

Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

American Journal of Infection Control 51 (2023) 466–468

Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org

Commentary

Health education after COVID-19: A time to revisit, revamp, and revitalize?

Malay Mody MPH [a,b], Kyle J. Gontjes MPH [b,c,*]

[a] Department of Physiology & Biophysics, Case Western Reserve University School of Medicine, Cleveland, OH
[b] Center for Research & Innovations in Susceptible Populations, University of Michigan Medical School, Ann Arbor, MI
[c] Department of Microbiology & Immunology, University of Michigan Medical School, Ann Arbor, MI

The educational system plays an integral role in equipping the next generation with the knowledge, skills, and resources needed to flourish as productive citizens. Health education class is a fundamental tool to ensure that students are health literate and encouraged to uptake healthy lifestyles.[1] Health education class also serves as a location for intervention, such as student-focused nutrition, drug use prevention, and safe sex programming.[2] Unfortunately, the current health education curriculum exemplifies a reactive model of health by focusing - often disproportionately - on individual health topics. The SARS-CoV-2 pandemic highlighted the importance of engaging students with the topics of health promotion, disease prevention, and public health. Here, we argue that addressing topics outside the traditional reactive, individualistic model of health would revitalize health education and promote coping strategies during the SARS-CoV-2 pandemic, prepare the populace for future public health crises, improve individual and public health promotion, and inspire future generations to join the public health workforce.

IMPACT OF THE SARS-COV-2 PANDEMIC ON THE EDUCATIONAL SYSTEM

The SARS-CoV-2 pandemic has affected numerous domains of health critical to primary and secondary student flourishing. In 2020 alone, the pandemic disrupted the education of nearly 1.3 billion students.[3] Continuous educational disruptions occurred throughout the pandemic, including the use of non-pharmaceutical interventions amid increases in community transmission and school outbreaks.[4] Symptoms of pandemic-associated educational disruption include staffing shortages and reports of decreased student academic engagement and performance.[5] The pandemic affected students' psychological status, having increased the prevalence of social isolation, depression, anxiety, and reduced quality of life.[6] Additionally, the pandemic impacted students' access to mechanisms for positive health behaviors, such as the availability of free or low-cost nutritious meals and opportunities for physical activity.[7] Alongside overtly health-related impacts, the pandemic also influenced the availability to pursue economic opportunities and identify role models, within the spheres of public health and the student's desired vocational domain. Furthermore, the pandemic exacerbated pre-existing disparities, including technological access, internet availability, access to educational resources, availability of after-school programming, and health care across vulnerable subpopulations, educational systems, and socioeconomic groups.[8]

SHIFTING DEFINITIONS OF HEALTH FROM A REACTIVE TO A PROACTIVE, MULTI-COMPONENT MODEL

This public health crisis exemplifies the necessity to move society's framework of medicine and public health away from predominantly reactive, clinical models to those that honor health as a multi-component state of well-being. Johannes Bircher eloquently defined health as the "dynamic state of well-being characterized by a physical, mental, and social potential, which satisfies the demand of a life commensurable with age, culture, and personal responsibility."[9] The World Health Organization's constitution encourages this philosophy by subverting traditional models of health, those that address health as merely the "absence of disease or infirmity," in favor of the holistic view that health is a "state of complete physical, mental, and social well-being."[9] When designing health education and public health interventions, we should be attentive to these proactive, multi-component models of health. The development and implementation of inclusive models of health, particularly those that encourage the holistic assessment of the biological, psychological, social, and spiritual domains of health, within the realms of health care, medical education, and public health have been eloquently described elsewhere.[9-12]

A CALL TO REVISIT, REVAMP, AND REVITALIZE HEALTH EDUCATION

Health education must honor the present and future realities of public health. Therefore, it is imperative to revamp health education

* Address correspondence to Kyle Gontjes, MPH, Department of Microbiology & Immunology, University of Michigan Medical School, 109 Zina Pitcher Pl., Rm. 3248, Ann Arbor, MI, 48109.
E-mail address: kgontjes@umich.edu (K.J. Gontjes).
Funding/support: Kyle J. Gontjes is supported by the National Human Genome Research Institute (training grant no. T32-HG000040) at the National Institutes of Health. *e National Institutes of Health.*
Conflicts of interest: None to report.

https://doi.org/10.1016/j.ajic.2022.11.018
0196-6553/© 2022 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

in a way that educates current and future generations about the necessity for strong public health preparedness alongside the traditional encouragement of individual health choices. Considering the SARS-CoV-2 pandemic, we argue that primary and secondary health education curricula and standards must be revisited, revamped, and revitalized. Specifically, public health topics must be tightly woven into revamped health education curricula. A fundamental understanding of both individual and population health will educate current and future generations on combating and coping with future pandemics while also enhancing current health promotion efforts. While this commentary focuses on primary and secondary education, this argument can be extended to post-secondary education, including undergraduate and medical education.

We posit that revamping health education will have multiple benefits. First, a revamped health curriculum would assist in promoting a positive health and safety culture in schools. Knowledgeable and engaged students can effectively disseminate information across social networks via interpersonal communication, social media, and activism. Effective public health communication plays a vital role in the development and implementation of public health interventions.[13] Second, effective public health education could increase student intervention compliance, prevent educational and community transmission of infectious diseases, improve outbreak control and reduce educational disruptions. Third, student exposure to public health topics and professions may promote interest in pursuing public health as a vocation.[14,15]

TRANSLATING THEORY TO PRACTICE: A FEW SUGGESTIONS

To achieve our goal of health promotion, a revamped health education curriculum is necessitated. When developing a modernized, updated health curriculum, a multidisciplinary team of experts and stakeholders should be consulted, including health professionals, public health practitioners, health educators, educational leaders, and students. As evidenced by the COVID-19 pandemic, we believe that the infectious disease community plays an integral role in promoting infection prevention and public health literacy across educational institutions.

With any call to action, it is integral to discuss the political realities of health education. In the United States, the National Health Education Standards, a set of 8 standards for pre-K to 12th-grade education, was developed as a framework for curriculum development and instruction in health education by the Joint Committee on National Health Education Standards. Initially released in 1995 and revised in 2007, the NHES was updated and refined in 2022 after the Society for Health and Physical Education (SHAPE) acquired the copyrights to these standards from the American Cancer Society in 2020.[16] Alongside the adoption of public health-friendly federal educational policies, interventions, and standards, we meaningfully encourage advocacy and involvement at the state level (ie, department of education) and local level (ie, school boards).

To facilitate the integration of public health into the current curricula, this forthcoming section will provide a sample of potential pedagogical activities. First, while the 2007 NHES standards recommended 40 hours of instruction for pre-K to second grade and 80 hours per year for grades third to 12th, not all states had accessible health education standards or adherence to the NHES, when surveyed in 2012.[17] As the recommended hours of educational instruction by state,[17,18] we broadly propose that, alongside traditional lectures on individual health topics, a respectable proportion (ie, 25%) of coursework should be dedicated to public health topics. Public health-adjacent topics addressed should include (1) discourse on community and population health, (2) examples of the interconnectedness of public health networks, and (3) continued discussions of infection prevention and public health preparedness. Second, we encourage inviting public health professionals, such as local researchers, medical professionals, infection preventionists, and health department employees, to speak about their role in individual and public health promotion. The provision of real-world examples of public health can exemplify and clarify public health's diverse role in a citizen's life. Third, invited speakers could discuss the educational requirements and employment opportunities within their fields. Prior research demonstrates that career exposure and counseling are important to high school students when they are discerning career aspirations.[19] Furthermore, collaborative interventions with local health leaders have proven effective in promoting student healthy behaviors.[1,2]

Integrating public health topics within primary and secondary education's broader science and humanities curriculum could improve student health literacy. We recognize that health education class may only - appropriately - serve as an introduction to the complexity of public health. Therefore, the development of fully-fledged public health coursework and the encouragement of extracurricular activities can serve as opportunities for students to dive deeper into topics like epidemiology, health policy, health behaviors, and health education. Public health coursework can also serve as a springboard for students to instigate career discernment and professional development before higher education.

Regardless of whether students join the public health workforce, faithful integration of public health into educational curricula could improve the greater public's health literacy, confidence in public health, pandemic preparedness, and health promotion efforts. As the SARS-CoV-2 pandemic-affected generations pursue their vocational goals, whether in medical professions, public health careers, or elsewhere, all will serve critical roles in the promotion of individual and population health. Therefore, we argue that public health is a key component of educational curricula and interventions designed to equip students with health literacy and skills necessary to serve as productive citizens. The time to act is now.

Acknowledgments

The authors wholeheartedly extend their sincerest gratitude to members of the Center for Research and Innovations in Special Population (CRIISP) at the University of Michigan for their thoughtful discussion of this topic and their meticulous review of the manuscript.

References

1. Marks R. Schools and health education: what works, what is needed, and why? Health Educ. 2009;109:4-8.
2. Kolbe LJ. School health as a strategy to improve both public health and education. *Ann Rev Public Health*. 2019;40:443–463.
3. United Nations Educational, Scientific and Cultural Organization (UNESCO). Education: from disruption to recovery. 2020. Accessed November 11, 2022. https://www.unesco.org/en/covid-19/education-response.
4. Viner RM, Russell SJ, Croker H, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Health*. 2020;4:397–404.
5. Donnelly R, Patrinos HA. Learning loss during COVID-19: an early systematic review. *Prospects*. 2022;51:601–609.
6. Imran N, Zeshan M, Pervaiz Z. Mental health considerations for children & adolescents in COVID-19 Pandemic. *Pakistan J Med Sci*. 2020;36:S67.
7. Masonbrink AR, Hurley E. Advocating for children during the COVID-19 school closures. *Pediatrics*. 2020;146: e20201440.
8. Goldberg SB. *Education in a Pandemic: The Disparate Impacts of COVID-19 on America's Students*. USA: Department of Education; 2021.
9. Bircher J. Towards a dynamic definition of health and disease. *Med Health Care Philosophy*. 2005;8:335–341.

10. Bircher J, Hahn EG. Will the Meikirch model, a new framework for health, induce a paradigm shift in healthcare? *Cureus*. 2017;9: e1081.
11. Bircher J, Kuruvilla S. Defining health by addressing individual, social, and environmental determinants: new opportunities for health care and public health. *J Public Health Policy*. 2014;35:363–386.
12. Gontjes KJ, Collier K. From a culture of blame to a culture of grace: a letter in reply to Papadakis. *Inf Cont Hosp Epidemiol*. 2021:1–2.
13. Bernhardt JM. Communication at the Core of Effective Public Health. *Am J Public Health*. 2004;94:2051–2053.
14. Blotnicky KA, Franz-Odendaal T, French F, Joy P. A study of the correlation between STEM career knowledge, mathematics self-efficacy, career interests, and career activities on the likelihood of pursuing a STEM career among middle school students. *Int J STEM Educ*. 2018;5:1–15.
15. Zahner SJ, Henriques JB. Interest in public health careers among undergraduate student nurses. *J Public Health Manag Pract*. 2013;19:62–69.
16. National Consensus for School Health Education. National Health Education Standards: Model Guidance for Curriculum and Instruction 3rd Edition 2022. Accessed January 3, 2023. www.schoolhealtheducation.org.
17. Vu LK. State Policies for Health Education in Public Schools. Dayton, OH: Write State University; 2012. Accessed November 11, 2022. https://corescholar.libraries.wright.edu/mph/56/.
18. Brixey E. 50-State Comparison: Instructional Time Policies. Educational Commission of the States. 2020. Accessed November 11, 2022. https://www.ecs.org/50-state-comparison-instructional-time-policies/.
19. Witko K, Bernes KB, Magnusson K, Bardick AD. Senior high school career planning: what students want. *J Educ Enquiry*. 2005;6;34-49.