

Fostering Collaborative Practice Through Interprofessional Education

M. Renée Umstadd Meyer, PhD^a; Tyler Prochnow, PhD^{a,b}; Burrirt Hess, MD^c; Christina During, MPH^a; Jasmine Opusunju, DrPH^a; Jacob Creighton, MD, MPH^{a,d}; Jasmin Sumrall, MPH^a

AUTHOR AFFILIATIONS:

^a Department of Public Health, Robbins College of Health and Human Sciences, Baylor University, Waco, TX

^b Department of Health Behavior, Texas A&M University, College Station, TX

^c Waco Family Medicine, Waco, TX

^d University of Tennessee Medical Center Knoxville, Knoxville, TN

CORRESPONDING AUTHOR:

M. Renée Umstadd Meyer, Department of Public Health, Robbins College of Health and Human Sciences, Baylor University, Waco, TX, Renee_Umstadd@Baylor.edu

HOW TO CITE: Umstadd Meyer MR, Prochnow T, Hess B, et al. Fostering Collaborative Practice Through Interprofessional Education. *Fam Med*. 2024;57(X):1-7.
doi: [10.22454/FamMed.2024.533520](https://doi.org/10.22454/FamMed.2024.533520)

PUBLISHED: 13 December 2024

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ABSTRACT

Background and Objectives: Health care leaders use interprofessional collaborative practice as a strategy to improve health outcomes, and they have stressed its importance in the education of primary care medical providers to apply public health concepts like the social determinants of health and community collaborations. Interprofessional education (IPE) prepares students from different professions for collaborative practice as they enter the health workforce by developing core competencies. Understanding the importance of IPE is vital toward improving person and client-centered care and population health outcomes. This study aims to evaluate IPE workshops' effects on participants' confidence in applying public health concepts to improve health outcomes and intention to collaborate with local resources.

Methods: Public health-focused workshops were provided to encourage collaboration between Master of Public Health (MPH) students and residents in a family medicine residency program. We analyzed change using McNemar's tests to determine significant differences between pre- and postworkshop responses.

Results: In total, 33 family medicine residents and 41 MPH students provided full data for the evaluation. We found statistically significant differences between self-efficacy levels and intention to partner with resources between pre- and postworkshop surveys.

Conclusions: Results point to the efficacy and value of IPE opportunities in the education of family medicine residents and MPH students. This study presents a viable and useful example of IPE integration between MPH students and family medicine residents. Understanding social determinants of health and the use of local resources to better the health of the community is vital for both groups.

INTRODUCTION

In 2023, chronic diseases such as cardiovascular disease, diabetes, and cancer accounted for most illness, disability, and death in the United States.¹ Treatment of chronic diseases in the United States accounted for an estimated 90% of the nation's \$4.5 trillion annual health care expenditures in 2023.¹ The United States spends more on health care than any other country and is expected to increase national health expenditures at an average rate of 5.5% annually over the next 7 years.² Many public health professionals use the social determinants of health model to better understand the factors leading to chronic disease.^{3,4} These determinants, which include neighborhood and built environment, health and health care, economic stability, education, and social community context, are critical for well-being.^{3,4} Addressing the behavioral, social, and environmental factors that affect health is necessary to effectively reverse or limit the rising

prevalence of chronic disease in the United States; however, collaborations among primary care providers and public and community health professionals are needed.

Health care leaders are using interprofessional collaborative practice (IPCP) as a strategy to improve health outcomes. In 2011, the Interprofessional Education Collaborative (IPEC) established a standard of recommendations to be met by health-related educational organizations; IPEC prepared updates in 2016 focused on strengthening population health approaches and incorporating concepts from the triple aim (improving the patient experience of care, improving the health of populations, and reducing the per capita cost of health care).⁵ These standards have been widely adopted across health professions, including medicine, nursing, pharmacy, and dentistry, leading to the development of various interprofessional education (IPE) models such as shared learning experiences, simulation-based training, and collaborative clinical place-

ments.⁶

The Council on Education for Public Health recently adopted the standards as part of its accreditation requirements.⁷ In 2023, the IPEC competencies for IPCP were further refined, for version 3, with concepts integrated from the quadruple aim (improving student and provider self-care and well-being), quintuple aim (advancing health equity), One Health, and fundamental public health concepts such as determinants of health, advocacy for social justice, and health equity.⁸ These updates reflect the evolving understanding of health as a multifaceted concept requiring diverse professional input. IPCP has resulted in improved outcomes in patient care, making it a justified approach to improving health outcomes.⁹ For instance, studies have shown that interprofessional teams in primary care settings can lead to better management of chronic diseases, improved patient satisfaction, and more efficient use of health care resources.⁹ Researchers are exploring the professional and educational use of this strategy.^{10,11}

Integrating public health with primary care medical practice is a viable application of IPCP. Collaborations between public health and primary care may come in many forms, including formal collaborations, integrative health care models, and collaborative educational experiences.^{12,13} Researchers and health leaders have stressed the importance and value of IPE opportunities as they relate to the education of primary care medical providers on public health concepts like the social determinants of health, community collaborations, and joint approaches to community health outcomes.^{12,14–16} For example, some medical schools have integrated population health courses into their curricula, while others have developed joint MPH (Master of Public Health)–MD programs.¹⁷ However, a need remains to evaluate IPE experiences specifically between family medicine residents and public health students, which this study aims to address.

While IPE has been widely suggested across various health care disciplines, a notable gap exists in research specifically examining IPE between public health and family medicine trainees. This study addresses this gap by focusing on the unique intersection of these two fields, an understanding of which is critical for addressing complex health challenges at both individual and population levels. Unlike previous IPE initiatives that often involved clinical disciplines exclusively, our approach brings together future public health professionals and family medicine residents, fostering a comprehensive understanding of health that spans from individual patient care to broader community health strategies. In this current study, we evaluated 4 years of workshops (2015–2018) and their effect on participants' confidence in applying public health concepts to improve health outcomes in the community. Additionally, we aimed to discover how participation in the workshops influenced the likelihood of collaboration and use of community resources to improve health outcomes.

METHODS

Study Participants

The Waco Family Medicine–Residency (WFM–R), in partnership with Baylor University, implemented public health–focused workshops to encourage interprofessional education between Baylor University Public Health Master of Public Health in Community Health (MPH–CH) students and WFM–R residents. Both Baylor University MPH–CH students enrolled in a program assessment and planning course and first- and second-year WFM–R residents were eligible to attend the public health focused workshops; MPH–CH students were required to attend as part of a core course during the second year of their program, and residents were strongly encouraged to attend during both years 1 and 2 of their residency as part of their required curricular meetings. Thus, MPH–CH students in the workshops were different each year, and WFM–R residents had the opportunity to participate in 2 years of workshops; however, attendance was not tracked. Evaluation of these workshops was conducted to assess curricular outcomes of interest to both programs and was designated exempt by the referent institution's institutional review board (IRB #1217433). All potential participants were asked to complete pre- and postworkshop evaluation surveys that were anonymous. Preworkshop and postworkshop surveys were matched using responses to four sociodemographic items on both the baseline and postworkshop surveys. Only participants with both preworkshop and postworkshop data in at least 1 year were included in these analyses.

Workshop Contents

Each workshop consisted of two sessions of 2 hours each, 1 week apart. Each session included presentation of informational material, with intermittent small-group discussions aimed at providing opportunities for residents and MPH–CH students to mix and learn from one another. These discussions were directed by the facilitators, who prompted participants by asking questions to help promote understanding and application. Sessions were led by the Baylor University MPH–CH graduate program director and the WFM–R associate program director. Each year, the theme and focus of the workshop was selected based on programmatic needs identified by the WFM–R curriculum director and MPH–CH graduate program director. In 2015, the workshop focused on community collaborations and collaborative health outcomes. The 2016 workshop focused on case studies of community health assessments. In 2017, case studies were used again; however, the workshops were focused on responses to infectious disease epidemics. The 2018 workshop covered social determinants of health. While the topics changed given the needs identified each year, all workshops aimed to foster collaboration, discussion, and understanding between residents and MPH–CH students.

Measures

Outcome evaluation was assessed using pre- and postworkshop surveys. Each eligible workshop participant was invited to complete a pre- and postworkshop survey that assessed

their self-efficacy in implementing public health and inter-professional techniques as well as their intentions to use additional resources to improve health outcomes. Changes in self-efficacy and intention measures were evaluated between the preworkshop survey and postworkshop survey to assess the effectiveness of the workshop.

Self-efficacy in this study was measured using an adapted five-item scale with four response options. Items included:

- ▶ How confident are you that you know how to assess the health status of your community if given specific health domains and indicators?
- ▶ How confident are you that you can identify groups and/or organizations within your community as potential resources?
- ▶ How confident are you that you know the purpose of Healthy People 2020?
- ▶ How confident are you that you can use the Healthy People 2020 priorities and benchmarks to appraise and improve the health of your community? and
- ▶ How confident are you that you can collaborate with professionals from different sectors (hospitals; state and local public health agencies; voluntary, civic, and faith-based organizations, health consumers; community businesses)?

Participants could respond with “not at all confident,” “somewhat not confident,” “somewhat confident,” or “very confident,” which were coded 1 through 4 and then averaged for a scale score.

Intention to use additional resources to improve health outcomes was measured by asking participants to rate how likely they would be to view an entity as a potential resource or partner in addressing important health risks or issues in the community. Specifically, participants were asked,

When you enter your field of practice in the future, how likely is it that you will view each entity on the following list as a resource or partner when trying to determine important health risks/disease issues in your community and how to address them?

Participants could respond “not very likely,” “somewhat not likely,” “somewhat likely,” or “very likely,” which were then dichotomized to likely (somewhat likely and very likely) and not likely (not very likely and somewhat not likely). Entities listed were local health/medical clinics/providers, local hospitals, county health department, Centers for Disease Control and Prevention website, community members, schools/department of education, local nonprofit organizations, faculty of nearby universities with health programs, faculty of nearby medical schools or residency programs, churches, department of transportation, city planners/developers, local law enforcement, city officials, parks and recreation department, World Health Organization (WHO) website, local news stations, and local worksites.

Data Analysis

We used mean, standard deviation, and frequency to describe demographic information collected as part of the baseline survey. We used paired sample *t* tests to determine significant differences between pre- and postworkshop self-efficacy scores. To analyze change in the intention to partner with outside resources, we used McNemar’s test to determine significant differences between pre- and postworkshop responses. All analyses were completed using SAS Version 9.4 using a 95% confidence level for all variables.¹⁸

RESULTS

In total, complete pre- and postworkshop data were provided by 33 residents and 41 MPH-CH students. On average, participants were 26 years old (SD=4.1 yrs) and predominantly female (72.6%). Table 1 shows complete demographic data from those who completed both pre- and postworkshop surveys.

TABLE 1. Demographic Data of Participants (N=74)

Age, mean (SD)	26.0 (4.1)
Gender (%)	
Female	72.6
Male	27.4
Race/ethnicity (%)	
African American or Black	4.1
Asian	10.8
Caucasian	62.2
Hispanic, Latina, Latino	12.2
Other	10.8
Classification (%)	
Family medicine resident	45
MPH-CH student	55

Abbreviations: SD, standard deviation; MPH-CH, Master of Public Health in Community Health

A paired *t* test showed a statistically significant difference between preworkshop (mean=2.8; SD=0.7) and postworkshop (mean=3.3; SD=0.5) self-efficacy levels ($P<.01$). We also found significant differences in intention to partner with resources between the pre- and postworkshop surveys. Significant changes were seen in the intention to partner with schools, faculty of nearby universities, department of transportation, city planners, city officials, local news stations, and local worksites. Table 2 displays the full sample self-efficacy and intention results between the pre- and postworkshop surveys and associated *P* values.

We then stratified the results by participant type (WFM-R resident or MPH-CH student). Paired *t* tests showed statistically significant differences in self-efficacy levels in both WFM-R residents and MPH-CH students between the preworkshop and postworkshop surveys. WFM-R residents were significantly more likely to indicate that they would partner with or use local law enforcement, city officials, WHO website,

TABLE 2. Self-Efficacy and Intention Results of Participants With Both Pre- and Postworkshop Data (N=74)

	Preworkshop	Postworkshop	P
Self-efficacy, mean (SD) (min: 1, max: 4)	2.8 (0.7)	3.3 (0.5)	<.01*
Intention, % likely			
Local health/medical clinics/providers	97.3	96.0	.56
Local hospitals	91.9	91.9	1.00
County health department	93.2	98.7	.10
CDC website	89.0	90.4	.76
Community members	83.6	89.0	.20
Schools/department of education	73.0	87.8	<.01*
Local nonprofit organizations	75.7	85.1	.12
Faculty of nearby universities with health programs	83.6	93.2	.03*
Faculty of nearby medical schools or residency programs	79.5	83.6	.46
Churches	66.7	76.4	.19
Department of transportation	30.6	50.0	<.01*
City planners/developers	42.5	56.2	.04*
Local law enforcement	38.4	63.0	<.01*
City officials	48.0	69.9	<.01*
Parks and recreation department	54.2	61.1	.27
WHO website	86.1	91.7	.15
Local news stations	46.6	71.2	<.01*
Local worksites	42.4	68.5	<.01*

*Denotes significant P value

Abbreviations: SD, standard deviation; CDC, Centers for Disease Control and Prevention; WHO, World Health Organization

local news stations, and local worksites after the workshop as compared to prior to the workshop. In contrast, MPH-CH students were significantly more likely to indicate that they would partner with or use schools, local nonprofit organizations, local news stations, and local worksites after the workshop as compared to prior to the workshop. Table 3 displays self-efficacy and intention results, stratified by participant type, between pre- and postworkshop surveys as well as P values produced.

DISCUSSION

This study evaluated the impact of an IPE workshop on participants' confidence in applying public health concepts to improve health outcomes in their community. Furthermore, this study showed that participation in the workshop influenced the likelihood of collaboration and use of community resources to improve health outcomes. Overall, participants reported greater self-efficacy after the workshop. When stratifying by participant type, these findings held true for both WFM-R residents and MPH-CH students. Self-efficacy is a vital predictor of behavior change and intention to change.¹⁹ An increase in self-efficacy also may promote an increase in the intention to partner with certain community resources.

We found significant increases in the percentage of participants who reported having an intention to partner with community resources in the future. Significantly more WFM-R res-

idents reported they would partner with local law enforcement and city officials as well as use the WHO website after attending the workshop. The presence of collaborations between law enforcement and health professionals is growing and shows promising implications for community health.^{20,21} Significantly more MPH-CH students reported that they would partner with local schools and nonprofit organizations after attending the workshop. Collaborations with nonprofit organizations has been described as “imperative” for population health and may serve as a crucial avenue for community health improvement.²² Moreover, collaborations between health professionals and local schools have been shown to improve health indicators and literacy.²³ Both participant groups were more likely to report intention to partner with local news stations and worksites after the workshop. With the spread of health misinformation,²⁴ health professionals need to be aware of proper uses and partnerships with media outlets to better inform the public with factual information on important health matters.^{25,26}

The knowledge and skills gained through this IPE workshop have several potential applications in future practice. For family medicine residents, understanding social determinants of health and community resources could enhance their ability to provide comprehensive care. For instance, they might be more inclined to screen for social needs and refer patients to appropriate community services, potentially

TABLE 3. Self-Efficacy and Intention Results, Stratified by Participant Type, With Both Pre- and Postworkshop Data (N=74)

	Family medicine residents (N=33)			MPH-CH students (N=41)		
	Pre	Post	P	Pre	Post	P
Self-efficacy, mean (SD)	2.5 (0.7)	3.0 (0.5)	<.01*	3.1 (0.4)	3.5 (0.4)	<.01*
Intention to partner, % likely						
Local health/medical clinics/providers	100.0	100.0	–	95.1	92.7	.56
Local hospitals	97.0	100.0	–	87.0	85.4	.65
County health department	90.9	100.0	–	95.1	97.6	.56
CDC website	84.9	87.9	.70	92.5	92.5	1.00
Community members	69.7	84.9	.06	95.0	92.5	.56
Schools/department of education	63.6	75.8	.20	80.5	97.6	<.01*
Local nonprofit organizations	69.7	72.7	.78	80.5	95.1	.03*
Faculty of nearby universities with health programs	75.0	87.5	.20	90.2	97.6	.08
Faculty of nearby medical schools or residency programs	84.9	87.9	.70	75.0	80.0	.52
Churches	56.3	68.8	.31	75.0	82.5	.40
Department of transportation	25.0	43.8	.05	35.0	55.0	.05
City planners/developers	25.0	40.6	.13	56.1	68.3	.19
Local law enforcement	28.1	56.3	.03*	46.3	68.3	.06
City officials	28.1	56.3	.02*	46.3	68.3	.08
Parks and recreation department	35.5	38.7	.08	68.3	78.1	.15
WHO website	75.8	87.9	.04*	94.9	94.9	1.00
Local news stations	34.4	65.6	<.01*	56.1	75.6	.02*
Local worksites	21.9	56.3	<.01*	58.5	78.1	.01*

*Denotes significant P value

Denotes missing P value from lack of variance in postworkshop measure

Abbreviations: MPH-CH, Master of Public Health in Community Health; SD, standard deviation; CDC, Centers for Disease Control and Prevention; WHO, World Health Organization

improving health outcomes for vulnerable populations. Public health students, on the other hand, might leverage their increased understanding of clinical perspectives to design more effective population-level interventions. Both groups could use their enhanced collaboration skills to initiate or participate in community health partnerships, bridging the gap between clinical care and public health initiatives. For example, they might collaborate on community health assessments, design targeted health promotion programs, or work together to address local health disparities. Future research could explore how participants actually implement these concepts in their professional roles, providing concrete examples of how IPE translates into practice.

The current expansion of the IPE workshop with WFM-R residents and MPH-CH students was informed by the results of this study. In 2023, Baylor University MPH-CH students enrolled in a public health immersion course, and third-year WFM-R residents used the PRECEDE-PROCEED model to engage in components of community health assessment and program planning.²⁷ This culminating IPE workshop builds on training experienced during the first and second year for WFM-R residents and incorporates community capacity and needs assessment, community collaborations and diverse stakeholders, collaborative health outcomes, and social deter-

minants of health. Students from family medicine, public health, and additional professions (eg, Master of Athletic Training) participate in this IPE experience to implement interprofessional and public health techniques as part of learning groups where they (a) gather information for a designated community through windshield surveys and secondary data, (b) identify priority health issues and describe contributing factors, and (c) draft a plan for implementation and evaluation of multilevel interventions. The interprofessional learning groups then adapt their work in collaboration with professionals from different sectors (eg, education, policy, social work, health administration) representing the diverse stakeholders needed to influence multilevel factors and impact community and population health outcomes. Workshop participants then reflect on the roles of different professions in improving community and population health outcomes, consider the value of multilevel factors and strategies, and discuss how they will approach interprofessional collaboration as they transition into practice.

LIMITATIONS

These results represent one setting and type of IPE and should not be generalized to all forms of IPE. Likewise, longitudinal follow-up was not possible in this study. Additional

studies using similar training materials should be evaluated to determine the broad appeal and utility of this approach, evaluating both the short-term and longer-term impacts. Furthermore, outcomes were measured through self-reported subjective questionnaires. Future studies may want to employ mixed-methods approaches through the addition of qualitative interviews as well as tracking of physician outcomes and referrals.

Implications

Despite these limitations, the IPE workshops presented here were effective in improving self-efficacy scores as well as increasing the number of individuals within the cohorts of both WFM-R residents and MPH-CH students who reported an intention to access and incorporate local resources in their future practice. Using collaborative discussion and case studies as an educational framework to promote growth through IPE may be a promising model for collaborations within family medicine residencies and public health education across the nation.

CONCLUSIONS

Accrediting bodies are encouraging and even requiring IPE.²⁸ The study presented here is a viable and useful example of IPCP between family medicine residents and MPH-CH students. Understanding the social determinants of health, community collaborations, and how to convert this knowledge into the practical use of local resources to better the health of the community is vital for both these disciplines. These results are encouraging and point to the efficacy and value of IPCP opportunities for the education of family medicine residents and public health students.

PRESENTATIONS

Portions of this study were presented locally as poster presentations at the Annual Health Research Forum, hosted by Waco Family Medicine (April 24, 2018; April 12, 2016).

ACKNOWLEDGMENTS

We acknowledge the following individuals for their involvement informing the development of and/or collecting data for this project: Katherine Landgrave Thomas, Kaitlyn Thumann Preble, Dr Megan McClendon, and Dr Eva Doyle. We also express our sincere gratitude to the residents and students who were involved in this project for allowing us to learn alongside them.

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