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Developing an Intensive Workshop on Water, Sanitation, and Hygiene in Healthcare Facilities for Emerging Leaders

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B.S.
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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in the Hubert Department of Global Health
2024

Abstract

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Background: Water, sanitation, and hygiene (WASH) services in healthcare facilities (HCF) are essential to reduce disease transmission and promote quality care, yet many obstacles exist to reach adequate access. Nearly half of healthcare facilities globally lacked basic hygiene services, and approximately 22% of facilities lacked access to basic water services (United Nations, n.d.). One approach to improving WASH in HCF is to provide training on the critical role of WASH in healthcare (World Health Organization, 2019). Using adult learning principles, this special studies project will create content for a WASH in HCF short course/workshop for WASH & health leaders. **Methods**: This special studies project extends prior work by the trainers from the Center for Global Safe Water, Sanitation, and Hygiene at Emory University. Content for three didactic PowerPoint sessions for WASH in HCF was created for an intensive short workshop scheduled to take place in Uganda. **Results**: Through strategic integration of text, graphics, and multimedia elements, the PowerPoint presentations are designed to foster enhanced comprehension and retention of information via the principles of andragogy. Each presentation lasts approximately one hour, with time for questions following the conclusion of the presentation. Session topics include 1) gender equality, disability, and social inclusion (GEDSI), 2) healthcare facility resiliency, and 3) financing of WASH in HCF. While each session has specific objectives, the overall goal of the sessions is to provide participants with the information needed to conduct effective programming and advocacy in the field of WASH in HCF. **Discussion**: The short-course workshop methodology emphasizes participatory learning approaches and engages diverse participants, including healthcare workers, policymakers, and other multidisciplinary representatives. Providing professionals with training on WASH in HCF will position them to be more effective in creating change and making an impact on WASH in HCF in their respective organizations and regions of operation. Future learning and research opportunities from this special study might focus on strengthening the empirical evidence on costing and evaluating the long-term impact of WASH interventions on specific healthcare outcomes and targeted policy changes.

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Acknowledgments

I would like to express sincere gratitude to all individuals and organizations who contributed to the success of this special studies project.

First and foremost, I am deeply indebted to my thesis chair, Dr. Joanne McGriff, for her invaluable guidance and insightful feedback throughout the entire research process. Her expertise and encouragement were instrumental in ensuring the completion of this project. Her flexibility and support ensured we could complete this undertaking. Without her, this project would not have been possible.

I am also grateful to Lindsay Denny, who served as another PI on the project. Her perspective and expertise were invaluable in shaping and refining the deliverables. With her generous assistance and insightful feedback,

Lastly, I want to extend a heartfelt thanks to my family and friends for their unwavering support, patience, and encouragement throughout the duration of the project. Their belief in me kept me motivated and inspired, even during the most challenging of times.

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Introduction

One out of every four healthcare facilities lack basic water services, leaving 712 million people without access to water in these settings, and approximately one-tenth of healthcare facilities lack sanitation facilities (World Health Organization, 2020). Healthcare facilities experience these major gaps in access to basic water, sanitation, and hygiene services, especially in least-developed countries (World Health Organization, 2020). Inadequate access to these basic necessities poses significant health challenges to individuals and communities alike, and each WASH element contributes greatly to livelihoods, school attendance, dignity, and resilience in healthy environments (World Health Organization, n.d.). WASH services are essential in reducing disease spread and promoting public health globally, yet many obstacles exist to reach adequate access for all.

Despite many efforts by the United Nations to promote safe drinking water and sanitation for all, there is still work that needs to be done to achieve Sustainable Development Goals that include ensuring available and sustainable water and sanitation management by 2030. (United Nations, n.d.). Because of this, in 2018, the United Nations launched a global call to action for WASH in all healthcare facilities (World Health Organization, 2023). However, in a recent report from 2022 by the World Health Organization and UNICEF's Joint Monitoring Programme for Water Supply, Sanitation, and Hygiene (JMP), it was reported that nearly half of healthcare facilities lacked basic hygiene services, and approximately 25% of facilities lacked access to basic water service (United Nations, n.d.). The glaring reality is that many healthcare facilities in low- and middle-income countries lack basic WASH necessities, and the consequences of these gaps are often dire, underscoring the work that needs to be done to improve access to WASH services.

Without basic WASH services, healthcare facilities risk spreading disease and increasing hospital stays. In addition, according to UNICEF, 3.85 billion people worldwide rely on healthcare facilities that lack basic hygiene services (Buechner, 2022). Additionally, primary healthcare facilities are typically the first point of care in rural areas; however, these facilities oftentimes have significantly lower WASH coverage than hospital settings (World Health Organization, 2015). Because of this, patients are at an increased risk of infection as professionals' ability to control and prohibit outbreaks is compromised. In response to this, the WHO and UNICEF have created the *Eight Practical Steps,* a list of action items for countries to take to improve and sustain WASH in healthcare facilities (World Health Organization, 2019). Within the *Eight Practical* Steps is an emphasis on "developing the health workforce" or educating WASH and health professionals on topics related to WASH in healthcare facilities.

Adult Teaching

As stated, inadequate access to proper water, sanitation, and hygiene threatens healthcare facilities and greatly impacts patients and healthcare professionals (Knowles, 1985). Specifically, doctors, nurses, and allied health professionals work to overcome disease in healthcare settings while attempting to stay informed and updated on medical knowledge and innovation as the medical field constantly changes. Staying current primarily involves continuing education, a form of professional development for post-secondary learners (Griscti & Jacono, 2006). Typically, continuing education is designed for adult learners and non-traditional learners. The demographics of these groups are important to note as the teaching methods differ from teaching children or traditional students in formal educational programs. For example, andragogy, or the teaching of adults, differs greatly in teaching methods, motivation, and purpose from pedagogy,

or the teaching children (Akintolu & Letseka, 2021). Because of this, many continuing education programs for adult professionals tend to base their methods on principles that encourage self-directed learning and generating feelings of empowerment. Moreover, active learning formats that seek to engage learners and draw from their previous experiences while promoting new knowledge appear to be among the most effective methods in continuing education courses (Sandrone et al., 2020). These formats aid adult learners in gaining the necessary skills to further their professional development. Because of this, many facilitators of continuing education courses opt to utilize a workshop method based on andragogy to teach or train working professionals. In choosing a workshop, the facilitator teaches through discussion and leans on participants' previous experiences more heavily than other modalities to meet session objectives (Steinert, 2010).

Organizations within the WASH sector, like the Center for Global Safe Water, Sanitation, and Hygiene (CGSW), have been diligently developing continuing education courses for WASH and health professionals since 2004. Initially, the focus has been on delivering WASH courses through online and in-person long formats (10+ weeks), with the short intensive workshop methodology over 5-7 days notably less frequent. While CGSW has successfully reached diverse audiences, including healthcare professionals and government officials, there exists an opportunity to enrich these offerings by introducing a novel in-person intensive course. This course would be characterized by its condensed format, interactive nature, and accessibility to participants beyond the sector's confines.

Expanding the current education and training practices to incorporate this new modality holds immense promise for both participants and the sector at large. By embracing hands-on learning experiences and fostering connections among peers, individuals would gain invaluable

insights and skills related to WASH in healthcare facilities programming. Moreover, broadening the audience to encompass multiple sectors is essential, recognizing that addressing the challenges of WASH in healthcare facilities necessitates collaboration across professions. In essence, this evolution in educational practices promises to yield greater benefits, fostering a more inclusive and collaborative approach.

Purpose Statement

Under Sustainable Development Goal (SDG) 6, the United Nations calls for access to safe water, sanitation, and hygiene. However, achieving this goal will take time, money, and dedicated individuals. One strategy for improving WASH in healthcare settings is encouraging continuing professional development for individuals in relevant fields of practice.

Using principles of adult learning, this special studies project will provide WASH and health leaders and professionals with the necessary information regarding WASH in healthcare facilities to facilitate change and impact in their respective organizations and regions of operation. With this being said, the purpose of this special study is to undertake a thorough review of the literature on adult teaching methods and the current status of WASH in healthcare facilities to then inform the design and preparation of three lecture sessions for an intensive workshop for selected professionals and leaders seeking continuing education in the field of WASH in healthcare facilities. The topics of the three sessions include 1) gender equality, disability, and social inclusion; 2) healthcare facility resilience; and 3) budgeting and finance of WASH in healthcare facilities.

Literature Review of the Status of Water, Sanitation, and Hygiene in Healthcare Facilities

Water, sanitation, and hygiene (WASH) in healthcare facilities is an emerging field of interest in developed and developing regions. Despite the suggested aim of achieving universal basic coverage of WASH in healthcare facilities by 2030 as part of the United Nations' Sustainable Development Goals, there is still substantial work to be done to obtain this objective, as consequences of poor WASH practices are abundant (Cronk & Bartram, 2015). This literature review aims to demonstrate the need for safe water, sanitation, and hygiene in healthcare facilities to decrease disease burden and encourage an interdisciplinary approach to combating the current issues faced by the sector. Additionally, this review will seek to understand themes surrounding the status of WASH in healthcare facilities and the necessary continuing education for WASH and health professionals that will help in moving the field forward, specifically professional development on topics such as gender equality, disability and social inclusion, resiliency, and financing in WASH in healthcare facilities. Generally, this literature review aims to answer how, with the available resources, healthcare experts and other targeted professionals can act to address inadequate WASH in healthcare facilities and how continuing education may aid in achieving standard practices among professionals in the sector.

History of Hygiene in Healthcare Settings

The nineteenth century heralded significant advances in public health knowledge and practice with the dawn of "the great sanitary awakening," which introduced ideas that reshaped societal perspectives on health at the end of the First Industrial Revolution (Institute of Medicine Committee for the Study of the Future of Public Health, 1988). During this period of transformation, a link was established between filth as a contributor to disease and means of

disease transmission, which shifted disease control efforts from response to prevention. With increasing urbanization during this time, environmental conditions declined, allowing disease to spread unchecked. It also became evident that previous ideas that illness only impacted the poor were inaccurate; even the wealthy could not escape disease.

At this time, water-borne diseases of dysentery and cholera became common causes of death, partly due to odious environmental circumstances, like close living quarters (Sakai & Morimoto, 2022). With increasing urbanization, filthy environments became common, spreading disease in an overburdened society, and early isolation and quarantine measures became nearly impossible in crowded living conditions where disease tended to spread quickly (Institute of Medicine Committee for the Study of the Future of Public Health, 1988). While the disease burden was high, changes in personal and domestic hygiene changes helped improve health and overall sanitation conditions (Aiello et al., 2008). In addition, the disease appeared to be exacerbated by poor living conditions, inadequate healthcare infrastructure, and limited understanding of disease transmission; however, advancements in public health and sanitation practices during this time led to improved living conditions and decreased disease burden (Institute of Medicine Committee for the Study of the Future of Public Health, 1988).

During the Second Industrial Revolution, the American hospital system, as it is today, with specialized departments and services, emerged (America's Essential Hospitals, 2023). Despite the rapidly changing medical landscape of the time, public and not-for-profit hospitals became pillars in the expanding field of medicine. However, this expansion also led to changing the scene of infectious disease transmission (Sakai & Morimoto, 2022). Early modern large-scale hospital settings created a breeding ground for healthcare-associated infections to spread more

quickly, especially in settings where adequate water, sanitation, or hygiene practices were not in place.

Between these two great movements, as disease easily spread through healthcare settings, Oliver Wendell Holmes, a 19th-century American physician, proclaimed that "doctors were agents of death" unless they correctly washed their hands and clothing to lessen transmission between patients (Poczai & Karvalics, 2022). At this same time, Ignaz Semmelweis, a Hungarian physician and scientist, discovered that hospital wards with physicians and medical students were prone to higher rates of infection than those with only midwives, and his answer to this was to implement preventive handwashing in a chloride and lime solution (Poczai & Karvalics, 2022). While the initial introduction of Semmelweis's idea faced harsh pushback, with the help of his successors, like Louis Pasteur, Robert Koch, etc., Semmelweis's ideas became more widely accepted, and proper hand hygiene became a more common practice (Gupta et al., 2020). This acceptance follows the development of the germ theory of disease and subsequent work on connecting microbes and infectious diseases (Smith, 2012). Prior to germ theory, the connection between proper hygiene and infection prevention and control was widely unknown, and the impact on healthcare settings was profound and undesirable. However, new ideas centered around the connection between hygiene and infection control spurred public health changes.

The Connection Between Hygiene and Infection Control

Ensuring access to safe water, sanitation, and hygiene in healthcare facilities plays a crucial role in preventing infections, controlling the spread of disease, safeguarding staff and patients, and maintaining the dignity of vulnerable populations (Cronk & Bartram, 2015). According to the World Health Organization (2020), progress toward water, sanitation, and

hygiene in healthcare facilities slowed as weaknesses, like inadequate infection prevention and control methods, were exposed and exacerbated following the recent COVID-19 pandemic. Moreover, “the problem of disease from unsafe healthcare settings is growing worse,” according to the World Health Organization (2008), as the number of healthcare-associated infections worsens. In fact, “five to thirty percent of patients develop one or more infections during a hospital visit, and this disease burden is preventable with adequate resources (World Health Organization, 2008). Additionally, some individuals worldwide willingly choose not to seek care from their local healthcare facility. This is partly due to functionality, distance, or because treatment remains uncertain from “shortages of water, electricity or supplies” (World Health Organization, 2008). In principle, there are standards for WASH in healthcare facilities at the national and sub-national levels intended to require minimum conditions in these settings; however, globally, these standards vary and are not always implemented, resulting in increased disease risk.

A crucial aspect of acquiring access to safe water and sanitation is to facilitate the practice of adequate hygiene, especially hand hygiene, as it is known to be one of the most effective methods for reducing healthcare-associated infections (Hillier, 2020). In addition, poor environmental conditions and hygiene practices can lead to life-threatening conditions, including healthcare-associated infections, like many multi-drug resistant gram-negative bacilli (Arowosegbe et al., 2021). It is clear there is a connection between hygiene and infection prevention and control, yet healthcare compliance with standard practices remains low (Allegranzi & Pittet, 2009). Because of this, multilevel intervention strategies are required to increase the uptake of optimal practices in healthcare settings (Allegranzi & Pittet, 2009). For example, in some areas where gaps in healthcare workers' knowledge exist regarding infection

prevention and control practices, education programs or other means of ensuring staff are up to date with current guidelines could be beneficial. Educational workshops, seminars, or other continuing education programs could benefit healthcare workers and help improve compliance (Zenni & Turner, 2021).

The occurrence of complications from healthcare-associated infections (HAIs) is a grave threat to patient safety (Peters et al., 2022). According to the World Health Organization (2008), healthcare settings may become the epicenter of future outbreaks of diseases like typhus or diarrhea due to the lack of adequate resources and infection prevention methods in place - especially when approximately "one-third of healthcare facilities do not have what is needed to clean hands where care is provided" (World Health Organization, 2020). Prevention methods and the changes necessary to reduce disease may differ depending on the type and size of the healthcare setting; however, robust, affordable solutions are necessary regardless of the type of setting (World Health Organization, 2008).

As healthcare facilities continue to operate in a compromised state, resilience of the health sector has become a topic of increasing magnitude following major outbreak events like the COVID-19 pandemic, Zika outbreak, etc. (Agostini et al., 2023). The concept of resilience has primarily entailed the "capability of a system to build adaptive capacities when disturbances occur and then 'bounce back' to the previous equilibrium," but this definition can vary (Agostini et al., 2023, p. 2). Other professionals believe resilience is broader in definition and encompasses foresight, coping, and recovery and is predominately about learning from the past to ensure future success (Jeffcott et al., 2009). Despite these differing definitions, the healthcare sector needs to be able to recover and adapt to external pressures in a new, rapidly changing

environment, and yet, there is a lack of clarity on how this should be approached from the literature (Wiig et al., 2020).

A commonly accepted topic surrounding resilience in the WASH and health sector is climate change and how the sectors should prepare for these new strains upon the respective systems. Climate change can profoundly affect the WASH sector, as water-related risks can arise from too much water, too little water, or even polluted water (GWP & UNICEF, 2014). In many places, the global water cycle is already affected, resulting in negative impacts for individuals and businesses alike (GWP & UNICEF, 2014). Additionally, climate change impacts weather and climate events, like "variability, seasonality, and extreme events," which can negatively impact the availability of safe drinking water (GWP & UNICEF, 2014). Increased extreme weather events may stress the already burdened system, like creating a decline in available drinking water sources that force people to drink from contaminated sources, which could increase the waterborne disease burden (GWP & UNICEF, 2014).

With additional stress from climate change impacting the healthcare system, many researchers agree that there needs to be a push for both proactive and reactive approaches for healthcare facilities following a disaster that considers resources and social factors (Agostini, 2023). In a recent systematic review, Agostini (2023) subdivided climate event response resources into hardware and organizational. The hardware resources encompass the availability of material and infrastructure, and the organizational resources focus on managing information and effectively making decisions during or following a disaster. Per Agostini, considering these categories when planning for a healthcare facility will increase resiliency.

The Current Status of Water, Sanitation, and Hygiene (WASH) in Healthcare Facilities

Access and reliability to safe water, sanitation, and hygiene in healthcare facilities is lacking globally, especially in the aftermath of the recent COVID-19 pandemic, which exacerbated existing critical weaknesses (World Health Organization, 2020). In the forward of the 2019 Global Baseline Report by the World Health Organization and the United Nations Children's Fund (UNICEF) states that approximately "896 million people use healthcare facilities with no water service and 1.5 billion people are served by healthcare facilities with no sanitation service" further exacerbating disease burden among healthcare-associated infections and placing further stress upon the system. Additionally, more individuals are likely served by healthcare facilities lacking adequate hand hygiene practices and safe medical waste management than previously stated (WHO & UNICEF, 2019). Even then, all healthcare facilities are unequal in resource allocation; hospitals typically have access to more resources than smaller healthcare facilities, and urban areas usually have greater access than rural areas (WHO & UNICEF, 2019). Yet, with improved WASH practices and infrastructure in these facilities, the World Health Organization estimates that approximately 6% of deaths could be prevented, thus reducing the burden on healthcare facilities (Bartram et al., 2010). However, many "buildings and poorly functioning water supplies and latrines exacerbate the cycle of disease and increase the risk of preventable infection" (Bartram et al., 2010, p. 218). This is especially true in least-developed countries, especially following the COVID-19 pandemic, where economic consequences widened the already large inequity gap (World Health Organization, 2020). In addition to poor infrastructure, African areas face overcrowding, further deterring patients from seeking care in healthcare facilities (Huttinger, 2017).

Finance Practices

Finance is another deterrent to patients seeking care or organizations investing in WASH infrastructure. Financing for WASH is typically defined as "funding or financial resources allocated to support water, sanitation, and hygiene projects and initiatives," this funding could come from many sources (Chandratreya, 2023, p. 394). In a recent study of public healthcare facilities in low- and middle-income countries, it was estimated that approximately "$6.5 billion to $9.6 billion from 2021 to 2030 is needed to achieve full coverage of basic WASH and waste services," which includes capital costs as well as recurrent costs (Chaitkin et al., 2022, p. e840). However, this is a conservative number considering the current overall health and WASH spending, and higher future investment could decrease the burden on the system and yield more benefits (Chaitkin et al., 2022). With this being said, there is a financial gap between what is required to achieve universal access to safe WASH and what is currently allocated, despite the recognition that this issue has become more urgent in recent years. Current barriers to achieving this financial goal are numerous, stemming from existing issues surrounding funding in the WASH sector (Pories et al., 2019). Challenges the sector faces regarding insufficient funding include short-term solutions that exacerbate dependency on assistance, affordability, and cost recovery, especially in developing countries (Chandratreya, 2023; Pories, 2019). For example, governments or providers face pressure to increase tariffs or user fees to cover operational and maintenance costs; however, users in low-income areas may not be able to afford to utilize the services in this scenario, resulting in resistance from the public that could result in individuals seeking unsafe drinking water (Chandratreya, 2023). Equitable access is also a challenge in this scenario if the cost is too high; disparities can arise in different income groups or rural or urban areas (Chandratreya, 2023).

Human Rights Considerations

Aside from the possible financial burden on the healthcare system, WASH is a human rights, dignity, social justice, and gender issue (World Health Organization, 2020). Future program planning for the WASH sector should consider the needs of vulnerable and marginalized populations, like women, children, the elderly, disabled, etc., who may need more attention to reach equitable ground (Sudhiastiningsih et al., 2024). There are colonial legacies in the global health realm, and recent initiatives to bring awareness to the unjust system have emerged to support equitable changes in the health sector, including in the WASH field (Lue et al., 2023). For example, vulnerable populations, like individuals with disabilities, may encounter more barriers, like limited physical accessibility, to accessing WASH services, especially given that many facilities are not accommodating (Sudhiastiningsih et al., 2024). Climate change may further exacerbate these barriers.

Additionally, there is overwhelming evidence to support a connection between WASH and gender, specifically the significant negative consequences faced by women and girls (MacArthur et al., 2020). A path to gender equality in these areas could be through household WASH practices, as women and children are primarily responsible for WASH activities in the home (Carrard et al., 2022). Another path is to address gender inequality within the healthcare system. Women patients in healthcare facilities are at a greater disadvantage for healthcare-associated infections than their male counterparts, as there is often inadequate water or sanitation in maternity wards (World Health Organization, 2023). Unsanitary conditions in delivery settings, coupled with the inability to wash after birth, further increases this risk. Additionally, maternity wards do not often have private or safe bathing and sanitation facilities, which contributes to increased risk of disease as well as issues of safety and dignity (World Health

Organization, 2023). The sector also recognizes that many activities associated with WASH in certain countries are often gendered, like water collection, cooking, cleaning, etc., and realizes solutions need to be cognizant of this in implementing solutions (MacArthur et al., 2020). However, in recent years, researchers have attempted to acknowledge the needs of each gender and bridge the gap through empowerment, participation, and decision-making (MacArthur et al., 2020). In addition to inadequate conditions, there are also power dynamics among female healthcare workers. Approximately 70% of healthcare workers are female, yet most leadership roles are held by men (World Health Organization, 2023). This discrepancy limits women's ability to make or be included in decision-making. Because of previous historical imbalance and inequity among vulnerable populations, considerations should be incorporated in monitoring gender equality, disability, and social inclusion in future WASH interventions (Macura et al., 2023). Ensuring individuals from marginalized populations are present for planning and decision-making guarantees equitable access to all healthcare services. Additionally, although possibly expensive, monitoring and surveillance efforts should be integrated to ensure compliance in this field, such as a checklist of policy and program analysis like in the World Health Organization's (2023) Toolkit on Mainstreaming of Gender Equality, Disability, and Social Inclusion (GEDSI) in WASH in healthcare facilities. Initiatives of this scale will likely include more than healthcare workers or individuals in the WASH sector.

The approach to improving WASH in healthcare facilities will require multidisciplinary collaborations. A prominent criticism of current practices is that they are implemented by non-health sector actors, which results in underperformance (Bartram et al., 2010). In some areas, national policies for water access may be met but do not meet the World Health Organization's guidelines (Huttinger et al., 2017). Therefore, advocating across sectors and organizations for

improvements in current policies, standards, and financing should provide the health sector with the means to genuinely improve WASH conditions. However, as stated, an approach at this scale will require leadership and commitment at the executive level.

Methods of Adult Learning

Healthcare professionals have continually been encouraged to update their knowledge and maintain clinical competence, especially given the rapidly changing field of medicine, with technological advancements to meet new standards (Griscti & Jacono, 2006). That said, pressure to engage in continuing education (CE) programs and training is ever-increasing in the healthcare sector. However, the problem with this is that CE programs are expensive, and it is still being determined whether these programs may genuinely improve patient outcomes (Griscti & Jacono, 2006).

The concept of andragogy, or adult education and learning, is still an ambiguous topic in academia that requires flushing out and clarification; however, it is the backbone of continuing education programs (Loeng, 2018). An important distinction is that andragogy should not be confused with pedagogy, which refers to teaching children and encompasses different views and principles of teaching than andragogy (Akintolu & Letseka, 2021). The term “andragogy” is often associated with Malcolm Knowles, who created pedagogical principles in the 1970s under the term; however, European andragogy originated before this. Therefore, clarification is required when speaking of the topic to differentiate between these schools of thought. The European perspective is considered more comprehensive than the American one. While the American perspective consists of two conceptual foundations, each with numerous components, the European perspective only consists of five varying schools of thought (Henschke, 2008). The

American concept is “comprised of two conceptual foundations: the learning theory and the design theory,” each with sub-components aimed at understanding the motivations of adult learning and the learner's need for active involvement to retain the material (Henschke, 2008, p.145). Knowles also successfully tested and refined the theory in numerous settings, including corporate, workplace, healthcare, etc.

However, the American perspective of andragogy initially experienced harsh criticism, primarily from Europe and Australia (Henschke, 2008). Initially, Knowles’ definition of andragogy lacked consistency, leading to confusion regarding its characterization as a teaching model for children, shifting focus from adults, or as ‘the science and art of helping adults learn,’ simplifying it to a set formula for adult teaching methodologies when it is far more complicated and encompassing (Henschke, 2008). Additionally, other accusations suggested a critique of the current state of adult education, highlighting concerns about its alignment with democratic values, foundational stability, relationship with power institutions, and responsiveness to the needs of marginalized populations (Henschke, 2008). Addressing these criticisms would likely involve reevaluating and reshaping adult education practices to better prioritize social justice, democratic engagement, and equitable access to educational opportunities. Despite these critiques, the American version of andragogy thrives in adult education, likely due to a lack of convincing empirical refutations on the subject; however, it is thought that the introduction of South African andragogic may aid in marrying the dueling European and American perspectives of andragogy (Henschke, 2008).

Continuing Education Approaches

Instead of employing an education approach centered around the teacher, adult learning should revolve around the students, emphasizing the importance of self-directed learning and empowering them to take charge of their learning journey. The South African government has made significant strides in this area since gaining independence in 1994 (Akintolu & Letseka, 2021). However, many adult teachers still apply pedagogical approaches when teaching adults instead of implementing interactive involvement between facilitators and the learner (Akintolu & Letseka, 2021). The instructional approach frequently adopted in adult CE courses tends to be didactic rather than fostering autonomy in directing learning; therefore, enhancing the effectiveness of CE programs requires learners to take a more active role in the learning process (Griscti, 2006). The approach should include an educational platform that caters to adult learners' needs by integrating aspects of their personal and professional lives (Akintolu & Letseka, 2021). Ideally, the learning environment would be more of a collaborative, informal space between facilitator and learner, where both parties could share previous experiences and mutually engage in the material (Akintolu & Letseka, 2021).

Furthermore, as mentioned, andragogy is learner-centered rather than teacher-centered, meaning that adult learners are usually more intrinsically motivated to learn, so evaluation should also be achieved by fulfilling the learner's needs, which introduces a level of individualization in these programs. Recent research on using technology to personalize a child’s learning experience may be applicable to adults in the future, despite adults' diverse motivations, level of access, time availability, sources of motivation, and resources, all of which influence the design of a personalized experience in contrast to children (Wozniak, 2020). In this regard, more empirical research needs to be conducted to recommend practices that may encompass a more

personalized approach to adult learning. The use of a short course or workshop setting may be a means to offer a beneficial learning environment conducive to the two-way nature of adult learning.

Methodology for Workshops and Seminars

Workshops and seminars are frequently utilized in higher education as they are flexible and encourage active learning. These qualities serve as critical principles in adult teaching and allow educators to use various teaching methods; however, facilitators often lack sufficient training to develop and deliver this teaching methodology (Steinert, 2010; Zenni & Turner, 2021). In fact, many workshops do not exhibit typical workshop dynamics. Participants often remain quiet and passively observe while a facilitator delivers a lecture-like presentation to the group, with minimal questions and discussion (Steinert, 1992). Therefore, these programs should emphasize active participation and highlight problem-solving activities, which are often lacking (Steinert, 1992). Although workshops are popular for teaching adults, few sources offer directions on adequately planning and executing this format for adult learners.

In determining whether a workshop or seminar is the best teaching modality for a given topic and audience, the desired faculty development approach and context for learning need to be identified accurately (Steinert, 2010). Workshops and seminars fall into a more formal faculty development approach and a group context for learning, similar to fellowships and other longitudinal programs. In contrast, activities that would be more individual and informal would be reflecting on experiences and learning by observing or doing (Steinert, 2010). Thus, before choosing this modality, the facilitator must assess their objectives, goals, and audience to ensure that a workshop or seminar is a sufficient environment for teaching their material.

In a recent study conducted by Zenni and Turner (2021), the design of effective workshops encompasses three fundamental aspects: preworkshop planning, the workshop, and evaluating whether learning has occurred. In the planning stage, essential steps for the facilitator are to define the objectives and the audience and to determine the appropriate teaching method for the proposed goal of the workshop (Steinert, 1992). It is imperative to confirm that the sessions' goals align with the workshop format and, from there, ensure that the chosen teaching modality meets these targets (Steinert, 1992). The seminar's content and subsequent format are influenced by the subject matter and the audience's experience with the subject matter (Steinert, 2010). At this time, the facilitator must also ensure that the topics in the workshop or seminar are cohesive, as the workshop needs to be viewed as a unified whole rather than parts (Zenni & Turner, 2021).

As previously stated, reflection can play a significant role in workshops and seminars. Reflection often serves as a method to connect the learned content to the participant’s working context, as a widespread criticism regarding short courses and workshops is that they are detached from their context, likely located physically elsewhere, and may not directly relate to the participant's circumstances (Zenni & Turner, 2021). Therefore, reflection is often incorporated into courses to allow students to process what they have learned and draw connections between previous experiences to cement these ideas further. Some examples of improving reflection in workshops include taking breaks that are different from natural breaks in the course and keeping a journal (Zenni & Turner, 2021). However, despite a facilitator’s best effort to encourage reflection, ensuring that a student engages in the process during the allotted time is sometimes tricky. Therefore, more supportive evidence is required in higher education regarding reflective learning techniques and their impact.

Utilizing adult learning principles is imperative when creating a workshop or seminar (Steinert, 1992). As previously stated, adult learners drastically differ from children in their motivations, availability, experience, etc., so it is essential to understand the audience's background and how participants may serve as “co-learners” rather than only in a student role in a workshop setting (Wozniak, 2020). In this regard, facilitators are encouraged to acquire participant feedback throughout the sessions to gauge the effectiveness of the teaching and provide the opportunity to improve (Steinert, 1992).

Additionally, facilitators may attempt to encourage communication between participants, increasing the course's impact (Zenni & Turner, 2021). Some activities that may encourage communication among participants include using a single table at mealtimes so everyone can sit together and converse and miscellaneous activities like icebreakers (Zenni & Turner, 2021). This is useful in garnering trust while learning about peers, as they are not often workplace colleagues in this setting.

Improving WASH conditions in healthcare facilities is foundational to maintaining health standards and disease prevention; however, achieving this improvement requires equipping health professionals with knowledge that goes beyond theoretical understanding to practical implementation. Workshops that employ principles of andragogy can aid in this endeavor. Through hands-on activities and sharing experiences, workshops can bridge the gap between theory and practice, allowing participants to grasp nuances of information, like inadequate WASH conditions in healthcare facilities contributing to increased risk of disease. Through interactive sessions, collaborative problem-solving, and skill-building exercises, workshops serve as a vital platform for professionals to deepen their understanding of WASH in healthcare facilities and develop competencies needed to effectively integrate these practices. In essence,

workshops serve as the conduit that transforms knowledge into action, empowering professionals to improve WASH standards in healthcare facilities.

Methods

Project Background

This special studies project serves as an extension of prior work conducted by principal investigators (PIs) and trainers from the Center for Global Safe Water, Sanitation, and Hygiene at Emory University. Previous educational initiatives conducted by the PIs sought to equip WASH and health practitioners with knowledge on the importance, severity, and implications of poor WASH conditions in healthcare facilities globally and to provide a foundation for programming in WASH in healthcare facilities. This special studies student joined the team following a meeting with the PIs, where the student agreed to begin working on an upcoming intensive short course/workshop for emerging WASH and health leaders that builds upon previous work of the PIs.

Intended Participants

The upcoming intensive short course/workshop, aptly named Advancing Action on WASH in HCF for Emerging Leaders, is scheduled to take place in Kampala, Uganda, within the next 12 months. This course will serve as a multisectoral opportunity to address water, sanitation, and hygiene issues in healthcare facilities on a global scale. Participants of the course are targeted professionals from the WASH sector and beyond, and they are selected to enhance the multisectoral and cross-disciplinary nature of the course.

Preliminary Curriculum

The precursor to the in-person workshop is an online, four-week, self-paced course called the Fundamentals of WASH in Healthcare Facilities. This course prepares participants to understand the essential principles and practices of WASH in healthcare facilities, which the in-person, intensive short course/workshop seeks to build upon. The objectives of the online Fundamentals course are to:

1. Define and explain the various elements of WASH services in healthcare facilities and the underlying principles that link WASH to safe healthcare delivery
2. Understand the fundamentals of health systems strengthening, as well as the key health topics that require basic WASH services in healthcare facilities
3. Recognize the necessity of cross-sectoral input, collaboration, and leadership in addressing WASH in healthcare facilities
4. Be familiar with the data sources, assessment tools, and strategies needed to analyze the status of WASH policies, guidelines, and services
5. Appreciate the lessons learned to date within the WASH in the healthcare facilities sector

To accomplish these overarching goals, there are specific session objectives within each module, with topics covering the linkage between WASH in healthcare facilities and health outcomes to leadership of the health sector. Upon completion of each module, participants complete a quiz to test their knowledge, and upon completing the entire online portion, they take a culminating final certification test that provides students with a certification of completion from the Center for Global Safe WASH.

Proposed Workshop Schedule

In terms of structure, during the first half of the day, participants in the intensive workshop will have the opportunity to listen to didactic lectures followed by practical workshops, master classes, and sessions focused on leadership, which will allow for skills application from the lectures. Each day follows roughly the same schedule of a short recap of the previous day's material in the morning, followed by an hour-long didactic lecture referred to as a Spotlight, with topics including gender equality, disability, and social inclusion (GEDSI), monitoring and evaluation (M&E), resiliency, and budgeting and finance for WASH in healthcare facilities. Following a short break after the lecture sessions, participants will experience an hour-long master class session, which will seek to apply the fundamentals of WASH in healthcare facilities to programming efforts. Topics for the master class sessions include system strengthening, applied research, implementation, and advocacy. Another hour-long session on leadership skills building follows this. These sessions focus on building skills needed to enhance leadership in the sector, including responding to change, strategic planning, and advocacy.

During the second half of the day, participants can apply the new content from the morning sessions in practical workshops and final project preparations. The practical workshops aim to offer application-based learning through case studies or small group work on several topics, such as root cause analysis. In addition to this, participants will utilize the sum of their new knowledge to develop and present a pitch to decision-makers to prioritize WASH in healthcare facilities, which will be given on the final day of the workshop. In summary, the workshop is structured to equip participants with the necessary information and skills to apply later in the day and their final projects.

Materials and Source Information

To complete this special study project and generate reliable deliverables, the Emory University Libraries provided many resources, as did a previous literature review on the topic of WASH in healthcare facilities obtained from one of the PIs. In addition, articles relating to GEDSI, resiliency, finance, and budgeting were found via online databases, webinars, academic journals, and professional publications. An Excel spreadsheet containing resources and how to utilize them best was created, as displayed below (Table 1). The purpose of the research was to inform the design and drafting of the main deliverables for this project: three didactic lessons for GEDSI, resiliency, finance and budgeting.

Table 1. Excerpt of Excel Spreadsheet of Resources

First Author	Title	Summary of Study/ Findings	Project Area
Cronk	Water, sanitation and hygiene in health care facilities: Status in low- and middle- income countries and way forward	Discusses the state of WASH in HCF across LMIC and highlights significant deficiencies in WASH infrastructure, which can lead to compromised patient safety and increase risk of infections. This report also emphasizes the urgent need for improved WASH services in HCF and proposes possible strategies to address the issues.	Finance and Budget, Resiliency
Henschke	Comparing the American and European Perspectives on the International Concept of Andragogy and the Implications for the Development of Adult Education	Highlights the differences between American and European perspectives on andragogy by illustrating differences in terminology, underlying assumptions, and educational approaches. Suggests there are common elements but differ significantly in concepts and applications.	GEDSI, Finance and Budget, Resiliency
Lue	Principles for increasing equity in WASH research: Understanding barriers faced by LMIC WASH researchers	Identifies challenges faced by LMIC WASH researchers, like limited access to resources, funding constraints etc., and by recognizing these barriers, Lue proposes approaches to fostering more inclusive WASH practices.	GEDSI, Finance

Creating Deliverables

After collecting ample information on GEDSI, resiliency, and finance and budgeting, didactic lecture content was created using Microsoft PowerPoint. The information included in these deliverables was drawn from previous research conducted by the PIs in addition to external sources. The previous research materials were provided to the special studies student via a Google Drive folder and Canvas page to access as necessary. The special study student also enrolled in the Fundamentals of WASH in Healthcare Facilities to understand the background with which participants would enter the course.

Utilizing the aforementioned resources, the special study student created a draft of each lecture based on pertinent information obtained from the literature. While researching, possible learning objectives were identified in accordance with the overarching goals of the workshop. Following this, a section on each session objective was created in the PowerPoint until roughly an hour-long presentation was created with pertinent information, activities, and multimedia about each topic concerning WASH in healthcare facilities.

Feedback and Revision Process

With the resulting draft, the special study student would meet with the PIs weekly to obtain verbal feedback on changes that should be made to adhere to the curriculum and main objectives of the workshop. After incorporating the feedback from the PIs, another draft was submitted for additional feedback to include in the final version. This process was repeated three times, one for each deliverable, and the feedback loop continued until all parties agreed upon the completion and satisfactory work of the deliverables.

IRB Considerations

Approval by the Institutional Review Board for this special studies project was unnecessary, as it did not include human participant research.

Results

This section of the special studies project shifts from the research and inquiry process to describing the tangible outcomes encapsulated in the planned deliverables: three sets of PowerPoint presentations that will be used in an upcoming workshop on WASH in healthcare facilities. This collection of informative and interactive workshop sessions has been created by meticulously exploring multiple sources of data and published literature. Through strategic integration of text, graphics, and multimedia elements, the PowerPoint presentations cater to diverse audiences and are designed to foster enhanced comprehension and retention of information. Each presentation lasts approximately one hour, with time for questions following the conclusion of the presentation. Session topics include 1) gender equality, disability, and social inclusion (GEDSI), 2) healthcare facility resiliency, and 3) financing of WASH in healthcare facilities. While each session has specific objectives, the overall goal of the sessions is to provide participants with the information needed to work toward programming and advocacy in the field of WASH in healthcare facilities.

The subsequent Results section will provide detailed annotations and explanations accompanying each PowerPoint deliverable. These annotations clarify the underlying rationale, key insights, and significance of the content provided in the PowerPoints.

Gender Equality, Disability, and Social Inclusion Deliverable

The presentation synthesizes key insights and data concerning GEDSI into an engaging visual narrative to promote awareness and understanding of aspects of GEDSI in the context of WASH in healthcare facilities. This slide deck contains approximately 35 slides, with three 10-minute-long, large-group discussions preceded by a question prompt, as seen in Table 2. A short

three-minute video is also included that features public latrines in Kathmandu, Nepal and the lack of accessibility for disabled persons. The content of the video aligns well with the session objectives and also serves as an audiovisual break from the more textual content of the presentation. The objectives of this session were to:

- Understand gender bias, inequity, and exclusion in healthcare facility contexts
- Analyze the intersectionality of different identities (i.e., gender, race, ability, ethnicity, age) and how they impact experiences of inequality and exclusion for WASH in HCF
- Understand the issues that perpetuate barriers to inclusion and explore best practices for promoting gender equality, diversity, and social inclusion in WASH in healthcare facilities

The PowerPoint content was presented in the same order as the objectives to help learners stay on track and recall the learning goals. For example, participants are taught about the current context of GEDSI in healthcare facilities globally before shifting to challenges with gender, disability, and social inclusion. The final part of the session focuses on sustainable approaches to addressing potential GEDSI barriers.

Table 2: Discussion Questions in GEDSI Deliverable

Question Prompt	Time	Purpose of Question
What factors may impact a person's access to WASH in HCF?	10 minutes	Encourage participants to start thinking about barriers that could impact someone's ability to reach WASH facilities
What challenges do females in each of these groups face in HCF?	10 minutes	Understand challenges faced by marginalized groups
What are some possible barriers to inclusion in accessing WASH in HCF?	10 minutes	Identify environmental/ physical, social, or institutional impacts on marginalized group's ability to access WASH services

Selected Slides from GEDSI Deliverable

As stated, the GEDSI presentation commences with a section dedicated to examining the current status of gender equality, diversity, and social inclusion within healthcare facilities in alignment with the first objective of this workshop. The slide shown in Figure 1 illustrates the content that was used to establish a framework for the rest of the presentation in that it underlines the challenges faced by socially excluded groups and their lack of representation in WASH-related decision-making and processes. This kind of background information enables participants to begin to contextualize the current landscape of GEDSI in healthcare facilities and to start to think about possible issues and areas of concern that will be prioritized for deeper exploration and analysis in subsequent slides.

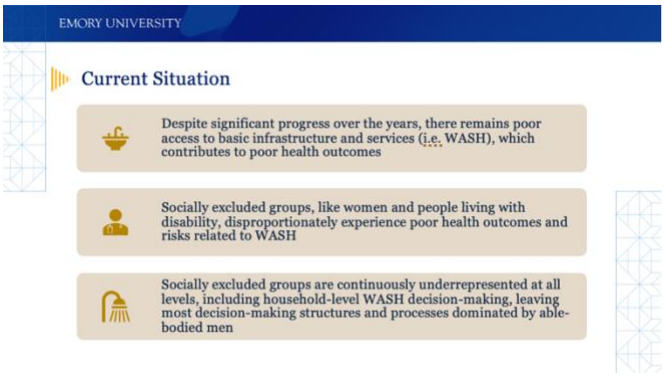

Figure 1. Slide describing Current Situation on GEDSI in HCF

An example of a group discussion in this section is in the 'social inclusion' section, where participants are asked, "What are some possible barriers to inclusion in accessing WASH in healthcare facilities?" Participants are asked to call out possibilities that the presenter will use to fill in the table shown in the slide (Figure 2). The purpose of this activity is twofold. First, filling in the table requires the participants to recall the knowledge shared in the previous section and then apply this knowledge to the healthcare facility context. Second, the interactive nature of the

discussion allows adult learners to integrate their own experiences with the new knowledge that they are learning (especially those who have experiences in healthcare facilities).

Figure 2. Barriers to Inclusion Discussion Prompt

Another learning technique used in this presentation involved the use of a three-minute video about accessibility in healthcare settings. As partially seen in Figure 3, the video depicts a disabled person attempting to access sanitation facilities in a healthcare facility but cannot, in part due to narrow passageways and the height of the toilets, urinals, and handwashing stations. The purpose of the video is to provide a real-life example of the inaccessibility of WASH facilities in healthcare facilities and to further stress how incorporating the opinions of marginalized populations can help create more inclusive WASH infrastructure and services accessible to all.

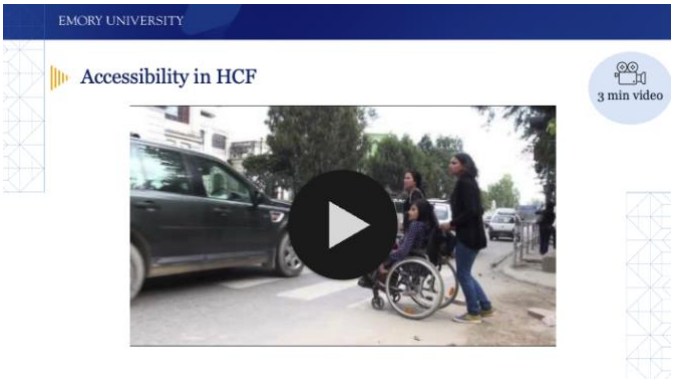

Figure 3. Video of Disabled Person Attempting to Access Sanitation Facilities in Nepal

After this session, participants should understand that there is no “one-size-fits-all” solution for the implementation of WASH in HCF programming that is sensitive to GEDSI. Instead, participants should understand that conversations about inclusion must begin early in the planning stages of WASH programs and projects and should also include experts and champions or representatives of marginalized groups. Overall, the content from this presentation should educate, inspire, and empower participants to become agents of change in creating more equitable, diverse, and inclusive solutions within the field of WASH in healthcare facilities.

Resiliency Deliverable

This presentation consolidates essential findings and information regarding resiliency within the healthcare system, specifically in response to climate change and public health emergencies. The slide deck contains approximately 46 slides, with large group discussion prompts, short videos, and case studies to break up text-heavy information and encourage active learning from participants. The objectives of the session were to:

- Define resilience in the context of WASH in healthcare facilities, understanding its importance in maintaining operations during a crisis
- Identify key challenges and vulnerabilities in WASH infrastructure and systems within healthcare facilities
- Develop strategies for assessing and prioritizing risk to WASH infrastructure and services in the healthcare system
- Examine best practices illustrating successful approaches to enhancing resilience in WASH within healthcare facilities

The slides follow the objectives, beginning with understanding resiliency in the health system, followed by climate-resilient WASH in healthcare facilities, public health emergencies, and sustainable approaches to enhancing the resiliency of the whole system. This session aims to highlight vulnerabilities within the healthcare system, which could be exacerbated following a crisis, impacting the delivery of healthcare services.

Table 3: Discussion Questions in Resiliency Deliverable

Question Prompt	Time	Purpose of Question
Why is resiliency in the health system necessary?	10 minutes	Highlight the role of resilience and reflect on the potential benefits and implications
What are some possible climate-related risks in HCF?	10 minutes	Discuss the impact of climate on healthcare facilities

Selected Slides from Resiliency Deliverable

The Resiliency presentation begins with a general section defining health system resiliency. This section includes a short two-minute video and a large group discussion question addressing the importance of health system resiliency (Session Objective 1). The session also has various visual aids, e.g., in Figure 4, which complement verbal and text information and cement abstract ideas, like the disruption cycle. Visual aids also promote active engagement and retention of information, especially in the event of language differences and diverse backgrounds and experiences, as visual aids typically transcend language barriers and ultimately foster a deeper understanding of the subject matter.

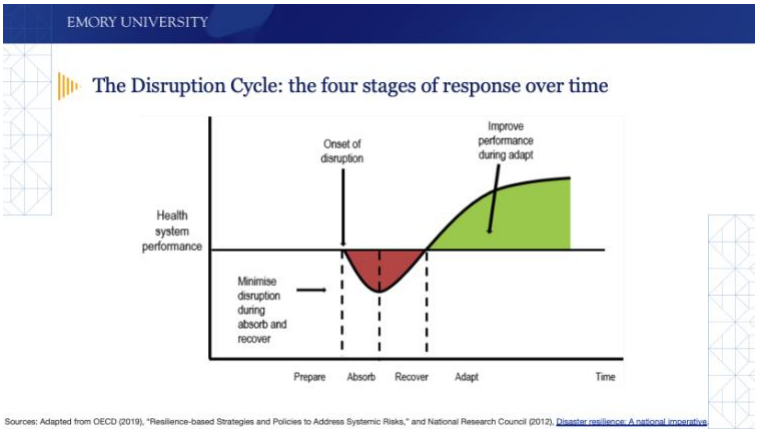

Figure 4. Example of a Visual Aid in the Resiliency Deliverable

Another method of adult teaching employed in the Resiliency Deliverable was the addition of two case studies. Case studies are powerful tools for teaching adults by presenting real-life situations or scenarios relevant to their experiences. Additionally, case studies allow participants to apply theoretical knowledge to real-world contexts, fostering deeper understanding and critical thinking skills. Figure 5 depicts an example of the beginning of the climate-related crisis case study about cyclones in Mozambique in 2019. The case study walks through the impact of the cyclones, provides a video of the damage, witness testimonies to the destruction, and provides evidence of the climate change that prompted this natural disaster. In addition, the case study highlights the impact of natural disasters on unprepared health systems and underscores the necessity of sustainable approaches.

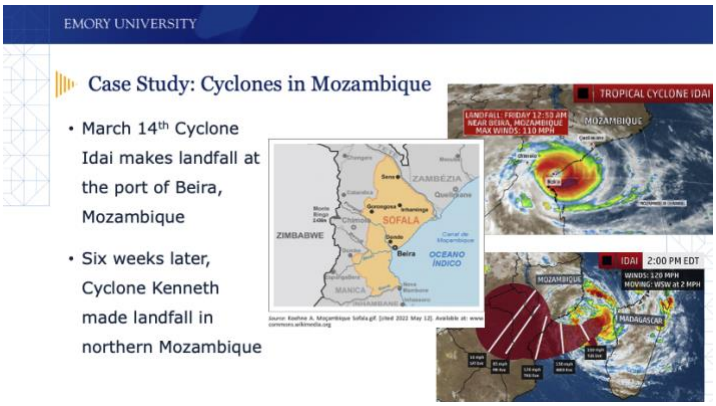

Figure 5. Case Study of Cyclones in Mozambique in 2019

Following this session, participants should understand that WASH services are the foundation of resilience in the health system and recognize that integrating resilience is not straightforward. Participants should understand that resilience must be considered from the outset of planning, but it also demands flexibility and adaptability to ensure efficient responses to evolving situations.

Finance and Budget Deliverable

The finance and budget presentation gathers crucial findings and information concerning the financial aspects and budget allocation strategies for WASH services within the healthcare system. This slide deck contains approximately 32 slides with videos, graphs, activities, and a walk-through of a published systematic review by Anderson et al. (2021). This session aims to highlight the financial burden resulting from inadequate WASH services and to provide participants with financial literacy regarding the costing and budgeting of WASH services in the healthcare system. To achieve this, the objectives of the session were to:

- Analyze the financial risks associated with inadequate WASH services in healthcare facilities, such as increased healthcare-associated infections
- Develop skills in budget planning and forecasting tailored to the unique requirements of WASH in healthcare settings
- Explore communication and advocacy skills to effectively convey the importance of investing in WASH in HCF infrastructure and services

The slides followed the flow of the objectives, beginning with the risks associated with inadequate WASH services in healthcare facilities, which illustrates the financial burden of subpar WASH services. Then, moving to the estimated cost of achieving basic WASH in

healthcare facilities to the disaggregation of costs of WASH in HCF, according to Anderson et al. (2021), a systematic review that discusses the current issues with cost variances and the importance of accurate cost reporting for WASH services in HCF. The final section of the session assesses current budget and finance practices, as well as sustainable approaches.

Selected Slides for Finance and Budget Deliverable

An important portion of the Finance and Budget Deliverable is the walkthrough of the systematic review of the costs of establishing and maintaining environmental health services in healthcare facilities in low- and middle-income countries (Anderson et al., 2021). The review provides a structured approach to understanding the intricate financial mechanisms of the healthcare industry (Figure 6). The review also provides examples of disaggregated water, sanitation, hygiene, and healthcare waste management costs in low- and middle-income countries (LMIC), highlighting the variation between facilities and the impact of poor cost reporting.

Incorporating this systematic review provided participants with a summary of a large body of existing research about real-life healthcare costing activities. By sharing this information, participants could think critically about their experience and background knowledge on costing and budgeting to bridge the gap to the new information regarding WASH in HCF. Moreover, this activity encourages participant engagement by promoting critical thinking and reflection on how the new information aligns with or challenges their existing beliefs.

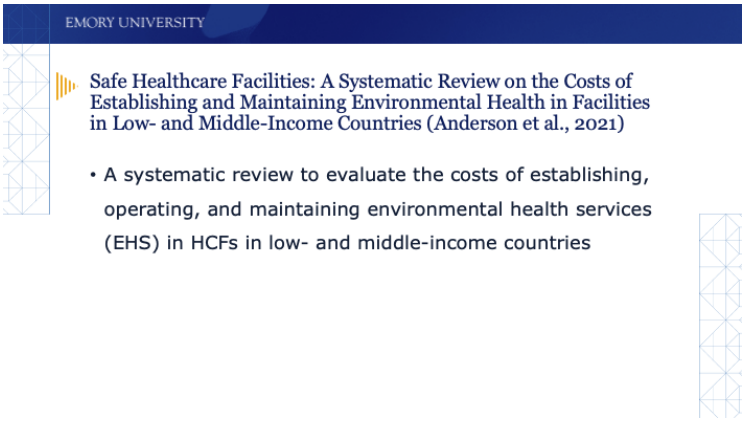

Figure 6. First Slide of the Walkthrough of Anderson et al. (2021) Review

Following the systematic review discussion, participants are asked to engage in pair discussions to create a "pitch" to a Ministry of Health stakeholder (Figure 7). During this ten-minute exercise, participants are asked to role-play as administrators in a local hospital system who inform their neighbors who work at the Ministry of Health of the problems that inadequate WASH services pose to the healthcare system. The "pitch" includes them extending this conversation to ask for financial resources. This activity aims to engage participants in a smaller setting and encourage peer learning, as the participants will receive peer feedback and perspectives about their pitch. Additionally, this activity allows participants to hone verbal communication skills while applying new content to a practical scenario.

Figure 7. Create a Pitch to a Ministry of Health Stakeholder Activity

Discussion

Summary of the Special Studies Project

The purpose of this special studies project was to undertake a thorough review of the literature on adult teaching methods and the current status of WASH in healthcare facilities to inform the design and preparation of three lecture sessions for an intensive workshop for selected professionals and leaders seeking continuing education in the field of WASH in healthcare facilities. Providing these professionals with knowledge and training on gender equality, disability, and social inclusion, health facility resilience, and budgeting and financing WASH in healthcare facilities will position them to be more effective in creating change and making an impact on WASH in healthcare facilities in their respective organizations and regions of operation. The overall workshop is designed to raise awareness and enhance knowledge about the importance of WASH practices in healthcare settings and the inadequacy of current infrastructure and systems. Through interactive sessions consisting of didactic lectures, practical demonstrations, and group activities, participants are equipped with essential skills to improve WASH infrastructure, promote hygiene behaviors, and incorporate more inclusive approaches to existing systems. The short-course workshop methodology emphasizes participatory learning approaches and engages diverse participants, including healthcare workers, policymakers, and other multidisciplinary representatives. The workshop intends to extend the impact beyond the immediate learning environment and influence WASH practices within healthcare facilities through a multidisciplinary approach.

Each lecture and deliverable were designed to engage and inform participants on specific topics, like GEDSI, finance, and resiliency for WASH in healthcare facilities, utilizing adult teaching principles to achieve successful learning outcomes. The role of the participants was

crucial in this process, as their active involvement in the interactive sessions is key to enhancing their retention and understanding of the material. From conception to application, principles of andragogy were applied to the deliverables, considering that many of the participants in the course are working adults who are continuing their education in a relatively new field. Each deliverable was also created with the understanding that participants have a background in WASH (in communities), enabling them to engage with the course material slightly differently, i.e., applying their current WASH knowledge and experience to new complex issues with a healthcare facility. In this process, learning objectives for each session topic were conceived based on a literature review of current issues in WASH in healthcare facilities, and the subsequent lecture content was based on information gathered from literature and multiple other sources (Table 1). Creating each PowerPoint deliverable was a time-intensive process filled with several feedback sessions and reviews with the project PIs to achieve the goal of producing high-quality, relevant content for the intended audience.

Implications and Recommendations

The future success of this workshop, defined by positive change in the sector, is not just a possibility but a necessity, contingent upon the recognition and prioritization of WASH initiatives within healthcare policies and regulations. WASH is the foundation of resiliency in healthcare systems, and its importance cannot be overstated. If recognized and acted upon, the knowledge gained from the workshop has the promise of assisting leaders in building a more resilient and inclusive healthcare system. Also, the significance of interdisciplinary collaboration in addressing the complex challenges within the sector and advancing knowledge across fields cannot be discounted. By embracing interdisciplinary approaches, we can pave the way for more

holistic, effective, and sustainable solutions that will benefit healthcare systems, communities, and individuals alike.

Each deliverable has significant implications and offers recommendations for future actions. For example, in the GEDSI session, addressing inclusivity in WASH interventions is important to ensure equitable access and participation, especially for marginalized populations who are excluded based on gender, ability, ethnicity, race, and more. This session emphasizes the need to recognize and accommodate the diverse needs of all individuals regarding WASH in healthcare facilities infrastructure and services. By integrating these perspectives, healthcare facilities can create more inclusive environments that promote dignity, safety, and empowerment for all, leading to improved health outcomes and increased quality of care. To achieve this, healthcare facilities would need to integrate GEDSI considerations into policies and guidelines, which involve gender-sensitive assessments, consulting diverse stakeholders, and adapting WASH interventions to meet the specific needs of marginalized groups. Moreover, in the development of the deliverables, more content surrounding other marginalized groups should be added. In this project, the focus of the session was on gender and disabled persons; however, there is space to highlight the experiences of other populations that face inequality in the healthcare system, e.g., inequality based on race, ethnicity, income, and displacement status.

The resiliency lecture underscores the importance of building resilient facilities capable of withstanding and recovering from various events, like natural disasters, climate change, and public health emergencies. Resilient facilities can mitigate risks and minimize disruptions to healthcare services, safeguarding the health of patients and staff alike. Therefore, investing in resilience-building measures is essential to the continuity and sustainability of WASH services in healthcare facilities. To aid in achieving this, future iterations of the workshop could present

technologies that can withstand disruption by incorporating climate-resilient design principles. Additionally, including another interactive activity that walks through a healthcare facility following a disaster to show participants examples of the next steps to take and how to build back better could greatly enhance the resiliency deliverable. Lastly, the case study for the resiliency session could have been of a previous event that impacted a healthcare facility, and participants could use their new knowledge to decide whether the facility responded appropriately or what they would have changed. This would engage participants in discussion and allow for the application of the new material.

The finance portion of the workshop is critical in determining the success and sustainability of WASH initiatives in healthcare facilities. The content provided in the lecture highlighted the need for innovative financing mechanisms and multisectoral collaborations with stakeholders and emphasized the burden inadequate WASH services pose on the health system. To achieve this, healthcare facilities must explore diverse financing options to support WASH infrastructure, which may involve leveraging public funds or engaging private partners. Additionally, capacity building on financial management and resource mobilization should be provided to administrators and other decision-makers to enhance their ability to plan, budget, and allocate resources appropriately. Moreover, advocacy efforts are required to raise awareness among other policymakers, donors, and the public about investing in WASH in healthcare facilities. Furthermore, in future iterations of the workshop, once more material about finance and budget exists in the WASH sector, more interactive teaching methods should be integrated into the deliverable and the case study could be exchanged for a budgeting activity to engage participants differently (vs. the exceptionally text heavy lecture that was created).

Future Learning and Research Opportunities

Future learning and research opportunities from this special study might focus on evaluating the long-term impact of WASH interventions on specific healthcare outcomes (such as improved maternal and neonatal health or a reduction in healthcare-associated infections) and policy change (including regulatory standards and guidelines and monitoring and evaluation programs), specifically exploring interventions like short-courses on healthcare worker practices and interdisciplinary collaborations. It is interesting whether information learned at short-term workshops is applied after course completion. In future workshop iterations, before and after knowledge surveys or assessments could be implemented to gauge understanding of concepts addressed in the course before and after completion. Furthermore, several gaps were identified in the literature surrounding the lack of empirical evidence that produced the costing data in finance reporting. In the costing data, it is evident there is non-standardized reporting of costs, which limits the ability to compare measures of costs meaningfully. Currently, multiple environmental health services are reported in a single line item without further specification, and differences in cost categories between countries, contexts, etc., hinder comparison (Anderson et al., 2021). Therefore, further research is required to address the gap in cost reporting and to disaggregate reported data further to understand the burden of inadequate WASH services on healthcare facilities fully and to accurately represent how much is needed in investments to approach the problem.

Overall, this workshop will serve as a catalyst for improving WASH practices in healthcare facilities, demonstrating the potential for transformative change through targeted education and capacity building. By addressing challenges to the system and leveraging opportunities for collaboration, policymakers and practitioners alike can work towards ensuring

universal access to safe and sustainable WASH services in healthcare settings, ultimately improving outcomes and promoting dignity and well-being.

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