

Exploring Wellness Dimensions of International Women of Color in STEM Graduate Education

Motahareh Darvishpour Ahandani, Arizona State University, Polytechnic Campus

Motahareh Darvishpour Ahandani is currently pursuing her Ph.D. in Engineering Education Systems and Design at Arizona State University. Serving as a research assistant, she brings with her six years of industry experience as a woman engineer. Her research interests focus on the mental health and well-being of international engineering graduate students, with a particular emphasis on the experiences of international women of color. Darvishpour Ahandani is deeply committed to improving the well-being of underrepresented groups in STEM, a mission with which she personally identifies.

Dr. Jennifer M Bekki, Arizona State University

Jennifer M. Bekki is a Professor and Associate Dean of Inclusive Excellence in The Fulton Schools of Engineering. Her research looks at the impact of support on the wellbeing and success graduate students and faculty in STEM

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Introduction

There has been a notable increase in research focusing on the mental health of graduate students in Science, Technology, Engineering, and Mathematics (STEM) in the past couple of years, especially after COVID-19 (Ahandani & Bekki, 2024). Literature shows that mental health problems such as suicidal thoughts, stress, depression, and anxiety are common among graduate students, and due to the chilly STEM climate, those pursuing these majors are more vulnerable to mental health problems (Rhodes et al., 2024; Bork & Mondisa, 2022). According to reports from the Educational Testing Service [ETS], half of the STEM graduate students are international, and most of them pursuing higher education in the United States choose to major in STEM, meaning that 60 percent of new students majored in mathematics and computer science (ETS, 2025). This demographic faces various hurdles that can seriously affect their social adaptation, mental health, and educational performance. Research shows that the language barrier is the most common challenge international students face, as it limits their ability to write scholarly papers, engage in conversation and networking, and access support through resources, leading to stress and isolation (Alpaslan and Yalvac, 2017). Moreover, adapting to a new system, culture, visa status, career trajectory, securing their future, and being away from home and family adds extra layers of pressure to international students' experience (Kamardeen and Sunindijo, 2018). In addition to social and cultural challenges, federal policies also have a significant effect on international students' wellness, such as limitations in scholarships and funding, visa restrictions, lack of regulation and monitoring of overworking, and low stipends (Ahandani et al., 2025). International women in doctoral programs in STEM fields face extra challenges, such as sexism, a lack of sense of belonging in a male-dominated atmosphere, and limited support from faculty and advisors, which affect their mental health and may lead them to leave their programs (Farra et al., 2025).

Despite support for international students, there are not enough studies focusing on the mental health of international graduate students in STEM, and there are no papers on international women of color in STEM (Ahandani & Bekki, 2024). To address this gap, this full paper reports findings from a qualitative study using a semi-structured interview approach to interview five international graduate women of color in STEM. To ground our exploration, we use the eight dimensions of wellness as our conceptual framework (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016; Mosley, 2023; Ahandani et al., 2025). This framework suggests that humans' overall wellness can be divided into eight dimensions of Emotional Wellness, Spiritual Wellness, Intellectual Wellness, Physical Wellness, Environmental Wellness, Financial Wellness, Occupational Wellness, and Social Wellness (Ahandani et al., 2025).

As this framework is new, and there is only a short description of it on the Substance Abuse and Mental Health Services Administration website, other papers frame it as a Blafemme Healing Framework model for only Black women (SAMHSA, 2016; Mosley, 2023). As a result, in this study, we believe that each group's experience varies from the others, and we cannot treat them as a monolith, which aligns with the action and activism pillar of ECSJ. Therefore, we examine this framework for the demographic of our focus, international women of color, and see how different aspects of their experiences play a role in their wellness. This study is a pilot

version of a larger study, so we only examine three dimensions, intellectual, physical, and environmental wellness, out of the eight dimensions. These dimensions were randomly selected due to the limited scope of the study and to avoid privileging wellness domains a priori. By centering participants' own definitions of wellness, this study offers a strengths-based, multidimensional perspective that is largely absent from existing engineering education research on international graduate students.

Research Question

How do international women of color graduate students in STEM define intellectual, physical, and environmental wellness?

Background

International students face many challenges during their journey in the United States that have roots in the social, cultural, systemic, and political atmosphere of the U.S. These challenges are even greater for graduate students because of the extra pressures of graduate school, responsibilities, and the advisor–advisee relationship (Ahandani et al., 2025; Bork & Mondisa, 2022). Findings from Baquero and colleagues show that most of the international graduate students would experience the feeling of isolation, cultural othering, and lack of structural and systemic support that affect their sense of belonging and well-being (Baquero et al., 2023). They experience higher levels of anxiety and stress, especially in the first year of their graduate journey, as they have to adapt to a new academic system, communicate with faculty members and peers, and find social groups and friends. In order to cope with these challenges and find support, they tend to seek help from communities that share similar cultural and spiritual values (Jwa & Berdanier, 2024; Rezwan et al., 2025).

Research on engineering graduate students shows a strong connection between advisor–advisee relationships and student success. If students have a good relationship with their advisor, their engineering identity will be shaped better, and they will have better performance, higher interest in science, and recognition through their advisor's networking, leading to even stronger support for international women of color, as it helps prevent them from being marginalized in STEM education environments. (Perkins et al., 2019). In contrast to a positive advisor–advisee relationship, a negative relationship can have an insidious effect on students' success, especially for international students, where power dynamics play a different role, as losing a relationship with an advisor could result in losing their funding, visa status, and facing legal immigration issues. As a result, an intensive relationship with an advisor can increase stress, anxiety, and isolation in international graduate students, leading to negative impacts on the mental health and well-being of this demographic (Sharma & McKenna, 2025).

Additionally, Lee & Rice explain the new term of “neo-racism”, where cultural differences become a tool for discrimination and isolation of international students, decreasing their sense of safety and belonging (Lee & Rice, 2007). For instance, social isolation is one of the strongest negative experiences reported by international engineering students, with things like language barriers, being silent participants, and polite friendships being the issues they pointed out. For example, while domestic students felt free and confident joking around with faculty members, international students often chose silence, remaining quiet even when joining lab group activities like eating lunch together or sitting in a lab space. They also expressed that although their domestic peers were polite and kind to them, they usually did not feel a strong

connection or friendship with them. Consequently, as time passed, international students felt less belonging and more like outsiders, which weighed heavily on their well-being, fostering loneliness, stress, and self-doubt despite their academic competence (Lee et al., 2019). There are also extra layers of challenges that may influence the well-being of international women, as they face issues such as sexism and numerical underrepresentation in STEM graduate education. Enduring gender disparity, a lack of belonging, and oppressive environments in engineering negatively impact persistence and increase psychological distress among international women, potentially leading them to leave their programs (Farra et al., 2020; Wilson & VanAntwerp, 2021).

Taken together, access to mental health resources and supports is a crucial matter for all graduate students, especially international and STEM major students. National data show that the usage of campus mental health services among U.S. college students rose significantly from 19% in 2007 to 34% in 2017, partially related to reduced stigma associated with mental health and seeking help (Lipson et al., 2019). Nonetheless, international students are significantly less inclined to utilize these programs, citing obstacles such as mental health being a stigma in their culture, language hurdles, expense, and insufficient culturally competent care. Research also shows that many international students view campus counseling services as a waste of time and ineffective, leading them to seek support from their peers, friends, and cultural communities (Afful, 2025).

To address these complexities, it is important to determine the difference between “mental health” and “Well-being” or “Wellness”. While mental health often emphasizes clinical conditions and treatment, the World Health Organization [WHO] defines well-being more broadly as a positive state determined by social, economic, and environmental conditions (WHO, 2023). Mental health addresses the positive, negative, or natural contributors to the mental state of human beings, while well-being and wellness involve social, cultural, environmental, intellectual, and most importantly, physical aspects of human beings' nature and lived experience (Gautam et al., 2024; Ahandani et al., 2025).

International women of color face unique challenges in male-dominated STEM fields, which are exacerbated by gendered and racialized barriers. Current research identifies stress, isolation, advisor–advisee power dynamics, and institutional constraints as major obstacles to student wellness. This study addresses a gap in the literature by examining intellectual, physical, and environmental wellness through the perspectives of international women of color graduate students in STEM.

Conceptual Framework

The eight dimensions of wellness were first introduced by SAMHSA, including emotional, physical, occupational, intellectual, financial, social, environmental, and spiritual dimensions. Although SAMHSA's Eight Dimensions of Wellness is not a traditional scholarly theory, it has become one of the most widely used wellness models in U.S. public health practice. Developed as a federal health promotion tool, the model has been incorporated into wellness programming across healthcare, counseling, higher education, and community health contexts (SAMHSA, 2016). Because it provides an accessible and comprehensive typology of holistic well-being, many researchers and practitioners use SAMHSA's eight domains as a baseline structure from which to conceptualize wellness, even when adapting or extending the model for

specific populations (Swarbrick, 2006). In this study, SAMHSA (2016) serves as the foundational framework defining the core dimensions of wellness.

Mosley (2023) reinterprets these same eight dimensions through the Blafemme Healing framework, conceptualizing them as heart, body, workspaces, knowing, finances, relationships, ecosystems, and spirit. Unlike SAMHSA's public health orientation, Mosley situates wellness within culturally responsive healing practices grounded in Black feminist traditions, biomythography, and liberation psychology. Her reinterpretation emphasizes interdependence, relationality, embodiment, and ancestral knowledge as central to healing and well-being.

Beyond its conceptual contribution, Mosley's Blafemme Healing framework has increasingly been taken up across disciplines. Several studies have used Mosley to illuminate the emotional, ancestral, and spiritual dimensions of Black feminist healing, often grounding personal or collective narratives in her emphasis on embodied knowledge and liberatory practices (Kerney, 2025; Vann Rubino, 2024). Others have employed the framework to critically distinguish between coping and healing in organizational or community-based wellness work, demonstrating Mosley's usefulness in applied contexts such as practitioner self-care and workshop facilitation (Chandler Golden, 2024). Researchers have also extended Blafemme Healing into ecological and relational analyses, linking Mosley's concepts to interdependence, land-based healing, and the role of place in wellness (Kerney & Malone, 2025; Ross, 2025). Additionally, Mosley has been incorporated into studies examining the holistic well-being of marginalized and international populations, where her culturally grounded reconceptualization of the eight wellness dimensions offers insights that SAMHSA's more general model does not fully capture (Ahandani et al., 2025; Bogan-Harr, 2025). Collectively, this emerging body of literature demonstrates that Blafemme Healing is not only theoretically robust but also practically adaptable, making it a valuable complement to SAMHSA's established wellness model. Its demonstrated relevance across contexts provides strong justification for integrating both frameworks in the present study.

In the present study, the eight dimensions of wellness serve as a conceptual lens that directly informs the research question and analytic approach. Specifically, the framework guides our research question by centering participants' own definitions of wellness rather than predefined or deficit-based outcomes, allowing us to examine how international women of color graduate students in STEM understand and define intellectual, physical, and environmental wellness. During analysis, these three dimensions functioned as sensitizing concepts that informed the initial deductive coding process, while still allowing themes and meanings to emerge inductively from participants' narratives. In this way, the framework structured the focus of the study without constraining participants' interpretations of their lived experiences.

These wellness dimensions are interrelated, with each domain influencing the others (SAMHSA, 2016; Mosley, 2023; Ahandani et al., 2025). Guided by this understanding, we elaborate on the eight dimensions in Table 1 and identify the three dimensions examined in this pilot study, referencing their conceptualizations as presented in Ahandani et al. (2025), which in turn were built from SAMHSA (2016) and Mosley (2023).

Table1**Eight Dimensions of the Wellness Conceptual Framework**

Dimension of Wellness	Definition
Emotional wellness	Emotional well-being refers to the ability to navigate personal feelings and emotions, identify and mitigate stressors, and experience joy.
Spiritual wellness	Spiritual well-being involves the pursuit of meaning and purpose and the acknowledgment of individual beliefs and values.
Intellectual wellness	Intellectual well-being encompasses active participation in cognitively stimulating endeavors that promote critical thinking, creativity, and continuous learning.
Physical wellness	Physical well-being includes accessing healthcare, practicing self-care, and engaging in behaviors that support physical functioning, such as maintaining sleep, diet, and exercise routines.
Environmental wellness	Environmental well-being emphasizes building healthy relationships between people and their surroundings and taking intentional action to protect the natural and built environment.
Financial wellness	Financial well-being includes understanding how to manage money, debt, and savings, as well as knowledge of how financial systems operate. Poor financial practices can create stress and negatively affect health,
Occupational wellness	Occupational well-being involves finding meaning and satisfaction in work or educational roles, supported by work–life balance, fair compensation, and healthy interpersonal relationships.
Social wellness	Social well-being concerns building and maintaining meaningful connections and feeling a sense of belonging within social networks and communities

Methods**Methodological Approach**

This study draws on a general qualitative inquiry approach, which is well-suited to the aims of the present study, which seeks to understand the wellness experiences of international women of color in STEM graduate programs across the United States (Collins and Stockton, 2018). General qualitative inquiry also aligns with the interpretive focus emphasized in methodological scholarship and frameworks, which serve as guides that structure inquiry while allowing adaptation to the phenomenon under study (Magana, 2022). In this study, the approach

enabled open-ended exploration of how participants describe and make sense of their wellness across academic, cultural, and personal contexts aligning with Sutton and Staw's (1995) call for qualitative research to move beyond description toward meaningful interpretation.

Procedure

Recruitment materials were distributed through our personal and professional networks, including email outreach, LinkedIn posts, and informal academic and community connections. Interested individuals accessed a screening survey through the QR code or link provided on the recruitment flyer, which outlined the study purpose, eligibility criteria, and compensation. Eligibility required that participants self-identify as international women of color enrolled in a STEM doctoral program at a U.S. university. The screening survey collected basic demographic information and confirmed eligibility.

Eligible participants were then invited to complete an individual, semi-structured interview on Zoom. The first author conducted all interviews and shared key identities with participants as an international woman of color in STEM. This shared positionality was intentionally leveraged to foster rapport, cultural resonance, and a sense of relational safety. Interview duration ranged from approximately 40 to 100 minutes; most interviews lasted between 60 and 90 minutes, with two interviews concluding around 40 minutes. Participants received a \$25 Amazon gift card upon completing the interview. Participant demographic information is summarized in Table 2.

Table 2

Participant Demographic Information

Participants' pseudonym	Race	Pronoun	Discipline	Year in graduate program
Marria	Hispanic/Latina	She/Her	Manufacturing Engineering	3 rd
Izzy	Middle Eastern/ North African	She/Her	Biomedical Engineering	4 th
Desy	Asian	She/Her	Human Systems Engineering	1 st
Joking	Asian	She/Her	Mechanical Engineering	2 nd
Avani	Asian	She/They	Engineering and Computing Education	5 th

The interview protocol included open-ended questions focused on intellectual, physical, and environmental wellness. Each domain began with a brief definition to establish a shared understanding. Example questions from the protocol included: "When you think about your own learning and academic growth, how would you describe your intellectual wellness?" Physical wellness questions included prompts such as "When you think about your physical health and

energy as an international woman of color graduate student, how would you describe your physical wellness?” and “Tell me about a time when you felt physically at your best, with good energy, sleep, or balance.” Environmental wellness items invited participants to reflect on their surroundings through questions such as “When you think about your living space, campus, or community, how would you describe your environmental wellness?”, “Can you tell me about a time when your environment felt supportive or comfortable?”, and “What made that environment feel right for you?” Additional questions asked participants to describe times of difficulty, sources of support, desired resources, and changes they wished universities would implement to better support international women of color in STEM. Participants were also invited to select a pseudonym at the conclusion of the interview.

Positionality

The first author is a third-year PhD student and an international woman of color from the Middle East. Growing up in a culturally conservative environment, working in the engineering field in my home country, and being an international graduate student, she has witnessed firsthand the systemic issues that women and international students face in engineering. These experiences have ignited a deep passion in her for transforming engineering education into a space that is fair and embraces all. She brings her personal journey to her work, recognizing that her identity and lived experiences inform how she engages with literature and the perspectives she brings to her research. This awareness drives her commitment to critically reflect on and challenge the structures that perpetuate inequities in the field.

The second author is an engineering and engineering education professor. She identifies as a white, American woman and so is an outsider to the participants on many dimensions. Holding that position, she trusts and defers to the interpretations of the first author, particularly. She has expertise in researching the experiences of doctoral students, including both women and international doctoral students, and the factors that contribute to (or deter from) their mental health. She brings that research to bear in her contributions to this study.

Analytical Approach

We analyzed the data using a reflexive thematic analysis approach, which is well-suited for exploring how individuals make meaning of their experiences and for identifying patterns across qualitative datasets (Braun and Clarke, 2006; Braun and Clarke, 2021). After completing all interviews, we transcribed and de-identified each transcript to ensure confidentiality (DeJonckheere and Vaughn, 2019). We then uploaded the transcripts into Dedoose, a cloud-based qualitative data analysis platform that we used to organize, code, and interpret the data.

Our analysis took place in two rounds. In the first round, we conducted coding within Dedoose using both deductive and inductive approaches. The deductive portion consisted of three sensitizing codes that aligned with the focus of the study: intellectual wellness, physical wellness, and environmental wellness. These categories provided broad conceptual anchors. Within and across these areas, we developed additional inductive codes directly from participants’ language to capture nuanced meanings and experiences emerging from the data, consistent with approaches that allow codes to arise from the data rather than being imposed in advance (Thomas, 2006). We treated the deductive categories as flexible guides rather than strict classifications, which aligns with reflexive thematic analysis practices.

In the second round of analysis, after exporting coded excerpts from Dedoose, we shifted our focus to theme development. This stage involved reviewing excerpts across participants, grouping related ideas, and examining connections, contrasts, and tensions among codes. Through iterative engagement with the data, analytic memo writing, and returning to transcripts as needed, we refined preliminary code clusters into broader themes following the interpretive guidance of Braun and Clarke (2021). We developed categories under three main themes based on their analytic significance and their ability to capture meaningful patterns of experience, rather than on frequency alone.

Because we conducted the analysis independently, we relied on reflexive practices such as memoing, documenting analytic decisions, and repeatedly revisiting the data to support transparency and trustworthiness throughout the analytic process (Saldaña, 2016). The findings illustrate how international women of color in STEM graduate programs understand and experience intellectual, physical, and environmental wellness, as well as the social, cultural, and political contributors that shape these dimensions.

Research Quality

To ensure the quality and integrity of the study, we drew on Tracy's (2010) criteria for excellent qualitative research, which emphasize sincerity, credibility, ethical practice, and meaningful coherence. Quality was supported through in-depth interviews, careful de-identification of transcripts, and a transparent, reflexive approach to data analysis. Ethical awareness was guided by Guillemin and Gillam's (2004) distinction between procedural ethics and the ethically important moments that arise during qualitative research, which we attended to through reflexive memoing and ongoing reflection.

Because we share identities and lived experiences with participants, we were especially attentive to our positionality. We drew on Secules et al.'s (2021) guidance for fairness-oriented qualitative research, which emphasizes awareness of social location, interpretive influence, and researcher-participant relationships. These practices supported the trustworthiness of the study and helped ensure that our interpretations remained grounded in participants' experiences.

Limitations

This study has several limitations that should be considered when interpreting the findings. Although participants were recruited from multiple universities across the United States, the perspectives represented may not capture the full diversity of experiences among international women of color in STEM graduate education. In addition, this study focuses on three of the eight wellness dimensions, intellectual, physical, and environmental, reflecting the scope and depth of this qualitative inquiry. As a result, the findings offer insight into selected aspects of wellness rather than a comprehensive account of all wellness dimensions. These limitations highlight the contextual nature of the findings and suggest caution in extending them beyond similar institutional and demographic settings.

Findings

Our findings are organized into one section that presents how participants defined the three wellness dimensions, drawing on their experiences and identities as international women of color in STEM.

Theme 1: Intellectual Wellness

Participants describe intellectual wellness in terms of learning, feeling engaged, meeting goals, and feeling confident. These four areas emerged to shape how they understand and experience intellectual wellness in their academic lives.

Learning

Participants define intellectual wellness as having the tools and support necessary to continue learning and developing critical thinking skills. Marria shares:

“I think the intellectual wellness is like how easy is it [for] you [to] get enough tools to continue learning, to improve your knowledge, to improve your critical thinking. Like, I see the tools that the school, the research, the program offer to you to continue learning, not just focus on working on that.”

Marria’s narrative shows the importance of receiving tools and opportunities that help her continue learning and improving her knowledge and critical thinking.

Feeling Engaged

In addition to active learning, participants associate intellectual wellness with feeling engaged and curious during their first years of graduate school. Avani explains:

“I think It was the first couple of years, when I started my journey, because you are in a you are in grad course, you engage in discussions with your peers, you are like, reading a lot more, I am engaging with the content more, because I do want to be, you know, engaging in these conversations. I want to know more, I want to gain more knowledge on this particular topic, and.....[at the time] I was traveling with my cohort in every single course, it was very intellectually curious for me, I was feeling exhausted, but, it was not a burnt-out situation; it was more of a thirst for knowledge, a thirst for learning more in that way, particularly.”

Avani describes engaging with peers, discussing ideas, and experiencing a strong desire to learn more.

Meeting Goals

Similarly, participants describe intellectual wellness as feeling confident in their prior knowledge and ability to apply it. Desy says:

“I think if I say I have a good intellectual wellness, or, like, in a good proportion of wellness. I think I might think of it as I'm confident about the experience, about the prior knowledge that I had previously, and I'm confident [in] utilizing it, in a further application, further implementation, when I'm engaged in research, or when I'm engaging in discussion.”

For her, confidence in using her knowledge in academic settings is central to intellectual wellness.

Feeling Confident

Participants also connect intellectual wellness to learning goals and balancing achievement with mental health. Joking states:

“I guess the intellectual part is about, like, the learning, and sort of like meeting our goals. I feel like whenever it comes to learning, there's always, like, a learning outcome or a learning goal that you want to achieve. So, for me, as I'm thinking about this. I guess, how much I believe in I could pursue a certain learning goals in life, and at the same time, I'm not crushing my own mental health, I guess that's the word, the wellness comes in. It's almost like finding a good balance between chasing your intellectual achievement in life, but also maintaining your mental health. I guess, that's how I would interpret it.”

For Joking, intellectual wellness is defined in the way of making a balance between academia and herself, between achieving the goals but not at the cost of her mental health.

Collectively, these findings suggest that intellectual wellness for international women of color in STEM extends beyond academic competence to include engagement, confidence, and balance. Participants described intellectual wellness as the ability to learn and meet goals while remaining mentally well, highlighting the importance of supportive academic environments that foster curiosity, confidence, and sustainable engagement.

Theme 2: Physical Wellness

Participants describe physical wellness in terms of having time and space to care for their bodies, understanding and responding to their bodies' needs, and maintaining energy, mobility, and overall physical functioning. Their reflections emphasize how physical wellness shows up in daily routines through sleep, rest, diet, and the body's ability to feel well in graduate school.

Having Time and Space for Self-Care

The most frequent idea participants raised was the importance of having enough time to take care of themselves. Joking also highlights time as a central part of physical wellness. She says:

“Um, my definition of physical wellness would be having the time. I think having the time, being able to have time to do the physical activities, is so important. I think for grad students, I feel like a lot of people don't even have the time. Like, I talk to certain people, they're like, Oh, I don't have time to work out... But recently, I think I slack off a lot, given how many deadlines I have, the amount of things I need to do. So I actually don't have the time. That's why I was reinforcing the idea around being able to have the time around for physical wellness.”

She describes how having time to engage in physical activities is necessary for physical wellness, yet often difficult for graduate students.

Understanding and Responding to the Body's Needs

In addition to having time, participants also emphasize the importance of understanding what their bodies need to feel well. Avani discusses learning what her body needs and adjusting her routines accordingly. She shares:

“So, yeah, I would just say, like, just getting to know my own body, how my hormones work in a cycle of 28 to 30 days, getting to prioritize what my body needs, what kind of nutrition it needs every day...One of the research recently shows that, like, women at least need 10 to 12 hours of sleep, and men really need only, like, 7 to 8 hours of sleep per night. Getting to know that was really mind-blowing for me, because I was not getting that much sleep.”

Avani describes how understanding their hormonal cycle, nutritional needs, and sleep patterns shapes her sense of physical wellness.

Energy, Strength, and Physical Functioning

Participants further define physical wellness in terms of feeling physically strong, having energy, and being free from pain or illness. Marria says:

“Physical wellness, I think, is when, first of all, you are not sick of anything. I think it's the most external layer. You are not sick of anything, like a simple view. The second thing is that you have mobility; you are able to do your routine, your normal routine, exercising, and walking without any problems or physical pain. Yeah, also, I think basically feel good with your body.”

Marria describes physical wellness as not being sick, having mobility, and being able to move through daily routines without pain.

Taken together, participants described physical wellness as the ability to care for their bodies through time, self-awareness, and daily functioning while navigating the demands of graduate school. Their definitions emphasize that physical wellness depends not only on personal health behaviors but also on access to time and flexibility within academic environments.

Theme 3: Environmental Wellness

Participants describe environmental wellness in terms of feeling comfortable and experiencing joy in their surroundings, feeling safe and supported by the communities around them, and responding to physical conditions such as weather patterns and climate-related changes.

Comfort and Joy in the Environment

Participants describe environmental wellness as closely linked to feeling comfortable and experiencing joy in the spaces where they live and work. Avani also describes how their environment shapes their sense of comfort and joy while working. She explains:

“.... to then set up your workspace in the way that you want, the things that will help you feel better, so, at least, like, spark joy in yourself to sit and work, I think that is more important. Something that will spark joy, that something that will want you to go to work every day, sit and work every day, because it is more about sitting and working [on] the laptop. So, you need stuff around you to make yourself happy to work, because otherwise, nothing is helping you to do it.”

Avani's narrative highlights how creating a workspace that feels comfortable and uplifting shapes her experience of environmental wellness.

Safety and Support from Community

Building on these experiences of comfort, participants also describe environmental wellness through feeling safe and supported within their communities. Desy explains how having friends who check in, offer help, and support her when she is sick contributes to her sense of wellness:

“I think environmental wellness can be seen from two perspectives: emotionally or physically. And emotionally, if I’m environmentally well, like, I’m supported by an environment that supports me to be well. I think, yeah, they take care of me if I have some issues. If I need help, when I’m sick, they are there to help me, picking up my groceries. I have, like, friends to talk to and they are reliable, they offer their help to me, so that’s very good...And in terms of the physical side, the environment needs to be clean [and] hygiene is my top priority. Other than that, safety. Even though my apartment complex is not gated, it’s like a close community, and I do have [Southeast Asian] friends living there. So, somehow, I also feel safe.”

Desy’s account highlights how support from friends and community members shapes her emotional experience of environmental wellness. She also connects environmental wellness to feeling physically safe and living in a clean, hygienic space.

Weather, Climate, and Environmental Conditions

Participants also describe environmental wellness in relation to weather and seasonal conditions, which shape their daily comfort and energy. Izzy describes how changes in local weather patterns shape her sense of environmental wellness. She shares:

“Based on recent weather changes that we had here, and lots of the kind of flood warning and haboob and all of those things that we received, especially the flooding thing that I read a lot that [is] not normal for here, not normal for this season. And the kind of winds that we had broke lots of trees, even burned some of the places. People were in. danger, basically. Lots of my friends' house ceilings were getting moist, and they had some problems. So, all of those things make me really sad, and all of the people were like, that is so good that it's raining, here is so dry, but I was like no. That's climate change, that's bad, and it shows how [badly] work is going on. So, on that part of our environment, I'm like that, this many years, scientists [have been] warning us, and now I'm old enough to realize that, oh my god, this is bad, this is what they were saying, and now we are seeing it, and it makes me sad that.”

Izzy’s narrative illustrates how sudden and severe weather events impact her well-being and shape her perception of her broader environment.

Overall, participants defined environmental wellness as feeling comfortable, safe, and supported in their living and working environments, while also being affected by broader environmental conditions such as weather and climate change. Their definitions emphasize that environmental wellness encompasses not only physical spaces and social support, but also emotional responses to environmental stability and change.

Discussion

Our study examined how international women of color graduate students in STEM define intellectual, physical, and environmental wellness. Drawing on multidimensional wellness frameworks (SAMHSA, 2016; Stoewen, 2017; Strout and Howard, 2012; Mosley, 2023), the findings demonstrate that participants conceptualize wellness through lived experiences that reflect their academic demands, bodily needs, and daily interactions with their social and physical environments. Their definitions are grounded in the realities of navigating graduate school as international women of color, revealing how wellness is shaped by both personal practices and their broader surroundings.

Intellectual Wellness

Participants described intellectual wellness through learning, feeling engaged, meeting goals, and feeling confident. These definitions align closely with established descriptions of intellectual wellness as curiosity, active engagement, and ongoing cognitive growth (SAMHSA, 2016; Stoewen, 2017). Stoewen (2017) emphasizes that intellectual wellness involves seeking new ideas, embracing challenges, and cultivating lifelong learning, all of which echo participants' reflections on reading widely, engaging in academic discussions, and sustaining a desire to deepen their knowledge. Strout and Howard (2012) describe intellectual wellness as participating in stimulating activities that expand understanding and support cognitive functioning, which parallels participants' emphasis on connecting with peers, staying mentally active, and refining their critical thinking skills.

Participants' focus on confidence and goal attainment also resonates with literature highlighting the importance of intellectual self-efficacy in academic success and well-being. At the same time, their attention to balancing academic aspirations with mental health extends current definitions by framing intellectual wellness as not only cognitive engagement but also the ability to pursue intellectual growth without compromising emotional well-being. This study adds nuance by illustrating how intellectual wellness for international women of color involves navigating learning environments that are both intellectually stimulating and emotionally demanding, requiring them to develop strategies that allow them to maintain confidence, energy, and balance as they progress through their programs.

Physical Wellness

Participants defined physical wellness in terms of having time and space to care for their bodies, understanding and responding to bodily needs, and maintaining energy and mobility. These interpretations are supported by wellness frameworks that emphasize rest, nutrition, physical activity, and self-awareness as central to physical well-being (SAMHSA, 2016; Stoewen, 2017). SAMHSA (2016) highlights the importance of adequate sleep, balanced routines, and listening to one's body as essential components of overall wellness, aligning closely with participants' attention to sleep cycles, hormonal rhythms, daily movement, and nutritional needs. Strout and Howard (2012) describe physical wellness as supporting optimal functioning across daily activities, a theme reflected in participants' emphasis on mobility, energy, and freedom from illness.

However, participants also emphasized dimensions of physical wellness that extend beyond current frameworks. For them, physical wellness was shaped not only by health behaviors but by the structural demands of graduate school, particularly the scarcity of time available for rest, exercise, and self-care. Their definitions reveal that physical wellness is

experienced as a negotiation between bodily needs and academic pressures, where maintaining health requires access to time, flexibility, and energy, resources that are often limited in STEM graduate programs. This highlights the importance of understanding physical wellness not merely as an individual responsibility but as a condition shaped by institutional environments and expectations.

Environmental Wellness

Participants defined environmental wellness through comfort and joy in their surroundings, safety and support from community members, and the influence of weather and climate conditions. These ideas align with literature describing environmental wellness as shaped by the physical, social, and natural environments in which individuals live and work (Stoewen, 2017; Strout and Howard, 2012). SAMHSA (2016) highlights the importance of safe, clean, and supportive environments for fostering well-being, which is reflected in participants' discussions of feeling secure in their living spaces and supported by nearby friends. Amaya, Melnyk, and Neale (2018) emphasize how pleasant, organized, and uplifting surroundings can enhance mood, reduce stress, and improve functioning, which aligns with participants' descriptions of creating workspaces that spark joy and help them remain motivated.

Participants' reflections also contribute new insights to the literature by highlighting how environmental wellness is shaped by weather-related and climate-related experiences. Harsh winters, extreme wind, and climate instability affected their emotional states and daily comfort, revealing dimensions of environmental wellness that are not fully addressed in existing frameworks. Their discussions of sudden weather changes and concerns about climate change extend the definition of environmental wellness to include emotional responses to environmental disruption and uncertainty. These findings suggest that for international women of color in STEM, environmental wellness is influenced not only by immediate physical and social surroundings but also by broader ecological conditions that shape their sense of safety, comfort, and stability.

Conclusion

This study provides insight into how international women of color in STEM define intellectual, physical, and environmental wellness within the context of graduate education. By centering participants' perspectives, this work foregrounds wellness as a lived, multidimensional experience shaped by academic, bodily, and environmental conditions. In doing so, it underscores the importance of attending to the contexts in which graduate students learn and live when seeking to support their well-being.

Implications

This study suggests that supporting the wellness of international women of color in STEM requires attention to the structural and environmental conditions of graduate education rather than relying solely on individual coping strategies. Graduate programs may benefit from examining how norms related to productivity, time expectations, and advisor relationships shape students' ability to sustain well-being. Creating space for flexibility in work schedules, reducing implicit expectations of overwork, and normalizing rest and self-care may be particularly important for fostering equitable graduate training environments.

At the institutional level, multidimensional wellness frameworks may offer a useful tool for designing graduate student support initiatives that move beyond narrowly defined mental health services. Rather than treating wellness as an individual responsibility, institutions can use such frameworks to guide holistic programming that attends to learning environments, physical conditions, and community support structures. These efforts may be especially impactful for international women of color, whose wellness is shaped by the intersection of academic demands, migration-related stressors, and broader environmental conditions.

Future work

Future studies can build on this work by engaging larger and more diverse samples of international women of color across STEM disciplines. Examining additional wellness dimensions beyond the intellectual, physical, and environmental domains may offer a more comprehensive understanding of how wellness is experienced throughout graduate education. Longitudinal research that follows students across stages of their programs could further illuminate how definitions of wellness shift over time and in response to changing academic and personal contexts. Comparative studies across disciplines or cultural backgrounds may also provide insight into how different institutional and sociocultural environments shape wellness in STEM.

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