Expanding Rural Opioid Addictions Treatment: An Inter-institutional, Inter-professional Telehealth Case Study Simulation

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Abstract

Purpose: To determine if inter-institutional collaboration, using telehealth technology, inter-professional education techniques, and case study methodology is a feasible way to teach health professions students how to appropriately address opioid addictions, especially in rural populations with limited health care access.

Study subjects: Ten health professions students from four Virginia universities participated. Professions represented included medicine, nursing, physical therapy, social work, nutrition, and psychology at the graduate and undergraduate levels.

Methods: Inter-professional faculty from four Virginia universities developed an opioid addiction simulation case study using a standardized patient. Students from different regions engaged in a facilitated patient interview and care planning via secure virtual meeting platform. Faculty observation and feedback, student feedback, and inter-professional education assessments were used to assess this pilot study.

Findings: Inter-institutional faculty collaboration and telehealth technology was successfully employed to convene multiple health professions students from different sites; simulation case study methodology using a standardized patient was effective and compelling; students effectively utilized inter-

professional competencies and skills to develop a comprehensive and holistic care plan for opioid addiction treatment.

Conclusions: Telehealth technology, inter-professional education, and simulation case study methodology can be successfully used to teach health professions students how to collaborate to address the opioid crisis, especially in resource-limited rural areas.

Implications: Many resources are necessary to successfully treat opioid addictions. By using telehealth technology combined with inter-professional concepts and skills, resources can be shared between institutions and professions to successfully treat patients with opioid addictions in resource-limited areas.

Introduction

The opioid crisis in the United States is a national, state, urban, and rural public health emergency. It is particularly hard felt in rural, economically underdeveloped and medically underserved areas such as Appalachia and former coal mining regions in the U.S. For example, in 2013, Virginia reported more fatal overdoses than traffic fatalities, with the highest numbers in seven rural counties (Commonwealth of Virginia). An estimated 1,079 Virginians died from opioid overdoses in 2016. In addition, Virginia Medicaid (public assistance) members are prescribed opioids at twice the rate of non-members and are at three-to-six times the risk of prescription opioid overdose.

In January 2017 the Governor of Virginia declared the opioid crisis a public health emergency and enlisted the state Task Force on Prescription Drug and Heroin Abuse to develop measures to address the crisis (Levine, 2017). Subsequently, in April 2017, Virginia Medicaid expanded community-based addiction and recovery services, scope of practice and training for medically assisted treatment, integrated physical and behavioral health, and reimbursement for telehealth, among other interventions (Governor's Task Force on Prescription Drug and Heroin Abuse, 2015; Virginia Department of Health Professions, 2016; Virginia DMAS, nd). These benefits are especially useful to rural areas struggling with high rates of opioid addiction, limited resources, and dwindling numbers of health care providers. The focus on telehealth and inter-professional practice are critical to effectively implementing community-based and integrated physical/behavioral health care services.

Addressing the opioid crisis requires health professions educators to respond through curriculum development. Acknowledging that inter-professional education is key to inter-professional practice (Brandt, Lutfiyya, Kind, & Chioreso (2014), health professions education faculty at four Virginia universities successfully developed and tested an inter-professional telehealth education case study for opioid addiction management and treatment. Medical, undergraduate nursing, nutrition, social work, physical therapy, graduate psychology, clinical nurse specialist, nurse practitioner, and doctor of nursing practice students were convened via telehealth technology. Using inter-professional competencies, skills, and practice behaviors (Muzyk, Tew, Thomas-Fannin, Dayal, Maeda, Schramm-Saptya, Andolsek & Holmer, 2017), the students collaborated to interview and subsequently develop a comprehensive plan of care for a standardized patient suffering from prescription and subsequent illicit opioid addiction.
Interprofessional Education

Traditional educational models for health care professionals often include 'siloed' approaches with profession specific coursework housed within school specific curricula, thus limiting opportunity for interprofessional engagement and learning. The Lancet Commission on Education of Health Professionals for the 21st Century (Frenk et al, 2010) called for new instructional and institutional approaches to kickstart innovation in health professions education in an effort to address "tribalism of the professions" which results from professions training and practicing in isolation from and in competition with each other (p.1923).The need for innovation in healthcare education dictates that as educators we "shed our protective professional skin" and transcend the natural boundaries to embrace a collaborative approach that challenges the traditional 'silos' of profession specific education (Poston, 2014). Specific focus on the interdependence between health in the global sense and health professions education as outlined by the Lancet Commission requires significant changes in how health professions experience education and training to include shifts from single institution to interinstitutional collaboration and alliances that capitalize on shared resources, expertise and experience (Frenk et al, 2010).

Forty-five years after the Educating for the Health Team (Institute of Medicine, 1972) report, progress has been made towards developing educational experiences and crafting curricula that address interprofessional practice competencies outlined in the revised 2016 Interprofessional Education Collaborative report (IPEC, 2016). Specific IPE curricular requirements now are visible in healthcare education accreditation documents (e.g. Liaison Committee on Medical Education (2017); Commission

on Collegiate Nursing Education (2011)). Yet, there is little standardization in how this is achieved or measured (Zorek & Raehl, 2012).

Despite national focus from leading health professions organizations and accrediting bodies for health care professions education, integration of IPE activities, courses, seminars, and experiences into established content heavy curricula for health professions students is challenging and there are known inherent structural barriers (Gilbert, 2005; Cahn, 2014). According to Lewis, Anson & Greenfield (2014), institution specific barriers include: limited financial resources and administrative support, lack of faculty development initiatives, scheduling of IPE within current programs, health professional degree calendars, different degree timetables, rigid/condensed curriculum, extra-curricular versus required course/unit, and differences in assessment requirements. Additionally, educators are often limited in the diversity of available health professions students to engage in curricular activities focused on developing competencies related to interprofessional practice. Strategies to overcome institutional barriers and limitations, such as those offered here, are necessary to move IPE forward across all health professions education programs regardless of size and diversity of health professions student mix.

Methods

Health professions faculty from the University of Virginia (UVA), Old Dominion University (ODU), Virginia Tech Carilion School of Medicine (VTCSOM), and James Madison University (JMU) collaborated over one school year to develop and pilot an inter-professional opioid addiction simulation case study for health professions students using telehealth technology. Each University brought strengths to the collaboration. JMU is a large public institution with more than 20,000 students. Its College of Health and Behavioral Sciences oversees seven health related disciplines. VTCSOM enrolls more than 4,000 students annually and has a curriculum uniquely focused on inter-professional education. Both JMU and VTCSOM are located in the Shenandoah Valley, a rural and largely underserved region situated in the western part of the state. ODU is located in the southeastern area of the state and is one of the largest providers of distance learning degree programs in the country. Graduate nursing programs at ODU are especially focused on developing a network of advanced practice nursing providers in rural and medically underserved areas via distance learning and telehealth modalities. The UVA Health System is a large teaching hospital with a well-developed telemedicine program and a service area that includes the rural, western half of Virginia as well as eastern West Virginia.

All four universities have large-scale inter-professional education programs for the various health professions. 4-VA, a consortium which awards grants for collaboration, research, and collaborative use of technological resources in the STEM fields, provided funding for this pilot program. Human Subjects Review and oversight was provided by James Madison University. Each university's institutional review board reviewed and concurred with the James Madison University Institutional Review Board approval. The opioid addiction case study was developed by collaborating faculty in consultation with pain management, telehealth, and inter-professional education experts (Figure 1). Faculty met for planning purposes in person at each university and virtually, using the same technology used to implement the case study with students (secure virtual meeting platform).

Case Summary

Personal background:

- Mr. Bob Johnson is a 50-year-old, manager at a large car dealership.

- Only medical treatment being hypertension.

- The family upper middle class and live in a multilevel Victorian home.

Initial events

- Nine months ago flipped his ATV

- Found to have an incomplete spinal cord injury (SCI) of his thoracic vertebrae (T-11).

- He was placed in an ICU and treated for pain with OxyContin.

- Underwent surgical decompression and stabilization of the T-11.

- Treatment for pain continued along with rehab.

- Eventually moved to a regular hospital bed and then had three weeks in a rehabilitation unit before being discharged home.

- Treated for hypertension and diabetes while in rehab.

Complications:

- Started on physical therapy and rehabilitation soon after surgery, but he had difficulty with this.

- He is home alone most days.

- MD switched him to Roxicodone 30 mg every 4 to 6 hours as needed and then gradually reduced the dose over a period of several weeks.

- He continued to experience pain along with nausea and craving.

- When he complains of nausea and craving the MD begins him on buprenorphine/naloxone combination. (Suboxone)

Current Crisis:

- At the urging of his family eight weeks ago, Bob tried to return to work
- Found it hard to keep up, felt the pain worsened and did not seem to have the energy, motivation or concentration he use to have
- The family had anger that Bob was not "trying more".
- Found an old prescription of the OxyContin and began to use it in place of Suboxone.
- Decided to buy opioid medication off the street about two weeks ago, some of which were in hindsight likely laced with fentanyl and heroin.
- His wife confronted him and got him into a medical inpatient detox unit- discharged after 4 days
- Within 2 days of discharge he started using again
- Yesterday he presented to the ED with a heroin overdose that required Naloxone
- He was discharged from the ED and given an appointment the next day in a care center.
- The OPHI team is assembled to determine the best short and long term treatments to further stabilize Bob medically, provide detox, counseling, and other services to prevent opioid relapse and return Bob to healthy functioning. Family support will be needed.

Figure 1. The Student Case Study

Health professions students were recruited from each university (Table 1) to participate in the opioid addiction simulation case study. Prior to participating in the case, students received a professional role description and a brief overview of the case study. Students met in a telehealth facility at their home university with project faculty. After the faculty reviewed the consent process, case study objectives and inter-professional competencies with students at each site, the students convened across all four universities using a secure live virtual meeting platform, and established the means by which they would interview the patient and subsequently develop a comprehensive care plan. The standardized patient was introduced to the students who, in two brief sessions, proceeded with their established plan. The standardized patient was located in a separate room at one site. A faculty "case manager" accompanied the standardized patient, facilitating the interview process and answering complex clinical questions via secure virtual meeting platform.

	Medicine	Nursing	Nutrition	Social Work	Psychology	Physical Therapy
JMU		U	D	U	D	
ODU		D				D
UVA	D	D				
VTCSOM	D					

Table 1. Health Professions Students by University (D = Doctoral, G = Graduate, U = Undergraduate)

Students interacted with the standardized patient and each other in the secure live virtual meeting platform on large video screens, with voice activation shifting from smaller to larger perspectives. Support from technical staff was necessary and was provided by 4-VA staff at each university. Students and the standardized patient signed informed consent to participate in the project, and completed a survey with four research instruments (Inter-professional Attitudes Scale (IPAS) (Norris, Lassche, Joan, Eaton, Guo, Pett & Blumenthal, 2015), Team STEPPS Team Assessment Questionnaire & Attitudes Questionnaire, Team Skills Scale (https://www.ahrq.gov/teamstepps/longtermcare/sitetools/tmassess.html; https://www.ahrq.gov/teamstepps/instructor/reference/teamattitude.html). The goal of the survey was to determine if any of the four instruments were suitable to measure lessons learned by students after this case study. Faculty who did not participate in the case study also assessed students using the Inter-professional Collaborator Assessment Rubric to determine if this rubric was useful for evaluating students during this case study (Grymonpre, van Ineveld, Nelson, Jensen, De Jaeger, Sullivan, Weinberg, Swinamer & Booth, 2010). Survey results are published elsewhere.

Results

Faculty Observations

Faculty observed that one student took the initiative to be the team leader. Telehealth technology facilitated this student's effort to ensure that the other students were asked for input. Medicine and graduate nursing students had questions about pharmacologic issues, but most of the students' interview and plan were more focused on psychosocial issues. The assessment of the patient was expanded and enhanced by questions posed by social work, physical therapy, undergraduate nursing,

and nutrition students who asked about financial, employment, and family dynamic concerns. The patient was given time to respond, and non-judgmental and compassionate communication was used throughout. The interview segment of the simulation was followed by a lively student discussion about options for supporting the patient's next steps for rehabilitation, with input from all students incorporated. The team used respectful communication, shared problem solving, and shared decision making skills as they worked through the many challenges faced by this individual. The care plan they developed together included clear and feasible steps for the patient to obtain additional support for his physical, nutritional, psychological, financial, social, and family needs. The students then returned to the patient to communicate their plan. The patient occasionally resisted some of the recommendations, with students handling these concerns with supportive options. In the end, the patient expressed his willingness to make important positive steps. A specific plan for follow-up actions was communicated, and ongoing support and communication were offered.

Student Feedback

Feedback on the pilot study was sought from students formally during debriefing after completion of the case study and during informal discussions with faculty at each site. Students felt they needed more time to interview the patient. A number of issues contributed to the length of time needed, and if resolved, could increase student comfort and effectiveness with inter-professional interviewing and care planning. There were also several suggestions for how the technology might be improved to better support team discussions. Overall however, students provided very positive feedback including one exuberant medical student:

> This was my first time ever speaking with students from many specialties that we don't train at UVA. I got a lot out of it . . . My brain was working hard and I was super engaged the whole time. This is a fun experience that will stick with me for sure!

Students also noted the assessment tools employed could be improved. They reported survey fatigue and wished that the survey could be shorter. They identified the IPAS as being able to represent their experience (Norris et al. 2015). Students also felt that the TSS could be useful if we gave clearer instructions that they were assessing the current team instead of other work teams in their responses (Grymonpre, et. al. 2010). They believed that the TSS would be useful only as a post survey (not pre-

post). They also reported that the variety in the way the Likert Scale was listed among the surveys was confusing. The IPAS and/or TSS as pre/post test would improve data collection and the rubric for observing teamwork (ICAR) was less appropriate for this exercise than would be an observation tool such as the Performance Assessment for Communication and Teamwork Tool Set (PACT) (Chiu, Brock, Abu-Rish, Vorvick, Wilson, Hammer, Schaad, Blondon & Zierler, nd).

Faculty Feedback

Feedback was sought from faculty during a formal group debriefing session two weeks after the event. Much of the student feedback was observed and reiterated by faculty. Faculty suggested providing a more formal plan with supporting documents would be helpful. Students could use their time more efficiently with clear objectives and time limits, ground rules for communication, assigned team leaders, and facilitation by faculty. Faculty noted that a great deal of time was taken up by students requesting further clinical information during the session. Simplifying the case study so that little additional information is required would ensure that all student communications are represented, and the session is not monopolized by the search for clinical data. Faculty also felt that differences in the telehealth display from site to site made communication more difficult.

Regarding the surveys, faculty all agreed that the ICAR rubric failed to capture this particular experience well (Curran et. al., 2011). Faculty concurred with the student narrative feedback that the IPAS and TSS questions best represented the student learning outcomes for this diverse group of students for this simulation (Norris et al. 2015, Grymonpre, et. al. 2010)). Although we did not test these instruments with other simulation experiences, faculty perception based on this experience was that it could be used as a measure for other student simulations, although it was noted that some of the questions would apply better to some simulations and less well to others. Faculty assessed that the TAQ applied less well to assessing this simulation (AHRQ, 2017). In particular, the sections on team structure and leadership seemed not to relate to the simulation experience. The Team Assessment Questionnaire also didn't seem to fit, in particular the questions about team formation seemed to require more time for team formation, function, team leadership, team identity, and performance subscales required more time together as a team than a simulation experience allowed (AHRQ, 2014). The Team Assessment Questionnaire subscales about team-skills and team climate did however seem to apply to this experience from the faculty perspective.

Faculty were overwhelmingly positive about the experience. They were pleased with the student engagement and interaction during the simulation activity. Faculty were energized by the idea of collaborating outside of their University. During the material development phase, faculty found the balance between virtual and in-person meetings to be useful, combining the efficient and flexible time (virtual) with the more effective and team building time (in-person) the team flourished and accomplished a great deal despite traditional barriers of institutional culture, geographic location and curricular/scheduling challenges.

Faculty discussed limitations of the experience. Faculty data validated all of the student complaints about the virtual meeting platform utilized for the telehealth encounter yet faculty also acknowledged the limitations of needing, for ethical purposes, to use the online meeting platform that allowed greater protection of confidentiality of recordings. Faculty discussed several technology options that may provide the desired experience but that were less secure. Other challenges included, designing a case for such a diverse student mix, logistical coordination, and institutional barriers to collaboration. Students varied in their levels of experience, education, previous SP experience, and previous telehealth experience; which was difficult to plan for. Logistics were complicated, and this would only be more difficult if the experience was scaled to include more groups. Merely finding a date and time to meet for the simulation was difficult given that the students had class at all different times of the day. The team discussed scaling the activity into a class, perhaps a term (May term, January term) class, that would allow for greater depth of experience and perhaps also greater breadth. Ultimately the team believes the activity was a success in part because each school had a dedicated, funded, faculty champion; and the mix of individuals was strong such that faculty enjoyed the experience.

Discussion
Case Study Development

The case was well utilized with this inter-professional group of students. The main problem identified was lack of time, and both faculty and students identified a number of tactics to improve efficiency. Chief among these was better coordination of roles, documents, communications, and objectives in advance of the event. In addition, faculty facilitation was key, and methods for intervention should also be agreed upon in advance. Important was the finding that this complicated case study naturally evoked

student questions regarding testing, findings, and interim outcomes. Simplifying the case study and clarifying student roles will likely enhance the flow of the exercise and improve time management.

Based on the student evaluation of the case we discovered some improvements that needed to be made to the case and supporting materials. For example, we had observed that the student physician took the lead in organizing the case discussion. During debriefing, this student noted that the physician role description included the text that "as a physician I am trained to lead the team" and thus they felt that taking that leadership was part of their role. Students identified that this became a barrier to team interaction, as others may have wanted to take the lead given the chance to discuss and decide that early on. This was an important lesson for the faculty team, that each word used in the case materials can change the experience for the group. It also highlighted the importance of pilots, such as this, which include evaluation of the materials for gaining student perspective and make quality improvements. Additional changes were also needed to the case materials. For example, although students were sent the role descriptions for all involved professions, we failed to instruct them to review all roles resulting in students reviewing only their own. After this simulation experience ended, they stated that it would have been beneficial to have reviewed all roles and wished instructions to do so had been explicit in the preparation leading up to the simulation. Students were provided with a list of the events taking place during the simulation, however, they desired a more exact and detailed timeline and greater guidance on the timing for specific simulation sections, indicating this would lessen stress and improve their focus. Specifically, the timeline showed when students would interact with the patient. Yet, it wasn't explicit that students were to come back the second time with more assessment questions. Therefore, the team moved too soon into creating the care plan and needed to be redirected by the case coordinator. In addition, students also felt that additional readings were needed to provide an interprofessional framework and readings specific to interprofessional behaviors. These findings demonstrate the need for clear/explicit instructions during simulations and again highlight the importance of gaining student perspective during case development.

Each of the professions contributed during the case. However, the individual in the nursing role contributed less often. This was discussed during the simulation debriefing. The student, as a generalist practitioner, felt that there were so many specialists present that there was less in the case for a health professions students with a generalist perspective. Moreover, the role of the care coordinator overlapped with traditional nursing responsibilities and may have led to less contributions for that

student. The student group struggled with the idea that perhaps less professionals would have been better, at the same time they valued the contributions of each professional present. The simulation initially planned for two of the participants (dietician and psychologist) to be available via phone consultation but ultimately all students were in-person, which may have caused this problem. The diversity in student preparation was noted to be initially intimidating to the undergraduate students working with graduate and doctoral colleagues. Although the students noted that getting to know each other throughout the experience helped them to feel comfortable despite initial discomfort. Moreover, students were astute to the potential benefit of experiencing this during training since they may encounter the same discomfort in their future work.

Telehealth

Overall, telehealth technologies were well utilized to bring mental health and other professional resources together in this pilot study and the use of inter-professional skills and competencies can be employed to "smooth" any overlap, expand treatment resources, and ensure comprehensive care for opioid addicted patients. The students and the standardized patient all validated that they felt the lack of physical presence. Students noted practical ways of overcoming technology barriers such as pausing more often virtually than in-person to allow others to talk and re-stating their name and professional role prior to speaking. They suggested "hand raising" technology to solve that problem. They did believe that having a care coordinator present with the patient was important to maintaining flow during the case study.

In this pilot work students did not have a chance to connect in either asynchronous or synchronous environments prior to the simulation experience via telehealth. In future work it may be helpful to require team member to post short videos of introduction to a virtual platform to allow the team to 'get to know' each other prior to the simulation experience which may be helpful and leverage some of the potential of technology in healthcare. An alternative 'low-tech' approach of an asynchronous discussion forum prior to the simulation experience could also achieve the goal of introducing team members to each other. Real-life interprofessional team collaboration across telehealth may not always allow for team members to meet each other prior to their 'on screen' introduction, yet educational environments that foster a safe space for learning and practice should allow for such introductions aid the team through the 'forming' stage of team development (Tuckman, 1965).

To aid interprofessional student teams in their progression towards high function and collaboration, it may be helpful to provide students with reading materials to review prior to the simulation experience that outline individual health professions team member's roles/responsibilities/educational background/training. In this pilot work summary sheets for each health profession involved were supplied as reading materials to review prior to the simulation experience, but explicit instructions were not given for all team members to review all health professions summary sheets. Enhanced knowledge of one's team members' training/background/roles/responsibilities can impact the level of common/shared knowledge that the team begins the exercise with and therefore impact team cohesion and potentially team function.

Building on the work necessary to move the interprofessional team towards optimal performance, we suggest that the start of the interprofessional simulation experience via telehealth includes focused time for team building. Simple and brief ice-breaker activities that expose the depth and layers of each person's professional roles/responsibilities/training and potential contribution to the case could be helpful in building trust across team members. Additionally, it may be helpful to include a 'warm up' exercise/case that allows the team to practice transitions between providers throughout the interview with the standardized patient. The technical skills of interprofessional communication in a virtual telehealth encounter require nuanced changes in how team members navigate transitions in leadership. Attention to this specific skill development is necessary to aid in the fluidity of telehealth encounters, especially those that involve an interprofessional team collaborating across geographical and institutional boundaries. Addressing the human factors aspect of telehealth interactions is necessary and requires a focused agenda within the preliminary time prior to the standardized patient encounter (Demiris et al., 2010).

While we did not specifically address the presence of faculty members within each telepresence room in the overall evaluation of the experience, we surmise that faculty presence may have some impact on team function and team performance in the virtual space. Previous research from nursing on faculty presence in clinical simulation experiences suggests anxiety levels for students may decrease with faculty presence shifted to a control room or remote viewing location (Horsley & Wambach, 2015). Yet, increased anxiety as a result of faculty presence in clinical simulation experiences did not detrimentally impact clinical performance, self-confidence or satisfaction with the learning experience (Horsely &

Wambach, 2015). While these findings apply specifically to traditional to 'in person' clinical simulation learning experiences within a physical simulation lab environment, they may provide some insight for virtual simulation experiences taking place via telehealth.

In this pilot simulation experience via telehealth, faculty did not facilitate any structured feedback from the standardized patient for the interprofessional student team. The faculty facilitated debriefing session at the conclusion of the standardized patient simulation focused on culling feedback from students on their experience within an interuniversity interprofessional team and within the virtual meeting space of telehealth. While this feedback was invaluable and helps inform the next iteration of this this work, future simulations may benefit from structured feedback for the student team from the standardized patient. Feedback from the standardized patient may provide: 1. insight on team performance (Eppich, Howard, Vozenilek, & Curran, 2011), 2. authenticity of the telehealth experience (Yudkowsky, Valdes, Raja & Kiser, 2011), 3. level of interprofessional professionalism demonstrated by students (Holtman, Frost, Hammer, McGuinn & Nunez, 2011), 4. impressions of rapport established by the interuniversity interprofessional team (Graves & Doucet, 2016), 5. skills demonstrated related to motivational interviewing specifically as they apply to treating patients with history of substance abuse such as opioid addiction (Carroll et al, 2006) , and 6. feedback related to key human factors necessary for successful telehealth visits such as telehealth etiquette (Haney, Kott, & Fowler, 2015). Standardized patients perform an integral role in the training and development of health professionals. In the realm of a simulation experience via telehealth their structured feedback to address these specific areas may significantly enhance the learning that occurs for both individual health professions students as well as the overall interuniversity interprofessional team.

As health professions educators continue to refine and improve the overall simulated learning environment to include specific encounters via telehealth, it may be helpful to pair with IT/Web/App developers to develop tech solutions for live telehealth experience for interprofessional team training. In this particular pilot study we were limited by the available technology that was compatible across all universities involved. This required multiple students at each site to connect and communicate with other sites and the standardized patient via one video/audio feed. This made it difficult to identify individual participants as they spoke up to engage with their team members and the standardized patient. Additionally not all sites were visible on the screen at all times making the fluidity and continuity of connection a bit fragmented at best. The secure virtual meeting platform utilized is

designed to enlarge the screen presentation of the speaking participant making other participants smaller or not visualized at all when they were not speaking. We suggest the development of a secure virtual meeting platform, to meet IRB requirements, that is designed to specifically facilitate telehealth visits between patients and an interprofessional team of providers where individual team members may access the visit from disparate remote locations. Visual presentation that reflects a 'hub and spoke' where the patient/standardized patient is at the center of the screen at all times with a 'name tag' at the bottom of their screen surrounding to screenshots of every team member with their 'name tag/role' located at the bottom of their screen.

Interprofessional Education

The various clinical factors were well addressed by the student team members who also displayed a strong sense of inter-professional practice. Professional roles were not well known by all team members and often overlapped, especially in terms of key psychosocial issues vital to addictions treatment. Although students did not note this, lack of role knowledge and overlap may have resulted in students failing to participate fully, leaving decisions to others who were more vocal or articulate. Despite this lack of role knowledge, the students did well in deciphering their roles while collaborating as a team. In this particular group there were a multiplicity of mental health and case management roles whose perspectives are an advantage in addictions treatment. However, capitalizing on this advantage requires coordination and appropriate communication strategies.

Limitations

This was a pilot study and will necessarily need adjustment for large scale curriculum adoption. The case study focus should be adjusted to ensure full participation by all professions, especially for the complicated but vital opioid addiction case genre which can be a challenge to students without previous exposure or experience with this patient population. Faculty organizational, coordination and preparatory efforts could all be improved for efficient case study facilitation and delivery. A tremendous amount of faculty time was invested to train a fairly modest number of students. Even so, faculty recommended reducing the number of students even more. Telehealth technology made it possible to convene such a broad array of professional students, resources, and faculty, but the technology and equipment did differ at each site, making communication halting on occasion.

Conclusions

The combination of telehealth technologies with inter-professional education strategies has the potential to bring vital resources to bear to solve the particular problem of opioid addiction in rural and resource-limited settings. Engaging inter-institutional, collaborative faculty enhances health education, exposing health professions students to varying geography, culture, and resources. Providing students with inter-professional tools to communicate and plan treatment in the context of the opioid epidemic will expand resources as these students go on to their respective practices, rural or otherwise. The multiple modalities and comprehensive resources elaborated in inter-professional practice, combined with telehealth technology--and in the case of Virginia, a motivated political environment--ensure substance addicted patients can get the help they need in resource-limited environments.

References

Agency for Healthcare Research and Quality [AHRQ]. (2017). Teamwork attitude questionnaire. Rockville, MD: AHRQ. Retrieved from: https://www.ahrq.gov/teamstepps/instructor/reference/teamattitude.html

AHRQ. (2014). Team assessment questionnaire. Rockville, MD: AHRQ. Retrieved from: http://www.ahrq.gov/teamstepps/longtermcare/sitetools/tmassess.html

American Association of Colleges of Nursing: Commission on Collegiate Nursing Education. (2011). The essentials of master's education in nursing. Retrieved from http://www.aacn.nche.edu/education-resources/MastersEssentials11.pdf

Assistant Secretary for Public Affairs. (2017). About the Epidemic. Retrieved from https://www.hhs.gov/opioids/about-the-epidemic/index.html

Boet, S., Bould, M., Burn, C. & Reeves, S. (2014). Twelve tips for a successful interprofessional team-based high-fidelity simulation education session. Medical Teacher, 36: 853-857. doi: 10.3109/0142159X.2014.923558

Brandenburg, M. & Garcia-Millian, R. (2017). Interinstituational collaboration for end-user bioinformatics training: Cytoscape as a case study. Journal of the Medical Library Association, 105(2), 179-184. doi:dx.doi.org/10.5195/jma.2017.224

Brandt, B., Lutfiyya, M., King, J. & Chioreso, C. (2014). A scoping review of inter-professional collaborative practice and education using the lens of the Triple Aim. Journal of Inter-professional Care, 28(5): 393-399.

Cahn, P. (2014). In and out of the curriculum: an historical case study in implementing interprofessional education. Journal of Interprofessional Care, 28(2): 128-133. doi: 10.3109/13561820.2013.872607

Carroll, K., Ball, S., Nich, C., Martino, S., Frankforter, T., Farentinos, C. … & Woody, G. (2006). Motivational interviewing to improve treatment engagement and outcome in individuals seeking treatment for substance abuse: a multisite effectiveness study. Drug and Alcohol Dependence, 81(3), 301-312. doi: 10.1016/j.drugalcdep.2005.08.002

Center for Disease Control. (2015). Today's Heroin Epidemic Infographics. Retrieved from https://www.cdc.gov/vitalsigns/heroin/infographic.html

Chiu, C.J., Brock, D., Abu-Rish, E., Vorvick, L., Wilson, S., Hammer, D., Schaad, D., Blondon, K., and Zierler, B. (nd). Performance Assessment of Communication and Teamwork (PACT) Tool Set. Retrieved from: http://collaborate.uw.edu/educators-toolkit/tools-for-evaluation/performance-assessment-of-communication-and-teamwork-pact-too

Commonwealth of Virginia, retrieved from http://www.dmas.virginia.gov/Content_atchs/bh/ARTS%20One%20page%20handout%2009052016.pdf.

Coy, B. & Brewster, M. (2016). Opioid addiction crisis declared a public health crisis in Virginia. Retrieved from https://governor.virginia.gov/newsroom/newsarticle?articleId=18348

Curran, V., Hollett, A., Casimiro, L.M., Mccarthy, P., Banfield, V., Hall, P. … Wagner,S. (2011). Development and validation of the interprofessional collaborator assessment rubric. Journal of Interprofessional Care, 25(5). 339-344.

de Frietas, S. & Oliver, M. (2006). How can exploratory learning with games and simulation within the curriculum be most effectively evaluated? Computers & Education, 46: 249-64. doi:10.1016/j.compedu.2005.11.00

Demiris, G., Charness, N., Krupinski, E., Ben-Arieh, D., Washington, K., Wu, J., & Farberow, B. (2010). The role of human factors in telehealth. Telemedicine and E-health, 16(4): 446-453. doi. 10.1089/tmj.2009.0114

Dow, A., Boling, P., Lockeman, K., Mazmanian, P., Feldman, M., DiazGranados, D. … Taylor, S. (2016). Training and assessment: Interprofessional virtual teams using a web-based case system. Academic Medicine, 91: 120-126. doi: 10.1097/ACM.0000000000000912

Eppich, W., Howard, V., Vozenilek, J. & Curran, I. (2011). Simulation-based team training in healthcare. Simulation in Healthcare, 6(7 sUPPL.). doi. 10.1097/SIH.0b013e318229f550

Governor's Task Force on Prescription Drug and Heroin Abuse. (2015). Recommendations of the Governor's Task Force on Prescription Drug and Heroin Abuse: Implementation Plan – Update Fall 2015. Retrieved from https://www.dhp.virginia.gov/taskforce/minutes/20151020/Fall2015 ImplementationPlan10202015.pdf

Frenk, J., Chen, L., Bhutta, Z., Cohen, J., Crisp, N., Evans, T. … Serwadda, D. (2010). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent

Gilbert, J. (2005). Interprofessional learning and higher education structural barriers. Journal of Interprofessional Care. Supplement 1: 87-106. doi: 10.1080/13561820500067132

Graves, M. & Doucet, S. (2016). Factors affecting interprofessional collaboration when communicating through the use of information and communication technologies: A literature review. Journal of Research in Interprofessional Practice and Education, 6(2). doi: dx.doi.org/10.22230/jripe.2017v6n2a234

Grymonpre, R., van Ineveld, C., Nelson, M., Jensen, F., De Jaeger, A., Sullivan, T., Weinberg, L., Swinamer, J., and Booth, A. (2010). See it – Do it – Learn it: Learning inter-professional collaboration in the clinical context. Journal of Research in Inter-professional Practice and Education, 1(2), 127-144.

Haney, T., Kott, K., and Fowler, C. (2015). Telehealth etiquette in home health care: The key to a successful visit. Home Healthcare Nurse, 33(4). 254-259. doi: 10.1097/NHH.0000000000000228

Horsley, T.L. & Wambach, K. (2015). Effect of Nursing Faculty Presence on Students' Anxiety, Self-Confidence, and Clinical Performance during a Clinical Simulation Experience. Clinical Simulation In Nursing, 11, 4 - 10. doi. 10.1016/j.ecns.2014.09.012

Holtman, M., Frost, J., Hammer, D., McGinn, K. & Nunez, L. (2011). Interprofessional professionalism: linking professionalism and interprofessional care. Journal of Interprofessional Care, 25(5), 383-385. doi: doi.org/10.3109/13561820.2011.588350

Institute of Medicine (1972). Educating the Health Team. p.4-5 as quoted in Interprofessional Education
    Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative
    practice: Report of an expert panel. Washington, D.C.: Interprofessional Education Collaborative.
    https://ipecollaborative.org/uploads/IPEC-Core-Competencies.pdf

Interprofessional Education Collaborative. (2016). Core competencies for Interprofessional
    Collaborative Practice: 2016 Update. Washington, DC: Interprofessional Education Collaborative.
    Retrieved from:
    https://nebula.wsimg.com/2f68a39520b03336b41038c370497473?AccessKeyId=DC06780E69E
    D19E2B3A5&disposition=0&alloworigin=1

IPE Texas Task Force. (n.d.). IPE texas task force: Interprofessional education task force. Retrieved from
    https://www.tamhsc.edu/ipe/resources/ipe-texas-task-force.html

King, S., Chodos, D., Stroulia, E., Carbonaro, M., MacKenzie, M., Reid, A. ... Greidanus, E. (2012).
    Developing interprofessional health competencies in a virtual world. Medical Education Online,
    17:11213. doi.org/10.3402/meo.v17i0.11213

King, S., Drummond, J., Hughes, E., Bookhalter, S., Huffman & Ansell, D. (2013). An inter-institutional
    collaboration: Transforming education through interprofessional simulations. Journal of
    Interprofessional Care, 27(5); 429-431. doi:10.3109/13561820.2013.791260

Levine, M. State Health Commissioner, Virginia Department of Public Health. January 17, 2017.
    Addiction Public Health Emergency Update #1.

Lewis, T., Anson, J., & Greenfield, D. (2014). Barriers and enablers that influence sustainable
    interprofessional education: a literature review. Journal of Interprofessional Care, 28(4): 305-
    310. doi: 10.3109/13561820.2014.895977.

Liaison Committee on Medical Education. (2017). Functions and structure of a medical school:
    Standards for accreditation of medical education programs leading to the MD degree. Retrieved
    from http://lcme.org/publications/#Standards

Morris, T., Jones, C., & Sehrawats, S. (2016). The pathway program: A collaboration between 3
    university to deliver social work distance education (DL) program to underserved areas of
    California. Online Journal of Distance Learning Administration, 19(4). Accessed June 21, 2017
    from http://www.westga.edu/~distance/ojdla/winter194/moriss_jones_sehrawat194.html

Muzyk, A, Tew, C., Thomas-Fannin, A., Dayal, S., Maeda, R., Schramm-Sapyta, N., Andolsek, K. & Holmer, S. (2017) An Inter-professional Course on Substance Use Disorders for Health Professions Students. Academic Medicine doi: 10.1097/ACM.0000000000001766.

Norris, J., Carpenter, J.G., Eaton, J., Guo, J., Lassche, M.A., Pett, M.A, & Blumenthal, D.K. (2015). Development and construct validation of the interprofessional attitudes scale. Academic Medicine: Journal of the Association of American Medical Colleges, 90 (10), pp. 1394-1400. doi.org/10.1097/ACM.0000000000000764

Norris, J., Lassche, M., Joan, C., Eaton, J., Guo, J., Pett, M. & Blumenthal, D. (2015) The Development and validation of the interprofesional attitudes Scale: Assessing the inter-professional attitudes of students in the health professions. Academic Medicine (2015) 90:1394-1400. OMID 25993280 http://www.ncbi.nlm.nih.gov/pubmed/25993280

Owen J, Brashers T, Peterson C, Blackhall L, & Erickson J. (2012) Collaborative care best practice models: A new educational paradigm for developing interprofessional educational (IPE) experiences. Journal of Interprofessional Care, 26(2):153-5. doi.org/10.3109/13561820.2011.645958

Poston, R.D. (2014). Shedding our protective professional skin: a new common language for Interprofessional Education (IPE). Nursing in the 21st Century (App), 2, 5. https://n21.atavist.com/n21_ipe#chapter-464685

Sandelowski, M. (2000). Focus on research methods: Whatever happened to qualitative descriptive? Research in Nursing & Health, 23, 334-340.

Sheree, A., Mackintosh, S., Muscato, D. & Pham, J. (2012). Inter-institutional interprofessional education. AACOM Conference. Retrieved from: https://www.aacom.org/docs/default-source/2012-annual-conference/aston_ipe.pdf?sfvrsn=0

Thomson, A.M., Perry, J.L., & Miller, T.K. (2007). Conceptualizing and measuring collaboration. Journal of Public Administration Research and Theory, doi:10.1093/jopart/mum036

Tuckman B. (1965). Developmental sequence in small groups. Psychological Bulletin, 63(6);384-399. doi: dx.doi.org/10.1037/h0022100

Virginia Department of Health Professions, retrieved from http://www.dhp.virginia.gov/misc_docs/VDHAddictionTrainings12202016.pdf

Virginia DMAS, retrieved from http://www.dmas.virginia.gov/Content_pgs/bh-sud.aspx

Yudkowsky, R., Valdes, W., Raya, S. & Kiser, R. (2011). Assessing residents' telehealth communication
skills using standardised patients. Medical Education, 45(11): 1155. doi: 10.1111/j.1365-
2923.2011.04104.x

Zorek, J. & Raehl, C. (2012). Interprofessional education accreditation standards in the USA: A
comparative analysis. Journal of Interprofessional Care, early online: 1-8. doi:
10.3109/13561820.2012.718295