

## Sound and Wellbeing in the Global Pandemic: A Humanities Lab Experience

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**Abstract:** Five years have passed since the COVID-19 global pandemic disrupted Arizona State University's 2020 Sound and Wellbeing Humanities Lab. As a response to this mid-semester disturbance, students in the lab were assigned to groups to generate sound experiences to promote healing and minimize stress in ways that might benefit the public. This paper presents key findings among students' responses to their classmates' sound and well-being projects. Key themes and analyses echo critical aspects of the relevant literature on sound and well-being during the pandemic. They also offer novel insights into several areas of investigation, as cited by a body of literature on sound and well-being during the pandemic.

**Keywords:** Sound; well-being; pandemic; nature; environment; music; noise

### Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) responsible for the Coronavirus disease 2019 (COVID-19) precipitated a global pandemic responsible for the deaths of millions of people. The pandemic also induced an unanticipated event involving Arizona State University's 2020 Sound and Wellbeing Humanities Lab—an interdisciplinary collaboration of women and gender studies, music, and library sciences. Due to the pandemic's disruption of the course's intended direction and ultimate pedagogical trajectory, students were divided into five groups and encouraged to produce projects surrounding sound and well-being in response to the pandemic's disturbance of daily life. Specifically, students heeded the charge of coordinating with their group members and generating sound experiences directed at the public, which could then promote healing and/or mitigate stress. Once they finished with the design and implementation of their projects, individual students were required to respond to other projects disseminated by their classmates.

The orientation of the projects included several guiding concepts posed to students in their reworked syllabus: (1) sound might be used relative to body and mind and incorporated into



practices of mindfulness and resilience; (2) different types of sounds might have sundry therapeutic effects for individuals; (3) nature and its sounds might inspire new understandings of the environment and promote novel aims to sustain it; (4) sound creates meaning, and hearing or not hearing might relate to social activism; (5) interdisciplinary reflections on the human condition coincide with the use of sound; (6) some sounds can have adverse effects and require increased awareness; and (7) given the unique challenges posed by the pandemic, thinking about and working with sound might generate new ways of understanding the crisis as well as practicable solutions. To address these and related concepts, a class of twenty-seven students ultimately developed, specifically, five distinct projects comprising a vlog, made available through YouTube.com; two podcast series, both available through Soundcloud.com; an anti-isolation toolkit, available on the Humanities Lab website; and a social media group, which is hosted on Facebook.com.

Through a review of the literature and a discussion of the findings made possible by a thematic analysis approach, this paper examines the findings from the students' responses to their peers' group projects, whose orientation to topics of sound and well-being unfolded in the context of the pandemic in real-time. Specifically, this paper contributes to a broader understanding of changes to the acoustic environment during the pandemic and its effects on individuals (i.e., students), whose lives the pandemic thoroughly disrupted. Furthermore, this paper contributes to calls for additional research in areas including, but not limited to, the therapeutic effects of sounds, alterations to people's sonic environments and soundscapes, and alterations to people's perceptions and wellbeing during the pandemic. Relative to additional scholarship in these areas, this paper demonstrates novel findings based on the phenomenological, lived experiences of students who weathered the pandemic and developed effective strategies for adaptation that might benefit the broader public.

Ultimately, students demonstrated that a successful combination of sound and well-being might reduce stress. Similarly, producing music and singing can be therapeutic and conducive to well-being. Students noted that their relationships with therapeutic elements like music can change after learning of its impact on well-being. Though their approaches to well-being may have differed, students were able to form a community around sound and well-being during the pandemic. Furthermore, they recognized there were different ways to maximize individual well-being despite the difficulties of the pandemic.

## Literature Review

Sound is largely constitutive of the human environment and the lived experiences of billions of people globally (Pimentel, 2017). This did not cease to be the case during the COVID-19 global pandemic but instead underscored the significance of sound in societies and individual lives (Dzhambov et al., 2021). Indeed, the pandemic posed several crises for individuals whose relationships with sound and the environment were disrupted, reoriented, and redefined in myriad ways (Qiu & Zhang, 2021). The pandemic changed how people listened, including to one another, which further encompassed their networks and the virtual nature of network configurations that have since continued to allow people to stay connected. Manipulations of

sound before the pandemic also made it possible for some to be better equipped to handle isolation than others. Nevertheless, a sense of alienation and loneliness would be fundamental to many experiences during social isolation and lockdown incidents (Ward, 2021). Heeding the effects of sound on the human person during the pandemic has since been critical to understanding the wide-ranging effects of the event on people around the world (Wu et al., 2023). Such is certainly true of students whose learning processes were radically altered because of the pandemic (Dzhambov et al., 2021).

Comprehensive analyses cite negative and positive impacts relative to changes in people's sonic environments (Hasegawa & Lau, 2022). For one, the effects of natural soundscapes on individuals had some positive effects despite the pandemic's overall disruption to individual lives. Due to the healthful dimensions of these soundscapes, the literature surrounding COVID-19 and sound in people's lives encourages a sustainable approach to maximize the viability of natural environments (Qiu & Zhang, 2021). Although natural sounds can help to mollify stress, studies cite the need to collect additional information and further investigate why particular sounds might be beneficial during life-altering events (e.g., a pandemic). Such information even provides insights into how to administer resources during a pandemic. Moreover, it helps to narrow the gap in research involving individuals and their environment, as well as people, their health, and their well-being (Qiu et al., 2020).

In response to the pandemic, government and institutional actions heavily impacted societies and individuals and their respective engagements with sound and environment. Consequently, official actions would inform people's lived experiences and perceptions of life on a global scale (Wu et al., 2023). The built environment, where many individuals would spend much of their time, was also heavily impacted by lockdowns and other official reactions to the pandemic. These outcomes effectively coincided with decreased sounds in certain aspects of cities and neighborhoods while simultaneously emphasizing the experience of certain noises that people lived with indoors and in heavily populated settings like schools and dwelling places (Arsenio et al., 2022). Furthermore, changes to the sonic environment corresponded to people's overall well-being, and focusing on corporeality remains key to future learning and knowledge construction in this area (Sasin, 2023).

Considering the pandemic, comprehensive studies that aim to address the effects of music, specifically on the whole of the body and the human stress response, encourage additional studies whose focus is more comprehensive and aims to address physiological and emotional responses (Efurhievwe et al., 2024). Perhaps due to so many unforeseeable changes to people's lives, some studies have recognized the need for interventions during the pandemic that include breathing, music, and other meditative approaches. Such might work to soothe and calm individuals who seek to reduce their levels of and experiences with stress (Kerrebroeck & Maes, 2021). Some studies have specifically aimed to address how sounds of nature and music affect and enhance student perceptions surrounding sound and well-being in academic settings. They indicate that there are ways of increasing student satisfaction with soundscapes via interventions aimed at improving school settings (Cal et al., 2025).



Ultimately, ideal sonic environments have been identified as maximizing one's exposure to the sounds of nature and music and freedom from constraints related to unwanted noises. In such environments, individuals might express themselves more freely and intimately despite a pandemic event or consequent experiences of isolation (Torresin et al., 2022). Some studies have investigated "psychosocial distress among healthcare workers," citing the burnout these workers face, as well as a decline in the delivery of adequate care to patients. Such studies have promoted mindfulness interventions to sustain the benefits of practice that nature-based programs do not deliver. Specifically, they have investigated the combination of sound and mindfulness to ameliorate stress and "promote psychosocial-spiritual wellbeing" in healthcare workers during the pandemic (Bagereka et al., 2025, p. 1).

Other studies have focused on the general mental health problems that are common for students in a university setting, which the pandemic exacerbated on several levels. Promoting student well-being due to the pandemic's impact on students (e.g., institutional closures, university-wide restrictions, and a decrease in social activity) would become essential. Students involved in studies promoting well-being through virtual reality interventions, for example, encouraged such experiences for other students because they were so helpful (Malighetti et al., 2023). Interestingly, some studies have found distinct correlations between types of sounds and increased or decreased levels of anxiety in university students. The pandemic impacted sound levels because of lockdown measures, which led to overall quieter acoustic environments. Furthermore, individuals studied reported a positive tolerance for sounds derived from community, society, voices, and musical instruments (Huang et al., 2025).

## Methodology

The qualitative research design consisted of a thematic analysis of students' peer responses to end-of-semester group projects on sound and well-being during the pandemic. A study of the students' peer reviews of group projects permitted the discovery of overarching groupings and categories for both peer responses and coincident quotes. This allowed different coding categories to emerge for further evaluation. Specifically, these categories allowed for organizing the qualitative data according to scrutable and meaningful units. Then, themes began to emerge within the categories once peer response quotes were gathered and placed in their relevant categories. Because the projects were unique to each student group that created them, and because they varied in modality and delivery, there was no need to hierarchize themes. However, some categories contained much more information relative to the peer group responses than others (Riger & Sigurvinsdottir, 2016). Ultimately, there was a review of the themes based on the data contained within each category. For example, under the code "bees," there were several data points coded for healing, sound, the body, pain, and more, with one theme emerging around the positive perception of the sound of bees buzzing and its connection to healing and an eagerness to try bee-related therapies in response to the stress partly wrought by the pandemic.



## Results

Key findings of this study demonstrate an explicit connection between sound and well-being. Students actively discerned the impacts of sound related to coping with the pandemic. Sound and human connections are presented as a dual means of overcoming some of the pandemic's most prominent and negative aspects. Finally, students identified ways of navigating the isolating experience of the pandemic quarantine, for which sound was a primary conduit. Sound proved highly connected to affectivity and environmental situatedness.

Table 1 below alphabetizes the categories generated from peer responses to student-group projects on sound and well-being during the pandemic due to the virus' disruption to Arizona State University's 2020 Sound and Wellbeing Humanities Lab. It offers sample sentences or phrases that align with the thematic analysis of the students' peer reviews of the group projects.

Table 1. Alphabetizes the categories generated on sound and well-being during the pandemic

Bees	"...I never would've considered bees as a calming sound, but I was clearly wrong."
Community	"...there was also a sense of community by hearing from each person..."
Conversation/Dialogue	"I loved...the way that the group members got to participate in active conversation with each other on the posts they made."
Coping	"This group created a 5-day 'vlog' to discuss how they were utilizing sound resources to cope with the COVID-19 quarantine..."
COVID-19/Pandemic	"I appreciate that they created [podcasts] not only for the COVID-19 context but also just to use in our daily lives."
Diction/Voice(s)	"His choice of language was beautiful."
Eagerness	"I am eager to try a soundwalk when I'm up in the woods this weekend."
Inclusion	"The [Facebook] page has a very open, inclusive, and supportive feel to it."
Isolation	"[Sharing] about their day and...what they are struggling with and where they are seeing progress is very comforting...in the social isolation we are experiencing."
Meditation	"While meditation is not for everyone, soundwalks have a much broader appeal and ability for implementation..."
Music	"The group shared their personal experiences that were related to music. I felt I was experiencing their life stories at the same time..."
Mutualism	"What I really love most about this project is that [it] could be of use to so many people outside of our course. I could easily send this...to people in my life who are seeking tools to improve their well-being, and they would inevitably find tools that could help them."

Nature	"I enjoyed listening to the sounds of nature captured in the episode."
Noise	"...one of the biggest problems with sound walking can be noise pollution blocking natural sounds..."
Quarantine	"This quarantine has definitely made me feel very up and down recently..."
Situation	"I felt like this project was a great way to showcase the struggles inherent in this pandemic time while also providing interesting and useful information about how to adapt meditation and music listening practices to your own difficult situation."
Social Media	"I love that this group created a Facebook page as their project. We are more reliant on social media now than ever to connect with each other, so for that reason, I think this project is a great depiction of where we are at in current times."
Sound	"...they also showed evidence of their knowledge and research about how sound relates to the virus."
Stress	"This project was very useful in light of the challenges with social distancing and heightened stress."
Trying Times	"In this series of podcasts, everyone has taken their own approach to how sound can help during these trying times and the different kinds of sounds that may help different students."
Well-being	"These different ways to help well-being were so incredible to see, especially since everyone's contribution was so individualized and a different take on well-being."

### Sound

- The healing power of bees buzzing presented a novel opportunity for students to heal during the pandemic. Bee buzz supplied individuals with a meditative medium.
- A social space for sound and well-being was key; conversation changed perspectives. Dialogue on sound and well-being enhances conversation. Continuous dialoguing induced a sense of being in conversation, notions of support and relatability, and the ability to use techniques to address negative aspects of isolation and the pandemic.
- The importance of sensing community, hearing others' voices, listening, interacting, and sensing comfort and connectedness was key. Community meant engaging with others, sharing resources, entertaining audiences, grieving not being together as a class, and simulation of spending time with peers.
- Students noted beautiful language choices, engaging interview voices, and conversational and entertaining tones. Diction and voice made for touching experiences for students while listening to others. Kinds of voices induced states of calmness and relaxation.
- Meditation included immersion in sound, a focus on breath and breathing, finding specific times during the day to meditate, and a focus on surrounding natural sounds. Students encouraged finding specific methods that worked best for individuals meditating, noting that sound meditation seemed to have little adverse effects.
- Creating music allows some a therapeutic process that is tied to heritage and culture, and mitigates stress while producing positive outcomes. Making music was conducive to mental

health, though music might induce negative emotional states. Music soothes and alleviates stress while affecting emotional states, even ones of healing after loss.

- Musical ties to emotion include specific songs and feelings, and music helps individuals feel as though they are experiencing another's life. Music was noted for being life-changing, for its use in healing emotions, and for its incredible social importance.
- The expressive creativity in music helps deal with stress and trying emotions. Individuals might use music to their advantage, permitting catharsis by creating emotions that are difficult to sustain. The act of singing was praised for its ability to make one feel good, and for quiet individuals, music might be a language that can be used expressively.
- All music has a source; it can build adrenaline and create new states, even providing focus during meditation. Recognizing how others interact with music might alter perceptions about sound and its effects on individuals and societies. The unspoken sounds of music, when combined with nature, brought a sense of solitude to students.
- Students cited noise as a nuisance, including construction, landscaping, traffic, and other distracting sounds. Some opted not to ignore noise pollution but imbibe it with different sounds. Others explored blocking out noise to enact a sense of healing. Noise pollution was cited as blocking natural sounds and exacerbating feelings of anxiety. Finding sounds that evoke positive and negative emotions became essential to maintaining positivity.
- Utilizing sound was critical, as was fomenting awareness of sound's impact on well-being in conversations about the pandemic. Students felt more knowledgeable given their increased awareness of the effects of sound. Sound was associated with positive feelings/states, and there were multiple ways of using sound to destress.
- Some noted the healing power of the sound of the human voice and other relaxing sounds, which helped them recognize how their relationship to regular sounds had changed since the pandemic. Students acknowledged the everyday sounds and the impact of sound on health.
- Despite the pandemic, students noted the utility of sound. There was comfort in knowing that others might be experiencing similar feelings and seeking to make connections.

## Wellbeing

- Discovering resources to cope with stress, anxiety, and depression was critical. Students sought resources for coping, noted the harmful effects on their abilities to cope with the pandemic experience, and sought to know how others were experiencing the pandemic.
- Dealing with the uncertainty of the pandemic was difficult. The virus was associated with loneliness and even the deaths of loved ones. New ways of discussing the pandemic in a less stressful way were key. Students noted enjoying simple pleasures and remaining open to new experiences during the pandemic.
- Inclusion was essential for creating a sense of openness and connection. Students realized that sharing their group projects with the wider world might create a very open, inclusive, and supportive feeling. The contents of their group projects were relatable to a broader audience. This included sharing group projects for the benefit of others. Doing so might close social distances and allow others to feel connected again.
- Students reported experiencing social isolation but took solace in not being alone in having mixed emotions. Drawing in new audiences to help others endure the negatives of the pandemic was important. Students wanted to encourage connection and healing.
- Some enjoyed meditating. A one-size-fits-all approach might not work. Instead, it was essential to focus on needs, affective states, environments, and changing contexts. Meditation was noted



as offering peace, relaxation, and contentment. Incorporating nature was meaningful, especially for meditation during the pandemic.

- Students noted becoming more reliant on social media to stay connected. Social media could indicate how people were living during the pandemic and create space for discussing sound and well-being. Some benefited from social media by talking about the pandemic and life under its constraints.
- Social distancing-related challenges heightened stress levels, yet students found many valuable tools for coping with this stress. They also accessed various ideas for navigating such a stress-inducing event.

## Discussion

While relevant research discerns the broad effects of sound on personal well-being by focusing on factors like the definitional, theoretical, and cultural dimensions of ambient sound, their results stem from performing research across multiple databases (Nazeri & Sabran, 2023). This paper focuses on a group of students who interacted with each of these factors and more. Importantly, other studies admit that the therapeutic dimensions of sound and its efficacious mechanisms are not entirely understood (Saskovets, 2024). They cite a lack of research on natural sound exposure (NSE) and its effects on health (Zhu et al., 2024). In addition to this paucity of scholarship, and although the pandemic expressly impacted people's lives by altering their acoustic environments, researchers have noted the insufficiency of studies oriented around soundscapes during the global pandemic (Hasegawa & Lau, 2022). Notwithstanding the evolution of research on sound or the subsequent effects of the pandemic, manifold researchers yet aim for a better understanding of changes to the acoustic environment—changes that likely influenced “human perception, wellbeing, and mental health” during the pandemic (Wu et al., 2023, p. 1). The students at the heart of this paper inherently address each of these factors—NSE, health, altered acoustic environments, the pandemic, etc.—through their group projects and peer reviews of said projects.

During the pandemic, various situations allowed students to meditate and navigate their struggles through sound. With audible media, the sound of voice and selection of language mattered greatly to students as they listened to music or podcasts. Such resources were further significant because they could animate individuals to meditate and explore healing. Meditation involving sound required contemplative practice and a search for what worked best for each individual. Furthermore, music and music-making similarly proved an enjoyable and cathartic experience that could heal while strengthening ties with culture and society. Such is in keeping with Sasin's (2023) observation that changes in individuals' acoustic environments will affect their well-being, and that by focusing on the corporeal aspects around contemplative or meditative practices with sound, future knowledge about the impacts of sound on individuals during the pandemic becomes possible.

For most students, the changes they experienced in their acoustic environments in response to the pandemic were largely positive. However, for some, noise (e.g., sounds of construction) was an irritant to be embraced or overcome with music or other natural sounds. Similarly,





Efurhievwe et al. (2024) acknowledge that studies about people's interactions with music and sound in specific settings focus on the body and seek greater knowledge in the areas of psychological and emotional responses, which the students at the heart of this paper manifested. Furthermore, studies (e.g., Kerrebroeck & Maes, 2021) have called for interventions including meditative practices to counteract the changes to people's lives that resulted from the pandemic, particularly to reduce stress.

Ultimately, changes in sonic environments have both positive and negative effects for students. Natural soundscapes and their restorative dimensions proved beneficial. The sounds of nature proved meditative and healing, and the student responses revealed a positive perception of natural sounds and their healing effects, even the buzzing of bees. Yet, noise was an environmental nuisance with multiple sources. Addressing heightened stress levels is tantamount to reducing and mitigating noise and unwanted sounds in the sonic environment, which some students shared. It is unclear from the findings of this paper whether the actions of the state imposed on the students in terms of sound, though other authors have cited the state as altering people's lived perceptions during the pandemic (e.g., Wu et al., 2023). Students did, however, become keener to their overall sonic and acoustic environments, which echoes the observations of Arsenio et al. (2022) concerning environmental changes during the pandemic.

It is unclear whether students valued the sustainability of the natural environment—which Qiu and Zhang (2021) argue for in their writing—beyond their enjoyment of natural sounds during the pandemic. However, students' reaction to their peer group projects do provide additional insights into why some sounds may be beneficial during events like the pandemic. This could shed light on how policymakers and others think about allocating resources during such a life-disrupting event, as Qiu et al. (2020) indicate.

Per Torresin et al. (2022), acoustic environments can ideally increase the exposure individuals have to the sounds of nature and music. On the other hand, reducing exposure to unwanted sounds is important. In environments where the sounds of nature or music are predominant, people have more latitude in expressing themselves even amid a pandemic and subsequent isolation. Focusing on the sustainability of the natural environment would prove positive, mainly because of the effects that natural sounds can have on well-being, as demonstrated by the students in Arizona State University's 2020 Sound and Wellbeing Humanities Lab and their group projects and peer responses.

Creating a community around sound and well-being was no small feat for students engaged in group projects. Yet, fostering community through inclusivity and interactivity was highly important. Sound and related resources inspired greater instances of sharing, fomenting still greater inclusion, and students prized inclusion, community-building, and collaboration. Social media expanded their access to the outside world, and extending their novel anti-isolation practices beyond the classroom was perceived as likely beneficial to others. The pandemic reshaped their lives in several ways, including their relationships with sound (see Qiu & Zhang, 2021). Students thus likely extrapolated that their experiences and peer projects could benefit



people elsewhere in the world, given the significance of sound in both societal and individual contexts (Dzhambov et al., 2021).

Students were able to stay connected not only through their group projects but also through the various media (e.g., podcasts, vlogs, Facebook); despite this, there were senses of alienation and isolation present during the pandemic. Such is par for the course with lockdown measures taken by various governments during a time of human health crisis, as noted by Ward (2021). The projects the students developed may equip some to better handle the isolating experience of the pandemic than others; hence, some expressed opinions that the group projects they manifested might benefit the public more broadly. This is in keeping with the work of Wu et al. (2023), who note that the effects of sound on people during the pandemic have been and continue to be paramount to understanding the sweeping impacts that the pandemic has had on people worldwide. Moreover, student experiences with the pandemic have much to offer in filling gaps in the continuing literature on sound and well-being and the pandemic precisely because their learning processes were so fundamentally altered (see Dzhambov et al., 2021).

The student group considered in this paper reported outcomes similar to the findings of the study performed by Bagereka et al. (2025). For example, students noted that integrating sound, nature, and mindfulness practices produced an upswell in overall well-being and a decline in stress. Though the student considered in this paper did not undergo a virtual reality intervention with a focus on enhancing well-being (e.g., Malighetti et al., 2023), they did experience interruptions and they did work virtually and digitally to address the problems precipitated by the pandemic. Furthermore, they found that interventions focusing on enhancing well-being might benefit other students and the broader public.

### Limitations

Several studies have heretofore examined the sonic environment and changes consequent to the global pandemic, but they have not applied speculative sound. This is a limitation of this study as well. Heeding sound and noise where social asymmetries unfold can generate new knowledge, including in the face of a global pandemic. This is the work of speculative sound, an analytical approach that precipitates investigations and research probes into whether and how sound and deleterious events like a pandemic-inducing virus coincide in people, processes, and places (Pimentel, 2021).

### Conclusion

The global pandemic disrupted Arizona State University's 2020 Sound and Wellbeing Humanities Lab—an interdisciplinary collaboration of women and gender studies, music, and library sciences. In response to this disruption, students joined distinct groups to address sound and well-being in a proactive response to the pandemic. Their real-time experiences and individual responses to their peers' group projects illuminate many of the salient features of the literature surrounding the pandemic, its effects on people globally, and radical changes to



the sonic environment. Student experiences and evaluations extend to a broad range of topics on sound and subsequent modifications to societies and individual lives during the pandemic.

Peer responses to the student group projects considered in this study highlight the importance of sound in everyday life. Indeed, the pandemic altered students' relationships with sound in many ways. Digital configurations and media such as vlogs, podcasts, and social media allowed students to stay in contact and avoid total isolation. Furthermore, the effects of sound on individuals during the pandemic matter for understanding the full extent of the impact of the pandemic on people. This remains true for the students who participated in the Arizona State University 2020 Sound and Wellbeing Humanities Lab.

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### References

- Aletta, F., De Coensel, B., & Lindborg, P. (2021). Human perception of environmental sounds. *Frontiers in Psychology*, 12, 714591.
- Aletta, F., Oberman, T., & Kang, J. (2018). Associations between positive health-related effects and soundscapes perceptual constructs: A systematic review. *International journal of environmental research and public health*, 15(11), 2392.
- Asensio, C., Pavón, I., & de Arcas, G. (2022). How the COVID-19 Pandemic Muted and Remixed the World's Acoustics for a While. *Current Pollution Reports*, 8(4), 328-340.
- Bagereka, P., Ameli, R., Sinaii, N., Vocci, M. C., Coulter, A. M., Neustedter, M., & Berger, A. (2025). Effects of a combined nature-based and audio-based virtual mindfulness intervention on stress and wellbeing of COVID-19 healthcare workers: a randomized controlled trial. *PeerJ*, 13, e19109.
- Cal, H. K., Aletta, F., Kang, J., & Clarke, P. (2025). Student perception of school soundscapes and wellbeing: A mixed methods examination of natural and musical sounds. *Building and Environment*, 277, 112946.
- Deep, P. D., Chen, Y., Ghosh, N., & Basith, I. I. (2025). The Impact of Integrating Mindfulness in the Classroom on Well-Being and Academic Success Among College Students During COVID-19 and Beyond. *Social Sciences*, 14(4), 218.
- Dzhambov, A. M., Lercher, P., Stoyanov, D., Petrova, N., Novakov, S., & Dimitrova, D. D. (2021). University students' self-rated health in relation to perceived acoustic environment during the covid-19 home quarantine. *International Journal of Environmental research and Public Health*, 18(5), 2538.
- Efurhievwe, M. A., Okpeki, P. I., & Kuluje, M. E. (2024). Hip-Hop Music, a Coping strategy during Covid-19 Pandemic: A Perceptual Analysis. *Journal of Contemporary Dialectical Sociology*, 12(1), 48-58.
- Erfanian, M., Mitchell, A. J., Kang, J., & Aletta, F. (2019). The psychophysiological implications of soundscape: A systematic review of empirical literature and a research agenda. *International journal of environmental research and public health*, 16(19), 3533.



- Goldsby, T. L., Goldsby, M. E., McWalters, M., & Mills, P. J. (2022). Sound healing: Mood, emotional, and spiritual well-being interrelationships. *Religions*, 13(2), 123.
- Hasegawa, Y., & Lau, S. K. (2022). A qualitative and quantitative synthesis of the impacts of COVID-19 on soundscapes: A systematic review and meta-analysis. *Science of the Total Environment*, 844, 157223.
- Hoti, A. (2025). Psychological well-being of students during the Post-covid-19 period. *International Journal of Ecosystems & Ecology Sciences*, 15(2).
- Huang, L., Li, J., Kang, J., Liu, F., Yang, M., & Zhang, Y. (2025). Understanding the Nexus Between Anxiety and Acoustic Perception in University Students: A Quasi-Experimental Study During Pandemic-Induced Lockdown. *Behavioral Sciences*, 15(3), 262.
- Liang, Q., Lin, S., Wang, L., Yang, F., & Yang, Y. (2024). The impact of campus soundscape on enhancing student emotional well-being: A case study of fuzhou university. *Buildings*, 15(1), 79.
- Lipscombe, A. J. C. (2022). *Precarious bodies: Viral listening to sound, silence, and trauma* (Doctoral dissertation, The University of Chicago).
- MacDonald, H. Z., Bradley, M., & Neville, T. (2025). Awareness as a vehicle for well-being: college students' Lived experiences participating in a mindfulness-based intervention during the COVID-19 pandemic. *Journal of College Student Mental Health*, 39(2), 242-260.
- Malighetti, C., Bernardelli, L., Pancini, E., Riva, G., & Villani, D. (2023). Promoting emotional and psychological well-being during COVID-19 pandemic: A self-help virtual reality intervention for university students. *Cyberpsychology, Behavior, and Social Networking*, 26(4), 309-317.
- Nazeri, N., & Sabran, K. (2024). Exploring the concept of ambient sound for well-being: a systematic review of theories and evidence. *Alam Cipta: International Journal on Sustainable Tropical Design Research & Practice*, 17(1).
- Pimentel, M. S. (2017). Artisanal and small-scale gold mining in Colombia: Noise, geographic constructions of embodied civic identities, and the unanticipated consequences of modernising socio-technical activities. *Journal of People's Studies*, 3(1), 49–58.
- Pimentel, M. S. (2021). *Heavy Metal: Mercury-Use Contamination and Sound in Artisanal and Small-Scale Gold Mining in Antioquia, Colombia* (Publication No. 28649683) [Doctoral dissertation, Arizona State University]. ProQuest.
- Qiu, M., Sha, J., & Utomo, S. (2020). Listening to forests: comparing the perceived restorative characteristics of natural soundscapes before and after the COVID-19 pandemic. *Sustainability*, 13(1), 293.
- Qiu, M., & Zhang, J. (2021). Exploring the perceived restorativeness of natural soundscapes under the global pandemic of COVID-19: A moderated mediation model. *PLoS One*, 16(8), e0256855.
- Rava, J. A., & Hotez, E. (2021). Mindfulness and wellbeing among college students during the COVID-19 pandemic: a qualitative analysis of emergent themes and concerns. *Cureus*, 13(12).
- Ratcliffe, E. (2021). Sound and soundscape in restorative natural environments: A narrative literature review. *Frontiers in psychology*, 12, 570563.
- Riger, S., & Sigurvinsdottir, R. (2016). Thematic Analysis. In *Handbook of methodological approaches to community-based research: qualitative, quantitative, and mixed methods* (pp. 33-41). Oxford University Press.
- Sasin, M. (2023). Human well-being in the context of rapid changes to the sound environment during the COVID-19 pandemic. *Horyzonty Wychowania*, 22(62), 141-151.
- Saskovets, M., Liang, Z., Piumarta, I., & Saponkova, I. (2024). Effects of sound interventions on the mental stress response in adults: protocol for a scoping review. *JMIR Research Protocols*, 13(1), e54030.

- Saskovets, M., Saponkova, I., & Liang, Z. (2025). Effects of Sound Interventions on the Mental Stress Response in Adults: Scoping Review. *JMIR Mental Health*, 12(1), e69120.
- Şentop Dümen, A., & Şaher, K. (2020). Noise annoyance during COVID-19 lockdown: A research of public opinion before and during the pandemic. *The Journal of the Acoustical Society of America*, 148(6), 3489-3496.
- Torresin, S., Albatici, R., Aletta, F., Babich, F., Oberman, T., Stawinoga, A. E., & Kang, J. (2021). Indoor soundscapes at home during the COVID-19 lockdown in London–Part I: Associations between the perception of the acoustic environment, occupants' activity and well-being. *Applied acoustics*, 183, 108305.
- Torresin, S., Albatici, R., Aletta, F., Babich, F., Oberman, T., Stawinoga, A. E., & Kang, J. (2022). Indoor soundscapes at home during the COVID-19 lockdown in London–Part II: A structural equation model for comfort, content, and well-being. *Applied acoustics*, 185, 108379.
- Torresin, S., Ratcliffe, E., Aletta, F., Albatici, R., Babich, F., Oberman, T., & Kang, J. (2022). The actual and ideal indoor soundscape for work, relaxation, physical and sexual activity at home: A case study during the COVID-19 lockdown in London. *Frontiers in psychology*, 13, 1038303.
- Van Kerrebroeck, B., & Maes, P. J. (2021). A breathing sonification system to reduce stress during the COVID-19 pandemic. *Frontiers in Psychology*, 12, 623110.
- Vidic, Z. (2025). Enhancing College Students' Well-Being through an Online Mindfulness Intervention During the COVID-19 Pandemic: An Exploratory Study. *American Journal of Health Education*, 56(4), 305-318.
- Ward, M. C. (2021). The sounds of lockdown: Virtual connection, online listening, and the emotional weight of COVID-19. *Sound Effects-An Interdisciplinary Journal of Sound and Sound Experience*, 10(1), 7-26.
- Watson, M. F. (2023). Nursing students' perceptions of how the COVID-19 pandemic impacts mental well-being and educational environment. *Heliyon*, 9(3).
- Weis, R., Ray, S. D., & Cohen, T. A. (2021). Mindfulness as a way to cope with COVID-19-related stress and anxiety. *Counselling and Psychotherapy Research*, 21(1), 8-18.
- Wu, Y., Kang, J., Liu, F., Xie, H., & Lau, S. (2023). Soundscape, well-being and mental health during/after the COVID-19 pandemic. *Frontiers in psychology*, 14, 1340207.
- Zhang, J., Pang, L., Yang, C., Fan, Y., Zhao, B., & Cao, X. (2024). Experimental evaluation of noise exposure effects on subjective perceptions and Cognitive performance. *Buildings*, 14(4), 1100.
- Zhu, R., Yuan, L., Pan, Y., Wang, Y., Xiu, D., & Liu, W. (2024). Effects of natural sound Exposure on health recovery: A systematic review and meta-analysis. *Science of The Total Environment*, 921, 171052. 7

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