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RESEARCH

The Prevalence and Characteristics of Dual PharmD/MPH Programs Offered at US Colleges and Schools of Pharmacy

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Objective. To assess the prevalence and characteristics of curriculum in dual doctor of pharmacy (PharmD)/master of public health (MPH) degree programs offered by US pharmacy programs.
Methods. An 18-item survey instrument was developed and distributed online to faculty members at US colleges and schools of pharmacy.
Results. Of the 110 colleges and schools that responded, 23 (21%) offered a PharmD/MPH degree. Common characteristics of these 23 programs included current PharmD program structure (3 + 1 year), early curricular recruitment, small enrollment, and interdisciplinary coursework occurring online and in the classroom. The impact of the dual degree on the curriculum and longevity of the dual-degree programs varied. About 55% of responding programs without a formal dual-degree program reported that additional public health training was available.
Conclusion. Twenty-one percent of colleges and schools of pharmacy offer a combined PharmD/MPH dual degree. Most programs required an additional 1 or 2 semesters to complete both degrees.
Keywords: pharmacy education, public health, masters of public health, dual degree

INTRODUCTION

Opportunities for pharmacists to impact public health needs have been well documented. Pharmacists have traditionally played key public health roles by providing immunizations,[1] needle exchange and medication disposal programs,[2-4] diabetes prevention and care,[5] and information.[6] As the profession evolves, pharmacists have become engaged in newer public health roles including in cancer and mental health screening,[7-9] emergency preparedness,[10] regulatory affairs,[11] domestic violence outreach,[12] and rural health.[13] With over 200,000 pharmacists practicing in community pharmacies, health systems, and other settings, pharmacy is the third largest health profession in the United States.[14] Additionally, more than 60,000 student pharmacists are enrolled in degree programs. As of 2012, approximately 127 professional programs are training these future pharmacists, with only 2 states not housing a pharmacy college or school.

Pharmacists are well positioned in communities and readily accessible to patients.[15]At the same time, a crisis in the public health workforce is building. The shortage of public health providers is expected to exceed 250,000 by 2020.[16] Given the existing involvement of pharmacists in public health initiatives, the growth of the pharmacy workforce in the United States, and the accessibility of pharmacists in the community, pharmacists are well positioned to take a larger role in meeting the public health needs of the nation.

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Recognizing the increased need for pharmacists' participation in community health endeavors, the Accreditation Council for Pharmacy Education (ACPE) mandated that colleges and schools of pharmacy teach and promote public health in their curricula.[17] ACPE Accreditation Standards and Guidelines are provided as a tool for pharmacy programs to structure and deliver education for the PharmD degree, and standard 12 specifically addresses public health and the role of the pharmacist. In order to address the shrinking public health workforce and place pharmacists in leadership roles involving public health projects and education at the local, state, and national levels, a call for even greater education in this area has emerged. This movement led many colleges and schools of pharmacy to create and/or offer joint integrated PharmD and masters of public health programs.[18] Information has been published on the locations of such programs but not the cumulative characteristics of these programs.[19] A further refined analysis of the programs would be of great interest to colleges and schools considering development of the dual-degree offering.

The objective of this study was to assess the prevalence and characteristics of dual PharmD/MPH degree programs offered to pharmacy students enrolled in ACPE-accredited colleges and schools of pharmacy in the United States. The Assessment Committee within the Public Health Special Interest Group (SIG) of the American Association of Colleges of Pharmacy (AACP) developed and conducted this study.

METHODS

Between 2010 and 2012, members of the AACP Public Health SIG's Assessment Committee used a series of conference calls to discuss the study's objectives and survey design. Because the committee did not find pertinent content areas and scales from primary literature sources, survey items were initially developed by committee members to assess characteristics of the dual PharmD/MPH degree programs. Additional ideas and feedback regarding survey items were solicited from individuals within the SIG's membership including a consultation with a panel of experts. An 18-item survey instrument was developed and contained questions regarding the existence of a dual PharmD/MPH program, program characteristics, curricular framework, and other opportunities for additional public health training affiliated with the college or school. The survey instrument developed had 2 pathways based on an initial response of whether the respondent's school had a combined program as well as an optional question at the end of the survey instrument to provide the respondent's college or school name.[20] The survey procedures and content were submitted to and deemed exempt from further review by the Wayne State University Institutional Review Board.

The survey instrument was administered using SurveyMonkey (http://www.surveymonkey.com) with the intent of capturing the largest possible online audience. In SurveyMonkey, the first survey page contained a research information sheet to obtain consent from the responder. Respondents who consented to participate were then invited to proceed with completing the survey instrument. AACP granted permission to the committee to use the Public Health SIG list serve to distribute the survey instrument by e-mail up to 3 times. The survey instrument was first electronically distributed to members of the AACP Public Health list serve in August 2011. The survey instrument was again distributed to the e-mail list serve in October 2011. Finally, a third electronic mailing to potential nonrespondents was distributed in April 2012. Potential previous nonresponders were identified based on initial college or school response. A personalized cover letter (memorandum) was created and e-mailed to nonresponders, followed by an invitation to participate in the survey by way of an Internet link for the third distribution to increase the response rate.

All survey data responses were captured in the SurveyMonkey database. Descriptive statistical analyses were conducted primarily through the report generator of this software. Secondly, a raw data file with all variables was uploaded and analyzed using Microsoft Excel. Duplicate responders and IP addresses were deleted. Because this analysis was essentially an exploratory pilot study, there were no prior expectations about whether differences existed across different groups of colleges and schools. Participants who only responded to a portion of the survey instrument are further delineated in the tables in the remainder of this manuscript.

RESULTS

One hundred ten of 127 colleges and schools responded (87% response rate). Twenty-three (21%) programs reported having a combined PharmD/MPH dual degree offering. The geographical location by state of these dual-degree programs in the United States is displayed in Table 1. Curricular framework for the PharmD segment of the dual degree varied among programs. The majority (20) of these dual-degree programs had 3 years of classroom coursework and 1 year of advanced pharmacy practice experiences (APPEs). The other 3 programs had 2 years of classroom coursework followed by 2 years of experiential education. No programs reported having an accelerated program. All responding pharmacy schools were on a semester-based academic calendar. Nearly two-thirds of the colleges and schools (62%) reported that 100

Table 1. Doctor of Pharmacy/Master of Public Health Dual-Degree Programs in the United States (N=19)[a]

State	Institution With Dual Degree
Arkansas	University of Arkansas for Medical Sciences College of Pharmacy
Arizona	The University of Arizona
California	University of California, San Francisco
	University of Southern California
	Touro University California
Connecticut	University of Connecticut
Florida	University of Florida
Georgia	University of Georgia
Iowa	University of Iowa
Kentucky	University of Kentucky
Maryland	University of Maryland
Nebraska	University of Nebraska
New York	University of Buffalo
North Dakota	North Dakota State University
Ohio	The Ohio State University
	Northeast Ohio Medical University
Tennessee	East Tennessee State University
Virginia	Virginia Commonwealth University
Wisconsin	University of Wisconsin

[a] Four schools were not identified

Table 2. Doctor of Pharmacy/Master of Public Health Programs at US Colleges and Schools of Pharmacy

Parameter/Measurement	School, No.
Number of years in combined program in existence[a]	
≥ 10 years	1
4-6 years	7
≤1-3 years	9
Methods for student recruitment[b]	
Early in pharmacy curriculum	22
Late in pharmacy curriculum	0
GRE required[c]	
Yes	10
No	12
Number of students enrolled[c]	
1-10 students	14
11-20 students	4
0 students	4
PharmD/ MPH graduates yearly[c]	
1-10 grads	15
11-20 grads	1
0 grads	6

Abbreviations: GRE = Graduate Requisite Examination; PharmD = doctor of pharmacy; MPH = master of public health.
[a] Six responders were unsure of length of program existence.
[b] One responder stated recruitment is in all stages.
[c] One non-responder.

or more students graduated each year from their PharmD degree program (range 80-160 students).

General PharmD/MPH program information is reported in Table 2. The number of years that the dual-degree program had been in existence varied significantly among programs. Seven colleges and schools were in existence for less than 1 year; 2 for 1-3 years; 7 for 4-6 years; and 1 for more than 10 years. Most programs (n=14) reported having 1 to 10 pharmacy students enrolled in the dual-degree program and nearly the same number graduated each year (n=15) with the dual PharmD/ MPH degree. All colleges and schools (n=23) reported that they recruited students early in the pharmacy school curriculum. Approximately half the programs (10 of 22) required the Graduate Record Examination (GRE) for admission to the PharmD/MPH program.

The impact of the combined degree on the overall curriculum is described in Table 3. When asked how many additional semesters were required to complete the MPH component of the dual degree, the most common response was 2 semesters (n=11), followed by 1 semester (n=4), and 3 semesters (n=3). Three colleges and schools reported that they did not require any additional semesters. The number of additional credits required varied, with most colleges and schools requiring greater than 20 credits (n=9), followed by 16 to 20 credits (n=6), 11 to 15 credits (n=4), and 6 to 10 credits (n=1).

For the item, "Does your school offer any APPEs that also fulfill a requirement for the MPH component of the program?" nearly half of the respondents had APPEs that fulfilled requirements (yes, n=9; no, n=11). Participants were also asked to describe the APPEs that fulfill a requirement for the MPH component of the dual-degree

Table 3. Impact of a Dual Degree Program on the Student and Doctor of Pharmacy Curriculum (N = 23)

Parameter/Measurement	School, No.
Additional semesters needed[a]	
0-1 semester	7
2 semesters	11
≥3 semesters	3
Additional credits needed[b]	
6-15 credits	5
16-20 credits	6
≥ 20 credits	9
APPE available for public health[b]	
Yes, APPEs	9
No, APPEs	11

Abbreviations: advanced pharmacy practice experience.
[a] Two of the 23 colleges and schools did not respond to this item.
[b] Three of the 23 colleges and schools did not respond to this item.

program, but the majority of respondents did not provide descriptions. One college stated that they had a state board of pharmacy practice experience that focused on drug policy and another experience that focused on the health behavior and education of MSM (Men who have Sex with Men).

The MPH program requirements are reported in Table 4. Of the colleges and schools that responded to this survey section, 7 programs required a thesis or capstone project and 4 programs required an additional practicum component. For both of these items, most of the colleges and schools did not respond. For the item asking "What types of students are in the MPH courses?" the most common response was multidisciplinary (n=10), followed by pharmacy students only (n=1). For those providing responses regarding the teaching methodologies in the MPH program, the majority offered a combination of classroom and online teaching (n=7), followed by classroom only (n=2), and online only (n=1).

Eighty-seven colleges and schools reported that they that did not currently have a dual PharmD/MPH program. These colleges and schools were asked about what types of other training they provided in public health coursework and experience. Twenty-eight percent responded that an MPH program was offered through other colleges and schools within their university/institution setting. Eleven percent of colleges and schools had an affiliation with an outside institution that offered an MPH degree and interested students were referred to that program. No specifics were provided by 39% of respondents and 6% of colleges and schools did not answer this survey item.

Table 4. Master of Public Health Program Requirements (N = 23)

Parameter/Measurement	School, No.
Thesis or capstone required[a]	
Yes	7
No	3
MPH requires additional practicum[b]	
Yes	4
No	7
Types of students[b]	
Multidisciplinary	10
Pharmacy only	1
Instructional delivery method[b,c]	
Online only	1
Classroom only	2
Online + classroom	7

[a] Thirteen of the 23 colleges and schools did not respond to this item.
[b] Twelve of the 23 colleges and schools did not respond to this item.
[c] An additional respondent stated "other."

DISCUSSION

Commonalities are seen within PharmD/MPH degree programs offered at US colleges and schools with respect to pharmacy education structure and program recruitment and enrollment. One of the commonalities of these dual-degree programs is that they seem to primarily exist in colleges and schools that have a more traditional course structure (3 years classroom courses plus 1 APPE year). We speculate that this is because the majority of programs currently exist in state-funded colleges and schools, which traditionally follow this course structure. While 23 colleges and schools reported joint PharmD/MPH programs, over half (16) had been in existence for less than 6 years and 7 programs were in their first year of existence. Colleges and schools of pharmacy are now recognizing this opportunity for advanced practice preparation and new programs are rapidly developing. In addition, students interested in enrolling in such programs probably want to decrease their educational cost and time spent in obtaining the dual degree as the majority of programs took 1 additional year or 2 additional semesters to complete.[21] Another consideration is that they may be interested in the secondary degree as an alternative career pathway. As seen in other pharmacy dual-degrees programs (such as the PharmD/MBA, PharmD/PhD), the majority of students enrolled in our PharmD/MPH program are higher academic achievers than single-degree students and tend to have a higher level of satisfaction with the student experience.[22,23]

Students are likely to be recruited early in the curriculum as they are being educated about the pharmacist's current role in public health, the opportunities that exist for the enhancement of that role, and the public health workforce crisis.[24] Early recruitment may also be necessitated by the need for dual-degree students to take specific coursework and/or assessments (such as the GRE) to qualify for the program.

With regard to programmatic requirements, the majority of programs appeared to be research and project intensive as well as interdisciplinary in structure. The focus on research and project development may be because the typical classroom lecture-based PharmD curriculum has a greater focus on assessment and assurance of public health and less focus on the core function of policy development and research.[25] It may also be influenced by the collaborative nature of public health practice and research as well as the pharmacy faculty members who serve as primary mentors for students enrolled in the PharmD/MPH programs.[26] Finally, these dual-degree programs are using a combination of online (asynchronous or synchronous teaching) and classroom-based teaching modalities,

which further accommodates the interdisciplinary approach needed, providing flexibility for students with different learner styles and varying class schedules of different healthcare professional programs.

We believe that these dual-degree programs have developed as interdisciplinary in nature as the importance of population health and disease prevention has increased with the changing landscape of healthcare. Approximately 58% (76/131) of medical schools offer a dual MD/MPH degree.[27] Other professions are seeing a rise in dual-degree program offerings, including the masters of science in nursing (MSN)/MPH, physician assistant (PA)/MPH, and master of social work (MSW)/MPH.[28,29] In 2011, the Interprofessional Education Collaborative (IPEC) released the core competencies for interprofessional education and collaborative practice.[30] Central to the 4 competency domains is the provision of patient-centered care with a "community/population orientation." With interprofessional education incorporated into the accreditation standards for health and social care professions, we anticipate an increase of dual PharmD/MPH degree program offerings as well as further refinement of current programs' curricular structure incorporating further focus and attention on the interprofessional team. Additionally, with the passage of the national Affordable Care Act of 2010 (ACA) and its funding for prevention programs, most healthcare profession programs and educators are responding to this potential need for more public health providers and the reimbursement it provides to students graduating from these expanded training programs.

Although many similarities exist among PharmD/MPH programs with regard to the program structures and requirements, a variety exists among programs with respect to both additional course credits required and availability of public health-related APPE site offerings. The largest number of responding programs had 16 or more additional credits required, but some had as little as 6 to 10 additional required credits. We speculate the reason for this variability may have been attributed to the colleges' and schools' definitions of credit and hours relationship or because of increased or decreased public health content in other course venues. Doctor of pharmacy programs provide graduates with strong clinical knowledge and skills in medication safety, general disease prevention, and incorporate some pharmacoepidemiology and basic research skills. Though APPEs are a requirement of all PharmD programs and ACPE offers guidance by way of Appendices C and D (Additional Guidance on Pharmacy Practice Experiences and Pre-Advanced Pharmacy Practice Experiences Performance Domains and Abilities) on specific criteria that should be fulfilled with regard to inpatient and ambulatory patient exposure, there are no requirements for standalone public health-focused APPEs.[31] This may partially explain the differences seen in APPE availability specific to public health in our survey (9 colleges and schools responded "yes"; 11 responded "no").

As evidenced in this survey, pharmacy colleges and schools are increasing their emphasis on public health, either in their curriculum or through a relationship with an MPH program. Some colleges and schools were developing or already provided a specialty certificate in public health. For example, North Dakota State University is working with a national advisory group to develop such a program and modules are under development in public health services, epidemiology, health promotion, community engagement, emergency preparedness, and cultural diversity. Such programs can provide additional training to students who want exposure to a potential public health career path but are unsure of their commitment to a dual-degree program. These programs also provide a pathway for colleges and schools of pharmacy to develop a future dual PharmD/MPH degree program.

This study has several limitations. While the overall response rate was strong, several individuals who responded as having a dual PharmD/MPH program only partially completed the survey instrument. (The numbers of nonresponders to specific survey questions are noted in each table.) This especially impacted the questions regarding whether a thesis or capstone or practicum were program requirements. Therefore, these dual PharmD/MPH programs may not have as much of a research or project component as previously speculated. In addition, the last item on the survey instrument was "The name of your college or school of pharmacy is _____." This item was listed as optional in order to meet IRB criteria. About 51% of respondents provided their college or school name and about 50% indicated their institution had a dual PharmD/MPH program. Although duplicate responses from colleges and schools were deleted as were responses originating from the same IP address, a small possibility remained that 2 faculty members from the same program may have responded to the survey from different site locations.

Unanswered questions remain with regard to dual PharmD/MPH programs, their structure, and graduates. Because of the newness of these programs, there is some uncertainty regarding the potential career paths available to these dual-degree graduates. These pharmacy students will be uniquely trained with the addition of an MPH degree and may have, depending on their focused concentration of study, the skills necessary to perform pharmacoepidemiology investigations; participate in public health programs such as disaster preparedness, disease prevention, etc; and assume positions of leadership

in local and national public health departments and organizations. While graduates of other dual-degree programs such as PharmD/MBA and PharmD/PhD have found jobs in academia, industry, and management, and earned more than their single degree counterparts, there is uncertainty around the monetary outcomes for an individual with an added MPH degree given the restructuring of healthcare and current economic climate.[22,32,33] Beyond these dual PharmD/MPH degree offerings, there are alternative training pathways emerging in pharmacy public health, such as residencies and fellowships. Individual students and practicing professionals seeking advanced skills in public health may be able to choose academic or experiential opportunities that best suit their public health interest and desires outside a dual-degree program.

CONCLUSIONS

Twenty-one percent of colleges and schools of pharmacy respondents offer a combined PharmD/MPH dual degree. Colleges and schools of pharmacy are recognizing the complementary educational pathway that a dual PharmD/MPH offers. Both common and divergent programmatic and curricular themes were found among current PharmD/MPH dual degree programs. Several questions remain unanswered including the potential career paths for these uniquely trained PharmD/MPH graduates and the impact of the changing landscape of other pharmacy-based, public-health training opportunities such as residencies and fellowships. Nonetheless, the increasing prevalence of these programs demonstrates the ever-expanding role of the pharmacist and the growing potential of the profession to serve in all domains of public health.

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