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A Telehealth Collaboration Between a Regional Veterans Affairs Primary Care System and a School of Pharmacy: Key Outcomes from 2024

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ABSTRACT

Background: The Veterans Health Administration is the largest integrated healthcare system in the United States, delivering services to more than 9.1 million Veterans across 1,380 facilities. We describe a partnership with a regional Veterans Affairs (VA) healthcare system and a health professional school.

Methods: The VA Northern California Health Care System, in collaboration with the University of the Pacific, Thomas J. Long School of Pharmacy, implemented a remote population health management course for pharmacy students. The course combined didactic and experiential learning, utilizing remote access to VA electronic health records and clinical dashboards to conduct telehealth activities focused on diabetes, cancer screenings, and opioid safety. A time and motion analysis evaluated the time the students saved the healthcare system. Pre- and post-course assessments evaluated students' knowledge and confidence in performing telehealth activities.

Results: In 2024, 126 students participated in the course, collectively saving 377.5 hours of healthcare system labor. Analysis of pre- and post-course assessments revealed statistically significant improvements in students' knowledge and confidence related to course activities and population health initiatives.

Conclusions: These findings demonstrate the effectiveness of a scalable telehealth course model in enhancing student learning while supporting population health management efforts within a healthcare system.

Introduction

SUMMARY OF THE VETERANS HEALTH ADMINISTRATION AND PRIMARY CARE PRACTICE MODEL

The Veterans Health Administration is the largest integrated healthcare system in the United States (U.S.), delivering services through 1,380 healthcare facilities, including 170 Veterans Affairs (VA) medical centers and 1,193 outpatient sites to more than 9.1 million Veterans enrolled in the VA healthcare program.[1]

In 2010, the VA began implementing the Primary Care Medical Home model across all its primary care clinics.[2] The VA delivers primary care to Veterans through an interprofessional Patient Aligned Care Team (PACT), which consists of a primary care provider, registered nurse, licensed practical nurse or medical assistant, clinical pharmacist practitioner, social worker, dietitian, mental health professional, and administrative clerk.[3]

TELEHEALTH SERVICES WITHIN THE VETERANS HEALTH ADMINISTRATION AND INTERPROFESSIONAL TRAINING

The VA launched telehealth services in 2003. During the COVID-19 pandemic, the VA saw a dramatic surge in video visits, which increased by 3,000%.[4] In 2024, approximately 40% of Veterans received at least a portion of their care from the VA via telehealth.[5]

The VA operates one of the largest interprofessional training programs in the U.S., annually educating over 122,000 health professional trainees across more than 60 professions including physicians, nurses and associated health professions.[6] A survey of 10,865 health professional trainees who trained within the VA during the 2023 academic year revealed generally neutral to positive perceptions of telehealth and virtual supervision in VA facilities. Among the associated health professions group, pharmacy had the highest number of respondents (n = 850), with 57% reporting involvement in telehealth services.[7]

ROLE OF PHARMACISTS WITHIN THE VETERANS HEALTH ADMINISTRATION

Until the introduction of Collaborative Drug Therapy Management (CDTM) in the 1960s and 1970s by the U.S. Public Health Service's Indian Health Service, federal pharmacists primarily served in traditional roles, such as dispensing medications and providing patient education and drug information.[8] Collaborative Drug Therapy Management can be defined as an agreement between one or more physicians and a clinical pharmacist, granting the pharmacist professional responsibility for performing patient assessments, ordering relevant laboratory tests, monitoring medication therapy, and initiating, modifying, and discontinuing medications.[9] In the VA, CDTM is codified by a scope of practice. While all pharmacists within the VA can engage in traditional pharmacy activities such as dispensing medication, counseling patients, performing medication reconciliation and chart reviews, and monitoring and assessing drug therapy to provide recommendations, a scope of practice is required for pharmacists to independently manage chronic conditions through CDTM. This includes prescribing medications, ordering laboratory tests and diagnostic studies, performing physical measurements and objective assessments, making referrals, and carrying out other essential patient care functions.[8] The VA utilizes this practice model to help mitigate the national shortage of primary care providers and to capitalize on published evidence showing that clinical pharmacist practitioners can improve clinical outcomes and reduce overall health care costs.[10-13]

THE VETERANS HEALTH ADMINISTRATION POPULATION HEALTH INITIATIVES

Opioid safety

Veterans enrolled in VA programs experience chronic pain at higher rates than the general U.S. adult population. The presence of certain conditions is linked to high-dose opioid use and increased overdose risk compared to the general population; these conditions include posttraumatic stress disorder, major depressive disorder, alcohol use and a history of suicide attempts. Veterans face a significantly higher risk of accidental overdose, with rates nearly twice that of the non-Veteran population.[14-16] The VA launched the *Opioid Safety Initiative* in 2013 to reduce inappropriate use of opioids and enhance the care of Veterans with chronic pain.

This initiative takes a comprehensive, interdisciplinary approach, with pharmacists playing a key role in efforts to minimize pain and the risks linked to chronic opioid therapy. In alignment with these efforts, in 2022 the Centers for Disease Control and Prevention (CDC), along with the VA and Department of Defense, updated clinical guidelines for opioid prescribing.[17,18] These guidelines emphasize thorough pain assessments, regular urine drug screenings, initial and periodic review of prescription drug monitoring program (PDMP) data, pharmacist collaboration, and referrals to specialists such as pain clinical pharmacists for advanced pain management. Given the evolving landscape of pain management, pharmacy students must be equipped to contribute meaningfully to the care of patients receiving chronic opioid therapy.

Diabetes monitoring and cancer screening

Women are the fastest growing group of Veterans, with over 600,000 women (44% of women Veterans) using VA services.[19] Women's health initiatives such as screening for breast and cervical cancer are a priority for the VA.

Diabetes monitoring is critical to ensure optimal disease management and to prevent micro- and macro-vascular complications. Within the VA, patients with diabetes require annual hemoglobin A1c, microalbuminuria, and LDL-cholesterol testing. Clinical dashboards assist clinicians in identifying patients needing laboratory monitoring for diabetes mellitus or cancer screenings.

In addition to VA healthcare facilities, Veterans may receive health care at U.S. Department of Defense and/or non-federal healthcare systems. The Joint Longitudinal Viewer (JLV) is a clinical application that provides a read-only display of health data from participating healthcare systems.[20,21] Clinicians access JLV to incorporate real-time medical data from other healthcare systems in the treatment of their patients. The use of JLV facilitates follow-up care and avoids duplication of tests and screenings, which is advantageous for the healthcare system as well as the patient. Priority initiatives such as diabetes monitoring

and breast and cervical cancer screening are supported by searching JLV for testing and screening results conducted at non-VA facilities. These activities help the healthcare system prevent unnecessary testing and cancer screenings, leading to lower costs and reduced workload associated with ordering and interpreting these tests.

RATIONALE FOR INNOVATIVE PARTNERSHIPS

As telehealth services become more widespread it is essential to equip health professional trainees with the skills needed to effectively provide virtual patient care. The Association of American Medical Colleges has identified core telehealth competencies in its publication *Telehealth Competencies Across the Learning Continuum*, which also includes curriculum frameworks.[22] In pharmacy education, the 2022 revision of the American Association of Colleges of Pharmacy's Curriculum Outcomes and Entrustable Professional Activities (COEPA) included "seek, analyze, integrate, and apply foundational knowledge of digital health."[23] This underscores the increasing importance of incorporating digital health into the education of future health professionals. Health professional education is typically divided into pre-clinical training, conducted at schools or universities, and clinical training, which occurs within healthcare settings. Telehealth technology enables students to engage in patient care remotely at the university, without traveling to a healthcare facility.

Herein, we present a telehealth program designed to enhance student learning while supporting a regional VA primary care system with population health management activities. The purpose of this paper is to describe the outcomes during a single year by a cohort of students using telehealth modalities on three specific initiatives: monitoring laboratory parameters for patients with diabetes, cancer screening in women, and opioid safety monitoring. We report the amount of time the program saved for the primary care team and the results of an analysis of pre- and post-course assessments evaluating students' knowledge and confidence related to the course objectives.

We present a scalable, collaborative model that allows health professional schools to introduce students to telehealth and population health training early in their education, leveraging university-based resources. Healthcare sites gain the advantage of student support on priority health initiatives without requiring space or on-site supervision at the healthcare facility.

Methods

COURSE DEVELOPMENT AND DESIGN

A collaboration between the VA Northern California Health Care System Primary Care Service and the University of the Pacific, Thomas J. Long School of Pharmacy for population health management began in 2016. As part of this initiative, a remote telehealth course focusing on population health was established exclusively at the school, granting students and preceptors remote access to the VA's electronic health record (EHR), Computerized Patient Record System (CPRS). To enhance clinical quality performance measures, the VA developed population management dashboards designed to identify Veterans in need of clinical interventions. The primary care dashboard includes features such as identifying patients who require PDMP reviews, diabetes monitoring, and cancer screenings.

Pharmacy students were assigned population management tasks typically performed by PACT members. Using university-issued laptops and VA-issued cell phones, students conducted PDMP activities, reviewed external medical records, ordered laboratory tests for prescriber approval, contacted patients to assess pain, and documented progress notes. To ensure proper supervision, the VA Primary Care Service hired and credentialed pharmacy practice faculty from the university, allowing students to be overseen by VA Clinical Pharmacist Practitioners.

Beginning in 2018, the telehealth introductory practice experience became a 1-unit required experiential course for second-year professional students, offered each semester within the tri-semester curriculum. In 2024, the course included approximately five hours of didactic and 25 hours of experiential learning, with enrollment ranging from approximately 40 to 50 students per semester. To accommodate these students, four 2-hour sessions were held weekly, each supervised by three to four pharmacist preceptors.

Before the start of each semester, students were processed as VA employees without compensation and completed necessary paperwork, fingerprinting for background checks, and online training in privacy, security, and the Health Insurance Portability and Accountability Act. Once the semester began, students received personal identity verification cards and remote access to CPRS using their university-issued laptops.

Students received an overview of the course, including expectations for professionalism, VA workflows, and navigation of the VA's EHR and population management dashboards. These dashboards were utilized to identify patients requiring laboratory monitoring, cancer screening, opioid prescription drug monitoring, or pain assessments.

Didactic materials covered laboratory monitoring requirements for diabetes management, breast and cervical cancer screening recommendations and reporting, an overview of the VA *Opioid Safety Initiative*, the CDC guidelines for prescribing opioids for chronic pain, and the interpretation of PDMP and urine drug screen results. Additionally, students were trained to assess pain using a validated three-item questionnaire.[24]

STUDENT ACTIVITIES

Students had both longitudinal (PDMP assessments) and intermittent (all other initiatives) patient care responsibilities throughout the semester. Figure 1 illustrates the student activities that were conducted at specific points during the semester. A dashboard identified patients with diabetes who required annual hemoglobin A1c, microalbuminuria, and LDL-cholesterol testing. Additionally, breast and cervical cancer screening dashboards flagged patients who were not screened according to national recommendations.

Figure 1: Weekly course schedule for each semester in calendar year 2024

Students' weekly course schedule			
		Mondays	**Tuesdays**
		1-3pm and 3-5pm*	**1-3pm and 3-5pm***
Week 1	2 hours	Orientation, Pre-survey	
Week 2	2 hours	EHR overview, PDMP demo	
Week 3-5	2 hours	PDMP notes	
Weeks 6-7	1st hour	JLV - DM	
	2nd hour	PDMP notes	
Weeks 8-10	1st hour	JLV - breast & cervical cancer	
	2nd hour	PDMP notes	
Weeks 11-14	1st hour	Pain assessment calls	
	2nd hour	PDMP notes	

*Sessions 1-3pm and 3-5pm are identical and repeated to reduce class size
Abbreviations: EHR = electronic health record;
PDMP = prescription drug monitoring program queries;
JLV = joint longitudinal viewer;
DM = diabetes mellitus monitoring of annual A1c, LDL-cholesterol and microalbuminuria

At the start of each class session, students were assigned patients requiring a PDMP assessment. They reviewed state PDMP records for prescriptions issued by non-VA providers, categorizing results as either positive or negative for non-VA controlled substance prescriptions. If positive, students reviewed health records to determine whether the prescription was appropriately indicated (e.g., documented in CPRS as being filled outside the VA) or if it raised concerns regarding adverse effects, aberrant behavior, overdose risk, substance use disorder, or potential diversion. As part of their assessment, students also reviewed the most recent urine drug screen results. Each patient case was discussed with a preceptor, after which students documented their findings in a standardized progress note. They included the preceptor and prescriber as co-signers before finalizing the note.

Students utilized JLV, a clinical application that integrates health data from the Department of Defense, the VA, and private health system partners, to search for outside medical records. The process for required laboratory monitoring varied depending on whether recent laboratory results were available in JLV. Similarly, JLV was searched for outside mammogram and cervical cancer screenings test results. For both diabetes and cancer initiatives, students entered relevant results found in JLV into CPRS. For the diabetes initiative, if outside results were unavailable, students reviewed CPRS for pending tests and if absent, ordered necessary laboratory tests for prescriber approval and sent laboratory reminder letters to Veterans.

For pain assessments, students contacted Veterans using VA-issued cell phones under the guidance of a preceptor. Before initiating calls, they rehearsed the pain assessment script with their preceptors who also reviewed the facility's "urgent symptoms" list to ensure appropriate escalation of any concerning findings to the facility's call center. During the calls, students administered a validated three-item questionnaire[24] and documented responses in CPRS.

All student work was conducted under close preceptor supervision, with no laboratory orders or progress notes finalized without preceptor review and approval. Furthermore, all calls to Veterans were made with a preceptor directly supervising the interaction. All approved and completed notes had the patient's primary care provider or prescriber added as an additional signer to notify them of the additional information found.

STUDENT OUTCOMES

Students completed both pre- and post-course assessments containing statement-based questions aimed at evaluating their knowledge, attitudes, and experiences related to population health activities. Responses were measured using a 10-point Likert scale (1 = Strongly Disagree to 10 = Strongly Agree). Changes in student self-assessment responses from baseline (pre) to course completion (post) were analyzed using Wilcoxon signed-rank tests. All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 28 (IBM Corp., Armonk, NY). A p-value of <0.05 was considered statistically significant.

DATA COLLECTION AND ANALYSIS

Students were required to log all patient care activities performed. For each assigned patient, students recorded their activities such as successfully completing a pain assessment call or identifying whether the PDMP review yielded positive or negative findings. This was in addition to documenting progress notes within the electronic health record. Students recorded the number and outcomes of PDMP reviews, the number of completed pain assessments, the results from outside record reviews from JLV, number of laboratory tests ordered, and number of reminder letters sent to patients to complete laboratory tests. All entries were verified by a pharmacist preceptor. Pharmacy student activities were documented throughout the 2024 calendar year.

A time and motion study was performed, whereby the PACT team member was timed while conducting the activities that would be assigned to students. The average

time it took PACT team members to complete each activity was recorded. A detailed description of the time and motion study is reported elsewhere.[25] We calculated the time the students saved for the PACT team in calendar year 2024. To estimate the total time saved for each activity, the frequency of each student-completed activity was multiplied by its corresponding average time to complete. Time saved for each activity was totaled; this calculation reflects the total time saved by having students perform these activities in lieu of the PACT team members.

One activity was excluded from the time and motion study. Reviewing outside records in JLV did not always produce results. If results were not found, the time spent on the activity was not included in the analysis.

This project was submitted to the VA Northern California Health Care System's Institutional Review Board who determined that reporting this data is not research based and was exempt from Research Service approval or monitoring.

Results

In the 2024 calendar year, a total of 126 students participated in the telehealth course. Table 1 outlines the types and frequencies of student activities conducted during this period. For opioid monitoring, students completed over 4,000 PDMP notes and conducted 840 pain assessments over the phone. Students reviewed external health records in JLV and documented test results or screening outcomes from outside health facilities in 1,061 cases. Students ordered over 1,500 laboratory tests and notified more than 600 patients about the need for additional laboratory tests. On average, each student completed 31.8 PDMP notes, 3.4 JLV record notes, 5 patient laboratory reminder letters, and 6.7 pain assessment calls. Table 1 also shows the time saved by the healthcare system when students perform tasks typically handled by PACT members. A total of 377.5 hours were saved by having pharmacy students complete these activities in place of PACT members, with the largest portion of savings derived from the PDMP initiative.

Table 1: Type and frequency of activities and estimated time savings in calendar year 2024

Activity type	Total frequency of activity in 2024	Total time saved (hours)
Opioid safety		
PDMP initiative (31 weeks)		
Negative PDMP notes	3677	122.6
Positive PDMP notes	328	32.8
Phone pain assessment (10 weeks)	840	84.0
JLV queries		
Cancer screening initiatives (7 weeks)		
Breast cancer data notes documented	90	39.0
Cervical cancer data notes documented	170	
Lab monitoring initiatives (8 weeks)		
JLV labs found*	365	25.1
JLV lab notes documented	167	
Ordering labs for providers if not found in JLV		
Lab tests ordered*	1535	74.0
Patient lab reminder letter sent	634	
Total		377.5

*a patient may have more than one laboratory test result documented in a note or included in the reminder letter
Abbreviations: PDMP = Prescription drug monitoring program; JLV = joint longitudinal viewer; Lab = laboratory.

Of the 126 students, 125 (99.2%) completed both the pre- and post- course assessment. Table 2 presents the 15 statement-based assessment questions, categorized by initiative type, along with the median score for each question at both baseline and course completion. A comparison of pre- and post-course survey responses revealed improvements in students' understanding of population health, as well as their knowledge and confidence related to key initiatives. There was a significant increase in student agreement for all statements ($p < 0.001$), including those related to confidence in performing specific skills and explaining specific concepts. The most notable change occurred for the statement "I have experience ordering laboratory tests" which had a median score of 1 at baseline and 10 at course completion. Other notable changes included the statements "I have experience utilizing a state prescription drug monitoring program" which had a median score of 3 at baseline and 10 at course completion, and "I am confident in my ability to report results of cancer screening tests" which had a median score of 3 at baseline and 9 at course completion.

Table 2: Student pre- and post- course assessment in calendar year 2024

Assessment statement scores pre- and post-course (n=125)			
General		**Median (IQR)**	**P-value**
I can explain the meaning of "population health".	Pre	7 (5-8)	<0.001
	Post	9 (8-10)	
I can explain the role of a clinical dashboard to conduct population health activities.	Pre	4 (2-5)	<0.001
	Post	9 (8-10)	
I can explain the role of the pharmacist in population health.	Pre	7 (5-8)	<0.001
	Post	9 (8-10)	
I have experience using a non-simulated (i.e. real patients) electronic medical record to perform patient care.	Pre	5 (2-7)	<0.001
	Post	10 (9-10)	
I am comfortable with documenting notes in a patient's electronic health record.	Pre	7 (4.5 - 8)	<0.001
	Post	10 (9-10)	
Opioid safety initiatives			
I have experience utilizing a state prescription drug monitoring program.	Pre	3 (1-6)	<0.001
	Post	10 (10-10)	
I can explain the kind of information that is accessible in a state prescription drug monitoring program.	Pre	5 (2-7)	<0.001
	Post	10 (9-10)	
I am confident in my ability to interpret the results of a state prescription drug monitoring program patient activity report.	Pre	4 (2-6)	<0.001
	Post	10 (9-10)	
I have experience asking patients questions about their chronic pain.	Pre	5 (2-7)	<0.001
	Post	10 (9-10)	
I am confident in my ability to interpret the results of a urine drug test.	Pre	5 (3-7)	<0.001
	Post	9 (8-10)	
Cancer initiatives			
I can explain breast cancer screening recommendations.	Pre	3 (2-5)	<0.001
	Post	8 (8-10)	
I can explain cervical cancer screening recommendations.	Pre	3 (1-5)	<0.001
	Post	8 (8-10)	
I am confident in my ability to report results of cancer screening tests.	Pre	3 (1-5)	<0.001
	Post	9 (8-10)	
Labs monitoring initiatives			
I have experience ordering laboratory tests.	Pre	1 (1-4)	<0.001
	Post	10 (8-10)	
I am confident in my ability to report the results of laboratory tests used to monitor medications.	Pre	6 (3-7)	<0.001
	Post	9 (8-10)	

Abbreviation: IQR, interquartile range

Discussion:

THE ROLE OF TELEHEALTH IN THE ERA FOLLOWING THE CORONAVIRUS DISEASE 2019 (COVID-19) PANDEMIC

In the U.S., telemedicine use among office-based physicians rose dramatically during the COVID-19 pandemic. Data from the National Electronic Health Record Survey (2018-2021) show that by 2021, nearly 87% of office-based physicians had adopted some form of telemedicine, a sharp rise from just 15% in the two years prior. Office-based physicians working in medical or academic health centers reported the highest adoption rate at 98%. Among specialties, primary care physicians led with 91% utilization, followed by medical specialists at 87%, and surgical specialists at 75%. Notably, over 80% of office-based physicians planned to continue using telemedicine beyond the pandemic.[26]

A systematic review of 102 peer-reviewed articles examined the global adoption of telehealth and telemedicine in the post-COVID-19 era. From 2019 to 2023, there has been a significant global effort to implement and expand these services. Among 77 countries analyzed out of 195 countries worldwide, 27 (13.8%) were identified as being in the advanced stage of adoption, 20 (10.3%) had reached a developed level and 24 (12.3%) were in the developing stage of utilization.[27]

Gullseltt et al[28] summarized findings from the Telehealth Programmes section of the 2022 World Health Organization (WHO) Survey on Digital Health (2022 WHO/Europe DH Survey). Among the 53 Member States in the WHO European Region, the COVID-19 pandemic catalyzed the rapid adoption of various telehealth modalities. By 2022, the most well-established telehealth services, defined as operational for at least two years with continued use expected for at least another two years, included teleradiology, telepsychiatry, telemedicine and teledermatology. Telemedicine demonstrated the most rapid growth reportedly offered in 37/48 (77%) of responding countries. The widespread use of telemedicine technologies across the WHO European Region reflects increasing acceptance of remote health care delivery. Systematic reviews evaluating telemedicine's

effectiveness have consistently shown clear benefits in the screening, diagnosis, management, treatment, and long-term follow-up of various chronic diseases.[29]

THE IMPORTANCE OF TEACHING THE NEXT GENERATION OF TELEHEALTH PROVIDERS

The WHO defines telehealth as the delivery of health care services, where patients and providers are separated by distance.[30] The WHO highlights the importance of establishing clear telehealth policies and strategic frameworks to support its integration into existing healthcare systems. As part of this integration, we advocate for the development of a pipeline of healthcare professionals trained in telehealth as a component of their professional education. To our knowledge, the telehealth experiential course described in this manuscript represents the longest-running pre-clinical population health experience of its kind offered at a health professions school in the U.S.

The U.S. Food and Drug Administration describes digital health categories such as mobile health, health information technology, wearable devices, telehealth and telemedicine, and personalized medicine.[31] The regional digital health action plan for the WHO European Region 2023–2030 emphasizes the importance of collaboration with academic institutions and other stakeholders to ensure that digital health policies are evidence-based, adaptive and innovative.[32] The goal is to improve health outcomes, promote sustainability of efforts and resources, and foster a culture of continuous learning to inform decision-making. One of the strategic priorities outlined in the plan is to explore how digital technologies can improve disease prevention and management. In alignment with this priority, our telehealth initiatives support cancer screening for women and aid in the management of common health conditions such as chronic pain and diabetes. The regional action plan further acknowledges that, when effectively implemented, these technologies can enhance the work of health professionals and align with national health system priorities.[32]

ACADEMIA AND TELEHEALTH

The World Federation for Medical Education develops and updates Global Standards for Quality Improvement for Basic Medical Education. The 2015 Standards, as part of the quality development standards, emphasized the Clinical Sciences and Skills portion of medical school curriculum should evolve in response to technological developments and the changing needs of health systems, and that clinical skills training should be appropriately structured for each stage of education.[33] The 2020 Revision further reinforced the value of incorporating well-designed digital and distance learning methods and experiences into medical education.[34]

In the U.S., accreditation requirements stipulate the development of clear policies regarding the supervision of medical students during patient care activities, including the use of telemedicine where applicable.[35] Similarly, the American Association of Colleges of Pharmacy's 2022 Curriculum Outcomes and Entrustable Professional Activities (COEPA) includes the competency to "seek, analyze, integrate, and apply foundational knowledge of digital health."[23]

MUTUAL BENEFITS OF PARTNERING WITH ACADEMIA

Telehealth course offers flexible learning options, including asynchronous chart review and direct patient contact.

While working remotely at the school under the direct supervision of VA clinical pharmacists, students accessed electronic health records to review patient charts, ordered laboratory tests under a prescriber's name, documented clinical notes, and sent laboratory reminder letters to patients. These activities are adaptable and can be adjusted in response to shifting healthcare system priorities.

At the height of the COVID -19 pandemic, the university transitioned to virtual learning, prompting modifications to the telehealth course. While the course is typically conducted at the university, students completed it from their homes for two semesters due to pandemic-related restrictions. They were granted remote access privileges to the VA's EHR system and received supervision from VA clinical pharmacists via Microsoft Teams.

Because faculty were not physically co-located with students and therefore unable to take over a phone call with a Veteran if needed, pain assessments by phone were temporarily suspended. This activity was replaced with women's health initiatives, which involved chart reviews of breast and cervical cancer screenings conducted through the Department of Defense, other VA facilities, or private health system partners. These women's health-focused efforts have remained a core component of our telehealth program beyond the COVID-19 pandemic.

Sharing of resources

Funding, infrastructure and workforce limitations are cited as major barriers to the sustained delivery of telehealth services.[28] Collaborating with academic partners can help mitigate some of these challenges through shared resources. The telehealth course was delivered remotely from the healthcare system, with the university contributing key infrastructure and personnel support. This included providing classroom space for course activities, laptops for student access to the EHR system, internet connectivity, and university faculty who taught the course and supervised student work.

The VA supported the initiative by supplying a limited number of phones that were shared for patient outreach, remote access to EHR systems, and access to clinical dashboards and the JLV. The VA clinical dashboards enable population health management by using EHR data to identify patients who may benefit from evidence-based care but have not yet received it.[36] The VA also employed university faculty to oversee student activities, and provided online training in Privacy and Health Insurance Portability and Accountability Act and VA Privacy and Information Security Awareness and Rules of Behavior for all participating students.

Collaboration between healthcare systems and health professional schools ensures that initiatives are mutually relevant and beneficial. Telehealth activities should align with the priorities of the healthcare system and be appropriate for the students' level of education. Our

telehealth course is required for second-year pharmacy students, designed to reflect their current knowledge and abilities. The skills they develop include team-based interprofessional care, applied population health, medication monitoring, documentation in electronic health records, and effective patient communication using telehealth methods. These initiatives are flexible, aiming to both enhance student learning and meet the evolving needs of the healthcare system. This telehealth course primarily focused on two critical clinical areas, the opioid epidemic and the high prevalence of diabetes, along with an economic initiative to reduce the costly duplication of screening and monitoring tests across different healthcare institutions.

Students receive hands-on, experiential training in telehealth at the school, eliminating the need to travel and occupy limited space at a healthcare facility. Analysis of pre- and post-course assessments revealed statistically significant improvements in students' knowledge and confidence related to course activities and population health initiatives. Similar positive outcomes have been reported in another study involving a telehealth course for health professional students.[37]

The VA received support for its population health activities through student involvement. As part of the opioid safety initiative, students completed over 4,000 PDMP notes and conducted 840 pain assessments over the phone. These activities would typically be carried out by the primary care team. Students also reviewed external health records in JLV and intervened in 1,061 cases, either documenting test results or screening outcomes from outside healthcare facilities. These activities helped the health system avoid redundant testing and cancer screenings, reducing both the costs and workload of ordering and interpreting these tests. Students also ordered required laboratory tests when indicated and notified patients about the need for additional laboratory tests. By performing these tasks, students alleviated pressure on an already burdened healthcare workforce.

Alami et al[38] highlight the positive attributes of telehealth services as clinically relevant, efficient, and mutually beneficial for all stakeholders including shared costs and benefits. Our academic partnership model aligns with these positive attributes, emphasizing collaboration and resource sharing.

Conclusions

Academic telehealth partnerships offer benefits to both health professional students and healthcare systems. By conducting telehealth activities remotely at the university, students gain early clinical experience, while leveraging resources from both the academic institution and the healthcare system. This partnership has significantly enhanced students' perceptions of their learning and helped develop the next generation of telehealth providers, addressed prioritized population health initiatives, and reduced the workload for practitioners at healthcare facilities.

Conflict of Interest: The authors have no conflict of interest to disclose.

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