can Increase Access to Care for Rural Populations



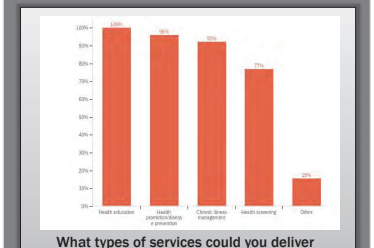
Long Distances to Care
"Round trip is probably four hours"

Poor Connectivity in Rural
"We have a lot of rural areas. If you do not live in a neighborhood with Comcast or FiOS, you only have satellite, and satellite connection is very poor. And then if people are dependent upon their phones, for mobile access to internet, the connections did not work."

Libraries as a Solution
"If they don't have like Internet at their rural house…you can drive 10 minutes to the library …and still get that that video call in."

"It's a great idea because [the library] is a place where patients are getting resources already, they're often going and looking up things if they don't have a computer."

Certain Visits Are Highly Amendable to Telemedicine in a Library

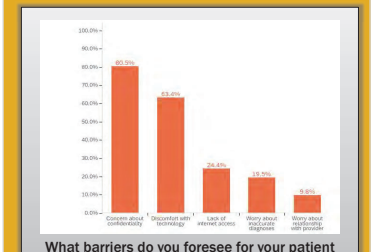


Chronic Illness Management
"[We could provide] better care for asthma management, depression management. I feel like a lot of those things you can do over a tele visit …they don't ever come back until they need that like next refill in three months or a year."

Transitioning Care
"One of the things we're finding that's very beneficial is when they come home from the hospital and have a transition of care appointment."

Not All Visits are a Good Fit
"Acute visits are absolutely terrible. Anything …respiratory related, or skin related lead to deviation from the standard of care."

Providers are Concerned about Telemedicine Privacy in a Public Library



Concerns on Behalf of Patients
"Some of my patients are very private, or they would have nothing, want nothing to do with a public library, you know."

"[Patients may have] hesitation unless there is an established channel…it would need to be a space [appropriate] for HIPAA regulations."

Their Responsibility to Patients
"[I would want] assurance there that patients know that nobody in the library can hear what they're saying."

IMPLICATIONS FOR EXPANDING ACCESS TO CARE

- **Public libraries can extend access to care for rural residents lacking home-based broadband.**
  - Many types of visits could be done from a library without the patient needing to drive many hours for specialized care
- **Providers may need information about of the existing public health role of public libraries.**
  - Libraries regularly assist patrons with access to health information
  - Libraries that have implemented telemedicine have privacy protocols in place

CAUSES OF MINORITY HEALTH DISPARITIES

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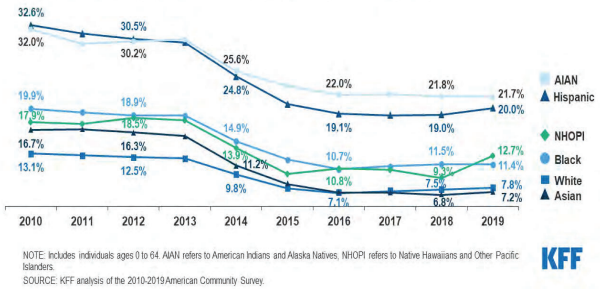
BACKGROUND

Purpose: Analyzing previous minority health disparities can help target ways to close the gap of these troublesome issues
Methods: Use recent data about minority disparities and find areas that can potentially affect health equity.
Results: There are many factors that influence why there is an imbalance as it pertains to health equity. Statistics show how socioeconomic status and race/ethnicity play a large role in many disparities.
Conclusion: Due to the subjective term of health equity, the best way to attack health disparities among minorities would be to create specific programs/laws that can allocate resources to their community's issue.

Figure 3

People of color face longstanding disparities in health coverage.

Uninsured Rates for the Nonelderly Population by Race and Ethnicity, 2010-2019



NOTE: Includes individuals ages 0 to 64. AIAN refers to American Indians and Alaska Natives. NHOPI refers to Native Hawaiians and Other Pacific Islanders.
SOURCE: KFF analysis of the 2010-2019 American Community Survey.

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STATISTICAL ANALYSIS

The graph displayed above shows the distribution of uninsured rates of health coverage among various ethnic groups between the years 2010 and 2019. Minority groups have a population where people are more likely to not have health care coverage. While there is a steady decline in uninsured populations among minorities there are intersectional factors that still cause this to be a troublesome issue especially with COVID-19. The shortage of jobs in this year caused the rates of uninsured people to increase for all groups, but as data shows, minority groups took an immense hit, because many people were unemployed during this time period. The ability to not have a steady flow of income could in turn, not only affect their ability to obtain adequate health coverage, but also the types of food they eat and how healthy they are on an individual level. The pandemic has caused over three times premature excess deaths per 100,000 people in the United States during the year 2020 for minority groups.

RESULTS

The idea of health coverage is the tip of the iceberg as to what the root of health disparities is caused by. Another prevalent factor that affects minority health are the environment that low-income households are in, and the sociocultural environment as well. Minority groups that live in areas where resources are scare tend to have a higher crime and mortality rates. This also leaves room to imply that social factors such as lifestyle and health behavior choices also make an immense difference in the health equity of minority groups. An overlooked element that people tend to ignore are genetics. Certain groups tend to have a predisposition to certain diseases. For example, high blood pressure is more prevalent in African American communities with about 55% of the population having high blood pressure. Once again this is due to the intersectionality of not having the resource to receive proper care, having enough income to consume health foods, and displaying a genetic predisposition to high blood pressure.

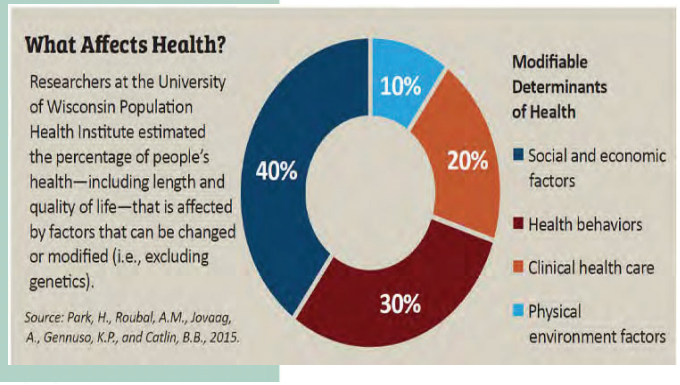
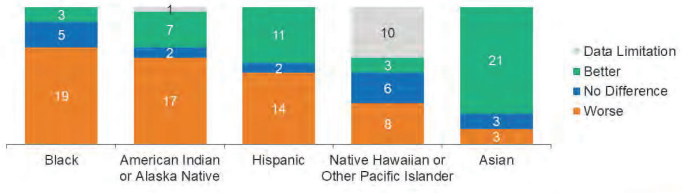


Figure 2

People of Color Fare Worse than their White Counterparts Across Many Measures of Health Status

Number of health status measures for which group fared better, the same, or worse compared to White counterparts:



Note: Measures are for 2018 or the most recent year for which data are available. "Better" or "Worse" indicates a statistically significant difference from Whites at the p<0.05 level. No difference indicates no statistically significant difference. "Data limitation" indicates data are no separate data for a racial/ethnic group, insufficient data for a reliable estimate, or comparisons not possible due to overlapping samples. Persons of Hispanic origin may be of any race but are categorized as Hispanic for this analysis; other groups are non-Hispanic.

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CONCLUSION

While the concept of health disparities can become complex and overwhelming, recognizing these differences and attempting to close the gap is the first step in fighting health disparity and increasing health equity for all people. There is sometimes a misconception that money alone could potentially solve every minority group's problems but that is not the case. Allocating resources specific to each problem according to the demographics and the current issues this population is dealing with is the best way to handle disparities in certain areas. Creating programs that could educate would be very beneficial. Dealing with intersectional factors as it pertains to health care makes it difficult to have access to resources that could teach communities more about healthier practices and about risky activities. Providing these necessary resources could affect the rates of health disparities in a positive manner.

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Examining the [Social] Determinants of Health among Immigrant and Refugee Families: Lessons Learned from the Field

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Abstract

This poster presents evidence from field work by a former regional migrant recruiter/community outreach liaison for the Iowa Migrant Education Program (2016-2020); and currently an Assistant Professor of Public Health. The presenter is from Sierra Leone, West Africa, with extensive experience working with immigrant/refugee families, students and out-of-school youth from diverse ethnicities and nationalities. Specifically, the poster share his first-hand experience in the field working with migrant agricultural workers across Iowa (rural & urban), and his collaborative endeavors with healthcare providers in bridging the gap that often emerges due to socio-cultural differences between migrant families and local healthcare providers. These families frequently move across the U.S. in search of agricultural work. This migration exposes them to a myriad of challenges and opportunities related to social determinants of health, including social support, social network, and access to healthcare services. For instance, some of the perceived miscommunications could be the difference between a migrant visiting a clinic, and thereby getting the care necessary to address an underlying health condition, to discontent that may lead to poor health outcome, and sometime, severe health condition. Healthcare providers may wonder why certain refugees and/or immigrants in the U.S. may not show up for a scheduled visit after numerous attempts, and thus not receive needed care. It is not merely due to language difficulties, but socio-cultural factors play a key role in migrants' health outcomes. Guided by the Social Determinants of Health Model, this session examines key determinants, supported by evidence from field experience.

Who are Migrant Agricultural Workers?

Migrant Agricultural workers are essential workers mostly made up of immigrants and refugees (including U.S. citizens and non-citizens) who move across the U.S., both within state-boundary and between states to work in agriculture, such as farms and meat-packing/processing plants. They comprised of adults, families, as well as out-of-school youth (OSY).

This population of workers are very mobile in that they move in search of agriculture work more frequently than the average person in the country. Because of their high mobility, coupled with their ethnic/racial, cultural, and socio-economic background, they experience challenges and opportunities related to the social determinants of health, such as health care access, food, and housing.

Figure 1. Educational session with Migrant Agricultural Youth Workers (Out-of-School Youth), Sioux City, IA

The Social Determinants of Health Model

The World Health Organization (WHO) defines the social determinants of health as the "conditions in which people are born, grow, live, work and age, and the wider set of forces and systems shaping the conditions of daily life."

As such, the social determinants of health model (depicted in figure 2) suggests that these determinants are essential to the livelihoods, social and economic well-being, which in turn influence the health outcomes of people and communities. For example, a policy that improve access to safe physical activity such as building green spaces, bike trails, sidewalks, and playgrounds can contribute to and positively influence the health of a community.

Economic stability	Neighborhood and physical environment	Education	Food	Community and social context	Health care system
Employment	Housing	Literacy	Hunger	Social integration	Health coverage
Income	Transportation	Language	Access to healthy options	Support systems	Provider availability
Expenses	Safety	Early childhood education		Community engagement	Provider linguistic and cultural competency
Debt	Parks	Vocational training		Discrimination	
Medical bills	Playgrounds			Stress	Quality of care
Support	Walkability	Higher education			
	Zip code/ geography				

Health outcomes
Mortality, morbidity, life expectancy, health care expenditures, health status, functional limitations

Figure 2. The Social Determinants of Health Model
Source: Birkhead, G.S., Morrow, C.B., & Pirani, S. (2021).

Evidence from the Field

The most common **challenges** experienced by migrant agricultural workers in Iowa are as follows:

- *Language barrier* that often resulted in miscommunication with healthcare providers.
- *Uninsurance* – most of the workers didn't have health and/or dental insurance.
- *Discrimination*, including racism.
- Lack of *transportation.*
- Lack of *information* on how and where to access essential social services, such as location of healthcare providers, applying for Medicaid, sliding scale fee at community health centers, dental services, as well as school lunch for children.
- Confusion of medical and dental bills.
- Migrant families move a lot, and thus not able to keep track of bills. Healthcare providers often fail to inform patients to notify them of any change of address and phone number.
- Healthcare providers send bills in English with the assumption that patients know how to read them.
- Healthcare providers' lack of qualified interpreter services.
- Many dental service providers not accept patients with government insurance plans.

Nevertheless, most migrant workers reported some **opportunities** they gained include:

- *Income* – they made more money than their previous jobs or better than being unemployed.
- For families, *better school* opportunities for their children in Iowa.
- Being able to *support families* back home with money.
- Meeting new people from different places and learning about other cultures.

Migrant Voices

"I cannot send my children to school because I don't have a car and no one want to help me, even the school. The school is very far. Many times I walk with them to school. But in the cold season, I cannot take them to school. The school is not helping us" (refugee family from Ethiopia).

"I received $3000 bill from the Dentist. This is very expensive. I don't have this money. I am very worried that I will go to jail if I don't pay them. Please help me" (migrant family from Micronesia).

"My boss is wicked. I have been working now for two months in the farm and he has not paid me. When I tell him to pay me, he said to keep waiting or he will fire me and no one will give me another job. I'm afraid, I need the job because I don't have papers" (undocumented, from Honduras).

"I went to the clinic the other day and the woman (receptionist) told me I owe them money because I did not pay the bill from my previous doctor's visit. She said they sent to me many letters with bills, but I don't know how to read English. How can I know what their letter looks like and what it is saying" (refugee family from Burma).

Implications for Public Health

Understanding the social determinants of health that impacts the lives of migrant agricultural workers and families would help tailor public health interventions, policies, and social services to address the unique challenges experienced by this underserved population.

For example, providing affordable housing and better working conditions are critical to improve their livelihoods and health outcomes.

Additionally, further research is needed to examine the unique experiences of migrant workers so as to foster our understanding of their experiences, needs, challenges, and opportunities. Due to the limited research on this topic, there is a need for more studies that focus on the unique experiences of migrant agricultural workers within the context of the social determinants of health.

Figure 3. Addressing the Social Determinants of Health
Source: http://www.healthscotland.scot/media/1164/social-determinants-of-health.png

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Racial Disparities in Routine Health Checkup and adherence to Cervical Cancer Screening Guidelines among Women in the United States

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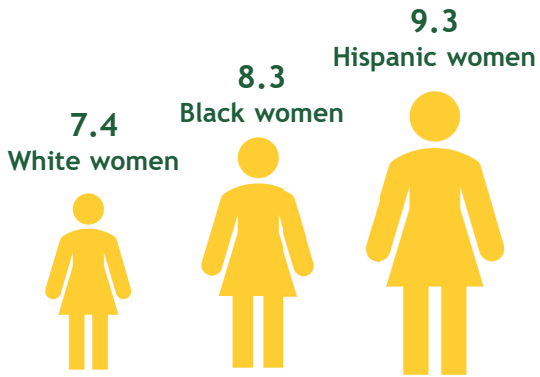
Background & Objectives

Background

- Routine health checkup & cervical cancer (CC) screening are primary prevention strategies, yet despite their importance, disparities persist among women that belong to different subpopulations [1]



Incidence of cervical cancer per 100,000 females [2]

- Yet, national screening rates remain low especially among minority women [3]

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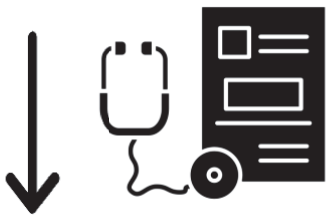

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Objectives

- To assess the previously understudied association between routine health checkup and adherence to CC screening among women in the United States
- To examine if there is a difference in the association by race/ethnicity among women in the United States

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Study Design

- This study analyzed survey data from the Health Informational National Trend Survey (HINTS 5) from the years 2017 through 2019 to identify respondents who had received routine health checkup & CC screening
- Following the 2012 American Cancer Society guideline, women aged 21-65 years who had recent CC screening within the last 3 years were included in the study
- Ronald Andersen's behavioral model was used to guide the selection of predictors
- Predisposing factors such as demographic characteristics; enabling factors such as income, insurance, emotional support, health information seeking & history of family cancer; needs factors such as obesity were all included as predictors
- Chi-squared tests were used to assess the significance of each predictor variable (Table 1)
- Sampling weights and replicate weights were used to estimate nationally representative descriptive summary & statistical models
- Binary logistic regression was used to examine the association between adherence to CC screening, routine health checkup & covariates

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Results

- **Overall, about 72% of women met the cervical cancer screening guidelines & a large proportion of women who had routine health checkups adhered to CC screening (91.2%)**
- Overall, compared to those who did not receive the CC screening, women who did were more likely to be younger, wealthier, racially diverse, married, more educated & insured (all $p<0.05$)
- **After adjusting for the covariates, women who had received routine health checkup in the past 2 years had 3.24 times odds of having received CC screening using pap test ($p < 0.05$)**
- **When stratifying by race/ethnicity, routine health checkup was the strongest predictor of CC screening among White women in both unadjusted & adjusted models (OR, 4.62; $p < 0.05$)**
- **Among Hispanic women, routine health checkup was not a significant predictor of CC screening in fully adjusted models**

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Conclusion

- **Routine health checkup remained an important influence on adherence to CC screening**
- **When analyzed by race/ethnicity, there were variations in the findings**
- Routine health checkup was a significant influence on adherence to CC screening among White, Black & Other women but Hispanic was an exception

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Implications & Future direction

Implications

- Empirical evidence to link routine health checkup and cancer screening among women and by race/ethnicity is still understudied at the national level in the US
- More efforts should be made to understand racial disparities between routine health checkup & adherence to CC screening among Black & minority women
- This study explores this association & suggests that interventions to promote CC screening should be targeted differently for racial/ethnic minority women

Future direction

- **Future work should develop a more comprehensive theoretical framework to include other potential needs factors such as comorbidity**

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PTSD in children post COVID-19 lockdowns in Norfolk, VA

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Introduction

The Novel Corona Virus Disease of 2019 (COVID-19) is classified as a pandemic by WHO in March 2020 and it has forced governments all over the world to lockdown that affected everyone's life and especially the children[1]. COVID-19 has affected and altered the life of 1.6 billion children across the world and in the United States, roughly 60 million children were also affected by the lockdowns and school closure[2,3].

Many studies concluded that previous outbreaks have led to an exponential increase in the Post-Traumatic Stress Disorder in population[4]. The pandemic has a very huge media coverage that increases the chances for more worldwide response. The children are also affected by associated measures taken to contain COVID-19 as the school is closed and a curfew is mandated and no more socialization for them.

Objectives

We aim to study the correlation between the COVID-19 pandemic and the lockdown measures on children for developing PTSD.
The study goal:
1- The effect of COVID in children for developing PTSD and aggravating symptoms.
2- Increase the awareness of the impact of COVID-19 on children's mental health

Study Design

This is a Case-Control using Convenience sampling

SMFQ-P Short Mood and Feeling questionnaire will be sent to the participants who meet the criteria.

The results will be gathered and collected to analyze the effect of COVID-19 lockdowns on children.

Inclusion Criteria

- Children admitted in school from elementary to high-school level before the pandemic
- Diagnosed with PTSD
- Healthy children

Exclusion Criteria

- Not living in Norfolk, VA
- Not admitted to any school before the pandemic
- In preschool or graduate level.

Exposure

Definition: The exposure definition is that the children are experiencing mental health disturbances because of the pandemic lockdowns and their associated effects.

Measurement: The questionnaire result will be analyzed whether COVID-19-influences affect the mental health of children who have PTSD or not.

Disease

Definition: The disease of interest to be studied is PTSD in children because of social isolation and lockdown measures.

Measurement: The effect will be collected using SMFQ-P, Short Mood and Feeling questionnaire to study the current and any changes of PTSD symptoms.

Confounders and Interactions

Potential cconfounders is a participant who already have PTSD, child displacement and sex-violance abuse.

Potential effect modifier are age, gender and ethnicity.

Data Collection

The study design is a case-control using convenience sampling by distributing the SMFQ-P questionnaire to every participant who meets the criteria and collecting the questionnaire online.

Logistic regressions will be conducted to measure the association between COVID-19 and PTSD in children.

Proposed Data Analysis

Utilize the program SAS to conduct all statistical analyses. We will need to determine the significance of our quantitative data when available, as well as incorporate interactions of qualitative and quantitative data.

Strengths / Limitations

The major strength is by evaluating if a correlation between COVID-19 and PTSD in children exists or not.

The major limitations of this study are: 1- the online distribution of the surveys, 2- the commitment to fill out the questionnaire completely.

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Life During the COVID-19 Pandemic

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Introduction

- ✓The COVID-19 pandemic has wreaked havoc in the world.
- ✓Academic institutions, especially higher education systems had profound effect on their regular activities by the pandemic.
- ✓College students' life, especially mental health was affected during this time.

Purpose

The purpose of this study was to assess the overall fear of COVID-19, anxiety, and stress of college students and their coping mechanism in a state university in the Shenandoah Valley.

Methods

- ➢An online survey was conducted among the enrolled students at James Madison University.
- ➢JMU's bulk email service was utilized to share the survey invitation.
- ➢To increase participation, gift cards were distributed among students.
- ➢Gift card recipients were choses by lottery.

Measures

- ➢Dependent Variables:

(a)Fear of COVID-19 Score.

I. Seven (7) Likert-type questions.

II.Answer choice:

1. Strongly disagree to Strongly agree (1 to 5).
2. Score range: 7 to 35.

Methods

- ➢Dependent Variables:

(b) Generalized Anxiety Disorder 7 (GAD-7) Score.

I. Seven (7) Likert-type questions.

II. Answer choice:

1. Not at all to Nearly every day (0 to 3).
2. Score range: 0 to 27.

(c) Patient Health Questionnaire 9 (PHQ-9) score.

I. Nine (9) Likert-type questions.

II. Answer choice: Not at all to Nearly every day (0 to 3).

1. Strongly disagree to Strongly agree (1 to 5).
2. Score range: 7 to 35.

- ➢Other Variables:

a)Age.

b)Gender.

c)Ethnicity.

d)Degree program.

e)College.

f)Off or on campus.

g)Diagnosed with COVID-19.

h)Vaccinated against COVID-19.

Methods

Data Analysis:

- ➢Descriptive analysis.
- ➢Inferential analysis:
- ➢General linear regression models were used to estimate association between dependent variables and other variables.
- ➢Statistical inferences were based on 95% confidence intervals (CI).

Results

Descriptive statistics:

i. Sample consisted of 680 participants.

ii.Females 80.4%, Males 19.6%.

iii.White: 81.9%.

iv.Mean age: 22.14 ± 5.48 years.

v. Diagnosed with COVID-19: 21.4%.

vi.Vaccinated against COVID-19: 19.8%.

vii.Undergraduate students: 78.0%.

viii.Health majors: 41.4%.

ix.Fear of COVID-19 score:

1. Mean: 15.78 ± 6.0

x. GAD-7 score:

1. Mean: 8.47 ± 5.84.

xi.PHQ-9 score:

1. Mean: 8.41 ± 6.24.

Results (Contd.)

Inferential statistics:

i. Females had significantly higher fear of COVID-19 than males.

ii.Non health major students had significantly higher fear of COVID-19 than health major students.

iii.Those who did not receive vaccine against COVID-19 had significantly higher fear of COVID-19.

iv.Females had significantly higher GAD-17 score than males, i.e. overall higher anxiety among females.

v. Females had significantly higher PHQ-9 score than males, i.e. overall higher depression among females.

Discussion and Conclusion

- ➢Results highlight that the fear of COVID-19 and overall stress was higher among female students, students without COVID-19 vaccine, those who did not have background in health majors.
- ➢University based health education programs should emphasize covid-19 and other infectious disease awareness, especially among the non-health major students.
- ➢Universities should extend and improve their counseling services to the student population.

JAMES MADISON UNIVERSITY

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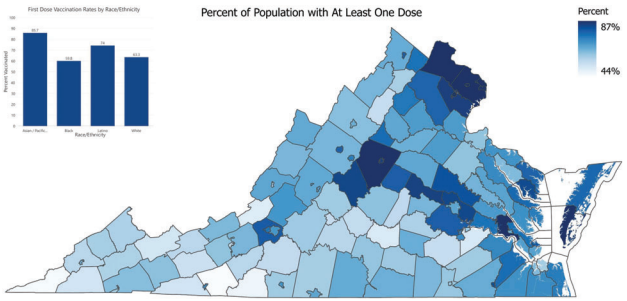
A Dashboard for Optimizing the Placement of Mobile COVID-19 Vaccination Clinics

Alex Telionis [1,2], Justin Crow [1], Zakaria Mehrab [2,3], Mandy L. Wilson [2], Brian D. Klahn [2], Serina Chang [4], Galen Harrison [2,3]
Bryan Lewis [2], Dennis Kim [1], Scott Spillmann [1], Kate Peters [5], Jure Leskovec [4], and Madhav V. Marathe [2,3]

Background

- Vaccination is extremely effective at protecting against severe disease, hospitalization, and death caused by COVID-19
- But large vaccination rate disparities by race / ethnicity, age group, and geography (urban vs rural) persist in Virginia

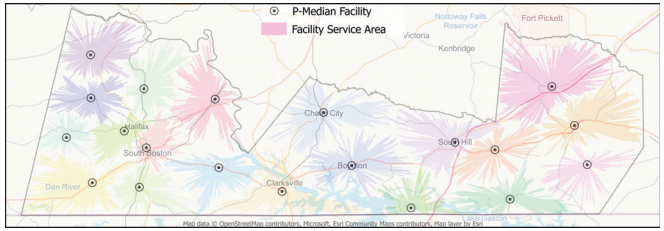


- Uptake depends on acceptance, accessibility, and advertisement
- VDH greatly increases accessibility with mobile clinics

Photo courtesy of VDH Vaccine Unit

Traditional Location–Allocation

- Requires candidate facilities, population data, and a road network
- Calculates driving time from all demand points to all candidates
- Selects clinic sites to minimize population-weighted travel time

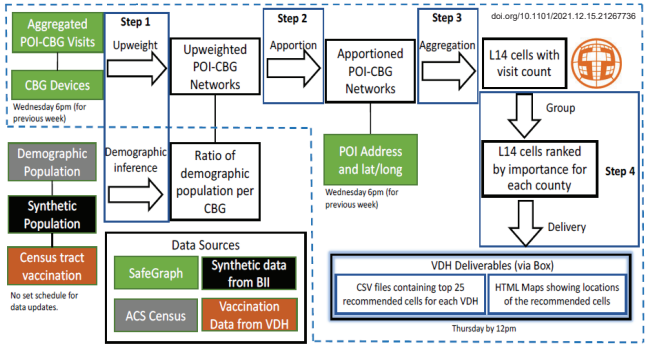


Limitations of Traditional Methods

- Traditional site selection does not account for daily travel routines
- But a site placed along the path of a resident's daily routine is often a better option for them than one placed near their home

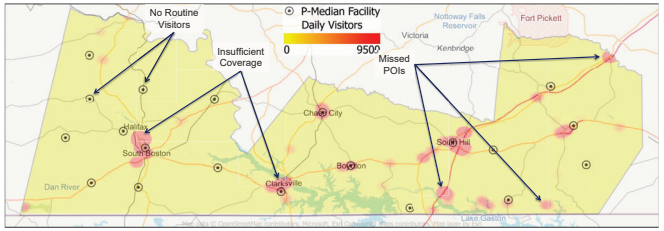
Mobility-Driven Placement by UVA

- Anonymized data from SafeGraph includes visits per Point of Interest (POI) and Census Block Group (CBG) of origin of visitors
- Joined with CBG data on race/ethnicity, age, and vaccination status



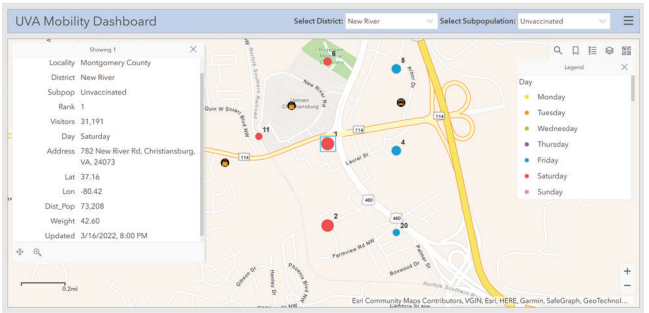
Comparison to Traditional Methods

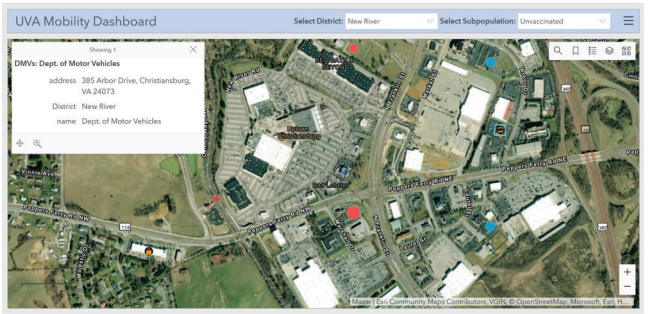
- New mobility-driven methods found heavily trafficked POIs that were missed by traditional methods or given insufficient coverage
- Traditional methods selected sites that were not routinely visited



VDH Dashboard

- Works with any web browser, but restricted to CoV Network
- Allows users to select and zoom to specific Health Districts
- Allows users to select various subpopulation options: "Whole Population", "Age 20-29", "Age 20-39", "Age 30-39", "Black", "Black or Latino", "Latino", and "Unvaccinated"
- User can enable or disable specific candidate sites including: Community Centers, DMV Offices, Fire-EMS Stations, Libraries, Local Government Buildings, Shopping Malls, and Schools
- Updated weekly, including major holidays
- Future work to include validation vs traditionally placed clinics, and adjustment for smartphone ownership rates by subpopulation





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For more details see: Mehrab, Zakaria, et al. "Data-Driven Real-Time Strategic Placement of Mobile Vaccine Distribution Sites." *medRxiv* (2021). https://doi.org/10.1101/2021.12.15.21267736

Returning to a New Normal: Examining Student's Perceptions and Experiences of Campus Reopening during COVID-19

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Introduction

Existing research on the impact of the COVID-19 pandemic on students' mental health and academic success reports adverse effects during the early stages of the pandemic due to the abrupt campus closures. However, with the relaxation of some restrictions, college students are allowed to return to in-person learning amid new policies. Few data exist regarding the mental health of college students during campus reopening. This study aims to explore students' perceptions on several topics related to the pandemic and how campus reopening and a "return to a new normal" may impact this vulnerable population's mental health.

Objectives

- Evaluate the mental health impact on the reopening of campus and a return to a "new normal."
- Investigate students' perceptions and experiences of campus reopening and returning to the "new normal."

Methodology

Study Population
- Old Dominion University (ODU) students aged 18 years or older who are enrolled in Spring 2022.

Study Design & Sampling
- A cross-sectional survey was used. The sample was selected using a stratified random sampling method to represent the gender distribution of 43% male and 57% female of the total enrollment at ODU.

Variables
- The survey, administered through Qualtrics Survey software, includes questions to capture demographic characteristics, self-reported use of mental health services, and questions assessing students' experiences and perceptions of ODU campus reopening events and policies over four weeks.

Statistical Analysis
- Descriptive statistics using frequency and percent were used to summarize the students' characteristics.
- Bivariate analyses were conducted using Chi-square & Fisher Exact tests.
- Multivariable penalized logistic regression was used to identify factors associated with MHS use during campus reopening.
- SAS Studio was used for analysis, and the significance level was set at $p < 0.05$.

Results

Sample Characteristics

- A total of 236 students completed the survey: Response rate = 23%
- 54.66% are between the ages of 18-24, about 77% of the respondents are undergraduate students, 56.36% of those students identify as Caucasian, 70.76% are employed, and 77.55% live outside the family home (**Table 1**).

Bivariate Analysis

Statistically significant association between self-reported use of MHS during campus reopening and Student status (p=0.0314), MHS use pre-pandemic, during the pandemic, and intention to use in the next 30 days ($p < 0.001$) (**Table 2**).

Results (Cont.)

Multivariate Analysis

Respondents' self-reported use of mental health services shows a statistically significant relationship between using mental health services prior to the pandemic and mental health services during campus reopening: OR=7.33, 95%CI=(2.54, 21.13) (**Table 3**).

Students' Perceptions of MHS Use and Campus Reopening Policies

- There is a greater increase in MHS use during the pandemic than pre-pandemic: 19.57% vs. 13.92% (**Figure 1**).
- While 56.72% of students surveyed did not take online classes prior to the pandemic, 40.52% felt they learned the same way when taking in-person classes, and 58.40% of students reported positive experiences when asked about receiving support from ODU during the pandemic (**Figure 2**).

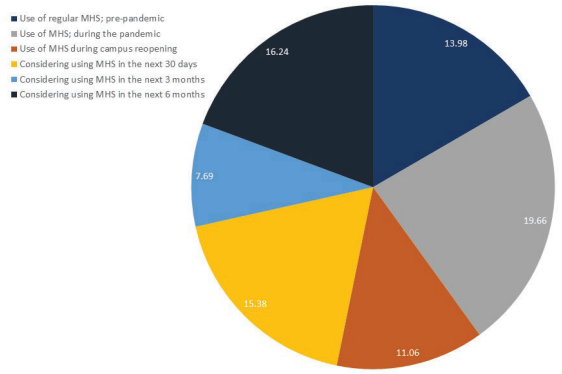
Table 1: Sample Characteristics

Selected Characteristics	n	%
Age Group		
18-24	129	54.66
25-34	71	30.08
35-44	21	8.9
45 and older	15	6.36
Race		
Asian	17	7.2
Black or African American	53	22.46
Caucasian	135	56.36
Two or more races	11	4.66
Other/Prefer not to say	22	9.32
Class Standing		
Undergraduate	184	77.97
Graduate	52	22.03
Employment Status		
Employed	167	70.76
Not employed	69	29.24
Living Arrangement		
Live outside family home	183	77.55
Live in family home	53	22.46

Table 2: Use of MHS during Re-opening

Selected Characteristics	Yes (%)	No (%)	P-value
Age group			0.2349
18-24	14 (53.85%)	115 (55.02%)	
25-34	11 (42.31%)	59 (28.23%)	
35-44	1 (3.85%)	20 (9.57%)	
45 and older	0 (0%)	15 (7.18%)	
Student Status			0.0314
Full-time	25 (96.15%)	163 (86.70%)	
Part-time	1 (3.85%)	45 (21.63%)	
Discipline Area			0.3693
Hard	12 (46.15%)	73 (37.06)	
Soft	14 (53.85%)	124 (62.94%)	
Class Standing			0.2603
Undergraduate	18 (69.23%)	165 (78.95%)	
Graduate (Maters & Doctoral)	8 (30.77%)	44 (21.05%)	
MHS Use			
Pre-Pandemic (Yes)	11 (42.31%)	22 (10.53%)	0.0001
During Pandemic (Yes)	19 (73.08%)	27 (13.04%)	<.0001
Next 30 days	17 (70.83%)	19 (9.09%)	<.0001

Figure 1: Percentage of students who reported use or intention to use mental health services

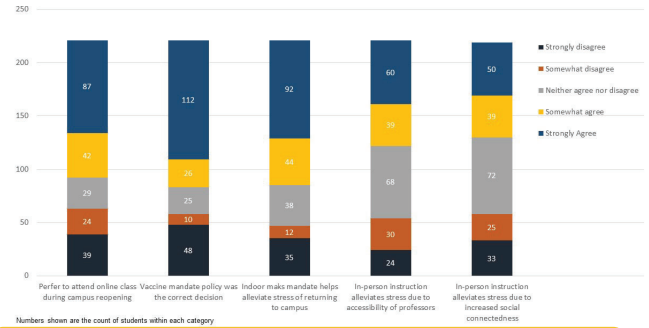


Results (Cont.)

Table 3: Results of the Multivariate Analysis for Predicting MHS Use During Re-opening

Selected Characteristics	Odds Ratio (95% CI)
Full-time Student vs. Part-time Student	0.29 (0.51-1.62)
Hard vs. Soft Disciplines	1.34 (0.51-3.53)
Undergraduate vs. Graduate	1.59 (0.53-4.76)
Male Vs. Female	0.48 (0.16-1.49)
Employed vs. Unemployed Statuses	0.82 (0.29-2.28)
MHS pre-pandemic vs MHS during campus reopening	7.33 (2.54-21.10)

Figure 2: Student's perceptions of campus re-opening polices



Discussion

- Given these findings, study authors suggest increased consideration of students' mental health status as a facilitator of learning and a need for further evaluation of in-person versus online learning to restructure higher education courses to best meet the needs of students.
- Future studies should consider expanding to additional college campuses and further explore the mental health impact of campus reopening on students and students' perceptions and experiences of campus reopening events.

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Efforts to improve employee health for cardiovascular and metabolic conditions: A systematic review of weight-management outcomes

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Health Policy and Administration | George Mason University

ABSTRACT

The objective of this study was to examine weight-management outcomes, specifically weight, physical activity, and nutrition, of employer-sponsored interventions to improve employee health for cardiovascular and metabolic conditions. This study is part of a larger research project regarding employer-sponsored health management programs.

INTRODUCTION

Background: Weight-management is defined as conducting long-term lifestyle changes to maintain a healthy body weight [1]. With approximately 70% of American adults classified as overweight or obese, weight-management could result in positive outcomes [1]. Worksites frequently serve as structured, shared environmental settings [1]. With over 132,000,000 individuals in the United States population employed, worksite wellness programs seeking to improve health behaviors and outcomes related to weight-management could target employee populations [2].
Research Question: Do employer-sponsored interventions to improve employee health for cardiovascular and metabolic conditions have a positive effect on weight-management, specifically weight, physical activity, and nutrition?

METHODOLOGY

Study Design: Systematic review adhering to PRISMA guidelines. Inclusion criteria included English, peer-reviewed articles published in the United States between 2000 to 2021 reporting weight-management outcomes aimed at improving employee cardiovascular and/or metabolic conditions. Included articles were based on randomized or non-randomized controlled trial or a before–after study design.
Data Collection: Searches used PubMed, CINAHL, ABI/Inform, and PsycINFO. 2268 journal articles were retrieved from database searches. After multiple rounds of screening, 22 articles reported weight-management outcomes of interest and were included in this analysis.
Data Analysis: Analysis was based on guidelines established by the Health Enhancement Research Organization (HERO) and Population Health Alliance (PHA). Outcome measures included physical and health behaviors that impact physical, mental, and emotional health. The review also included a quality assessment of research design based on National Heart, Blood, and Lung Institute criteria.

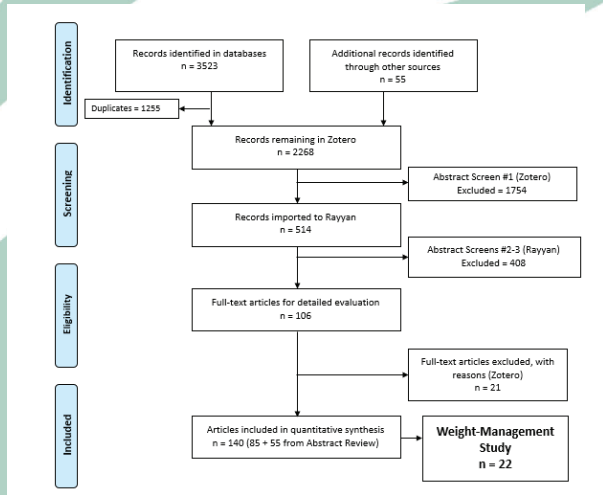

Figure 1. PRISMA flow diagram

RESULTS

All twenty-two studies included at least one weight intervention, with most that involved weight loss and body mass index. Thirteen studies included at least one weight intervention as well as a physical activity or nutrition intervention, several that involved frequency of physical activity. Sixteen studies included at least one weight intervention as well as a physical activity intervention, a few involving increased time spent exercising. Nineteen studies included at least one weight intervention as well as a nutrition intervention, some that consisted of diet alterations. Twenty-one studies had positive weight measurement outcomes, such as decreased body fat percentage and decreased waist circumference.

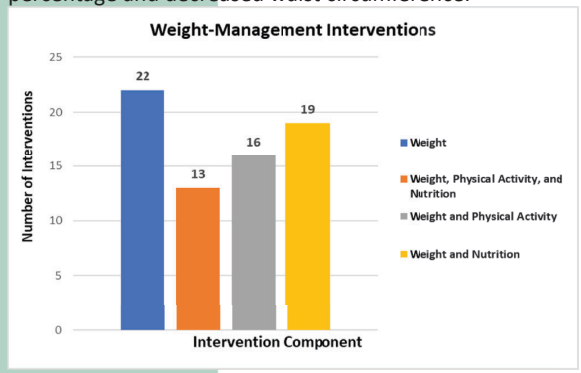

Figure 2. Weight-management interventions and their components

RESULTS (CONT.)

Seventeen studies had positive physical activity measurement outcomes, such as increased daily steps and more vigorous exercise. Nineteen studies had positive nutrition measurement outcomes, such as decreased saturated fat intake and increased fruit and vegetable intake.

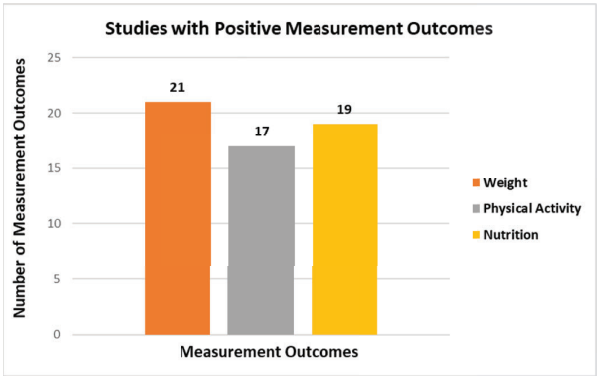

Figure 3. Studies with positive measurement outcomes

CONCLUSIONS AND POLICY IMPLICATIONS

Employee-sponsored health management programs focusing on improving cardiovascular and metabolic conditions may result in positive weight-management, specifically weight, physical activity, and nutrition. Future research could further examine the effect of employee-sponsored health management programs on weight-management, whether on weight, physical activity, nutrition, or another component. Given the COVID-19 pandemic and resulting "Great Resignation," workplaces could serve as an additional channel and support system for those participating in weight-management programs.

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VIRGINIA COMMONWEALTH UNIVERSITY

Impacts On The Quality Of Life for Residents of Long-Term Care Facilities

Jade Craig, Dr. Christine Booker

Abstract

The elderly population should receive the best care possible. Providing for the needs of this group which will increase the quality of life. Research for this project focuses on the factors that effect the care this older adult population living at long-term care facilities in Virginia. This study also examines whether there is a correlation between quality-of-life factors and the facilities ratings. Using the secondary data that I collected, it was concluded that all factors affect the care given to the patient as well as quality of life.. Therefore, there is a correlation between the factors impacting care and quality of life (number of beds, price and/or region) and the ranking of all long-term care facilities in the state of Virginia.

Introduction

Often, elderly people have a difficult time advocating for themselves to make sure they receive the most optimal care for their needs. When it comes time for them to enter long term care facilities someone needs to provide a voice for their safety. To ensure that the aging populations are receiving the best care I researched all 255 long term care facilities in Virginia. My two research questions were as follows: what factors (number of beds, price, and/or region) have an impact on the Quality of Life (QOL) of residents living in long-term care facilities? Also, is there a correlation between factors that impact the QOL of residents living in long-term care facilities and the rating of the facility?

Methodology

First, using the quantitative method I began to gather data each week by researching about 45 facilities. I created an excel sheet with different categories to collect information for each facility. These categories included, location, website accessibility, ranking, number of beds, and price. This research was conducted remotely via the internet. To find the secondary data I primarily used three websites, Virginia Health Information, Family Assets, and Health US News. Using only three websites helped me to ensure that the data was collected objectively due to the consistency of the ranking criteria. After collecting the data for each facility, I organized them based on their ranking from best to worst. I also color coded each place based on their region in Virginia (central, eastern, northern, northwestern, and southwestern).

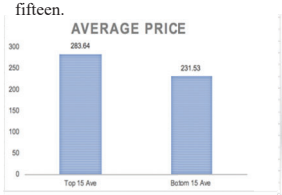
Once I collected all of my data, I began to assess the top fifteen as well as the bottom fifteen facilities. I reviewed the categories based on the cost of facility and their number of beds and locality. Being that I color coded each place I was also able to compare the efficiency of each region's facilities. To do so, I created pivot tables; then I converted these tables to the appropriate charts that would best highlight the data. After carefully reviewing these charts, the data began to answer questions that directly affect the quality of life for patients.

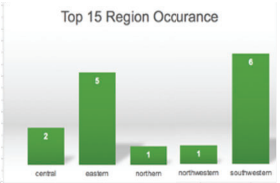
Results/Discussion

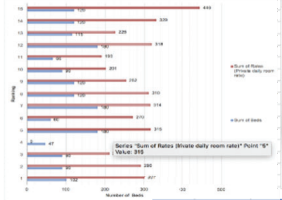
When choosing a place to reside at, older adults should be confident that they will receive the best care available. Often, prices can be a large factor in this decision being that everyone has different economic resources. A bar graph was created to look at the average cost for the top fifteen facilities in Virginia versus the bottom fifteen. The average daily rate for a private room in the top fifteen facilities is $283.64. The average daily rate for a private room in the bottom fifteen facilities is $231.53; this creates a difference of only a $52.11 in the cost on average.

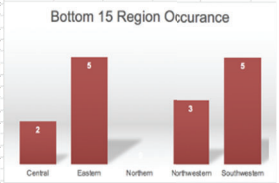
Another major factor to consider is the number of beds in each facility. I compared the daily rate to the number of beds offered at the top fifteen facilities. After reviewing this data, it was clear that on average, as the rating increases, the number of beds decreases. While researching, I noticed that some websites were immensely useful, being that they are user friendly, and the information was listed clearly. However, other websites were difficult to review and locate necessary information which is a concern for consumers. I added a category on website accessibility because I feel that it is important for finding a place to reside in one's later years. Each facility's website was listed as either poor, good, or great on the accessibility chart. Sixteen percent of the websites were poor, fifty-five percent were good, and twenty-nine percent were great.

Lastly, I examined the occurrence of the top fifteen facilities and the bottom fifteen facilities in each region. I thought that this would be a good way to examine which regions are doing well and which are not. The Southwestern region had the highest number of occurrences in the top fifteen. The Northern region did not have any occurrences in the bottom fifteen.









Conclusion

As a result of the data found, it is clear to see that these various factors do affect the rating of the facility which in turn will affect the quality of life for the residents. Initially, the website accessibility helps when finding a facility. The more organized the website is, the easier it is to decide if it is the right place. Next, comparing the average costs showed that on average there is not a large difference in price range. There is a $53 difference in the top fifteen and bottom fifteen places, therefore, on average the price increases when ranking increases. When looking at the number of beds there is better care at the facilities with less beds, based on their ranking. Further research questions arise when thinking about this topic. For example, is there a higher number of staff members at the facilities with more beds? Lastly, when looking at the different region's occurrence in the top and bottom fifteen, it is not cut and dry to draw conclusions. Overall, there are many factors to consider when looking for the best care. There is a correlation between the factors researched and the rating of each facility. Doing well in each factor leads to a positive correlation in the facilities ranking. More research needs to be conducted to determine if trends in Virginia are consistent with regional or national data. If national trends show similar rankings, then more funding may be needed at the federal level to better support the needs of low-income residents and/or facilities.

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Substance Use and Rapid Access to Firearm Among College Freshmen

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INTRODUCTION

In 2019, one-third of college students binge drank within the past 30-days, and more than one in five reported current marijuana use. This is concerning as previous studies have found positive associations between alcohol use and gun access, ownership, and possession. Cannabis use has also been associated with suicide, which often occurs by firearm among young people. While prior research have measured for firearm in terms of ownership, carrying, or having a gun at home, this study assesses how quickly students could access a firearm.

Objective: The purpose of this study was to examine rapid access to firearm among college students and potential associations with current binge drinking and marijuana use.

METHODS

- Cross-sectional data from first-year college students aged 18 to 24 (n=183) were obtained from the spring 2019 wave of the *Mason: Health Starts Here* cohort study at George Mason University in Fairfax, Virginia.
- A dichotomous measure was created for rapid access to a gun to distinguish students who could get and shoot a gun within 15-minutes.
- Multivariable logistic regression models evaluated rapid access to a firearm in relation to binge drinking (≥4 drinks for females and ≥5 for males per occasion, past 30 days), marijuana use (any, past 30 days), age, sex, and race.

MASON Health Starts Here! Research Study

RESULTS

Table 1. Multivariable logistic regression models of factors associated with rapid access to a firearm

	All participants (n = 183) 15-minute access			18-year-old participants (n = 161) 15-minute access			All participants (n = 183) 30-minute access			All participants (n = 183) 60-minute access		
	AOR	95% CI	*p*-value	AOR	95% CI	*p*-value	AOR	95% CI	*p*-value	AOR	95% CI	*p*-value
Past 30-day binge drinking	**6.4**	**2.1, 19.7**	**0.001**	**6.2**	**1.7, 22.0**	**0.005**	**4.8**	**1.6, 14.0**	**0.004**	2.9	1.0, 8.2	0.051
Past 30-day marijuana use	0.3	0.1, 1.9	0.226	0.2	0.02, 2.0	0.166	0.3	0.1, 1.8	0.192	0.3	0.0, 1.4	0.115
Non-Hispanic White only	**4.1**	**1.3, 12.7**	**0.016**	**5.6**	**1.5, 21.9**	**0.012**	**4.1**	**1.5, 11.7**	**0.008**	**7.0**	**2.5, 19.2**	**<0.001**
Age (19+ vs. 18 years)	1.9	0.5, 7.9	0.354	--	--	--	1.6	0.4, 6.4	0.473	2.3	0.6, 8.3	0.217
Male (versus female)	1.0	0.3, 3.2	0.994	0.6	0.2, 2.5	0.50	1.0	0.3, 3.0	0.980	0.6	0.2, 1.9	0.415
	Pseudo R-squared = 0.18			Pseudo R-squared = 0.20			Pseudo R-squared = 0.15			Pseudo R-squared = 0.18		

The comparison group for the race/ethnicity variable was Hispanic and/or non-White. Bolded text indicates $p < 0.05$.

- 88% of students were 18 years old, and 72% were female. 11% reported past 30-day marijuana use. 18% were past 30-day binge drinkers. 10% could access a gun within 15-minutes.
- **Past 30-day binge drinkers had more than six times the odds of being able to access a gun within 15-minutes compared to students, who did not binge drink in the last month.**
- Age, sex, and past 30-day marijuana were not associated with rapid access to firearm.

DISCUSSION

- Firearm safety programs may benefit from targeting heavy drinkers.
- Policies limiting alcohol access on campus may be an important step as an environmental-level strategy to reduce gun violence.
- More research and similar surveillance data are needed to prevent shootings and related casualties on U.S. college campuses.

Scan for References

Addressing Child Abuse and Neglect: Empowering Medical Students to be Part of the Solution Through Clinical and Community Engagement

Angela Liu, Diana Tran, Sravya Uppalapati, Rachel Schendzielos, Erica Johnson, Dr. Robin Foster

Virginia Commonwealth University School of Medicine

Introduction

- Child abuse and neglect is a significant public health concern.
- Medical professionals frequently encounter maltreated children, but lack of training leads to under-identifying and underreporting cases.
- A virtual, two-week Child Abuse and Neglect elective was offered to students at Virginia Commonwealth University (VCU) School of Medicine during the COVID-19 pandemic

Two-Week, Virtual Elective Format:
Online lectures, cases, and readings on following topics:

- Intro to Child Abuse and Reporting
- Burns, Bruises, Bites
- Chest and Abdominal Trauma
- Fractures
- Abusive Head Trauma
- Medical and Nutritional Neglect
- Substance Exposure
- Suffocation, Strangulation, Drowning
- Unsafe Sleep
- Sexual Abuse
- Child Trafficking
- Pediatric Radiology

Objective

Outline the expansion of a virtual, two-week Child Abuse and Neglect elective into a permanent, in-person, four-week elective for fourth-year students at VCU School of Medicine

Methods

STEP 1: Assessment

- Involved obtaining feedback from students in the virtual elective (N=22). Key interests included:
  - Direct clinical experiences
  - Engagement with social workers and community partners
  - Clarification of the Child Protective Services reporting process
  - An expanded, four-week elective

Methods

STEP 2: Curriculum Design

- Involved creating new educational activities and collaborating with interdisciplinary partners
- Elective Learning Objectives:
  - Identify cases of child abuse and neglect
  - Understand the process of reporting a case and the steps after a report is made
  - Work collaboratively with social workers to connect patients and caregivers to appropriate community-based resources
  - Recognize the impact of adverse childhood events, identify trauma-associated behaviors, and provide trauma-informed care.

Expanded Four-Week, In-Person Elective Format:

- Asynchronous recorded lectures and readings from the online elective
- A high-yield slide deck, with an expanded section on reporting cases
- In-person clinical rotations at following sites:

Week A	VCU Children's Hospital of Richmond (CHoR) Child Protection Team – Inpatient
Week B	VCU (CHoR) Child Protection Team – Outpatient
Week C	VCU CHoR social workers
Week D	Local Child Advocacy Center (SCAN)

STEP 3: Implementation

- The new elective proposal was submitted and approved by the Curriculum Council in November 2021
- The elective was first offered February 21- March 18, 2022 to four students
- Students received a detailed syllabus, email introduction, and group chat with Elective Leaders

Children's Hospital of Richmond at VCU

greater richmond SCAN Stop child abuse now

Results

STEP 4: Evaluation

- Average pre and post-elective survey data (on a scale of 1 - 5)

	Pre	Post
I feel comfortable **identifying cases** of child abuse and neglect.	2.5	4.7
I feel comfortable **reporting cases** of child abuse and neglect.	2.0	4.7
I feel comfortable **identifying trauma-associated behaviors** in children and **providing trauma-informed care.**	1.8	4.0
I understand the **forensic interview process** for reported child abuse and neglect cases.	1.3	4.3
I understand the **role of social workers** for suspected child abuse and neglect cases.	2.0	5.0
I understand the **role of Child Advocacy Centers** for suspected child abuse and neglect cases.	1.5	4.3
I **will report a case** of child abuse and neglect if I suspect it.	4.3	5.0
I believe **this Child Abuse and Neglect elective addresses an important gap** in medical education.	N/A	5.0

- Other evaluation methods include a quiz on lecture materials, a written reflection, and a quality improvement project

Discussion

- Future directions include electing new Child Abuse and Neglect Elective Student Leaders to ensure course sustainability
- To our knowledge, this is the first student-led maltreatment curriculum to include structured time with social workers and community partners.
- This process can inspire other students to partner with multidisciplinary teams to address child maltreatment through a public health lens.

Acknowledgements

We would like to thank the CHoR Child Protection Team, CHoR social workers, the Greater Richmond SCAN, and the students who participated in the elective.

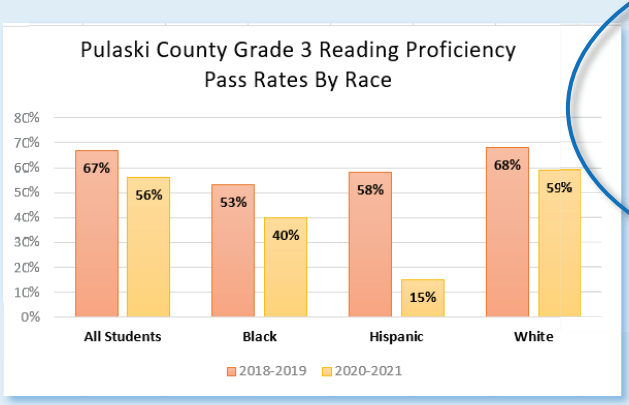
"I See Me" Reading Challenge: Spotlight on Diversity Literature for Elementary School Students in Pulaski County, VA

Program Coordinator: Meagan Graham, MPH Candidate, Virginia Tech

Why a Reading Challenge?

Pass rate differentials range from 19 - 44% across races in a single school year.

Source: https://schoolquality.virginia.gov/



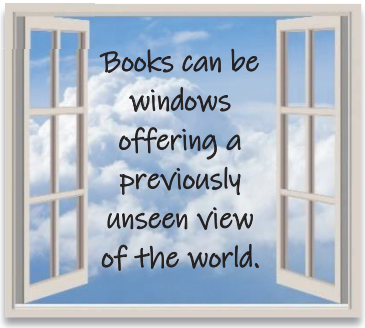
Elementary school students of color in Pulaski County show an apparent deficit in reading scores that is likely to continue through the middle and high school years.

What's the Good News?

Introducing diversity literature helps create a sense of identity and belonging that is crucial to the enhancement of reading engagement and comprehension!

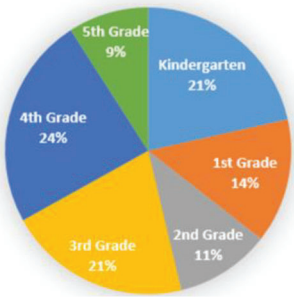
According to the NIH, 95% of struggling readers can be brought to grade level with sufficient support.

Books can be mirrors reflecting human experiences back to the reader.



What Were the Results of the Challenge?

% Participation by Grade



I See Me
Reading Challenge
January 1, 2022-February 28, 2022
Grades K-5

152 Student Participants County-wide from 4 out of 5 (80%) Pulaski County Elementary Schools!

6.6 books, on average, read per child
or
1,009 Reading Sessions!

End-of-Challenge Celebration Party with over 100 attendees!

What's Next?

- Seek funding to support and continue "I See Me" on an annual basis
- Appeal to Pulaski County School Board for funding to embed diversity literature into structured curriculum across ALL grade levels
- Mobilize local community groups to expand future "I See Me" initiatives and reach more readers

Therapeutic Interventions to Improve Gross Motor Function in Children with Spastic Cerebral Palsy

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Introduction & Background

- Cerebral Palsy (CP): A developmental condition that affects three out of every 1,000 children in the United States and is the most common motor disability for children. Spastic CP is the most common form of CP and accounts for 80% of all cases.
- CP is an incurable disease, but most people grow up and live fully functioning adult lives when they are properly treated at an early age.
- Gross motor function (GMF) is the movement of large muscles - arms, legs, and torso - and is learned at an early age. These smaller movements are crucial to whole body movements, like climbing and jumping, and completion of activities of daily living (ADLs).
  - Without being able to complete ADLs, comorbidities can arise such as dental disease, eating disorders, sleep disorders, learning difficulties, and more.
- **Hippotherapy** uses horses, alongside physical and occupational therapists and speech language pathologists, to provide motor and sensory input for an individual.
- **Equine therapy**, also frequently called horse therapy, is focused on treating both physical and mental side-effects that go along with a diagnosis. This form of therapy is frequently used to treat a variety of mental and physical disabilities, such as autism spectrum disorder, Down Syndrome, spina bifida, scoliosis, cerebral palsy, and more.
- **Strength training** is seen to have a positive effect on children with spastic CP, specifically diplegic, which means paralysis in both lower limbs.
- **Electric stimulation therapy** is another form of intervention that is commonly seen as a treatment for children with spastic CP. This form of therapy can see improvements in balance, posture, and gait.

Purpose

The purpose of this systematic review was to identify therapeutic interventions to improve gross motor function (GMF) for children with spastic cerebral palsy (CP). This study specifically looked at strength training, electric stimulation therapy, hippotherapy, and equine therapy.

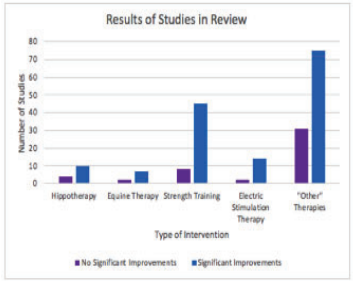

Figure 1. Significance of the results in the reviewed studies.

Methods

- A systematic review was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines.
- PubMed was used to conduct this systematic review.
- Articles inclusion criteria:
  1. Full articles, written in English, peer-reviewed, and published within the last 10 years.
  2. Studies on children with CP between the ages of 0 and 18 years old.
  3. Therapeutic interventions in which the child took active participation in the form of therapy.
  4. Discussed the effectiveness of the intervention on treating gross motor function using a form of the Gross Motor Function Measure (GMFM) or other measurements looking at gross motor function.
- Articles exclusion criteria:
  1. Surgical interventions or invasive interventions.
  2. Medicinal interventions.
  3. Looked at movements that do not qualify as gross motor function (GMF).

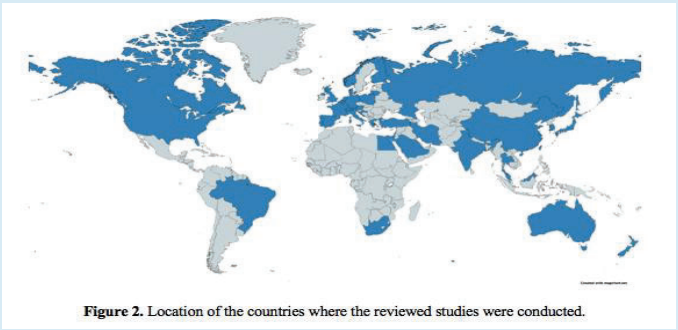

Figure 2. Location of the countries where the reviewed studies were conducted.

Results

- 376 articles and studies were found during the initial search. After duplicates were removed, inclusion/exclusion criteria was applied, 198 studies were selected for literature review.
- 147 studies reported significant improvements in different areas of GMFM and 51 reported nonsignificant improvements, did not find definite results, or were literature reviews that did not address significance levels (Figure 1).
- Strength training: 52 total studies met the criteria for review. The following common interventions were seen: resistance training (*n=13*), muscle strength training (n=11), treadmill training (*n=6*), robot-guided therapy (*n=5*), vibration therapy (*n=3*), cycling (*n=3*), and high intensity circuit training (HICT) (*n=2*). Improvements were seen for muscle strength and gait.
- Electric stimulation therapy: 15 total studies met the criteria for review. The following forms of therapy were seen: neuromuscular electric stimulation (NMES), transcutaneous electrical acupoint stimulation (TEAS), functional electric stimulation (FES), transcranial direct current stimulation (tDCS), transcranial pulsed current stimulation (tPCS), transcutaneous electrical nerve stimulation (TENS), transcutaneous spinal cord stimulation (TSCS), functional electrical stimulation (FES), neuroprosthesis, and anodal and transcranial direct current stimulation. Improvements were seen for gait, lower extremity movements, and posture.
- Hippotherapy and equine therapy: Often mentioned in overlapping manner by the studies (n=30), total of which 24 met the criteria for review. Improvements were seen for postural control and balance.

Discussion & Conclusion

- Only 2% *(n=4)* of studies were longitudinal and looked at the long-term effects of these therapies. Future studies should look at how these therapies affect and benefit the patients long term.
- Most studies were conducted in European countries and the United states; there needs to be more variety in where studies are conducted because a large portion of the population is not being treated/ not included in research (Figure 2).
- Most studies looked at children between the ages of 6 and 11 years old (Figure 3). This is known as middle childhood, and this is when children are able to gain a sense of independence and understand goal setting. Goal setting, making independent choices, and having free will is crucial to participation and success in therapeutic interventions.
- Postural control was seen to improve the most with hippotherapy and equine therapy due to the children having to hold themselves upright on a moving horse. With the unpredictability of a horse's movements, core strength is crucial to remaining upright on the horse.
- Gait improvements were seen to improve with both strength training and electric stimulation therapy.
- Electric stimulation therapy also saw improvements in other lower extremity movements, step length and speed, and some upper extremity movements.
- Other therapies were identified during this study and saw significant results but were not included in the study itself. These include: acupuncture, aquatic therapy, modified constraint-induced movement therapy (mCIMT), reflexology, and virtual reality/video game therapy.
  - Not enough research has been conducted on these studies and therefore, more research on these is recommended for future research.
- More research needs to be conducted on both younger age groups, and older age groups – in order to determine the best course of treatment for children in those groups.

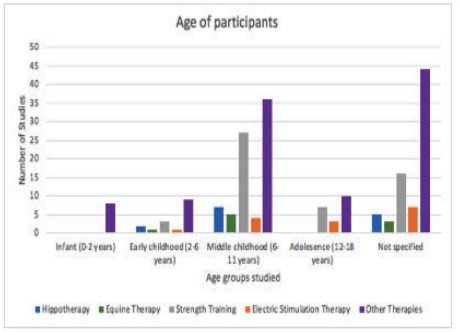

Figure 3. Age of participants in reviewed studies based on Erik Eriksons stages of development.

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JAMES MADISON UNIVERSITY.

People with active opioid use disorder as first responders to overdoses: Improving implementation intentions to administer naloxone

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GRADUATE SCHOOL VIRGINIA TECH
TRANSLATIONAL BIOLOGY, MEDICINE, & HEALTH

CARILION CLINIC

Background

- In 2021, over **100,000** Americans died from an opioid overdose.[1]
- Naloxone, an antidote for the effects of an opioid overdose, is widely available from community-based training programs, syringe exchange programs, and community pharmacies across the United States.[2,3]
- Recent behavioral research and a meta-analysis indicate people who use opioids (PWUO), are not likely to take or carry naloxone.[4,5,6]

- A just-in-time adaptive intervention could improve PWUOs taking and carriage of naloxone.[7]
- The Action, Actor, Context, Target, Time (AACTT) framework (outlined in Methods) is an adaptive, low-cost planning intervention.[8,9]
- **Our research question is:** Can we increase naloxone use by using an adaptive, low-cost planning intervention?
  - *Obtaining naloxone* from local sources (e.g., syringe exchange program, community pharmacy, or from peers)
  - *Carrying naloxone* to locations 'street products' are used
  - *Discussing the use of naloxone* with peers
  - *Administering naloxone* to an opioid overdose victim

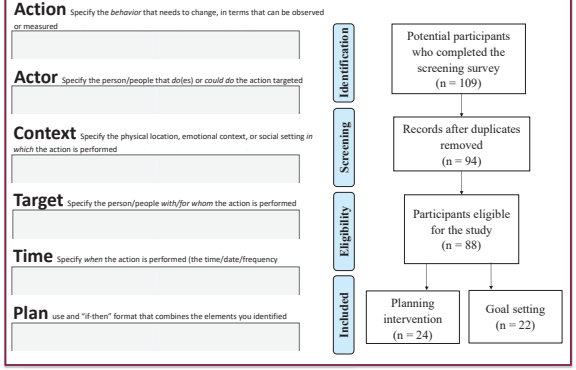
Methods

Recruitment and Eligibility

- Researchers distribute flyers at authorized syringe exchange programs in the Commonwealth of Virginia. Individuals self-screen for active opioid use disorder (≥ 3 active symptoms from the Drug Abuse Screening Tool[10]) and are ≥ 18 years of age.

Randomization, Baseline Assessment, and Follow-up

- Longitudinal design with baseline randomization to naloxone planning intervention (experimental group) or naloxone goal setting (control group)
- 7-point Likert scale of attitudes (20 items), subjective norms (4 items), perceived behavioral control (12 items), and intentions (4 items)[11,12]
- Quantitative survey of naloxone use at baseline, 3-months, and 6-months
- 15-to-30-minute interview to establish plans or goals for naloxone use
- Participants receive $25 compensation (additional $25 after 6-month follow-up) for their time.



Results

Demographics

Table 1. Target population

	Experimental	Control
Sample size	**24**	**22**
Gender (% Female)	63%	55%
Ethnicity (% Hispanic)	4%	9%
Race (% White)	88%	91%
Age (Average)	40	38
Naloxone training		
Yes (%)	54%	73%
Location	Community-based	Peer provided
Overdoses treated	13	8
Overdoses witnessed	16	15

- Participants' demographics are relatively similar between groups.
- Fewer participants in the experimental group are trained in naloxone administration.
- More participants in the control group received naloxone administration training from peers.
- Participants in the experimental group have treated more overdoses with Narcan® or intramuscular naloxone.

Attitudes, Subjective Norms, Perceived Behavioral Control (PBC), and Intentions

Table 2. Average (SD) responses to 7-point Likert scale

	Experimental	Control
Attitudes		
Obtain	6.77 (0.53)	6.48 (1.09)
Carry	6.54 (0.80)	6.56 (0.64)
Discuss	6.36 (0.79)	6.41 (1.01)
Administer	6.78 (0.51)	6.64 (0.71)
Subjective Norms		
Obtain	6.29 (1.00)	5.95 (1.50)
Carry	6.12 (1.23)	6.05 (1.17)
Discuss	6.00 (1.06)	5.77 (1.48)
Administer	6.25 (1.03)	5.86 (1.64)

Table 2. continued

	Experimental	Control
PBC		
Obtain	6.47 (0.71)	6.47 (1.07)
Carry	6.49 (0.90)	6.52 (0.95)
Discuss	6.36 (0.95)	6.21 (1.14)
Administer	6.56 (0.90)	6.39 (0.82)
Intentions		
Obtain	6.71 (0.46)	6.45 (0.91)
Carry	6.58 (0.58)	6.41 (1.10)
Discuss	6.29 (0.86)	6.18 (1.18)
Administer	6.54 (0.78)	6.68 (0.72)

Cronbach's Alpha (α): Attitudes towards 'Obtain', α = 0.63 [0.32, 0.85]; 'Carry', α = 0.91 [0.81, 0.96]; 'Discuss', α = 0.94 [0.90, 0.97], 'Administer', α = 0.87 [0.67, 0.94]; Subjective norms, α = 0.83 [0.65, 0.93]; Perceived behavioral control towards 'Obtain', α = 0.91 [0.73, 0.95]; 'Carry', α = 0.81 [0.49, 0.94]; 'Discuss', α = 0.86 [0.73, 0.92], 'Administer', α = 0.78 [0.45, 0.94]; Intentions, α = 0.81 [0.72, 0.87].

Plans and Baseline Levels of Obtaining, Carrying, Discussing, and Administering Naloxone

Implementation intentions versus goals for naloxone use:

If I go to the [syringe exchange programs' mobile unit] between 1-4pm, then (Context / Time)
I will obtain naloxone for myself and others. **[Male, 28 years old]** (Actor / Action / Target)

If I leave the house, then I will carry naloxone in my purse in case (Time / Actor / Action / Context)
I overdose or someone else does. **[Female, 53 years old]** (Target)

If I am in a bedroom getting ready to get high, then I will (Context / Time / Actor)
discuss the use of naloxone with others. **[Female, 33 years old]** (Action / Target)

If I'm in my bedroom and I notice someone's not breathing, then I'll administer (Context / Time / Actor / Action)
naloxone to the person experiencing the overdose. **[Female, 33 years of age]** (Target)

Find more rides to [syringe exchange programs' mobile unit].
[Male, 22 years old]

Keep some [Narcan] in a bookbag I carry or in the car. **[Male, 39 years old]**

I will make sure all peers have a basic understanding of naloxone and how to use it - and a small supply. **[Male, 27 years old]**

Recognize unresponsiveness, skin color of victim, and loss of breathing.
[Male, 63 years of age]

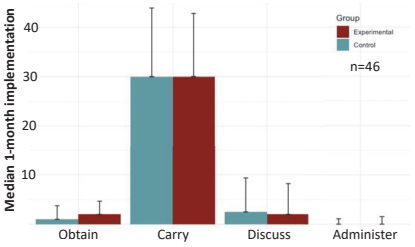


Figure 1. Baseline naloxone implementation

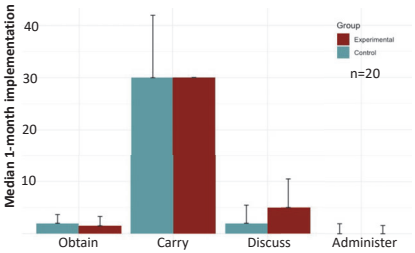


Figure 2. 3-month follow-up naloxone implementation

Conclusion

- Participants' motivation to perform overdose prevention behaviors, including obtaining, carrying, discussing, and administering naloxone are similar.
- '*Discuss the use of naloxone with peers*' is consistently lower on the 7-point Likert scale compared to other behaviors.
- Participants' baseline levels of naloxone implementation are similar over the course of 1-month.
- Possible difference in participants' 3-month follow-up levels for the '*Discuss*' behavior.

Current Work

- Continue recruitment (no more than 80 PWUO) and expand to other authorized syringe exchange programs in the Commonwealth of Virginia.
- Utilize adapted codebook to score participants' plans and goals for specificity and completeness.[9] Two raters will score participants' plans and perform inter-rater reliability analyses.
- Continue 3- and 6-month follow-ups with enrolled participants according to their respective date of consent.
- Utilize authorized syringe exchange programs' data collection system to supplement naloxone distribution and overdose reversal data.

Acknowledgements

- This project is supported by a Human Factors and Ergonomics Society Training Technical Group Award and Dr. Sarah Parker's Research Lab.
- Recruitment and distribution of flyers is supported by Lisa Via, Manager of the Drop-in Center North (syringe exchange program in Roanoke City).
- Contact information: **gfedward@vt.edu**

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Clip art: https://www1.nyc.gov/site/doh/health/health-topics/naloxone-reversal-form.page

PERCEPTIONS OF WORKERS IN THE FAST-FOOD INDUSTRY: A QUALITATIVE STUDY

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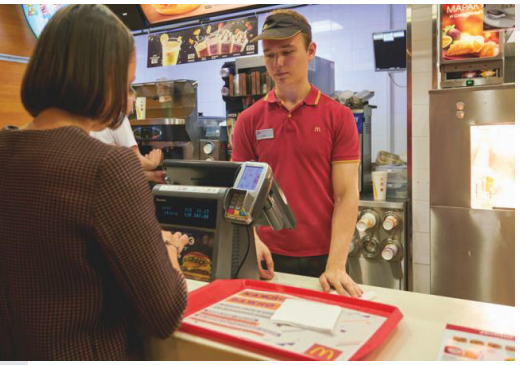
Dept. of Public & Community Health
March 2022



Background

- Food & beverage industry, including fast-food restaurants scored top three most unhealthy workplaces 2017 United States (U.S).
- Individuals working in fast-food ⇧ workplace stress, panic attacks, depression & sleep disturbances.
- ⇧ Alcohol abuse/ illicit drug use.
- Fast-food workers ⇧ risk physical injuries on job but many lack adequate health insurance / paid sick leave.
- Very limited research


A Day in the Life of a Fast Food Worker
Operate cash register
Serve customers
Prepare and cook food
Provide excellent customer care

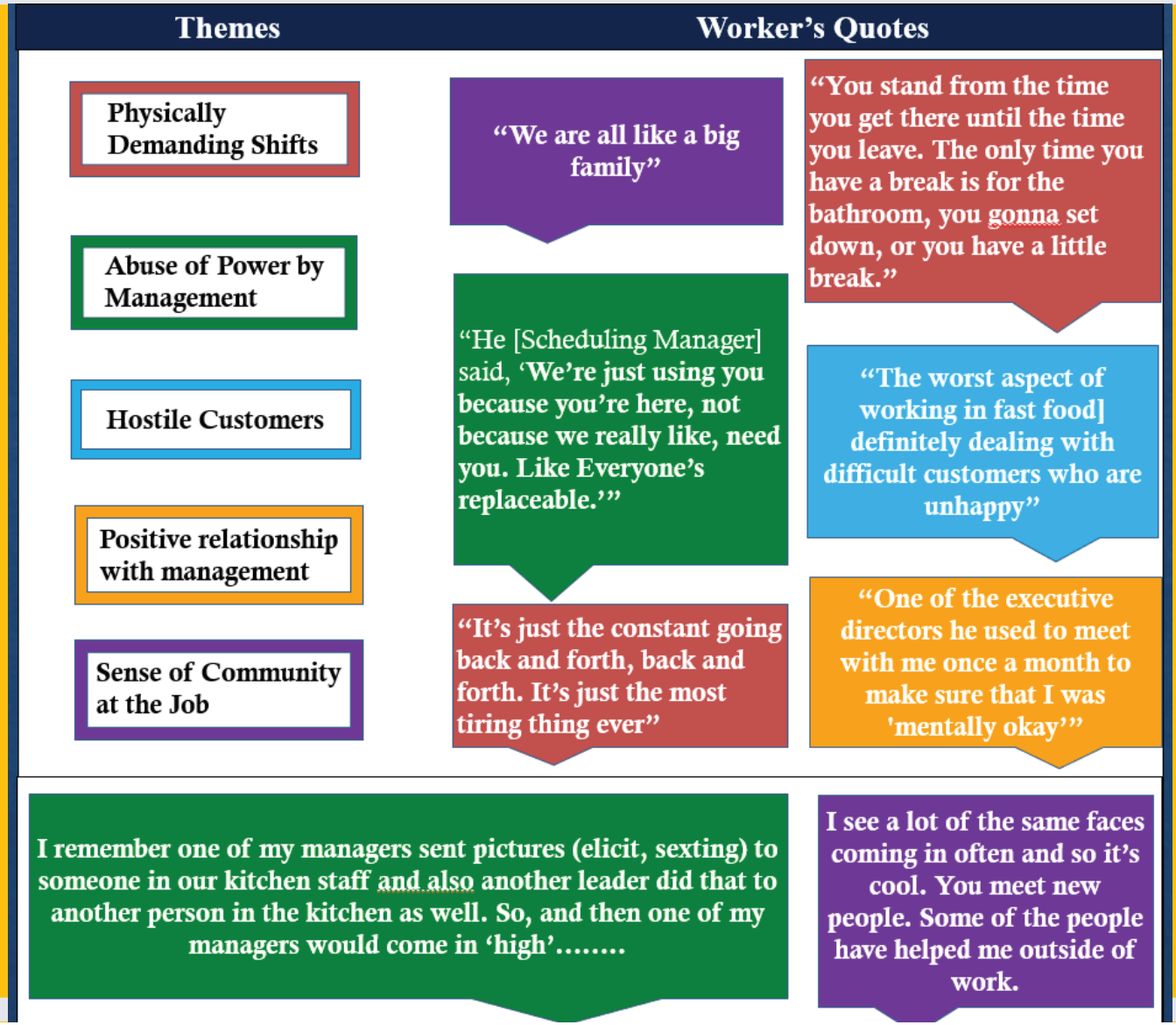
What are the perceptions and experiences of fast-food workers in Central Virginia?

Methods

- Recruited 7 fast-food workers, Central Virginia worked 20 hrs. /week & employed ≥ one month in a fast-food restaurant.
- Semi-structured qualitative interviews
- Interviews audio recorded via Microsoft Teams, transcribed verbatim/ thematic analysis.
- Demographic/ health hx.
- Restaurants: Taco Bell, Hardees, Chick-Fil-A , Wendy's & Captain D's.

Demographic Data

Age (years)	Race/Ethnicity	Sex	Education	Job Title	Work Full-Time or Part-Time
20	White	Female	Some College	Cashier	Full-Time
21	White	Female	Some College	Cashier	Full-Time
22	Black	Male	High School	Cashier	Part-Time
21	Black	Male	Some College	Cashier	Part-Time
70	Black	Female	Some College	Food Prep	Part-Time
23	Hispanic	Female	Some College	Manager/Cashier	Part-Time
22	White	Male	Some College	Manager/Cashier	Part-Time


Themes
Worker's Quotes
Physically Demanding Shifts
Abuse of Power by Management
Hostile Customers
Positive relationship with management
Sense of Community at the Job
"We are all like a big family"
"He [Scheduling Manager] said, 'We're just using you because you're here, not because we really like, need you. Like Everyone's replaceable.'"
"It's just the constant going back and forth, back and forth. It's just the most tiring thing ever"
"You stand from the time you get there until the time you leave. The only time you have a break is for the bathroom, you gonna set down, or you have a little break."
"The worst aspect of working in fast food] definitely dealing with difficult customers who are unhappy"
"One of the executive directors he used to meet with me once a month to make sure that I was 'mentally okay'"
I remember one of my managers sent pictures (elicit, sexting) to someone in our kitchen staff and also another leader did that to another person in the kitchen as well. So, and then one of my managers would come in 'high'……..
I see a lot of the same faces coming in often and so it's cool. You meet new people. Some of the people have helped me outside of work.

Qualitative data yielded several themes:

- Stress on the job was aggravated by physically demanding shift work
- Abuse of power by management
- Hostile customers
- Workplace created a sense of community

Results: Demographic Intake Form

- Three subjects reported anxiety disorders and/or chronic sleep problems.

Conclusion

- Larger quantitative studies are needed on health issues / stresses experienced by Americans in fast-food industry.
- Future research interventions might consider workers' access to healthcare & resources to address social stress at work.

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