

Fostering Trust and Advancing Health Equity: An Innovative Pilot Curriculum Rooted in Principles of Trustworthiness

by

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Background: Medical mistrust, or skepticism that healthcare providers and organizations genuinely care for patients' interests, is associated with disparities in healthcare utilization, healthcare engagement, and health outcomes. Trust is foundational for behavior change and trustworthiness is an essential prerequisite to trust. It is critical that health science professionals and trainees establish their trustworthiness to combat medical mistrust and promote health equity. Research emphasizes the need for educational curricula that extend beyond cultural competence and equips students and trainees with the necessary skills and knowledge to earn trust though such curricula are rare, revealing a critical gap.

Purpose: To describe a novel trustworthiness curriculum for future health science professionals and evaluate the impact of the curriculum on trainee knowledge and beliefs.

Methods: The curriculum was informed by existing literature and findings from six 30-minute, semi-structured interviews with public health professionals and community members. Thematic affinity cluster analysis revealed four key themes. The curriculum pilot included an 18-item pre-post survey to assess changes in students' knowledge and beliefs post-curriculum exposure. Belief questions addressed three subthemes: understanding and addressing mistrust, recognizing the importance of medical mistrust, and preparedness for building trust.

Results: Key themes that emerged from six interviews included the challenges of mistrust, principles of trustworthiness, behaviors to avoid, and considerations for working with minoritized

and vulnerable communities that experience medical mistrust. The principles of trustworthiness include reliability, presence, humility, and reciprocity. Fourteen students participated in the curriculum pilot, consisting of women (100%) between the ages of 18 and 24 (87%) between their first and second year (60%) studying in the school of public health (53%). The survey showed increased knowledge (71% to 83%, $p=0.082$) and belief scores post-curriculum exposure (34 to 37, $p=0.059$). Significant changes in responses were observed for the “preparedness for building trust” (11 to 13, $p=0.001$) and “understanding and addressing mistrust” (9 to 10, $p=0.042$) belief subthemes.

Conclusion: Pilot results show significant shifts for two belief subthemes, emphasizing the need for intentional efforts in health science education to include medical mistrust and trustworthiness in their trainee education to foster health equity.

Table of Contents

Preface.....	x
1.0 Introduction.....	1
2.0 Background	2
2.1 Definition of Terms.....	12
2.2 Theoretical Framework	13
2.3 Purpose	15
2.4 Intervention.....	16
2.4.1 Curriculum Setting - Bridging the Gaps-Pittsburgh	16
2.4.2 Curriculum Overview.....	18
3.0 Methods.....	23
3.1 Survey Development and Data Collection.....	23
3.1.1 Statistical Analysis	26
4.0 Findings.....	27
4.1 Pilot Results - Knowledge Assessment.....	28
4.2 Pilot Results - Belief Assessment	29
5.0 Discussion.....	31
5.1 Limitations	34
5.2 Future Directions.....	35
6.0 Conclusions	36
Appendix A : Qualitative Data Collection	37
Appendix A.1 Interview Guide Development	37

Appendix A.2 Qualitative Data Analysis.....	38
Appendix B : Qualitative Interview Results.....	39
Appendix B.1 Theme 1: Challenges of Mistrust	39
Appendix B.2 Theme 2: Principles of Trustworthiness	40
Appendix B.3 Theme 3: Behaviors to Avoid When Establishing Trust	42
Appendix B.4 Theme 4: Considerations for Working with Communities that Experience Medical Mistrust.....	43
Appendix C : Trustworthiness Curriculum Full Lesson Plan.....	44
Bibliography	48

List of Tables

Table 1: Addressing Mistrust and Fostering Health Equity Using Principles of Trustworthiness Curriculum Lessons.....	20
Table 2: Addressing Mistrust and Fostering Health Equity Using Principles of Trustworthiness Summarized Lesson Plan	21
Table 3: Survey Assessment Including Knowledge and Belief Statements	24
Table 4: Demographics of the BTG-Pittsburgh Interns.....	27
Table 5: Survey Pre- and Post-Score Assessment Results	28
Table 6: Survey Pre- and Post-Score Dichotomized Belief Assessment Results	30

List of Figures

Figure 1: Trustworthiness Curriculum Theoretical Framework.....	14
Figure 2: Trustworthiness Curriculum Conceptual Framework.....	15

Preface

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1.0 Introduction

The following thesis presents the pilot results of a novel curriculum that I developed and tested. I created this curriculum to prepare health sciences trainees to combat medical mistrust by fostering relationship- and trust-building skills and providing concrete strategies to establish trustworthiness in communities where medical mistrust is prevalent. I begin this thesis with an extensive review of medical mistrust literature, including definitions, various impacts of medical mistrust, historical and modern facilitators of medical mistrust, and the importance of trust and trustworthiness as solutions to medical mistrust. Additionally, I describe the theoretical framework guiding the curriculum, leveraging Ajzen & Madden's (1986) Theory of Planned Behavior (Ajzen & Madden, 1986). Next, I provide a detailed description of the newly developed curriculum and pilot, including an accompanying survey-based assessment to evaluate the impact of the curriculum on participant knowledge and beliefs. I use descriptive statistics, Fischer's exact tests, and Mann-Whitney tests to determine the impact of this curriculum and relate these findings to existing literature. Finally, this thesis concludes with important implications of these results and recommendations for future directions.

2.0 Background

Medical mistrust is associated with numerous health disparities including delays in healthcare utilization, inadequate healthcare engagement, and poor health outcomes (Hammond, Matthews, Mohottige, Agyemang, & Corbie-Smith, 2010; Jaiswal, 2019; Jaiswal & Halkitis, 2019; Powell et al., 2019). Much of the existing mistrust literature focuses on interpersonal trust between physicians and patients but medical mistrust can extend beyond this context to mistrust of medical organizations, research institutions, and entire healthcare systems (Benkert, Cuevas, Thompson, Dove-Meadows, & Knuckles, 2019; Jaiswal & Halkitis, 2019). As such, there is no standardized definition of medical mistrust. Hostetter & Klein (2021), for example, defined medical mistrust as “an absence of trust that healthcare providers and organizations genuinely care for patients’ interests, are honest, practice confidentiality, and have the competence to produce the best possible results” (Hostetter & Klein, 2021). Similarly, researchers investigating the associations of medical mistrust and vaccine hesitancy defined medical mistrust as “distrust of healthcare providers, the healthcare system, medical treatments, and the government as a steward of public health” (Bogart et al., 2021).

Griffith et al. (2021) went a step further and operationalized trust, distrust, and mistrust as distinct attitudes toward healthcare providers and public health entities. According to these researchers, distrust is an attitude based on three beliefs: healthcare providers or public health entities may be untrustworthy; quality of care is variable; and the patient is receiving poorer quality than the standard of care. Distrust includes a heightened sense of fear and suspicion that is based on a sense that trust has been violated. Conversely, mistrust refers to a general sense of unease or suspicion that is based on the belief that the healthcare provider or public health entity may not

prioritize the patient's best interest and may actively work against the patient. Unlike distrust, mistrust may arise even without a violation of trust (Griffith, Bergner, Fair, & Wilkins, 2021). Building on this distinction, Anderson & Griffith (2022) defined medical mistrust as a sense of unease or concern that a provider may not act in a person's best interest based on a generally pessimistic attitude toward healthcare providers and public health institutions while distrust is a sense of unease or suspicion toward specific health care providers or institutions (Anderson & Griffith, 2022). For the purpose of this study, I leverage these definitions to conceptualize medical mistrust as a broad lack of confidence in health providers, researchers, and the organizations they work for, characterized by concerns about their genuine care for patients' interests, honesty, confidentiality, and competence. This skepticism is rooted in a general sense of unease, suspicion, or pessimism toward health providers and organizations.

Medical mistrust is an important risk factor and social determinant that affects health outcomes for many minoritized and vulnerable communities (Benkert et al., 2019; Howell, 2017; Jaiswal & Halkitis, 2019; H. S. Thompson et al., 2021). It is associated with worse self-reported physical and mental health, failure to take medical advice, poor health-related quality of life, and underutilization of health services (Anderson & Griffith, 2022; Benkert et al., 2019; LaVeist, Isaac, & Williams, 2009). For example, in a study of Black women who have sex with women, investigators found that lower levels of trust were significantly associated with less engagement in care (Brenick, Romano, Kegler, & Eaton, 2017). Likewise, past literature has associated mistrust with delays in preventive care use, increasing the risk of chronic diseases, disabilities, and mortality (Office of Disease Prevention and Health Promotion, n.d.; Powell et al., 2019). For instance, Powell et al. (2019) found a positive association between medical mistrust and odds of delaying routine check-ups and blood pressure screenings in a sample of African American men

(Powell et al., 2019). Similarly, another study found that African American men with higher levels of mistrust were more likely to delay routine check-ups, blood pressure screening, and cholesterol screenings (Hammond et al., 2010).

Multiple studies have also linked medical mistrust to vaccine acceptance and treatment hesitancy (Bogart et al., 2021; H. S. Thompson et al., 2021). Immunizations, or vaccinations, are an important component of preventive care as they help reduce the risk of disease and control infectious disease outbreaks (World Health Organization, 2024). The relationship between medical mistrust and vaccine acceptance was prominently demonstrated during the COVID-19 pandemic which claimed over a million American lives (Centers for Disease Control and Prevention, 2024). In the U.S., the COVID-19 pandemic disproportionately devastated communities of color, and Black Americans were nearly twice as likely as White Americans to die after infection (Centers for Disease Control and Prevention, 2023). Even so, investigators found that Black participants reported higher levels of vaccine rejection compared to White participants (Charura, Hill, & Etherson, 2023; Kricorian & Turner, 2021; H. S. Thompson et al., 2021) and one study found associations between medical mistrust and Black participants' refusal to receive a vaccine (H. S. Thompson et al., 2021). Similarly, Bogart et al. (2021) assessed associations between mistrust and COVID-19 vaccine hesitancy among a sample of Black Americans living with HIV. Their results indicate that greater mistrust was significantly associated with greater vaccine and treatment hesitancy (Bogart et al., 2021).

Studies have also found a relationship between medical mistrust and medication and treatment adherence, particularly as it relates to anti-retroviral therapies for HIV (Anderson & Griffith, 2022; Duthely et al., 2021; Saha, Jacobs, Moore, & Beach, 2010). One study, for example, assessed whether increased trust mitigated racial disparities in HIV care and found that, while trust

was not associated with likelihood of receiving treatment or achieving viral suppression, it was associated with self-reported adherence to treatment. Additionally, the results indicated that African Americans expressing incomplete trust, defined by the authors as any rating less than 10 on a 10-point rating scale, had significantly lower adherence to treatment compared with African Americans endorsing complete trust (Saha et al., 2010). Another study found a similar relationship among Creole, English, and Spanish speaking women living with HIV. The investigators found that medical mistrust was inversely and significantly associated with adherence to medications and higher levels of trust correlated with viral load suppression among all three language groups (Duthely et al., 2021).

In addition to the impact of medical mistrust on healthcare engagement, vaccine acceptance, and medication and treatment adherence, mistrust is also a significant barrier to research participation (Knopf, Krombach, Katz, Baker, & Zimet, 2021; Scharff et al., 2010; Smirnoff et al., 2018; H. S. Thompson et al., 2021). Recent studies have distinguished *research* mistrust from *medical* mistrust, though these concepts are inherently interconnected as they often arise within the same healthcare context and, subsequently, exacerbate one another. Research mistrust, as defined by Smirnoff et al. (2018), is a study participant's belief that their needs are secondary to those of the study and researcher, as evidenced by unethical research practices including withholding important information and using research data to harm communities or individuals (Smirnoff et al., 2018). Like medical mistrust, research mistrust is frequently reported as a barrier to research participation by many minoritized and vulnerable communities (Knopf et al., 2021; Scharff et al., 2010; Smirnoff et al., 2018; H. S. Thompson et al., 2021). In a study conducted during the COVID-19 pandemic, Thompson et al. (2021) observed that, while most participants indicated low willingness or refusal to participate in a COVID-19 vaccine clinical

trial, Black participants endorsed the highest level of rejection, and medical mistrust partially mediated the association between Black race/ethnicity and refusal to participate in a COVID-19 vaccine trial (H. S. Thompson et al., 2021). Furthermore, a separate investigation found that increased trustworthiness of local researchers was positively associated with COVID-19 vaccine acceptance (Ragavan et al., 2022). While COVID-19-related research hesitancy is a more recent example, past studies have demonstrated that mistrust is a persistent barrier to clinical trial participation for minoritized and vulnerable communities (C. Henderson et al., 2022; Schmotzer, 2012; Smirnoff et al., 2018). For example, a systematic review of literature assessing barriers to minority enrollment in research trials found that mistrust in research and the medical system was the most common barrier to patients' willingness to participate in research trials. This ultimately reduces the generalizability of research findings and hinders the understanding of disease mechanisms (Benkert et al., 2019).

The historical context is a critical aspect to consider, especially given the impact of medical mistrust on research engagement and participation among minoritized and vulnerable communities. Medical mistrust is commonly recognized as a product of the Tuskegee Syphilis Study, the notorious, 40-year study conducted by the U.S. Public Health Service. During this study, researchers observed the effects of untreated syphilis in socially and economically marginalized Black men, even after the creation of penicillin, which was a safe and reliable cure for the disease (Gamble, 1993; Howell, 2017; Jaiswal & Halkitis, 2019; McVean, 2019; Powell et al., 2019; H. S. Thompson et al., 2021). This resulted in the unnecessary transmission of syphilis to family members and the untimely deaths of many (Frakt, 2020). The Tuskegee Syphilis Study is frequently used as a topic in research ethics, highlighting the role in which racism played in the perpetration of abuse against the Black community for 40 years (Howell, 2017).

While much of the literature attributes medical mistrust to this infamous study (Howell, 2017; Jaiswal & Halkitis, 2019; Powell et al., 2019; Scharff et al., 2010; H. S. Thompson et al., 2021), the legacy of medical and research exploitation of minoritized and vulnerable people extends both before and after the Tuskegee incident. For example, in a verdict considered a win for the Eugenics movement, *Buck v. Bell* was the 1927 Supreme Court decision that upheld a state's right to forcibly sterilize a person considered unfit to procreate by a vote of 8 to 1. This resulted in the forcible sterilization of 70,000 "mentally ill" or "mentally deficient" Americans during the 20th century, the majority of whom were minorities, poor people, and "promiscuous" women (NPR, 2016). Another example includes a research study conducted in the 1990s that hypothesized a genetic etiology of aggressive behavior. This study restricted recruitment to Black boys and used financial incentives to convince parents to enroll their sons in a study that withheld water, forced a low protein diet, administered a drug suspected to be associated with aggressive behaviors, mandated an overnight stay (without parents), and required hourly blood draws and the withdrawal from all medications (Scharff et al., 2010; Washington, 2006). More recently, a legal case settled in 2010 in favor of the Havasupai Tribe who filed a lawsuit against Arizona State University after researchers violated their informed consent by sharing their blood samples and conducting undisclosed medical disorder research. The result of this settlement included a payment of \$700,000, the return of the blood samples, and additional assistance including scholarships and help obtaining funding for a health clinic for the impoverished tribe (Sterling, 2011).

Apart from the historical context, it is equally important to consider the modern factors that facilitate medical mistrust (Scharff et al., 2010). For example, racial inequities in pain management are extremely prevalent such that Black patients are more likely to be under-treated for pain than White patients (Hirsh et al., 2019; Hoffman, Trawalter, Axt, & Oliver, 2016). A 2016 study found

that a significant number of White laypeople, medical students and medical residents hold false beliefs about biological differences between Black people and White people, such as the belief that Black people have nerve endings that are less sensitive than White people or that Black skin is thicker than White skin. These beliefs predicted racial bias in pain perception and treatment recommendation accuracy among medical students and medical residents. In particular, students and residents that strongly endorsed these beliefs rated the Black patient's pain as lower and made less accurate treatment recommendations compared to White patients (Hoffman et al., 2016). Additional modern facilitators include clinical diagnoses that disproportionately affect communities of color due to the reinforcement of inaccurate and harmful racial stereotypes. One such diagnosis is excited delirium, a clinical diagnosis describing the sudden presentation of severe agitation in a patient with symptoms including paranoia, shouting, unexpected physical strength, hyperthermia, and bizarre and/or aggressive behavior (Takeuchi, Ahern, & Henderson, 2011; Walsh, Agboola, Coupet, Rozel, & Wong, 2023). A recent study by Walsh et al. (2023) analyzed the language defining the diagnosis and found that it elicits and reinforces damaging racial stereotypes, such as Black individuals have significant physical strength and stamina and feel less pain compared to White individuals. Consequently, Black men receive excited delirium diagnoses more often than White men and Black men labeled as having excited delirium have higher mortality than White men (Walsh et al., 2023).

Studies have also demonstrated an association between medical mistrust and negative experiences within the healthcare system (Bazargan, Cobb, & Assari, 2021; Benkert et al., 2019; Chen & Yang, 2014; Read, Korenda, & Nelson, 2021; Scharff et al., 2010; Shippee, Schafer, & Ferraro, 2012). One study found that over half of the participants reported a negative healthcare experience that led them to lose trust in their healthcare providers. These experiences included

providers dismissing symptoms, not listening to them, being culturally insensitive, providing incorrect information, and not engaging with or caring for them (Read et al., 2021). Additionally, past research has indicated a positive relationship between medical mistrust and perceived discrimination, including discrimination based on race, ethnicity, primary language, income, and type of or lack of insurance (Bazargan et al., 2021; Chen & Yang, 2014; Shippee et al., 2012). Scharf et al. (2010), for example, conducted focus groups with African Americans and found that medical mistrust was reinforced by modern health system issues and discriminatory events, such as receiving poor quality of care or being treated disrespectfully (Scharff et al., 2010). Historical abuses, disparities in care, structural racism and negative experiences within the healthcare system have culminated in deep medical mistrust among many minoritized and vulnerable communities (Leonard, Pursley, Robinson, Abman, & Davis, 2022).

Frequently, the literature has conceptualized medical mistrust as a “cultural barrier,” implying that mistrust is characteristic of minoritized and vulnerable communities (Jaiswal & Halkitis, 2019). Consequently, many interventions aimed to address mistrust are targeted toward individuals and communities who do not trust (Anderson & Griffith, 2022; Griffith, Jaeger, Bergner, Stallings, & Wilkins, 2020; Jaiswal & Halkitis, 2019). Jaiswal & Halkitis (2019) considered this framing extremely problematic and racist as it places the burden of combatting medical mistrust on the communities experiencing structural, social, political, and economic exclusion and marginalization (Jaiswal & Halkitis, 2019). Similarly, Anderson & Griffith (2022) argued that encouraging minoritized and vulnerable communities to place their trust in untrustworthy health systems undermines efforts to achieve health equity (Anderson & Griffith, 2022). This framing also fails to consider the current and historical abuses perpetuated by healthcare and public health systems, and neglects to acknowledge that medical mistrust is rooted

in the perceived trustworthiness of healthcare and public health organizations, institutions, systems, and entities (Anderson & Griffith, 2022; Best, Fletcher, Kadono, & Warren, 2021; Ramos et al., 2019). As such, a growing number of researchers are calling on these institutions and systems to demonstrate and improve their *trustworthiness* (Anderson & Griffith, 2022; Best et al., 2021; Griffith et al., 2020; C. Henderson et al., 2022; Jaiswal & Halkitis, 2019).

Because researchers across disciplines are increasingly considering the importance of trustworthiness and its' role in promoting health equity, the definitions of trustworthiness are many and varied. Sellman (2006), for example, conceptualized trustworthiness as a virtue, describing a trustworthy person as “one who can be counted on, as a matter of the sort of person he or she is, to take care of those things that others entrust to them” (Sellman, 2006). Alternatively, Ramos et al. (2019) offered a two-part definition of trustworthiness consisting of: 1) the demonstration of integrity by an individual and 2) the belief that they will tell you the truth. They also argued that trustworthiness is a “demonstrated assurance of protection from harm” (Ramos et al., 2019). Henderson et al. (2022) defined trustworthiness as the notion that an individual deserves trust (C. Henderson et al., 2022). In this sense, trustworthiness is an important prerequisite for fostering trust, and in the absence of trustworthiness, mistrust is rational (Anderson & Griffith, 2022; Best et al., 2021; Ramos et al., 2019). The authors, however, fail to provide a definition for the word *trust*.

Like trustworthiness, the definition of trust remains unstandardized. According to Li & Betts (2011), trust describes a behavioral construct where one places their confidence in another party (Li & Betts, 2011). Dinç & Gastmans (2012), conversely, argued that trust refers to a relationship in which a power imbalance is present such that one party is more vulnerable or dependent on another's moral commitment (Dinç & Gastmans, 2012). Larson et al. (2018)

similarly conceptualized trust as a relationship where one party accepts a vulnerable position with the assumption that the other party will behave with competence and best interests (Larson et al., 2018). In terms of the healthcare provider-patient relationship, Rasiah et al. (2020) defined trust as a set of expectations that the provider will do the best for the patient, and with good will, recognizing the patient's vulnerability (Rasiah et al., 2020). There is one common theme between these definitions of trust: vulnerability in which one party relies on the good will of another. Leveraging these definitions, I define trustworthiness in the medical system as a multifaceted quality in a relationship where one party assumes a position of vulnerability to another under the expectation that the latter party is reliable, honest, and assures protection from harm.

Trust is foundational for behavior change and *trustworthiness* is a prerequisite of trust (Anderson & Griffith, 2022; Best et al., 2021; Ramos et al., 2019). It is critical that health science professionals, defined for this study as individuals that work in hospitals, doctor's offices, clinics, health departments, public health institutions, community-based organizations and other community-based settings, and individuals receiving health sciences training establish their trustworthiness to combat medical mistrust and promote health equity (C. Henderson et al., 2022; Leonard et al., 2022). Consequently, research has emphasized the importance of including medical mistrust in professional training, advocating for educational curricula that extends beyond cultural competence and equips students and trainees with the skills and knowledge needed to earn trust (Draper, Feltner, Vander Schaaf, & Mises Malchuk, 2022; C. Henderson et al., 2022; Tupas et al., 2023). Though there is a current trend of health science educators incorporating social justice and anti-racism framework into their student training, rarely does this education explicitly include training on medical mistrust and trustworthiness (Chandler, Williams, Turner, & Shanahan, 2022; Collins, Smith, Hack, & Moorhouse, 2023; Draper et al., 2022; Tupas et al., 2023). As such, a

critical gap remains. To address this gap, this thesis seeks to describe and evaluate the impact of a novel curriculum that emphasizes principles of trustworthiness in a pilot sample of health science trainees.

2.1 Definition of Terms

Trust describes the willingness to accept a position of vulnerability to a party under the expectation that the party will operate with good will and intentions (Dinç & Gastmans, 2012; Larson et al., 2018; Li & Betts, 2011; Rasiah et al., 2020).

Trustworthiness in the medical system is a multifaceted quality in a relationship where one party assumes a position of vulnerability to another under the expectation that the latter party is reliable, honest, and assures protection from harm (C. Henderson et al., 2022; Li & Betts, 2011; Ramos et al., 2019; Rasiah et al., 2020; Sellman, 2006).

Medical mistrust is a suspicion of healthcare providers and organizations, characterized by doubt about their genuine care for patients' interest, honesty, confidentiality, and competence (Anderson & Griffith, 2022; Benkert et al., 2019; Bogart et al., 2021; Griffith et al., 2020; Hammond et al., 2010; Hostetter & Klein, 2021; Jaiswal, 2019; Jaiswal & Halkitis, 2019; Powell et al., 2019). Medical mistrust can also extend beyond this context to mistrust of health-related organizations, research institutions, and entire healthcare systems.

2.2 Theoretical Framework

The theoretical framework guiding this intervention leverages Ajzen & Madden (1986)'s theory of planned behavior. This theory posits that behavior is directly related to intentions which are influenced by attitudes, subjective norms, and perceived behavioral control (Ajzen & Madden, 1986; Sansom, 2024). The researchers also argued a direct effect of perceived behavioral control on behavior, such that the performance of a behavior depends on both a person's intention to perform the behavior (motivation) and the level of control they perceive over it (perceived control) (Ajzen & Madden, 1986; Terry & O'Leary, 1995). Additionally, they proposed that perceived behavioral control includes both perceived control and a person's beliefs about how easy or difficult it will be for them to perform the behavior (self-efficacy) (Ajzen, 1991; Ajzen & Madden, 1986; Terry & O'Leary, 1995) (**Figure 1**). This intervention seeks to empower trainees with knowledge of medical mistrust and strategies to address it, thereby promoting positive beliefs and self-efficacy related to trust-building. In so doing, this curriculum seeks to indirectly influence an individual's intentions toward establishing trustworthiness, as depicted in the conceptual framework in **Figure 2**.

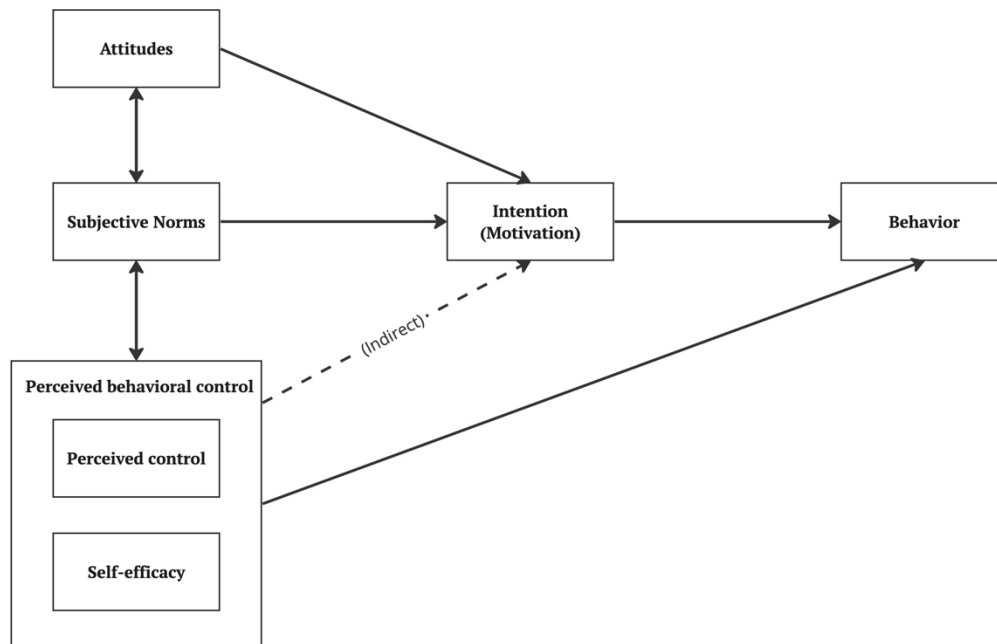


Figure 1: Trustworthiness Curriculum Theoretical Framework

The conceptual framework is adapted from the ideational model of communication (Health Communication Capacity Collaborative, 2015). This model highlights how communication affects ideational factors, such as subjective and social norms, values, and beliefs, and skills and knowledge, which subsequently determine behavior change. In the adapted framework, the curriculum intervention includes education on the history of medical mistrust, the principles of trustworthiness, best practices for building trust, and strategies for establishing trustworthiness. The intervention aims to affect the skills and knowledge of participants, including knowledge of medical mistrust, knowledge of health disparities associated with medical mistrust, relationship-building skills, communication skills, and trust-building skills. Additionally, the intervention seeks to impact an individual's ideational factors, including self-efficacy and attitudes related to trust-building. These factors, combined with skills and knowledge, influence an individual's intention

and behavior, including transparent and honest communication, establishing trustworthiness and trust-building with minoritized and vulnerable communities.

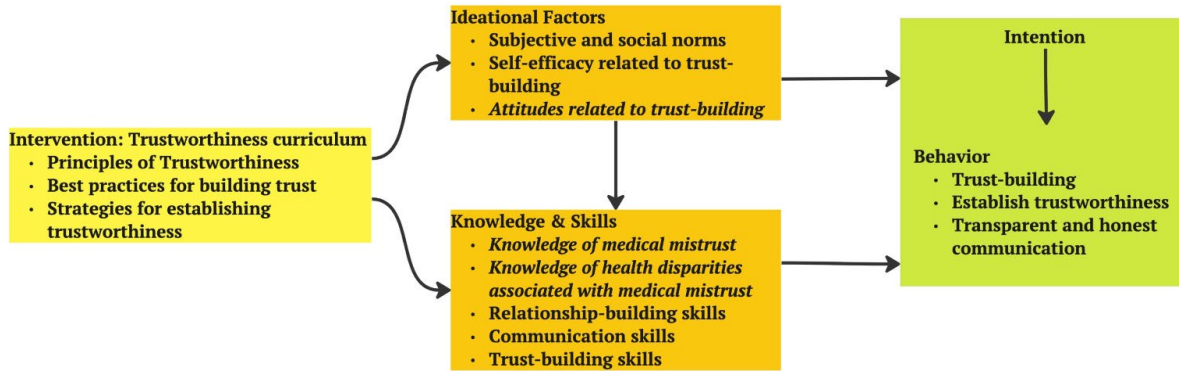


Figure 2: Trustworthiness Curriculum Conceptual Framework

Italicized points were assessed as a part of the curriculum evaluation

2.3 Purpose

This study's purpose was to describe and evaluate a novel trustworthiness curriculum for future health science professionals and evaluate the results from the curriculum pilot. My aims were to: 1) describe a novel, culturally appropriate training on the impact of medical mistrust and the importance of trustworthiness, including historical and modern-day research and clinical practices that have perpetuated mistrust; and 2) evaluate the impact of the curriculum on knowledge and beliefs related to medical mistrust. For the purposes of this study, I define “culturally appropriate” as reflective of the cultural values, subjective culture (such as norms and

attitudes), and behavioral preferences and expectations of minoritized and vulnerable communities (Marín, 1993). To determine knowledge and belief changes in participants exposed to the trustworthiness curriculum, I created and administered a survey-based assessment before and after curriculum exposure.

The scope of this thesis is to contribute to medical mistrust education and professional training by detailing the findings of a curriculum pilot. This novel curriculum was developed to equip health science trainees with the necessary skills to combat mistrust by fostering relationship-building skills and providing concrete strategies to establish trustworthiness among communities that experience medical mistrust.

2.4 Intervention

2.4.1 Curriculum Setting - Bridging the Gaps-Pittsburgh

I piloted the curriculum with the 2023 cohort of Bridging the Gaps (BTG)-Pittsburgh students, a group of primarily graduate students from across the schools of public health, nursing, pharmacy, medicine, social work and rehabilitation sciences. BTG-Pittsburgh is a member of the multi-institutional Bridging the Gaps Network, which is a collaboration among multiple academic health centers and universities in Pennsylvania and New Jersey and approximately 100 community organizations that links the interprofessional education of health/social service professional students with the provision of health-related services for economically disadvantaged populations (Bridging the Gaps, 2023).

Per BTG-Pittsburgh program requirements, students work full-time over two months with marginalized communities to understand the health issues, needs and perspectives of these populations. Simultaneously, students offer capacity-building assistance to host organizations at the forefront of healthcare. In BTG-Pittsburgh, interdisciplinary pairs of students are partnered with community practicum sites and mentors involved with marginalized communities, such as homeless shelters, Early Head Start, and substance use recovery programs. Community mentors at each host site come from diverse backgrounds with substantial experience that helps to shape students' learning (Elias, Thompson, Boak, & Cannon, 2022). Students participate in reflective and didactic sessions that include community guest speakers, readings with community voices, and experiential learning activities, such as a full-day poverty simulation exercise, enabling students to navigate challenging budgeting and family scenarios to gain a deeper understanding of the complexities associated with poverty (J. R. Thompson, Boak, & Elias, 2020). These program components aim to build students' understanding of challenges for marginalized populations, thereby building their empathy and cultural humility (J. R. Thompson et al., 2020). Cultural humility is a relatively new concept, coined in 1998 by Tervalon & Murray-Garcia (1998) to describe:

“a lifelong commitment to self-evaluation and self-critique, to redressing the power imbalances in the patient-physician dynamic, and to developing mutually beneficial and non-paternalistic clinical and advocacy partnerships with communities on behalf of individuals and defined populations (Tervalon & Murray-Garcia, 1998).”

Cultural humility evolved from the concept of “cultural competency” which is often criticized for contributing to social stereotypes and power imbalances between providers and their patients. Subsequently, cultural humility emphasizes addressing power imbalances, appreciating

the historical context and having a willingness to learn and self-reflect (Foronda, 2020; Foronda, Baptiste, Reinholdt, & Ousman, 2016; Lekas, Pahl, & Fuller Lewis, 2020; Stubbe, 2020; Tervalon & Murray-García, 1998). By building students' empathy and cultural humility, BTG-Pittsburgh ostensibly improves their effectiveness as future practitioners.

2.4.2 Curriculum Overview

I developed this curriculum to prepare health science trainees to combat medical mistrust. It focuses on fostering relationship- and trust-building skills and providing concrete strategies to establish trustworthiness among communities that experience medical mistrust. I based it on insights from the work of Henderson et al. (2022), who interviewed researchers affiliated with the University of Pittsburgh to understand their perspectives on mistrust and trustworthiness. The resulting recommendations highlighted the critical need for comprehensive training in both historical and modern facilitators of mistrust in minoritized and vulnerable communities (C. Henderson et al., 2022). I integrated these recommendations into the subsequent curriculum and emphasized the impact of mistrust and the concept of trustworthiness. By incorporating these insights, I developed this curriculum to prepare health science professionals to address medical mistrust and establish their trustworthiness, ultimately promoting health equity.

Additionally, building on the prior insights of Henderson et al. (2022), the development of the “trustworthiness” curriculum included a thorough review of existing literature (Allen et al., 2022; Anderson & Griffith, 2022; Bazargan et al., 2021; Benkert et al., 2019; Best et al., 2021; Bogart et al., 2021; Brenick et al., 2017; Chandler et al., 2022; Charura et al., 2023; Chen & Yang, 2014; Dinç & Gastmans, 2012; Draper et al., 2022; Duthely et al., 2021; Frakt, 2020; Gamble, 1993; Griffith et al., 2021, 2020; Hammond et al., 2010; Hirsh et al., 2019; Hoffman et al., 2016;

Hostetter & Klein, 2021; Howell, 2017; Jaiswal, 2019; Jaiswal & Halkitis, 2019; Knopf et al., 2021; Kricorian & Turner, 2021; Larson et al., 2018; LaVeist et al., 2009; Leonard et al., 2022; Li & Betts, 2011; McVean, 2019; NPR, 2016; Office of Disease Prevention and Health Promotion, n.d.; Powell et al., 2019; Ragavan et al., 2022; Ramos et al., 2019; Rasiah et al., 2020; Read et al., 2021; Saha et al., 2010; Scharff et al., 2010; Schmotzer, 2012; Sellman, 2006; Shippee et al., 2012; Smirnoff et al., 2018; Sterling, 2011; Takeuchi et al., 2011; H. S. Thompson et al., 2021; Tupas et al., 2023; Walsh et al., 2023; Washington, 2006) and semi-structured interviews with public health professionals and community members (detailed methods and results are available in **Appendix A** and **Appendix B**). Four key themes emerged from these interviews that I subsequently incorporated into the trustworthiness curriculum: 1) the challenges of mistrust; 2) principles of trustworthiness; 3) behaviors to avoid when establishing trust; and 4) considerations for working with minoritized and vulnerable communities that experience medical mistrust. Importantly, the principles of trustworthiness include reliability, reciprocity, presence, and humility. Reliability refers to the extent to which you can be depended on to come through, to act consistently, and to follow through. Reciprocity is the degree to which you seek to generate mutual benefit and value to community members. Presence is the degree to which you show up and meet community members where they are and entails being visible to community members outside of clinical and health-related spaces. Finally, humility is the extent to which you are humble, non-judgmental, and willing to learn. The trustworthiness curriculum was developed to empower trainees to effectively: 1) identify historical and modern facilitators of medical mistrust; 2) describe the impact of medical mistrust on important health and research outcomes; and 3) define the principles of trustworthiness and strategies to establish trustworthiness. I structured the trustworthiness curriculum around five central questions:

1. What is medical mistrust?
2. Where did medical mistrust come from?
3. What is the impact of mistrust?
4. Who is responsible for addressing medical mistrust?
5. What is trustworthiness?

A summary table, including the central questions and associated lessons, is available in **Table 1**, while a summarized lesson plan is provided in **Table 2**. The full lesson plan is available in **Appendix C**. I delivered the resulting curriculum in a single, one-hour pilot session that included an interactive lecture followed by a facilitated group discussion. Fourteen BTG-Pittsburgh students participated in the curriculum pilot.

Table 1: Addressing Mistrust and Fostering Health Equity Using Principles of Trustworthiness Curriculum Lessons

Guiding Curriculum Question	Associated Curriculum Lesson
What is medical mistrust	Science, research, and medicine have been used to harm minoritized communities and these institutions continue to perpetuate harm in the form of institutional policies and practices. Medical mistrust is a justified and valid reaction to this abuse.
Where did medical mistrust come from?	
What is the impact of mistrust?	Medical mistrust is associated with numerous health disparities in minoritized communities, impacting healthcare engagement, vaccine uptake, medication adherence and many other health outcomes. Medical mistrust is an important risk factor and social determinant of health.
Who is responsible for addressing medical mistrust?	Medical mistrust is rooted in historical and current trauma perpetrated against minoritized and vulnerable

	communities. The onus of rebuilding trust falls on the scientific, research and medical communities as the perpetrators of abuse.
What is trustworthiness?	Building trust in healthcare, public health, and related fields relies on reliability, presence, reciprocity, humility, and avoiding detrimental behaviors. Trust is not given freely but is something that must be cultivated through consistent, dependable, and humble actions.

Table 2: Addressing Mistrust and Fostering Health Equity Using Principles of Trustworthiness Summarized Lesson Plan

Guiding Curriculum Question	Important Points Covered
What is medical mistrust?	<ul style="list-style-type: none"> • Briefly define medical mistrust • Discussion question: What comes to mind when you think of medical mistrust?
Where did medical mistrust come from?	<ul style="list-style-type: none"> • Discuss the origins of medical mistrust: <ul style="list-style-type: none"> ○ J. Marion Sims: the Father of Modern Gynecology ○ Forcible sterilization of “mentally ill” in 1920 ○ Tuskegee Study of Untreated Syphilis ○ Henrietta Lacks’ ‘Immortal’ Cells • Discuss modern facilitators of medical mistrust: <ul style="list-style-type: none"> ○ Racial inequities in pain management ○ Excited delirium (ExD) ○ Perceived discrimination from healthcare providers • Discussion question: Ask the participants to explain the historical or modern facilitators of mistrust as they understand it.

<p>What is the impact of mistrust?</p>	<p>Facilitated group discussion using 4-5 short, predetermined articles that demonstrate the impact of medical mistrust in different spaces</p> <ul style="list-style-type: none"> • Healthcare Engagement <ul style="list-style-type: none"> ○ Discuss how medical mistrust affects healthcare utilization and outcomes. ○ Highlight disparities in cancer screenings, primary care engagement, and chronic condition monitoring. • Clinical Research <ul style="list-style-type: none"> ○ Explore the impact of mistrust on participation in research studies. ○ Emphasize the importance of diverse samples in clinical research. • Vaccine Hesitancy <ul style="list-style-type: none"> ○ Discuss how medical mistrust influences vaccine acceptance and treatment hesitancy. ○ Provide examples of vaccine hesitancy among different communities. • Medication Adherence <ul style="list-style-type: none"> ○ Highlight studies linking medical mistrust to poor medication adherence. ○ Emphasize the implications for specific health outcomes.
<p>Who is responsible for addressing medical mistrust?</p>	<ul style="list-style-type: none"> • Explain why placing the onus of addressing medical mistrust on potential “trustees” perpetuates injustice • Discuss why health science professionals are responsible for rebuilding trust and combatting medical mistrust
<p>What is trustworthiness?</p>	<ul style="list-style-type: none"> • Define trustworthiness and its principles • Explore strategies to establish trustworthiness and behaviors to avoid

3.0 Methods

The University of Pittsburgh Institutional Review Board determined this study to be exempt from review. I conducted a secondary analysis of evaluation data collected during the curriculum pilot in July 2023. I delivered the trustworthiness curriculum in a single, one-hour pilot session that included an interactive lecture followed by a facilitated group discussion during the sixth (of eight) week of BTG-Pittsburgh.

3.1 Survey Development and Data Collection

Following a thorough review of the literature on curriculum evaluation (Asgary, Naderi, Gaughran, & Sckell, 2016; Chun, Yamada, Huh, Hew, & Tasaka, 2010; Denizard-Thompson et al., 2021; Kuthy, Heller, Riniker, McQuistan, & Qian, 2007; Meili, Fuller, & Lydiate, 2011), I developed an anonymous, survey-based assessment to measure knowledge and beliefs related to addressing medical mistrust. The 18-item survey included a knowledge section, consisting of seven true or false statements, and a belief assessment, composed of 11 statements answered using a 4-point Likert scale of agreement (1=Strongly disagree, 2=Disagree, 3=Agree, and 4=Strongly agree). The belief assessment included questions related to participant understanding (comprehension), attitudes, self-efficacy, and subjective norms. Furthermore, the belief section was further divided into three subthemes: understanding and addressing mistrust (three statements), recognizing the importance of medical mistrust (four statements), and preparedness for building trust (four statements) (**Table 3**). BTG-Pittsburgh students also provided basic

demographic information, including gender, age group, program of study and year of study. A convenience sample of five individuals pilot tested the initial survey for clarity and ease of understanding which resulted in changes to two belief statements. I administered the survey before and immediately after exposure to the trustworthiness curriculum to assess changes in participants' knowledge and beliefs using MS Forms.

Table 3: Survey Assessment Including Knowledge and Belief Statements

Section I	Statement	Guiding Curriculum Question
Knowledge*	Medical mistrust is the belief that medical, research, and public health institutions do not genuinely care for patients' interests.	What is medical mistrust?
	"Excited delirium," a medical diagnosis rooted in biased language and racial stereotypes, is no longer recognized by medical institutions as a legitimate clinical diagnosis.	Where did medical mistrust come from?
	J. Marion Sims is well-known for his use of chloroform when surgically treating the vesicovaginal fistulas of slave women.	Where did medical mistrust come from?
	Medical mistrust can influence individuals' decisions to participate in clinical research studies.	What is the impact of mistrust?
	Mistrust in medicine acts as a barrier to the uptake of COVID-19 treatment and may also hinder future vaccination efforts.	What is the impact of mistrust?
	Placing the burden of resolving mistrust in medicine on individuals that have historically been the subject of exploitation and discrimination potentially promotes justice for these communities.	Who is responsible for addressing medical mistrust?

		Trustworthiness is the notion that medical, public health, and research institutions are deserving of trust.	What is trustworthiness?
Section II		Statement	Belief Subtheme
Belief Subsection †	Understanding	I understand the impact of medical mistrust on health disparities and health outcomes for minoritized communities.	Understanding and addressing mistrust
		I understand the importance of reliability, humility, presence, and reciprocity for rebuilding trust in medicine.	Understanding and addressing mistrust
Belief Subsection †	Attitude	Medical mistrust is a justified and valid reaction to historical trauma and abuse.	Recognizing the importance of medical mistrust
		Medical mistrust is an important risk factor and social determinant of health.	Recognizing the importance of medical mistrust
Belief Subsection †	Self-efficacy	I know how to engage effectively with community and public health teams to reduce medical mistrust.	Understanding and addressing mistrust
		I am confident about my ability to build trust with minoritized communities.	Preparedness for building trust
		I have strategies to effectively build trust with minoritized communities.	Preparedness for building trust
		I feel comfortable working with communities that may experience medical mistrust.	Preparedness for building trust
		I have the knowledge and skills required to effectively work with communities that experience medical mistrust.	Preparedness for building trust
Belief Subsection Subjectiv		It is important for individuals in my discipline to understand the impact of medical mistrust on health outcomes.	Recognizing the importance of medical mistrust

		The onus of rebuilding trust falls on the medical, research, and public health providers as the perpetrators of abuse.	Recognizing the importance of medical mistrust
* Response Options: True; False			
† Response Options: 1=Strongly Disagree; 2=Disagree; 3=Agree; 4=Strongly Agree			

3.1.1 Statistical Analysis

Demographic data for gender, age group, program of study and year of study were reported using descriptive statistics. The knowledge section of the questionnaire totaled seven points, with each correct response worth one point. Similarly, the belief component totaled 44 points, where a higher score reflects more alignment between the statements and the participant’s belief. Furthermore, belief subthemes were summed over three or four statements for 12 or 16 points, respectively. Because the survey was anonymous and responses were unmatched, I was unable to conduct a paired analysis of belief scores. Instead, I conducted a Mann-Whitney test to compare belief scores before and after exposure to the curriculum. For secondary analysis purposes, the responses to the belief statements were dichotomized into two categories such that a response of strongly agree (4) or agree (3) was considered an “endorsement” while a response of strongly disagree (1) and disagree (2) was considered a “rejection.” Due to my small sample size, I used Fischer’s exact test to assess changes in knowledge and dichotomized beliefs following exposure to the trustworthiness curriculum.

4.0 Findings

The curriculum pilot took place during the sixth week of BTG-Pittsburgh. Fourteen students participated in the pilot, consisting of women (100%) between the ages of 18 and 24 (87%). Additionally, 60% of students were in between their first and second years of study while 53% were enrolled in the school of public health (**Table 4**).

Table 4: Demographics of the BTG-Pittsburgh Interns

Demographics	N (%)
Gender	
Woman	14 (100)
Age Group	
18-24	12 (87)
25-34	2 (13)
Program	
Public Health	7 (53)
Health and Rehab. Sciences	5 (33)
Nursing	1 (7)
Pharmacy	1 (7)
Year	
First	1 (7)
Second	8 (60)
Third	2 (13)
Fourth	2 (13)
Fifth	1 (7)

4.1 Pilot Results - Knowledge Assessment

In unadjusted analyses, knowledge scores increased after exposure to the curriculum. Pre-survey knowledge scores ranged from 57% (4 out of 7 points) to 86% (6 out of 7 points) with a mean score of 71% (95% CI [64.7, 78.1]). Post-survey knowledge scores also had a minimum score of 57% but a higher maximum score (100%) and a higher mean score (83%; 95% CI [72.9, 92.5]). Additionally, I conducted a Fisher’s Exact test to compare the pre- and post-survey scores, yielding a p-value of 0.082, indicating no statistically significant difference in scores following exposure to the curriculum (Table 5).

Table 5: Survey Pre- and Post-Score Assessment Results

Outcome	Mean	CI	Min.	Max.	p-value	
Knowledge (<i>Max. 100%</i>)	Pre-Score	71%	64.7, 78.1	57%	86%	p=0.082 [†]
	Post-Score	83%	72.9, 92.5	57%		
Total Belief (<i>Max. 44 points</i>)	Pre-Score	34	31.3, 35.7	28	39	p=0.059*
	Post-Score	37	34.3, 40.0	32	44	
Subtheme: Understanding and addressing mistrust (<i>Max. 12 points</i>)	Pre-Score	9	8.2, 9.6	7	11	p=0.042*
	Post-Score	10	9.1, 10.8	8	12	
Subtheme: Preparedness for building trust (<i>Max. 16 points</i>)	Pre-Score	11	10.0, 11.6	9	13	p=0.001*
	Post-Score	13	12.2, 14.3	11	16	

Subtheme: Recognizing the importance of mistrust (<i>Max. 16 points</i>)					
Pre-Score	14	12.7, 14.9	12	16	p=0.735*
Post-Score	14	12.8, 15.2	12	16	
† Fisher's Exact Test * Mann Whitney Test					

4.2 Pilot Results - Belief Assessment

Similarly, in unadjusted analyses, belief scores also increased after exposure to the curriculum. The total belief scores pre-exposure to the curriculum ranged from 28 to 39, with a mean score of 34 (95% CI [31.3, 35.7]). Mean total belief scores increased in the post-assessment to 37 (95% CI [34.3, 40.0]; p=0.059) though this change was not statistically significant. This improvement persisted for two of the belief subthemes, while the third subtheme, “Recognizing the importance of medical mistrust,” remained stable across both timepoints. Importantly, the “Preparedness for building trust” subtheme experienced the most significant increase in mean scores post-curriculum exposure from 11 (95% CI [10.0, 11.6]) to 13 (95% CI [12.2, 14.3]; p=0.001). A less strong, but still significant, increase is observed for the last subtheme, “Understanding and addressing mistrust” (Pre: 9, 95% CI [8.2, 9.6] vs. Post: 10, 95% CI [9.1, 10.8]; p=0.042) (**Table 5**).

In secondary, dichotomized analyses, I evaluated the mean number of belief statements participants endorsed prior to and following exposure to the curriculum. On average, the total number of belief statements endorsed significantly increased after curriculum exposure (Pre: 9, 95% CI [8.0, 9.9] vs. Post: 11, 95% CI [10.5, 11.0]; p=0.009). Again, this pattern is reflected in all but one of the belief subthemes, “Recognizing the importance of medical mistrust,” which

demonstrated no changes in the number of belief statements endorsed after exposure to the curriculum (**Table 6**). Notably, in the dichotomized analysis, the “Understanding and addressing mistrust” experienced the most significant increase in mean number of belief statements endorsed.

Table 6: Survey Pre- and Post-Score Dichotomized Belief Assessment Results

Outcome	Mean	CI	Min.	Max.	p-value
Total Belief (<i>Max. 11 statements</i>)					
Pre-Score	9	8.0, 9.9	6	11	p=0.009 [†]
Post-Score	11	10.5, 11.0	10	11	
Subtheme: Understanding and addressing mistrust (<i>Max. 3 statements</i>)					
Pre-Score	2	1.9, 2.6	1	3	p=0.003 [†]
Post-Score	3	2.8, 3.1	2	3	
Subtheme: Preparedness for building trust (<i>Max. 4 statements</i>)					
Pre-Score	3	2.0, 3.4	1	4	p=0.014 [†]
Post-Score	4	3.6, 4.1	3	4	
Subtheme: Recognizing the importance of mistrust (<i>Max. 4 statements</i>)					
Pre-Score	4	4.0, 4.0	4	4	N/A
Post-Score	4	4.0, 4.0	4	4	
† Fisher’s Exact Test					

5.0 Discussion

Medical mistrust is a persistent barrier to achieving health equity and its disparate impact on the health outcomes of minoritized and vulnerable communities has spurred increased attention in the public health community. Increasingly, researchers are acknowledging the role of trust in promoting positive health behaviors and emphasizing the need for health science professionals to establish their trustworthiness and earn back this trust to promote health equity (Anderson & Griffith, 2022; Brincks et al., 2019; Jaiswal, 2019). Though research has highlighted the importance of including medical mistrust in the professional training of health science professionals, few examples of such trainings are available, and their effectiveness is subsequently unexplored. To my knowledge, this is the first study to describe a medical mistrust focused curriculum and evaluate the effect of the curriculum on health science trainees' knowledge and beliefs toward medical mistrust and trust-building, bridging a critical gap in the literature.

This study's findings show that trainees' knowledge related to medical mistrust and trust-building improved by over ten percentage points after exposure to the curriculum, suggesting the curriculum's effectiveness at improving trainee short-term knowledge. Belief scores showed similar improvement and two of the three belief subthemes, "Preparedness for building trust" and "Understanding and addressing mistrust," demonstrated statistically significant differences in pre- and post-scores (p -value=0.001 and p -value=0.042, respectively), highlighting the curriculum's success in promoting positive beliefs and self-efficacy related to medical mistrust and trust-building among health science trainees. Additionally, this study's results have meaningful implications for trainees' future interactions with individuals from minoritized and vulnerable communities that experience medical mistrust. Specifically, trainees are equipped with a deeper

understanding of medical mistrust and trust-building and, subsequently, are better prepared to build relationships and establish their trustworthiness. Though this study is the first attempt at assessing the impact of a trustworthiness-specific educational curriculum on knowledge and beliefs, the literature is rife with past studies examining the effect of education programs on knowledge and beliefs across various domains, including social justice, health literacy, nutrition, and many others (Almomani, Qablan, Almomany, & Atrooz, 2021; Cross-Denny & Heyman, 2011; Kupolati, MacIntyre, Gericke, & Becker, 2019; Munala, Allen, Beall, & Phi, 2022). The results build on these past studies by focusing on the understudied domain of medical mistrust and trustworthiness within the context of health science education.

While two of the belief subthemes showed statistically significant differences pre- and post-curriculum exposure, the final subtheme, “Recognizing the importance of medical mistrust,” did not change following exposure to the curriculum (p -value=0.735). This was not entirely unexpected as the scores observed in the pre-exposure survey assessment were already quite high, which left little room for improvement post-exposure. This result may indicate some bias in the study sample since students (who compete to be engaged in the BTG-Pittsburgh program) are exposed to a variety of experiential activities and didactic components that aim to build their cultural humility which may subsequently prime their awareness of the importance of medical mistrust and influence their survey responses (J. R. Thompson et al., 2020). Even so, it is critical to highlight that, despite this potential priming and overall lack of statistical significance, both knowledge and total belief scores improved from pre- to post-curriculum exposure, demonstrating the effectiveness of this curriculum. It is also important to note that there is considerable overlap between the concepts included in this curriculum and those of cultural humility curricula (Foronda, 2020; Foronda et al., 2016; Lekas et al., 2020; Stubbe, 2020; Tervalon & Murray-García, 1998).

Key components in cultural humility curricula, such as addressing power imbalances, appreciating the historical context, and having a willingness to learn, are crucial concepts in the trustworthiness curriculum (e.g., principles of trustworthiness humility and reciprocity). As these concepts are already prominent throughout the BTG-Pittsburgh educational experience, it is possible that the trustworthiness curriculum reinforced these concepts, rather than introducing entirely new ideas.

This pilot study has several substantial implications for the field of medical mistrust and trustworthiness education. First, the study demonstrates the success and effectiveness of a novel medical mistrust curriculum rooted in principles of trustworthiness, highlighting its potential to reduce disparities. Establishing trustworthiness and, consequently, building trust are important for preventing inequitable health outcomes and promoting positive health behaviors, such as vaccination intention and engagement with healthcare providers (C. Henderson et al., 2022; Leonard et al., 2022; Saha et al., 2010; Siegrist & Zingg, 2014). Similarly, public trust is essential for the success of public health efforts that rely on self-protective behaviors to combat disease and protect medically vulnerable populations, as demonstrated during the COVID-19 pandemic (Bults, Beaujean, Richardus, & Voeten, 2015; J. Henderson et al., 2020; Hutchins, Truman, Merlin, & Redd, 2009; Siegrist & Zingg, 2014). As such, the success of this curriculum may facilitate improved public trust and subsequently mitigate health disparities associated with medical mistrust.

Additionally, this novel curriculum fills a critical gap in medical mistrust education and provides a blueprint for a successful trustworthiness educational training that health science educators can incorporate into their student education. It expands on existing cultural competency and social justice trainings by explicitly focusing on medical mistrust as a barrier to health equity and trustworthiness as a solution. Furthermore, the curriculum's comprehensive training approach,

including both historical and modern facilitators as well as expert-endorsed best practices, assures a holistic understanding of medical mistrust and trustworthiness. Finally, the curriculum is portable across disciplines and easily adapted to a variety of health science settings. These qualities highlight the curriculum's versatility and potential for widespread impact, making it a valuable resource for addressing medical mistrust in diverse contexts. Given these strengths, I advocate for health science educators to leverage this novel framework and incorporate trustworthiness education into their student training.

5.1 Limitations

This study is subject to several limitations. First, the small sample size and use of a pilot study design make it more difficult to identify significant differences as well as limit the generalizability of the results. This limitation is further compounded by the absence of a long-term assessment and an appropriate control group. Also, it is important to consider the inherent self-selection bias that may impact this pilot's results, as BTG-Pittsburgh is known for its work with under-resourced and marginalized communities. Students self-select for enrollment in the program, which includes a competitive application process, and successful applicants participate in experiential learning activities that may prime their understanding and awareness of medical mistrust and the importance of trustworthiness that students outside of the program may lack. Consequently, the changes observed during this curriculum pilot may be less pronounced than for students that did not experience BTG-Pittsburgh. Additionally, this particular cohort of BTG-Pittsburgh had no male participants, and the role of gender on curriculum receptivity or impact was not explored. Finally, as I was unable to find an appropriate, validated survey instrument to

evaluate this curriculum's impact, I created a new survey which is not validated. As such, there may be limited reliability and validity of my instrument, once again limiting the generalizability of the results.

5.2 Future Directions

Future studies should aim to replicate the findings of this study in a more representative sample, as well as in populations that have not experienced specialized cultural humility training which would reduce bias and improve the generalizability of the study results. Additionally, future investigations would benefit from including a long-term assessment to determine the longevity of the changes to participant knowledge and beliefs. Such investigations could further inform professional development and educational policy for health sciences professionals. Furthermore, future iterations of this curriculum would greatly benefit from the inclusion of skill building activities, such as role playing and active listening exercises, which would further reinforce the curriculum teachings (Pilnick et al., 2018; Pourghaznein, Sabeghi, & Shariatinejad, 2015). Finally, as medical mistrust affects different communities in different ways, future educators should consider adapting this curriculum to specific communities, such as American Indians, Latinos, and individuals living with disabilities.

6.0 Conclusions

To conclude, this study presents the pilot results of a novel curriculum that I developed to prepare health sciences professionals to combat mistrust by fostering relationship-building and trust-building skills and providing concrete strategies to establish trustworthiness among minoritized and vulnerable communities where medical mistrust is prevalent. The results demonstrate the effectiveness of this curriculum at improving participant knowledge and beliefs related to medical mistrust and trust-building. Future studies should replicate these findings in diverse populations and include long-term assessments to further inform professional development. Future curriculum iterations should incorporate skill-building activities and adapt it to specific community needs. Though the curriculum's success at improving participant knowledge and beliefs highlights important implications for the field of medical mistrust and trustworthiness education, it is a community-level solution to a systemic problem. Medical mistrust is deeply rooted in structural racism, and addressing it comprehensively requires broader, systemic changes in health science institutions and policies. This includes implementing policies that allow adequate time for establishing trustworthiness in health and research settings as current policies may impose time constraints that are not conducive to building trust. Nonetheless, the effectiveness of this newly developed curriculum marks a critical step towards fostering a health science workforce equipped with an understanding of medical mistrust and the necessary skills to establish their trustworthiness, consequently improving public trust, and promoting health equity.

Appendix A : Qualitative Data Collection

To further inform the curriculum and identify concrete strategies health science trainees can use to facilitate trust-building and establish their trustworthiness, I conducted semi-structured qualitative interviews with public health professionals and community members. Participants were purposively sampled for their expertise using a targeted recruitment strategy and each engaged in a one-on-one, 30-minute interview.

Appendix A.1 Interview Guide Development

I created two interview guides, a public health professional guide and a community member guide, based on extant literature and my professional experiences under the mentorship of one academic faculty member and one community-based mentor. Iterative changes were made following each interview to ensure content remained on topic. Questions from the interview guides include:

1. How does mistrust in medicine challenge the work you do? (PHP interview guide)
2. What strategies do you rely on to build trust? What do you always try to do? What do you avoid doing? (PHP interview guide)
3. What are some challenges or barriers new or inexperienced professionals should anticipate when working in community health? (PHP interview guide)
4. What does mistrust look like for your community? (CM interview guide)

5. How can public health, healthcare, or research institutions build trust with your community? (CM interview guide)
6. What is something you wish public health and healthcare institutions knew about medical mistrust in your community? (CM interview guide)

Appendix A.2 Qualitative Data Analysis

To identify common themes from the interviews, I used a thematic affinity cluster analysis approach. Thematic affinity cluster analysis leverages two qualitative data analysis techniques: affinity mapping and thematic analysis. Affinity mapping, or cluster analysis, is a technique commonly used in human-centered design to group items or ideas together based on perceived similarity. Thematic analysis assigns codes to these clusters to identify patterns, relationships, and themes within a dataset (LUMA Institute, n.d.; Szerovay, 2020). Thematic affinity cluster analysis enables rapid synthesis of qualitative data while providing a clear visual of the data, enabling easier and faster interpretation (Guest & McLellan, 2003).

Appendix B : Qualitative Interview Results

Six participants with a range of backgrounds completed interviews. Interviewee backgrounds included psychiatry, pediatrics, social justice resource navigation, clinician education, language equity research, and professionals in the non-profit sector. The majority of interviewees were from communities of color and the entire sample was composed of women. Four key themes emerged from these interviews that were subsequently incorporated into the curriculum: 1) the challenges of mistrust; 2) principles of trustworthiness; 3) behaviors to avoid when establishing trust; and 4) considerations for working with communities that experience medical mistrust. These themes are discussed in further detail, as well as example quotations, in the following sections.

Appendix B.1 Theme 1: Challenges of Mistrust

Interviewees identified a number of challenges and barriers associated with medical mistrust. Many noted the impact of mistrust on individuals' decisions to seek healthcare, resulting in delays and challenges providing preventive care. One participant who works at a non-profit organization that supports Black girls described, *"It takes somebody else encouraging [parents] to [seek care]. They wouldn't seek it out on their own (Interviewee #2)."* Another interviewee discussed her experience with people in her own community that experience mistrust, particularly around the COVID-19 pandemic and subsequent vaccination campaign:

I think specifically, there was so many people that distrusted the vaccine from COVID... There was all kinds of conspiracy theories that was associated with the COVID vaccine... and I know that I was very much a proponent, that when the vaccines came out, I wanted people to get them so that they could stay healthy. They could keep their neighbors healthy. And I got a lot of push back from that. And it was surprising, I got push back from people that I didn't think would push back (Interviewee #4).

Finally, one participant discussed the impact of medical mistrust on research participation, explaining the importance of using science to amplify community voices: *“I think one of the big challenges is that a lot of people don't want to participate in research. And I think participating in research is a really important way to amplify your voice through science and share your perspectives on things. (Interviewee #3).”*

Appendix B.2 Theme 2: Principles of Trustworthiness

Participants also shared their best practices for establishing trust with minoritized and vulnerable communities that collectively make up the curriculum's principles of trustworthiness. Many interviewees endorsed the importance of being reliable and keeping your promises, and one interviewee discussed the impact of overpromising on trust: *“Only say what you can actually do. If you end up being able to do more, then that's a pleasant surprise. But when you don't do even the smallest thing that you say you would do, it contributes to that gap in trust (Interviewee #1).”* Similarly, participants spoke extensively about the importance of showing up for the community and being present outside of health-related settings. One participant shared,

I think it's important to come to community events to support community partners when they're speaking, or they have their important events. That, to me, is really important. You can't do every single thing, but I think showing up for community events is really, really important because otherwise it's very one-sided (Interviewee #3).

Another participant echoed this sentiment, saying *“I have run into my patients in settings that they have not expected me... and I think that means a lot, because they see you outside of that professional interaction (Interviewee #5).”*

Additionally, participants emphasized the importance of reciprocity for establishing trust, defined as the degree to which you seek to generate mutual benefit and value to the community. One participant discussed the often one-sided nature of research:

So, mainly for research students trying to do get access to [the community] for their dissertations or projects... They would come in and do their research or their study, whatever, and then get the findings. But they never, they rarely came back to say, ‘this is what we found, and this is what you might need to do or add this to your program, or this is what's going well,’ whatever it was... (Interviewee #2).

Another interviewee explained the importance of addressing power imbalances when working with minoritized and vulnerable communities by sharing information and resources: *“It's important to adjust for some of those power dynamics and one way to do it is clearly set up a way in which decisions are made jointly. Information is shared in a timely fashion, and it's a transparent fashion, and so folks can make informed decisions (Interviewee #1).”* Finally, interviewees also aligned on the significance of having humility, defined as the extent to which you are humble, non-judgmental, and willing to learn. One interviewee, whose background includes language equity research, discussed recognizing that expertise extends beyond the

researcher: “... coming at it from like a place of humility, I think researchers have this tendency to think that they're the experts. But coming at it from a place of humility, it's not just the researcher that's the expert, but really the community is the expert (Interviewee #3).”

Appendix B.3 Theme 3: Behaviors to Avoid When Establishing Trust

In addition to best practices, participants also advised against a number of behaviors when establishing trust with minoritized and vulnerable communities. For example, multiple interviewees encouraged avoiding exploitative dynamics that undermine trust by ensuring adequate compensation of community members for partnership. One participant shared, “*I do believe that resources should be shared as well. So, community members should be paid for their time and not, you know, relying on passion (Interviewee #1).*” This interviewee also advised against entering communities with a “savior complex” or a mindset that includes a perceived position of superiority or expertise over a group or community in need. Similarly, another interviewee explained, “*My main thing, I think, is just letting them see me and know that I'm not better than you. I'm not smarter than you. We are all on the same level, and I feel like when they see that I actually care, and that they can rely on me, then that definitely helps build the trust (Interviewee #6).*” Additionally, multiple interviewees described the importance of avoiding judgement and one participant described, “*I mean we're all judgey to some extent. I don't think we can be that perfect...but just have compassion and think about, you know, like, how can I? How can we work together? What can I, you know, find common grounds to work together? Right? I think, avoid being judgmental (Interviewee #5).*” This interviewee also recognized the importance of validating individuals’ experiences, rather than rejecting them.

Appendix B.4 Theme 4: Considerations for Working with Communities that Experience Medical Mistrust

The interviews also highlighted key considerations for health science trainees when working with communities that experience medical mistrust. One interviewee emphasized the significance of preparing professionals for potential mistrust, saying, *“I always tell folks, especially undergrad. If you go out [in the community], you may hear [‘we don’t trust you. We don’t want to work with you’]. Be prepared. Don’t like look like a deer in headlights because you’re bound to hear it (Interviewee #1).”* This interviewee also advised that professionals understand that the baggage associated with an institution or employer can impact perceived trustworthiness within a community. Another participant highlighted the significance of understanding and recognizing the history of medical mistrust, particularly in the fields of research and academia,

I think people know Tuskegee, but they don't know the ongoing history of how research basically traumatized minoritized communities. And so, I wish people knew that because people still will be very confused as to why someone doesn't want to participate or like why somebody's not interested in research...It feels like a lot of people just don't realize that a lot of the mistrust is kind of well justified in some sense (Interviewee #3).

Finally, participants noted that building trust requires time and patience, and it is important not to be discouraged:

I think people value when you show up and try to get a hold of them that way... So, be persistent and that really will earn trust, right? And so sometimes I will go to events just so that I get a chance to talk to someone. Right? So, spending the time. And it's okay. It's part of that trust building right? And don't think that, ‘Oh, my God, you know, I don't have time to do this right.’ I'll make the time. And then you own that trust (Interviewee #5).

Appendix C : Trustworthiness Curriculum Full Lesson Plan

Addressing Mistrust and Fostering Health Equity Using Principles of Trustworthiness

Lesson Duration: 1:15

Target Audience: Health science professionals and trainees

Learning Objectives:

- Identify historical and modern facilitators of medical mistrust
- Describe the impact of medical mistrust on important health and research outcomes
- Define the principles of trustworthiness and strategies to establish trustworthiness

Materials and Resources:

- Wilson Trustworthiness curriculum presentation
- 4-5 articles demonstrating the impact of medical mistrust
- Curriculum knowledge and belief assessment (optional)

What is medical mistrust?

(3-5 minutes)

- Welcome and introduction
- Briefly define medical mistrust
- **Discussion question:** What comes to mind when you think of medical mistrust?

Where did medical mistrust come from?

(10-15 minutes)

- Discuss the origins of medical mistrust:
 - J. Marion Sims: the Father of Modern Gynecology
 - Forcible sterilization of “mentally ill” in 1920
 - Tuskegee Study of Untreated Syphilis
 - Henrietta Lacks’ ‘Immortal’ Cells
- Discuss modern facilitators of medical mistrust:
 - Racial inequities in pain management
 - Excited delirium (ExD)
 - Perceived discrimination from healthcare providers
- **Discussion question:** Ask the participants to explain the historical or modern facilitators of mistrust as they understand it.

What is the impact of mistrust?

(20-30 minutes)

- Facilitated group discussion using 4-5 short, predetermined articles that demonstrate the impact of medical mistrust in different spaces
 - Group the participants into small groups of 3-4 and assign each group a different article
 - Allow participants five minutes to read the article and another five minutes to discuss the article within small groups
 - After an in-group discussion, ask the participants to pick a partner from an adjacent group and take turns sharing what they’ve learned about the impact of mistrust
 - Reconvene as a large group and discuss the various implications of medical mistrust
- Healthcare Engagement

- Discuss how medical mistrust affects healthcare utilization and outcomes.
- Highlight disparities in cancer screenings, primary care engagement, and chronic condition monitoring.
- Clinical Research
 - Explore the impact of mistrust on participation in research studies.
 - Emphasize the importance of diverse samples in clinical research.
- Vaccine Hesitancy
 - Discuss how medical mistrust influences vaccine hesitancy.
 - Provide examples of vaccine hesitancy among different communities.
- Medication Adherence
 - Highlight studies linking medical mistrust to poor medication adherence.
 - Emphasize the implications for specific health outcomes.
- **Discussion questions:** What did you learn about the impact of medical mistrust? What solutions, if any, does your article provide to address the mistrust?

Who is responsible for addressing medical mistrust?

(5-10 minutes)

- Explain why placing the onus of addressing medical mistrust on potential “trustees” perpetuates injustice
- Discuss why health science professionals are responsible for rebuilding trust and combatting medical mistrust

What is trustworthiness?

(15 minutes)

- Define trustworthiness and its principles

- Explore strategies to establish trustworthiness and behaviors to avoid

Closing

(5 minutes)

- Recap key points from the session.
- Emphasize the importance of ongoing efforts to address medical mistrust.
- Open the floor for questions and discussion.

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