



Does Having a Master of Public Health (MPH) Improve Physician Assistants' Ability to Address the Social Determinants of Health in Their Clinical Practice?

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Abstract

Background: There is mounting evidence that clinicians need to address the social determinants of health (SDOH) in their practice. The primary aim of this study was to determine whether or not having a Master of Public Health (MPH) improves physician assistants' (PA) ability to address the SDOH in their clinical practice.

Methods: A cross-sectional study was conducted with 25 practicing PAs who were jointly trained with the MPH degree and 32 practicing PAs who were not jointly trained. An online survey was administered to gather SDOH knowledge, attitude and behavior data using an adapted 13-item SDOH scale.

Results: Of the 57 respondents, the majority were female (64.9%), 70.2% identified as White and 64.3% classified their practice as specialty care. This study found that jointly trained PA/MPH clinicians reported significantly more perceived knowledge about SDOH (37.6 vs 31.1; $P = .028$), were more likely to identify SDOHs as important to their patients' health (38.6 vs 32.9; $P = .035$), were more likely to intend to address SDOH with their patients (29.7 vs 23.5; $P = .031$) and reported feeling more comfortable talking about SDOH with their patients (3.75 vs 3.2; $P = .05$) despite no significant differences in reported barriers to addressing SDOH.

Conclusion: These findings suggest that joint clinical training with the MPH degree can positively impact PAs ability to address the SDOH in their clinical work and lays the groundwork for future research.

Keywords: Master of Public Health; Physician Assistants; Social Determinants of Health

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Introduction

Current and future healthcare needs are complex and require more than medical intervention as a solution (1-3). While healthcare clinicians receive medical training for the purpose of diagnosing, treating, prescribing, and

bandaging patients, growing evidence has shown that it is not sufficient in improving overall clinical health outcomes of patients (4,5). In fact, many leaders in medical education have established the need for more clinicians trained in the core values of public health, including prevention,

research methods, applications of epidemiology, and the management of healthcare organizations. This need has been documented in relationship to the current and future supply of health professionals for over two decades as a strategic means to address improvement in the overall health of medical patients (6-9). This concept has been further supported by the Institute of Medicine (10), which has recommended that medical schools educate clinicians to be fully trained in the public health approach to health care.

With the implementation of the Patient Protection and Affordable Care Act, this need has become even more evident. The Affordable Care Act requires that clinicians be able to practice medical from the public health perspective, taking into account issues of cost, access, and quality of care, to ensure that they will be able to practice medicine in an effective and efficient manner (11). Together these are called the social determinants of health (SDOH) and play an integral role in promoting health equity (12).

More attention is now being focused on the significance of SDOH as the primary driver influences population health. According to Healthy People 2020, “social determinants of health are conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks, also referred to as ‘place’ (13).” With the SDOH as the foundation for public health, the need for increased public health training among clinicians and opportunities to integrate formal public health training in medical education have emerged in universities across the country (4, 14).

Evidence has suggested that clinicians are experiencing the need to understand SDOH in their practice. Recent research findings have suggested that clinicians do not feel well trained to deal with the non-medical needs of their patients (15). When asked about their preparedness for addressing

SDOH, clinicians and clinical students have reported the need for different type of interventions, such as “hands-on” guidance for implementing community-based projects, more group discussion (16) and ongoing or continuous training (15).

Schools have responded to these needs by increasing the availability of dual degree programs and/or by incorporating one or more public health courses into the basic medical curriculum (17,18). Despite efforts to integrate public health education within medical curricula, it has not been systematically implemented (14). Thus, the gold standard for training “public health” clinicians is the Master of Public Health (MPH) as a dual or joint degree option, which provides applied, hands-on opportunities, group and interprofessional training as well as more extensive ongoing education. Student interest in these types of dual degrees has also been positive (19).

While much of the literature speaks to the importance of attaining public health training for student clinicians, there is limited research available to document the efficacy of public health training. Physician assistants (PAs) are one of the fastest growing clinical professions and is expected to grow by 37% by 2026, which is faster than any other career path in medicine including nurse practitioners (20). More PA programs are offering MPH degrees concurrently with PA studies, yet the perceived impact of the MPH degree has not yet been fully explored (21, 22). As the PA profession was created to provide basic primary care to underserved populations to off-set shortages of primary care physicians, the limited research in this area exposes a significant gap in the literature to support dual degree PA/MPH clinicians (22).

The Accreditation Review Commission on Education for the Physician Assistant indicates public health training as a core requirement for PA education, with the expectation that PAs should understand the SDOH that contribute to the development

of chronic diseases (22). While public health concepts are fundamental to the PA training, the added comprehensive public health training of an MPH degree as it relates to SDOH has not been fully explored.

To gain a fundamental understanding of the efficacy of the MPH degree for PAs in relationship to addressing the SDOH in their clinical practice, the primary aim of this study was to investigate whether or not MPH training influences knowledge, attitudes, and behaviors regarding the SDOH between PA clinicians with the MPH degree and PA clinicians without the MPH degree.

Methods

A quasi-experimental cross-sectional design was employed to examine SDOH knowledge, attitudes, and behaviors among PAs.

A convenience sample was selected from two list serves: alumni listserv from a joint PA/MPH program that included graduating classes of 2010-2017 with 298 emails and alumni listserv from a stand-alone PA program that included graduating classes of 2010-2017 with about 310 emails. It was not possible to determine the number of emails that reached active email accounts but based on an audit, we estimate that approximately 75% of the emails were inactive.

A 13-item SDOH survey was adapted, with permission to use and modify, from a survey designed to gather cross-sectional data of SDOH knowledge, attitudes, and behaviors from nurses (23). The original survey had Cronbach's alpha reliability coefficient of 0.83 while content validity was not reported. To account for the modifications in the survey, a pilot test was administered to a sample of five current PA/MPH students to provide feedback on wording and comprehension along with the length of time to complete the survey.

The survey included four areas:

1. SDOH measures were divided into three domains according to the following statements: 1) Knowledge: How knowledgeable are you are about each of following as Social Determinants of Health? 2) Attitudes: How important are the following Social Determinants of Health issues for your patients' health? 3) Behavioral intentions: How likely are you to ask your patients about the following Social Determinants of Health? Each section included a 13-item scale to measure SDOH knowledge, attitudes, and behavioral intentions using a 5-point Likert scale with the following range of scores: 1 = *not at all*, 2 = *slightly*, 3 = *moderately*, 4 = *very*, 5 = *extremely*. The highest possible score was 52.

2. Two questions were included to measure knowledge, comfort, and perceptions regarding the impacts of SDOH on patients' overall knowledge of the impacts of social, economic, and legal issues using a 5-point Likert scale with the following range of scores: 1 = *not at all*, 2 = *slightly*, 3 = *moderately*, 4 = *very*, 5 = *extremely*.

3. One question was included to measure whether respondents' training contributed to their understanding of the importance of addressing the SDOH for the health of their patients using a 5-point Likert scale with the following range of scores: 1 = *not at all*, 2 = *slightly*, 3 = *moderately*, 4 = *very*, 5 = *extremely*.

4. One question was included to measure respondents' perceptions of their barriers to addressing SDOH issues with their patients. Ten response categories were included, consisting of issues related to time, patient's comfort, clinician's comfort, availability of resources, knowledge of resources, organizational practices, and perceptions of PA roles.

For the purpose of analysis, independent variables included all study demographic factors: gender, race/ethnicity, clinical practice type, and graduation year. Dependent variables included SDOH knowledge, attitudes, and behavioral

intentions; knowledge of SDOH resources and comfort discussing SDOH with patients; perception of the impact of PA training on understanding SDOH; and perceptions of barriers to addressing SDOH issues with patients.

An emailed invitation accompanied an electronic questionnaire to all potential participants. A detailed explanation of the study was provided in the introduction of the questionnaire that described the purpose of the study, main topics, and procedures for the survey along with discussing the voluntary nature of study participation. Consent for participation was included in the questionnaire and required respondents to indicate their consent for participation prior to initiation of the survey questions. The strategies to prevent any lapse in confidentiality were explained (e.g., not using names on questionnaires or any data reports, storing primary electronic data on a hard drive, a secured and password protected data storage system, and not using any identifying information in any summary reports or communications).

Two weeks after the initial email invitation, another email invitation was forwarded to individuals who did not respond to the first email in an effort to increase the response rate. Due to the slower than expected response rate from the pool of PA/PH alumni, an additional invitation was forwarded to the PA/MPH alumni group via Facebook as a means to increase the participation rate in the PA/PH sample in order to reach or exceed the numbers of participants in the PA sample. The Facebook invite was directed to the same pool of PA/PH participants that already received email invitations. A total of 57 individuals responded to the email invitation that went to approximately 150 active accounts, representing an estimated 38% response rate.

Completed surveys were downloaded from the online survey

platform to Stata 15 for analysis. Descriptive statistics (means and proportions) were calculated for each survey question. Bivariate analysis (*t*-test) was conducted to determine associations between school type and the three SDOH study domains: knowledge, attitudes, and behavioral intentions. Next, bivariate analysis (*t*-test) was conducted to examine the difference between PA/MPH and PA alumni clinicians' knowledge, comfort, and perceptions regarding the impacts of SDOH on patients using three 5-item scales. Finally, differences between PA/MPH and PA participants reported barriers to addressing SDOH were examined with bivariate analysis (chi-square). A significance level of $P < .05$ was considered significantly different given the small sample size.

Results

Of the 57 respondents, 25 (43.8%) were jointly trained PA/MPH and 32 (56.1%) were trained solely as PAs. Women made up approximately two-thirds (64.9%) of the entire sample. There was a significant difference between the two groups by gender (83.3% female among PA/MPH alumni vs. 50% female among PA alumni, $P = .008$). Race/ethnicity among the entire sample found just under three-quarters (70.2%) were White or Caucasian, of which 16 (64%) were PA/MPH alumni and 24 (75%) were PA alumni; approximately one-fifth were Asian or Asian American, with seven (28%) PA/MPH and six (18.7%) PA; Hispanic or Latinx respondents made up 7% of the entire sample population, of which two (8%) respondents were PA/MPH and two (6.25%) were PA; Other Race/Ethnicity respondents made up 3.5% ($n = 2$) of which both were PA/MPH; Black or African Americans were 1.75% of the entire sample ($n = 1$), a PA respondent; and there were no respondents in the sample of American Indian/Indigenous American or

Table 1. Demographics of Respondents, total and by degree type (n=57)

Variable	TOTAL	PA/MPH	PA	p-value ¹
	n (%)	n (%)	n (%)	
	n=57	n=25	n=32	
Gender				.008
Male	20 (35.7)	4 (16.7)	16 (50.0)	
Female	37 (64.9)	21 (84.0)	16 (50.0)	
Race/Ethnicity				.57
American Indian/ Indigenous American or Alaskan Native	0	0	0	
Asian/Asian American	11 (19.3)	7 (28.0)	6 (18.7)	
Black or African American	1 (1.75)	0	1 (3.13)	
Hispanic or Latinx	4 (7.0)	2 (8.0)	2 (6.25)	
Native Hawaiian or other Pacific Islander	0	0	0	
White or Caucasian	40 (70.2)	16 (64.0)	24 (75.0)	
Other Race/Ethnicity	2 (3.5)	2 (8.0)	0	
Type of Medical Practice				.631
Primary Care	15 (26.8)	7 (29.2)	8 (25.0)	
Specialty Care	36 (64.3)	15 (58.3)	22 (68.8)	
Other	5 (8.9)	3 (12.5)	2 (6.3)	

¹ Chi-square tests used for association

Alaskan Native or Native Hawaiian or other Pacific Islander origins. (see Table 1).

In describing medical practice type, 15 (26.8%) of all respondents identified their medical practice as primary care, 36 (64.3%) as specialty care, and 5 (8.9%) as other. A comparison of medical practice types of PA/MPH and PA respondents found no statistical differences: primary care 7 (29.2%) vs 8 (25%), specialty care 15 (58.3%) vs 22 (68.8%), and other 3 (12.5%) vs 2 (6.3%). Other practice types identified by respondents included military medicine and occupational health. There were no statistically significant differences between degree programs by type of medical practice (Table 1).

Table 2 shows p-values associated with t-tests comparing PA and PA/MPH mean scores of the 13 items that made up the scales that measure SDOH perceived knowledge, attitudes, and behavioral intentions for PA/MPH and PA alumni.

Jointly trained PA/MPH alumni were asked, "How knowledgeable are you are about each of following as SDOH?" Respondents with the joint PA/MPH degree more likely to report higher perceived SDOH knowledge across 4 of the 13 individual items: earning/disposable income ($P = .02$); social support ($P = .04$); food insecurity ($P = .02$); and race ($P = .01$). Five of the 13 items showed a trend

towards significance including social gradient ($P = .07$); stress ($P = .08$); social inclusion/exclusion ($P = .08$);

transportation ($P = .06$) and disability ($P = .09$).

Table 2. Comparing Perceived Social Determinants of Health Knowledge, Attitudes and Behavioral Intentions by degree type (n=57)

Items	SDOH Knowledge	SDOH Attitudes	SDOH Behavioral Intentions
Earning/Disposable Income	0.02*	0.02*	0.29
Social Gradient	0.07	0.07	0.95
Stress	0.08*	0.08	0.001*
Social Exclusion/Inclusion	0.08	0.08	0.07
Work Conditions	0.1	0.1	0.05*
Unemployment and Job Security	0.11	0.11	0.05*
Social Support	0.04*	0.04*	0.004*
Addiction	0.98	0.98	0.98
Food Insecurity	0.02*	0.02	0.11
Transportation	0.06	0.06*	0.01*
Education	0.12	0.12	0.48
Race	0.01*	0.01*	0.74
Disability	0.09	0.09*	0.51
Overall Score	.028*	.035*	.031*

*Denotes statistical significance at the .05 confidence level.

Mean scores found jointly trained PA/MPH alumni were significantly more likely to perceive SDOH as important factors in their patients' health in comparison to PA alumni on the following items: work conditions ($P = .01$); unemployment/job security ($P = .001$); social support ($P = .009$); transportation ($P = .02$); and race ($P = .03$). The remaining seven SDOH items also found PA/MPH alumni to have higher mean scores, of which the following four trended toward significance: earning/disposable income ($P = .07$); social

gradient ($P = .07$); stress ($P = .08$); and disability ($P = .09$).

To measure behavioral intentions, respondents were asked, "How likely are you to ask their patients about each SDOH item?" Compared to the PA alumni, PA/MPH alumni were significantly more likely to ask their patients about the following SDOH issues: unemployment/job security ($P = .001$); social support ($P = .009$); transportation ($P = .02$); and race ($P = .03$).

Table 3. Comparing Knowledge, Comfort, and Perception Levels Regarding SDOH of Patients, by degree type

Question	Total	PA/MPH	PA	p- value ¹
	n (SD)	n (SD)	n (SD)	
	n=57	n=25	n=32	
How <u>knowledgeable</u> are you on the social, economic, and legal issues that impact the patients that you care for? *	3.1 (0.88)	3.4 (0.83)	2.9 (0.90)	.088
How <u>comfortable</u> do you feel raising and discussing issues related to social determinants of health with the patients you care for? *	3.5 (1.0)	3.75 (0.9)	3.2 (1.0)	0.05*
My clinical training (PA degree) has contributed to my understanding of the importance of addressing the social determinants for health for my patients.	4 (0.8)	4.4 (0.7)	3.6 (0.7)	.0000*

*Denotes statistical significance at the .05 confidence level.

¹ T-tests used to compare mean scores for SDOH knowledge, comfort and perception levels

Table 4. Comparing Provider Barriers to Addressing SDOH with Patients, by degree

Items	TOTAL	PA/MPH	PA	p-value ¹
	n (SD)	n (SD)	n (SD)	
	N=57	N=25	N=32	
It takes too much time	26 (48.2)	9 (37.5)	17 (53.1)	.246
I'm uncomfortable asking for this type of information	3 (5.6)	2 (8.3)	1 (3.12)	.392
I think my patients would be uncomfortable if I asked	15 (27.8)	5 (20.8)	10 (31.3)	.384
I don't know how to address the issues if they are present (referrals, resources)	9 (16.7)	4 (16.7)	5 (15.6)	.916
I don't have support available to me to assist with these issues	23 (45.6)	12 (50.0)	11 (34.4)	.240
I don't think my patients have these types of issues	3 (5.6)	0	3 (5.6)	-
I don't think these are important issues	0	0	0	-
PAs should not be involved in these types of issues	0	0	0	-
There are other people in my organization who address these issues	22 (40.7)	11 (45.8)	11 (34.4)	0.385

¹ Chi-square tests used for association

The remaining seven SDOH items also found PA/MPH alumni to have higher mean scores, of which the following four trended toward significance:

earning/disposable income ($P = .07$); social gradient ($P = .07$); stress ($P = .08$); and disability ($P = .09$).

The overall mean scores of PA/MPH alumni were found to be statistically higher than mean scores of the PA alumni across each domain area: knowledge about SDOH (37.6 vs 31.1; $p = .028$), attitudes about the importance of SDOH (38.6 vs 32.9; $P = .035$), and behavioral intentions with regard to SDOH (29.7 vs 23.5; $P = .031$).

Table 3 shows PA knowledge of and comfort in asking about the impacts of SDOH on patients. When asked to rate their level of knowledge regarding specific SDOH indicators (social, economic, and legal issues) that impact their patients, while not statistically significant, we found a statistical trend among PA/MPH alumni, whose mean SDOH knowledge scores were higher in comparison to PA graduates' scores (3.4 vs 2.9; $P = .088$).

When asked to rate their level of comfort discussing issues related to SDOH with their patients, PA/MPH respondents reported significantly higher mean scores compared to PA respondents (3.75 vs 3.2; $P = .05$).

Participants were asked if they thought their degree contributed to their understanding of the importance of addressing the social determinants for health for their patients. Results found jointly trained PA/MPH clinicians reported statistically significant higher mean scores representing perceptions of their clinical training as contributing to their understanding of the importance of addressing the SDOH among their patient populations (4.4 vs 3.6; $P < 0.0001$).

Respondents were asked to identify the barriers to addressing them with their patients. Of the nine barriers that were provided, results found no statistical differences between PA/MPH and PA alumni (Table 4).

Discussion

This study found that jointly trained PA/MPH clinicians reported significantly

more perceived knowledge about SDOH, were more likely to believe in the importance of SDOH, were more likely to plan to address SDOH with their patients, and reported feeling more comfortable talking about SDOH despite both groups reporting that they experience the same barriers to addressing SDOH with their patients.

Past studies have also found that specific training on SDOH can support increases in knowledge, attitudes, and behaviors. Clinicians and clinical students who have received some training on addressing SDOH with their patients have reported some benefits. Evaluation results from a 12-month SDOH curriculum for pediatric interns found more knowledge and comfort when discussing housing and community resources (24). An evaluation of a 3-hour training for medical residents found participants more likely to recommend governmental food subsidy benefits such as Women Infants and Children and Supplemental Nutrition Assistance Program (25). While these are promising results, the same studies found null results on other important items such as understanding the importance of screening for food security and of social hardships (24).

Since public health instruction is included as an educational standard in PA education, it is not surprising that all study respondents were relatively well aware of SDOH as outlined in the 13-item scale. However, jointly trained PA/MPH respondents reported significantly more perceived knowledge of social, economic, and legal SDOH factors such as earnings/disposable income, social support, food insecurity, and race. While knowledge of SDOH alone is insufficient for improving overall health outcomes, it represents the first step in understanding the challenges that patients face and may provide clinicians with the ability to connect patients with community resources (26).

Responses from the attitude scale, which asked about the importance of SDOH, revealed that jointly trained PA/MPH respondents were more likely to perceive SDOH as important compared to solely trained PAs. As MPH training is infused with the theory and practice that underscores the importance of SDOH and serve as the primary basis for public health training, it is not surprising that PA/MPH respondents were more informed and understood the significance of SDOH for their patients.

The survey results also revealed that PA/MPH clinicians were significantly more likely to report their intentions to address SDOH in their practice by asking their patients about the specific SDOH issues outlined in the 13-item scale. This finding was further supported by results that revealed PA/MPH clinicians were significantly more comfortable with raising issues of SDOH with their patients in comparison to PA clinicians.

There were no significant differences between the two groups' responses to the barriers to addressing SDOH. Overall results for both PA/MPH and PA clinicians indicated that the most common barriers were organizational, time, resources (available support), and the lack of others within their organizations who are equipped to address SDOH issues. Barriers that might speak to their training, such as knowledge or discomfort, were less common in both groups.

The results of this study should be interpreted in the context of several limitations including the low response rate, the small sample size, instrumentation bias, and limits to generalizability. These limitations are detailed as follows: The survey was emailed to listservs that contained over 500 alumni emails in total. It is difficult to determine the exact response rate because we know that many emails were no longer being used. We estimate a response rate of just under 40%, which is considered low. There was no

incentive provided to study participants. PAs who responded may be more likely to care about SDOH, and therefore the results of this student may be an overestimate of knowledge, attitudes, and behaviors of the underlying groups. The small sample size and unequal distribution of respondents from each institution was a limitation that restricted the types of statistical analyses performed, in particular examination of race/ethnicity, gender, and practice type. The questionnaire for the study was adapted from nursing research, and the SDOH knowledge, attitudes, and behaviors scale have not been validated among PAs. It is possible that the context of SDOH resonates differently among PAs in comparison to nursing students, thus resulting in potential bias. Furthermore, study participants were recruited for this study from two private non-profit educational institutions; their experiences may not be generalizable to PAs in the general population. Lastly, it is important to note that two of the study's authors teach in an integrated program for students to earn a Master of Science in Physician Assistant Studies, and a Master of Public Health simultaneously. Familiarity with a joint program that emphasizes the social determinants of health may bias the researchers towards the effects of the programs on their alumni. However, in order to mitigate this potential bias, the third author who is not directly connected to the program reviewed the results independently. These findings have potential implications for healthcare organizations and PA education.

At the healthcare organizational level, there are systematic issues within healthcare organizations that challenge opportunities for PAs to address SDOH in the clinical setting. While jointly trained PA/MPH degree clinicians demonstrated more knowledge, favorable attitudes, and behavioral intentions, both PA/MPH and PA clinicians felt that they did not have time or resources to address SDOH in their practice. Thus, these findings suggest that

healthcare organizations may want to explore avenues to support new PAs in identifying and addressing the SDOH issues they see in their patients.

Given that dual degree PA/MPH programs have slowly gained in popularity over the past two decades with increasing numbers of program applicants (22), these findings reinforce the significance of this type of training and support the added value of the dual PA/MPH degree with regard to SDOH. In addition, the results also suggest that PA education and PA schools may consider opportunities to incorporate more instruction that is focused on SDOH within their public health curriculum. Since PA accreditation standards for public health instruction is required but not defined (27), this can be viewed as an opportunity for PA schools to consider standardizing public health instruction with a focus on SDOH into the existing PA curricula.

Future studies should investigate the influence of joint PA/MPH trained clinicians on health organizations, patients, and community health outcomes. Adding a qualitative component or conducting interviews or focus groups would further strengthen the findings and may add contextual evidence to the development of a standardized public health curriculum and training program for PA education. As dual degree training requires added tuition costs and longer training, future studies should also investigate the cost-benefit of the added degree and training.

Understanding and addressing the social and economic factors that make up the SDOH are complex, as they are deeply embedded into the historical and political structure of our society. Comprehensive solutions are needed to undertake these systematic challenges. The clinicians of the future are called to focus on improving patient communication around issues of SDOH and to help create and advocate for a clinical environment that understands the importance of providing social service resources and referrals; help create research

agendas that advocate for social change; get involved in community needs assessments; and get involved in community engagement opportunities for changing social norms (28). PA/MPH clinicians are in an ideal position to contribute significantly to the multi-layered solutions needed to address health inequities and overall poor health outcomes resulting from these structural issues.

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