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[H1]Abstract

The future of health care professional education is moving from a focus on the individual to embrace the health of the larger society. The COVID pandemic has further highlighted the connection between social determinants and the health of populations. There are frameworks and competencies to support the delivery of population health content in the entry-level DPT curriculum. Three options for integrating population health content into the DPT curriculum are presented: (1) threading the content throughout the curriculum, (2) concentrating the content in 1 or 2 identified courses, and (3) offering elective courses. Each of these strategies has benefits and challenges but threading the content throughout the curriculum provides the best opportunity to reinforce population health competencies across populations and practice settings. Experiential learning using authentic scenarios provides an ideal opportunity for students to understand population health concepts in a real-world context. Activities that incorporate interaction with other health professions broadens students' perspectives of the role of different professions for achieving population health goals. Examples of learning activities are included in three competency areas, Foundations of Population Health, Prevention and Health Promotion, and Health Policy. Current societal issues provide an opportunity to enhance population health education from a meaningful perspective for students. The topic of health equity presents an opportunity to tie social and political factors of population health to social justice and health outcomes. Similarly, the COVID-19 pandemic puts issues of mental health, health disparities, and health systems front and center in our understanding of population health.

Impact. Healthcare practitioners are looking at health through the lens of health equity and acknowledging the impact of social and political determinants on health to address health disparities, decrease healthcare expenditures, and respond to changes necessitated by pandemics such as COVID-19. As healthcare systems and practices are rethought and reconstructed, the intentional integration of population health principles woven into the fabric of professional education is a critical component of preparing future providers. This paper describes how population health concepts can be meaningfully embedded into Doctor of Physical Therapy curriculum along with providing realistic examples and activities.

[H1]INTRODUCTION

Connecting health professional educational content to reflect community needs and the people they serve requires curricular goals derived from and accountable to society.¹ Integrating population health perspectives throughout physical therapist education is an essential means of understanding and addressing the complex array of factors that contribute to individual, community and societal health.²⁻⁴ The urgency of this message served as the foundation of the 2020 Physical Therapy Educational Leadership Conference keynote presented by Dr. Alan Jette, “Bringing a Population Health Perspective to Physical Therapy Education”.⁵ Dr. Jette argued that achieving the American Physical Therapy Association’s aspirational vision of “transforming society by optimizing movement to improve the human experience” requires leveraging population-based approaches to ensure the delivery of equitable care, support healthy behavior change at the individual, organizational and societal levels, and inspire transformational leadership.⁵ The next generation of clinicians and leaders within the physical therapist profession will require new skills as change agents to achieve this aspirational vision,

acquired through the integration of transformative learning opportunities with informative and formative learning.⁶

Dr. Gail Jensen and colleagues,⁷⁻⁹ similarly called upon the physical therapist profession to meet “non-negotiable broader social responsibility” and community health needs when preparing future practitioners. Their pivotal Excellence in Physical Therapy Education study was modelled after the Carnegie studies of medicine, nursing, law, and clergy, driven by concerns about health professional education drifting away from civic and social responsibility toward a narrow focus on individual care.⁷⁻⁹ One of the major recommendations from the Excellence in Physical Therapy Education study was to ensure that student learning outcomes address “population health, the needs of communities where health disparities exist, and the social determinants of health”.⁸ The current pandemic has placed a bright spotlight on the interconnection between health, the environment, and existing health disparities, as well as the underlying social and structural factors that create and perpetuate these disparities. Promoting population health within physical therapist professional education has never been more urgent.

Population health integrates disease and injury prevention, health promotion, and the multiple determinants of health (behavioral, social, environmental, economic, and political) as a means of improving individual and societal health.¹⁰ The broader systems-based approach requires consideration of contributions of these intertwining and complex factors for individual, community and societal health and elements to be addressed in healthcare. One of the major challenges as a profession is defining our unique contributions to population health through our expertise in movement, an area that as a profession we have often delegated to others, even in clinical settings.⁹ Jensen and colleagues^{7,8} challenged educators to address societal needs using

our expertise in movement and to establish our unique identity related to contributions to population health. The vast need for increasing activity¹¹⁻¹⁴ and our skill set as movement experts elevates the importance of preparing students to address life-style related contributors to disease such as smoking, nutrition and activity.¹⁵⁻¹⁷ However, improving movement is tightly linked to political and social determinants of health such as healthcare funding and regulations impacting living and recreational environments. As educators, our social responsibility extends beyond providing a didactic curriculum to working alongside community stakeholders and identifying ways that our programs can address priorities to contribute to sustainable solutions; in turn providing a rich and lasting impact on our students and profession.¹⁸

Existing population health and health promotion frameworks provide valuable foundations to help guide the delivery of population health content in physical therapist professional education.¹⁹⁻²² Two recent papers have outlined content and competencies that are valuable when considering integrating population health into physical therapist education. Domholdt and colleagues²¹ encourage programs to use the Clinical Prevention and Population Health Curriculum Framework (CPPH), developed by the Association for Prevention Research and Training (APTR).²³ The APTR Healthy People Curriculum Task Force, representing prominent health professional education associations (medicine, nursing, osteopathic medicine, pharmacy, dentistry, allied health professions, nurse practitioners, and physical assistants), developed the framework to advance the Healthy People 2020 educational objectives and inform the delivery of individual and population-oriented prevention and health promotion content.²³ The CPPH framework is revised every 5 years and consists of four components: Foundations of Population Health; Clinical Preventive Services and Health Promotion; Clinical Practice and Population

Health; and Health Systems and Health Policy. Using the CPPH framework (v 3.0) as a guide, Magnusson and colleagues²⁴ employed a modified Delphi process to establish 25 consensus-based competencies in three topical areas: foundations of population health, clinical preventive services and health promotion, and health systems and policy.

The perspectives in this paper build from the CPPH framework²³ and established competencies²⁴ to present educators with options to integrate population health content within physical therapist professional education curricula, provide transformative learning activities, and teach how to analyze contemporary health issues using population health perspectives. The American Council for Academic Physical Therapy Education (ACAPT) characterizes excellent academic programs as “continually and intentionally striving to transform learners, advance knowledge and improve societal health.”²⁵ While there is strong support for delivering population health content to meet societal needs in physical therapist professional education,^{20,21,26} educators have expressed concerns regarding the addition of content to already crowded curricula and limited faculty expertise to deliver this content.²⁰ This perspective discusses options for educational methods to introduce population health across a continuum for an early introduction to more extensive curricular integration.

[H2]Integration of Population Health Content in Physical Therapy Education

Curriculum design requires consideration of the explicit organization of content scope (breadth and depth), sequence, continuity with vertical development of topics in sequential classes, and integration—both horizontal and vertical.²⁷ In this section, 3 options for integrating population health content within physical therapist professional education are discussed: (1) threaded throughout the curriculum, (2) concentrated in 1 or 2 courses, and (3) delivered via

elective courses or independent study. These options are not mutually exclusive, and options may be considered at different stages of program development or revision. Yet, threading content throughout the curriculum provides the most powerful opportunity to reinforce population health competencies for all patient populations and practice settings.

[H3]Threaded Content

An estimated 40% of physical therapist education programs in the United States (US) report incorporating population health content throughout their curricula.^{20,26} The threaded approach involves systematic integration of population health learning objectives and related content throughout the program, building from simple to complex, or lower to higher level Bloom's Taxonomy objectives.²⁷ The explicit integration of population health learning objectives may also be organized as modules or course units in specific systems-based courses (eg, musculoskeletal, neuromuscular, cardiopulmonary), across cases in multiple courses or in problem-based learning units, and using a variety of instructional methods. Embedding learning objectives across multiple courses throughout the program serves to reinforce population health competencies across practice settings and populations, and helps students recognize and address barriers to health at the individual, community and societal levels.

There are 2 published examples of curricular innovation promoting the integration of population health content in Doctor of Physical Therapy (DPT) curricula. The first describes evidence-based health examinations and lifestyle behavior change interventions integrated across a first professional degree physical therapist education as a means of addressing the growing non-communicable disease pandemic (eg, cardiovascular disease, hypertension, and diabetes).² In the second a comprehensive curricular model was designed to: "systematically

present the challenges of modern health care, integrate new models of care (ie, population health), develop outstanding clinicians, and prepare innovative leaders”.¹⁹ In this model a “Leadership, Policy, and Advocacy” course was intentionally developed to run concurrently with courses in advanced physical therapist practice, advanced research training, and business management to support the development of students as change agents.^{2,19} Both models consider the need to prepare students for responsibilities to address societal needs. While there are examples of integration in other healthcare professional education and there are potentially programs where the mission and vision of the institution, college or department supports a coordinated and systematic approach throughout the curriculum, most publications in the physical therapy literature focus on individual activities or courses.

In the threaded approach, opportunities for synchronous or asynchronous activities need to be explicitly identified and reinforced at multiple timepoints in the curriculum to allow learners to recognize their importance and reflect on the surrounding context. Cases, discussions, and other activities can be developed to complement course content (see Section 2), with the deliberate linkage of population health concepts within and between courses. Regardless of the approach used, assessment strategies (eg, examinations, reflections, capstone projects) should reflect desired learning objectives (Tables 1–3).

The successful implementation of population-based approaches in clinical practice requires strong inter-professional and inter-sectoral practice collaborations to tackle the complexity of social and structural determinants of health.²⁸ The focus on interprofessional education has increased in the past decade to prepare students for interprofessional practice. Further expansion of team approaches to address health and prevention rather than illness is

an area for future growth,¹ and integration of population health concepts within interprofessional courses and activities is a natural fit.²⁸ Interprofessional education offers additional opportunities for transformative learning activities covering socio-ecological models of health, social determinants of health, public health, health equity, and health policy.^{29,30} Others embed interprofessional education (IPE) activities, and community experiences in the context of population health principles in threads across multiple years.³¹⁻³³ Singh and coworkers describe the integration of population health content in a four-month IPE course for 575 students across 12 health professions.^{2,31} Concepts were introduced and reinforced using learning cases, emphasizing social determinants of health, differential access to resources, and health disparities within the care plan.

Integrated Clinical Education (ICE) is another option that supports the application of content introduced throughout the didactic curriculum. Recent calls for health professional education reform have emphasized the importance of longitudinal clinical experiential training in a variety of settings but especially in under-resourced areas.^{28,34} There are limited examples of ICE for physical therapist experiential education in less traditional community settings, such as rural clinics or community organizations. Nursing programs have shifted clinical experiences from primarily acute and outpatient facilities to include community-based patient care in diverse, non-traditional settings with greater population health and community care emphasis.^{28,35} These settings can expand availability of clinical sites as well as preparing students for the realities and complexities patients face due to structural and social determinants of health. The lack of clinical experiential opportunities in under-resourced or lower socioeconomic communities perpetuates a world view for those students and faculty who

are not familiar with the challenges faced by marginalized populations. The existing educational demographics emphasize the need to expand locations for learning in underserved areas where students can begin to understand the realities *all* patient's face daily. A longitudinal experiential curriculum including service learning and structured clinical education in settings where population health concepts are modeled and in areas with the greatest need can merge public health and health care provider perspectives. In settings where community-oriented services are the priority, reciprocal and mutually beneficial partnerships address both community and educational needs simultaneously.^{28,36}

[H3]Concentrated Focus Courses

An estimated 40% of US-based PT education programs report delivering population health content in a designated course or set of courses.^{20,26} Such courses (eg, Health Promotion, Wellness, and Prevention) address objectives consistent with components of the CPPH framework, while leveraging individual and community health assessments to inform individualized plans of care, community-based programming, and other meaningful deliverables.³⁷ Topics include epidemiology, disease prevention (primordial, primary, secondary, and tertiary), health promotion, behavioral counseling, social and structural determinants of health, population health informatics, interprofessional and intersectoral collaborations, health systems, health services financing, and health policy.³⁸ If concentrated courses are used, a coordinated approach to introduce and build progressively on content should emphasize relating concepts to a variety of clinical populations and practice settings, and provide continuity across the curriculum.

[H3]Elective Courses and Independent Study

Programs may choose to deliver population health content via elective courses or independent study for students with a particular interest in this area. Such options can enrich and complement existing content,²⁹ while integrating concepts on a smaller scale. While electives and independent study allow more rapid implementation in the short-term, they are likely insufficient in inspiring the level of transformational change required within our profession to address societal needs in the long-term. For those programs offering population health content within the standard curricula, however, electives and independent study represent opportunities for advanced applications and experiential learning (eg, community-based service learning and global health experiences, see Tab. 1–3) where smaller numbers of students allow for more in-depth training.³⁷

[H2] Transformative Learning Activities for Population Health

There are various educational philosophies, approaches, and methods useful for the delivery of population health content. Integrating scenarios representing the complex and complicated world in which we live into learning activities meeting course objectives across the curriculum provides relevance and meaning to activities and strengthens transfer of knowledge. Situated learning, defined as learning delivered in a context representing practice and the complex interactions of social and physical environments, provides a perfect learning approach for developing population health, prevention, and health promotion competencies. Situated learning theory emphasizes the importance of learning using authentic scenarios where the learners are active participants in deriving meaning while understanding the impact of sociocultural factors. Learners begin to understand and develop skills sorting and prioritizing the multitude of interdependent factors influencing health at the individual and societal levels,

starting with peripheral participation and building towards independent responsibility and engagement in a community of practice.³⁹ In the Excellence in Physical Therapy Education study, intentional structure, sequence, and timing of situated learning were recommended as being critically important for the development of professional skills.⁷ Jensen and colleagues⁷ also propose that situated learning should be used “early, often, and continuously” to scaffold and support a learning trajectory towards increasingly complex tasks and higher-order cognitive skills. While early situated learning can involve guided participation in classroom settings, conscious design of frequent and progressively more complex practice opportunities is important for developing higher-order thinking. Jensen and colleagues⁹ also outline the importance of opportunities for modelling and interacting with a community of practice and a progression from peripheral participation and cognitive apprenticeships to full participation in professional roles.

Situated learning philosophies and learning activities can be implemented across the curriculum with goals and objectives to develop population health knowledge, skills, and attitudes. Options for learning activities are illustrated in Tables 1 to 3 and are discussed below. These examples can be matched to local community resources and specific curricular needs. The examples in the tables, provided by members of APTA’s Population Health Work Group and members of the APTA Health Promotion and Wellness Council are organized using 3 categories from the modified CPPH framework: Foundations of Population Health, (Tab. 1) Prevention and Health Promotion, (Tab. 2) and Health Policy. (Tab. 3) Examples are matched to competencies developed by Magnusson and coworkers,²⁴ and are by no means exhaustive. The learning activities are organized broadly from simple to complex, emphasizing higher order Bloom’s

Taxonomy learning objectives and focusing on situated learning philosophies. Whether part of a stand-alone course or integrated throughout the curriculum, the relevance of these activities to clinical practice needs to be made explicit as well as reinforced consistently for students to appreciate the importance of concepts for patients and their roles within the healthcare team.

[H3]Foundations of Population Health

Foundational content is an important first step in preparing students to consider a population health perspective (Tab. 1). This content does not necessarily require physical therapist clinical knowledge and is suitable for didactic synchronous or asynchronous content delivery early in the curriculum. Background epidemiology can be used to provide context, while exposure to types of preventive services and health promotion activities can be introduced using examples to cover all areas described in the CPPH. The impact of social determinants on health and wellness can be intentionally organized as separate units (eg, education, wealth, culture, discrimination), or integrated into problem-based learning cases across the lifespan.³⁷ Practical application of these concepts using situational and active learning provide more powerful understanding and retention of the complexities of population health than passive lectures or reading alone. Cases can build in complexity in the same course or across courses; for example, identifying and addressing social factors in the initial educational activity followed by identifying options for the healthcare team to address structural factors.

[H3]Prevention and Health Promotion

There are different methods for identifying health promotion and clinical practice resources to meet both learning and professional service (Tab. 2). Educators and clinical

instructors may: (1) develop learning activities and programs centered around national initiatives, eg, Healthy People 2030,⁴⁰ National Physical Activity Plan,⁴¹ National Council on Aging Evidence-based Falls Prevention Programs,⁴² Healthy Weight Programs,⁴³ Million Hearts screening and education initiatives to prevent cardiovascular incidents,⁴⁴ National Institute on Aging Go4Life exercise and physical activity campaign,⁴⁵ (2) partner with local, public health and community entities using community engagement or service-learning, or (3) collaborate with health care providers at the local, regional or national level for delivery of screening and prevention programs, eg, Special Olympics, concussion prevention programs, nonpharmacological management of pain initiatives, activity promotion programs for schools, workplaces.

Health promotion and prevention activities may involve service-learning,⁴⁶ ICE, or clinical experiences in community settings, and projects to assist with identified community needs. These learning experiences can also involve preparatory course content and community-engaged scholarship and should strive to be sustainable.^{47,48} Common features of outstanding learning experiences have been reported as providing a variety of community-based learning projects driven by the local context and working with community partners to meet real needs.⁴⁹ There are countless opportunities for educational programs to partner with rural clinics, federal health clinics, Indian Health Services, inner-city health and community organizations for experiential or service-learning.⁵⁰⁻⁵⁵ However, considerable time and effort is needed to build strong partnerships and long-term sustainability rather than only considering short-term educational needs.⁵⁶

[H3]Health Policy

Interventions that change policies or the environment affect a greater number of people than do treatments and programs focused on individual behavior change⁵⁷ (Tab. 3). Physical therapists are uniquely positioned to be change agents in population health due to their knowledge of lifestyle and environmental factors that influence the health of the communities we serve. However, knowledge alone is not sufficient to bring about the large-scale changes necessary to impact population health. Advocating for changes to social and health policies, and to physical environments is essential to bring about meaningful improvements in population health.⁵⁸ APTA's Public Policy Priorities also mentions advocacy to endorse policies "to empower people to live healthy and independent lives".⁵⁹

A competency to "advocate for the health needs of society" in physical therapy education would be well-supported by training in advocacy and the process of influencing health policy.⁶⁰ Advocacy is best learned through experiential methods. Students who have the experience of writing a letter to the editor of an online news source or an article in a local newsletter can feel empowered to promote change in public and population health. The APTA currently focuses on advocacy to support the profession with Physical Therapist Day on The Hill and Legislative Action Alerts. However, as Dr. Jette stated in his ELC Keynote Address,⁵ we could improve upon our efforts to advocate for issues that affect the greater population, such as improving physical activity levels.

[H2]Examining Contemporary Issues Using a Population Health Perspective

Continued social unrest and a global pandemic held much of our attention in 2020. As a society we tend to associate outcomes with an individual's life choices, paying little attention to the life chances afforded them by their environment. Population health perspectives allow us

to describe health outcomes within and between groups of people, explore health disparities, and understand the complex and interrelated factors that influence health at the individual, community, and societal level. Equipped with this information, physical therapists better positioned to examine interventions, programs, and policies from a systems perspective and advocate for health equity. The following discussion leverages 2 relevant health issues, health inequity and the COVID-19 pandemic, to explore how programs can integrate current challenges into content and learning activities using the modified CPPH Framework: (1) Foundations of Population Health, (2) Prevention and Health Promotion, and (3) Health Policy.

[H3]Health Equity

Population-based approaches to health seek to understand how biological, behavioral, environmental, social, and structural factors influence health, while leveraging this information to improve health and advance health equity. Health *inequities* reflect systemic differences in health status or the distribution of health resources resulting from unjust and avoidable socio-economic conditions.⁶¹ The fundamental causes of health inequity arise not from innate biological differences, but from historical policies deeply rooted in various forms of structural oppression and discrimination (eg, racism, sexism, ableism). Extensive literature demonstrates the persistence of racial disparities across health outcomes, even after controlling for individual- and community-level factors such as education, income, and neighborhood advantage,^{62,63} suggesting racism as a risk factor for poor health outcomes. Thus, it is imperative that student physical therapists understand the fundamental causes of health inequity to avoid perpetuating health care practices that result in harming marginalized clients and communities.

Understanding one's role in advancing health equity can be promoted by weaving health equity concepts, practices, and activities throughout the curriculum. Case-based activities, small and large group discussions, and reflections can be used to highlight sources of inequity such as implicit and explicit bias, micro- and macro-aggressions, racial profiling and police brutality, poverty, living conditions, non-existent or crumbling infrastructure and recreational spaces, and limited access to nutritious food, affordable housing, and high-quality health care.^{64,65} Experiential learning activities include service-learning and walk-alongs (guided walks with members of the community who share insights regarding the area's history, culture, and sources of pride), and community asset mapping.²⁸ In order to address root contributors to structural health inequity, current and future physical therapists will need to tackle our own biases and work in concert with members of the community to address population health challenges. If educators provide meaningful, early, and frequent opportunities for students to appreciate the needs, life circumstances, and experiences of groups other than those they readily identify with, new graduates may approach professional responsibility in population health with greater confidence. Further, if educational programs initiate and cultivate sustainable and mutually beneficial community partnerships, our profession will be better prepared to work with, and alongside, clients and communities to facilitate equitable healthcare implementation and reduction of health disparities.

Advocacy is another critical skill required for dismantling structures that perpetuate systemic forms of oppression (eg, racism, classism, sexism, heterosexism, ableism). Armed with knowledge of the fundamental causes of health inequity, students are better prepared to engage in self, peer, systems, and legislative advocacy. Examples of experiential learning

activities that develop advocacy skills to improve health equity include appraising local, state, and federal policies regarding their influence on health equity, writing letters in support of or opposition to proposed legislation, constructing policy briefs, and participating in “legislative day” activities (Tab. 3). APTA and state activities provide additional opportunities for students to expand their awareness and refine their skills advocating for health equity (eg, House of Delegates, Federal Advocacy Forum). In fact, a number of position statements calling upon PT professionals to support diverse, equitable and inclusive environments resulted from the direct advocacy efforts of students, clinicians, and faculty. Two recent APTA House of Delegates resolutions affirmed: (1) the association’s commitment to diversity, equity, and inclusion as a means of better serving the association, the profession, and society (HOD P06-19- 43-16),⁶⁶ and (2) our role in identifying and addressing health disparities, paying particular attention to the social determinants of health (HOD P06-19-46-54).⁶⁷

[H3]COVID-19 Pandemic

The COVID-19 pandemic has shined a bright spotlight on existing health inequities, revealing the detrimental consequences of various social, economic, and educational policies. In light of the pandemic, a recent Lancet editorial emphasized the need to value health as a foundation and outcome for all other aspects of society.⁶⁸ The pandemic has forced us to explore how we might work more effectively alongside community members to identify systematic and systemic disparities in health outcomes, and address the underlying causes of poor health. One year into the COVID-19 pandemic, cases in the US surpassed 24 million while deaths exceeded 500,000.⁶⁹ Significant and systematic variations in exposures, cases, hospitalizations and deaths, exist and are impacted by the social determinants of health.^{70,71}

Physical environments, neighborhoods, transportation accessibility, housing conditions, occupational requirements, education, and economic security are all structural determinants of health further magnified by the recent pandemic. Discrimination further shapes the socio-economic fabric that places people at increased risk for COVID-19 infection, decreases access to early or quality care and increases risk of long-term disability.^{70,72} Many of the health disparities associated with COVID-19 can be tied to the policies that influence our conditions of daily living. Everyday news and publicly available reports can be used for learning activities, providing an extremely impactful understanding of the immense effect of current systems and inequity on health. Thus, as with experiential learning activities tied to the advancement of health equity illustrated in Table 2, students can appraise local, state, and federal COVID-19 policies and regulations, assess infection control strategies and social inequities, and construct policy briefs for defined populations. Working alongside community members to raise awareness regarding current COVID-19 policies and regulations (see Tab. 3), or providing community services such as meal support, or vaccine administration events also provides greater understanding of the community health challenges, needs, assets, and priorities. Potential barriers and facilitators for implementing population health concepts

It is imperative to include population health content in DPT curricula for adequate preparation of graduates who are ready to meet contemporary societal needs. While individual activities can be impactful and curricular content may be comprehensive, there are surrounding contextual factors that may impede or expedite this work (see Figure). Through threaded content, concentrated courses, or elective courses focused on population health, educators can brush broad, vibrant strokes of population health concepts throughout traditional physical

therapy instruction using many of the activities discussed in this paper. However, unwillingness to change on the part of faculty or students at best limits student appreciation of these ideas, or at worst, presents a major barrier for student learning and translation into practice. This is particularly important to consider if students' assessments, interventions, and approaches to care lack an equity lens in clinical practice—consistent support and reinforcement is even more important for students who have a sheltered or uni-dimensional view. Program and institutional culture, values, and strategic priorities also impact the efficacy of integrating curricular change. Whether programs operate within a Public Health, Medicine, Liberal Arts, or other organizational structure may significantly impact prioritizing and including population health content within curricula. More clearly defining population health, disease prevention, and health promotion competencies within accreditation standards would help ensure prioritizing concepts across educational institutions.

There are numerous policies sustaining and impacting population health. For future clinicians to impact systemic change, they will need to have the confidence and drive to work with policymakers and payors to dismantle the very policies and systems that reinforce health disparities. Conversations regarding how policies like the Affordable Care Act, Medicaid expansion, telehealth, and other state or federal laws influence specific populations' access to and experience with healthcare are an important aspect of professional advocacy. Preparing students for discussions with lawmakers would be further enriched by leveraging population health perspectives to illustrate the strong linkages between various social determinants and poor health outcomes.

[H1]Conclusion

As the health system turns its attention toward the health of populations, it will be critical for PTs to demonstrate the skills necessary to contribute to change. This perspective paper presented options for integrating population health content within physical therapist professional education through transformative learning activities. Given the potential for significant variation in curricular organization between programs, best practices for integrating population health content should be the focus of structured inquiry. In the meantime, each program will need to determine opportunities and mechanisms that best meet the needs of students and their community according to institutional purpose and vision statements. Examples presented in this perspective provide a sampling of activities across the core elements of CPPH organized across Bloom's taxonomy. Within the context of health equity and the COVID-19 pandemic, this perspective illustrated how programs might apply population-based approaches to important contemporary health issues. The various ways students and faculty might understand and address emerging population health issues will require a pedagogy that is flexible, adaptable, and meaningful.

Our profession has adapted to evolving societal needs over the past 100 years. The next 100 years will require that physical therapists assess and intervene at the community level alongside historic strengths in individualized patient care for physical therapists to remain at the forefront of a rapidly developing health care landscape. It is important that physical therapist educators contribute to transformative practice through cultivating and integrating population health perspectives throughout curricula in a manner that reflects community needs, assets, and priorities, while considering contextual barriers and facilitators.²⁷ Further, it is imperative that physical therapist educators develop, deploy, and assess teaching and

curricular strategies that inspire physical therapist students to realize their full potential as health professionals to fulfill their role in improving the health of both individuals and populations. We are positioned to join other providers in advancing the healthcare field by holistically considering specific populations' health outcomes only if we find meaningful ways to incorporate population health principles into every aspect of our care for patients and our teaching. Ideally, our academic program missions will support collaborative community partnerships that intentionally bridge gaps in health equity.

Educators who facilitate transformative education, practice, and leadership, will play an essential role in our profession's contribution to meeting societal needs. The time has come for us to take a more active role in improving the health of *all* members of society and prepare the next generation of physical therapists to advance health equity using population-based approaches to care.

[H2]Author Contributions

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FIGURES



Figure. Contextual factors impacting population health educational content and delivery in entry-level physical therapist education programs.

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TABLES

Table 1. Competency Topics and Active Learning Strategies for the Modified Clinical Prevention and Population Health Curriculum Framework Domain of *Foundations of Population Health*^a

Foundations of Population Health	
Competency Topics	Active Learning Strategies and Examples
Recognize the multiple determinants of health, including social and physical and how they interact to influence individual and population health	<p>Framed cases</p> <ul style="list-style-type: none"> Cases developed with surrounding context and/or the express purpose of understanding population health concepts and frameworks, eg, ICF model,⁷⁴ socio-ecological model,^{75,76} model of political economy of health,⁷⁷ disease prevention model.⁷⁸
Define population health, and justify the physical therapist's role in prevention and health promotion Recognize the multiple determinants of health, including social and physical and how they interact to influence individual and population health	<p>Simulated activities</p> <ul style="list-style-type: none"> Role-playing simulations to apply concepts regarding the impacts of social and structural determinants on health for specific groups and understand services and resources in the community, eg, older adults living alone, minority groups, immigrant populations or individuals in rural areas. Interactive games to examine impacts of structural factors on health and choices available to patients, eg, Smartie's Poverty Game,⁷⁹ Brain Architecture Game.⁸⁰ Oxford style debates and position statement activities to analyze the role of physical therapists in prevention and health promotion.
Identify key health indicators used to monitor population health Collect and utilize sources of population health data to guide the provision of prevention/health promotion services, inform precision physical therapy, and evaluate outcomes Access sources of population health data to guide the development and provision of prevention and health promotion services	<p>Outcome and data evaluations</p> <ul style="list-style-type: none"> Explain the Behavioral Risk Factor Surveillance System.⁸¹ Utilize wearable devices to interpret and monitor physiologic characteristics. Examine data from a physical therapist patient database to link correlation between outcomes and demographics Analyze population health programs by using PRECEDE-PROCEED model.⁸²
Access sources of population health data to guide the development and provision of prevention and health promotion services Identify key health indicators (eg, physical activity, BMI) used to monitor population health	<p>Community-engaged service</p> <ul style="list-style-type: none"> Conduct community needs assessments for a particular community or population using state/local data, eg, Robert Wood Johnson zip code tool, census tract data.⁸³⁻⁸⁵ Create a health promotion service project alongside a local organization. Research, design, and implement targeted interventions for a specific community.

^aCompetencies are not all inclusive and can be adjusted to be lower or higher on Bloom's taxonomy. BMI = body mass index; ICF = international classification of functioning, disability and health.

Table 2. Competency Topics and Active Learning Strategies for the Modified Clinical Prevention and Population Health Curriculum Framework Domain of *Prevention and Health Promotion*^a

Prevention and Health Promotion	
Competency Topics	Active Learning Strategies and Examples
<p>Recognize risk factors and integrate knowledge of the personal and environmental factors of clients who experience health disparities</p> <p>Apply evidence-based principles to engage positive health behaviors and function as a member of an inter-professional team</p>	<p>Framed cases</p> <ul style="list-style-type: none"> • Utilize existing cases to explain the role of prevention (eg, prevention of ACL injury, osteoporosis, lymphedema). • Discuss longitudinal care of someone with a complex health condition via ICF model and recognize the environmental, structural, social, and personal factors that impact patient presentation and outcomes with other students and healthcare team members. • Apply the 5 A's⁸⁶ and motivational interviewing⁸⁷ to promote behavior change in patients through case scenarios and role playing.
<p>Assess your client or community's health, health literacy, readiness to change, and health-related goals, risks, and assets to engage in positive health behavior</p> <p>Integrate knowledge of personal and environmental factors into a prevention/health promotion plan of care</p>	<p>Program and outcome evaluation</p> <ul style="list-style-type: none"> • Examine population health programs and educational materials for health literacy using Newest Vital Sign tool.⁸⁸ • Apply frameworks, like the PRECEDE-PROCEED model, and compare and contrast different factors to design a health promotion program for a population. • Appraise a self-health assessment and address an area of health behavior with explicitly linked theories (eg, transtheoretical model, socio-ecological model, decision architecture, and behavior change).
<p>Organize and participate in clinic or community-based evidence-based screening programs that meet the needs of clients to advance health equity through evidence-based strategies</p> <p>Communicate as a member of an interdisciplinary team regarding prevention and health promotion information in ways that recognize and respect clients' values, priorities, and communication needs</p>	<p>Community-engaged service</p> <ul style="list-style-type: none"> • Assemble and engage in longitudinal community-based IPE events or pro-bono services that engage patients in prevention and health promotion activities. • Use community data (eg, from patient interviews and community resources) to construct community service and educational opportunities (eg, for a community health fair, developing infographics, etc.). • Create community screenings, evidence-based injury prevention programs, and community, sports injury prevention programs, or act as health coach "buddies" for individuals at the YMCA as part of a course or ICE experiences.

^aCompetencies are not all inclusive and can be adjusted to be lower or higher on Bloom's taxonomy. ACL = anterior cruciate ligament; ICE = Integrated Clinical Education; IPE = interprofessional education; YMCA = Young Men's Christian Association.

Table 3. Competency topics and active learning strategies for the modified Clinical Prevention and Population Health Curriculum Framework domain of *Health Policy*^a

Health Policy	
Competency Topics	Active Learning Strategies and Examples
Describe the function of the health sector and non-health sector agencies in promoting health and well-being vis-à-vis the social determinants	Framed cases <ul style="list-style-type: none"> Use CDC Policy Analysis model to understand a patient case and locate what needs are present within the community.⁸⁹
Describe the function of the health sector and non-health sector agencies in promoting health and well-being vis-à-vis the social determinants	Outcome and data evaluation <ul style="list-style-type: none"> Assume mock roles on Urban Planning committees and implement models such as the System for Observing Play and Recreation in Communities (SoPARC) to examine use of parks, playgrounds, and greenspace in local community and its' effects on health and wellness of community members.⁹⁰ Analyze asset mapping to determine strengths within identified communities and question the role of non-health sector environmental factors on health equity, eg, insurance, environmental accessibility.⁹¹
Support the integration of healthy behaviors into educational and community-based settings Describe the function of the health sector and non-health sector agencies in promoting health and well-being vis-à-vis the social determinants	Community-engaged service <ul style="list-style-type: none"> Develop programs that promote health encourage health and reduce disparities such as walking programs.⁹² Assemble community partners to promote exercise in specific populations, eg, MS Society, Brain Injury Association of America and advocate for services, funding, or other support to community organizations to promote improved health and wellness.
Advocate for the health needs of society	Advocacy <ul style="list-style-type: none"> Appraise the built environment on campus or in communities, utilizing an ADA checklist, and formulate proposals for modifications. Participate in Federal Advocacy Forum or local advocacy activities that engage with legislators and investigate the role of physical therapists in advocacy and policy. Formulate letters of support for policy or public health initiatives, eg, via Flash Action Strategy.⁹³ Construct a policy brief on a topic of their choosing related to class content or a population.

^aCompetencies are not all inclusive and can be adjusted to be lower or higher on Bloom's taxonomy. ADA = Americans with Disabilities Act; CDC = Centers for Disease Control and Prevention; MS = multiple sclerosis.