Interprofessional Collaborative Education for Substance Use Screening: Rural Areas and Challenges

Kathryn R Puskar, DRPH, RN, FAAN [1]

Heeyoung Lee, PHD, PMHNP-BC [2]

Ann M Mitchell, PHD, RN, AHN-BC, FIAAN, FAAN [3]

Irene Kane, PHD, MSN, RN, CNAA, EP-C [4]

Susan A Albrecht, PHD, RN, CRNP, FAAN [5]

Linda Rose Frank, PhD, MSN, CS, ACRN, FAAN [6]

Holly Hagle, PhD [7]

Dawn L Lindsay, PhD [8]

Martin P Houze, MA, PhD [9]

[1] Professor and Associate Dean for Undergraduate Education, University of Pittsburgh School of Nursing, krp12@pitt.edu

[2] Assistant Professor, University of Pittsburgh School of Nursing, leehee@pitt.edu

[3] Professor, University of Pittsburgh School of Nursing, ammi@pitt.edu

[4] Associate Professor, University of Pittsburgh School of Nursing, irk1@pitt.edu

[5] Associate Professor, Associate Dean for Special Projects, University of Pittsburgh School of Nursing, saa01@pitt.edu

[6] Associate Professor, University of Pittsburgh Graduate School of Public Health, frankie@pitt.edu

[7] Director of the National SBIRT ATTC at IRETA, Institute for Research, Education, and Training in Addictions (IRETA), holly@ireta.org

[8] Director of Evaluation Services, Institute for Research, Education, and Training in Addictions (IRETA), lindsayd@ireta.org

[9] Date Analyst, University of Pittsburgh School of Nursing, houzem@pitt.edu

Abstract

Purpose: Interprofessional collaborative practice (IPCP) has been advocated to overcome challenges related to rural healthcare and substance abuse. The investigators evaluated the effectiveness of an online interprofessional education (IPE) program to improve healthcare professionals' perceptions in treating people with substance use and identified the challenges of conducting IPE.

Sample: Sample included 106 healthcare professionals (nurses, behavioral health counselors, and public health workers) from rural areas in Pennsylvania, Ohio, and West Virginia.

Method: This prospective study utilized a quasi-experimental design with healthcare professionals who received a 6-hour online IPE regarding substance abuse. Measures were the Alcohol & Alcohol Problems Perception Questionnaire (AAPPQ) and the Drug & Drug Problems Perception Questionnaire (DDPPQ).

Findings: Perceptions of alcohol (i.e., role adequacy and role support) and drug (i.e., role adequacy, role legitimacy, sole support, and work satisfaction) problems were improved after training (Ps < .05). Competing priorities, leadership support, technology, rural culture, and fiscal consequences were addressed as challenges during project implementation.

Conclusion: The IPE program improved the participants' attitudes and perceptions toward working with patients who struggle with substance abuse. Rural nurse managers can influence

professionals in a range of clinical team settings to improve safety and quality of health care through IPCP. Challenges experienced by rural healthcare professionals can be resolved by the leadership support. Consequently, the leadership of nurse management can favorably impact patient healthcare outcomes by reinforcing IPE.

Interprofessional Collaborative Education for Substance Use Screening: Rural Areas and Challenges

Background

Rural areas face specific healthcare challenges such as vulnerable populations, workforce shortages, and poverty. Rural populations tend to be older and poorer than the urban population, and exhibit higher rates of chronic diseases (e.g., obesity, diabetes, and hypertension) (Ortiz, Meemon, Zhou, & Wan, 2013). The rural healthcare workforce has high turnover rates due to financial and geographical barriers, access to peer support, and limited numbers of healthcare specialist, such as behavioral health (Rosenblatt, Andrilla, Curtin, & Hart, 2006).

In particular, substance use is a significant and emerging problem in rural areas. For example, in 2013, approximately 8.2% of the population aged 12 or older (i.e., 21.6 million) in U.S. rural areas were substance users (i.e., defined by dependence or abuse) (Substance Abuse and Mental Health Services Administration, 2014). The prevalence rates of using alcohol and tobacco among both adults and youth in rural areas tend to be higher than those of their counterparts in urban areas (Gfroerer, Larson, & Colliver, 2007; Rhew, Hawkins, & Oesterle, 2011). Methamphetamine use also is frequently higher in rural areas compared to metropolitan areas (Gfroerer et al., 2007; MacMaster, 2013).

Substance use, and in particular alcohol consumption, has been associated with various medical conditions and is a leading cause of death (i.e., 1 in 10 deaths among adults aged 20-64 years old), which shortens lives by 30 years (Centers for Disease Control and Prevention, n.d.).

Moreover, substance abuse contributes to over $600 billion per year in crime, lost work productivity, and healthcare costs (National Institute on Drug Abuse, 2015). The consequences of substance use in rural communities may be greater in than in urban areas because of limited access to treatment and resources (Lenardson, Race, & Gale, 2009).

Interprofessional collaborative practice (IPCP) has been advocated in prior studies (Heath et al., 2014; R. Mitchell et al., 2013) to overcome such rural healthcare challenges because, through IPCP, multiple healthcare professionals can work in collaboration to strengthen the skills of each, which enhances functioning at the highest capacity (World Health Organization [WHO], 2010). Stated simply, IPCP is collaborative work among healthcare professionals from different disciplines carried out to improve the quality of care through enhancement of comprehensive care through interprofessional education (WHO, 2010). Interprofessional education (IPE) is an experience that "occurs when students from two or more professions learn about, from, and with each other" (WHO, 2010). For example, in a systematic review on the topic, (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013) assert that IPE improved not only quality of care, including diabetes care, collaborative team behaviors in emergency departments and operating rooms, care for domestic violence, and delivery of care in domestic violence, but also mental health clinicians' competencies to deliver care, despite limited evidence. In order to address the problems related to substance use in rural areas, we developed an online IPE program for healthcare professionals to improve their competencies to identify

high-risk substance use, and to provide interventions within a collaborative practice model that serves to improve patient outcomes.

Purpose

The purpose of this study was twofold. First, we sought to evaluate the effectiveness of the IPE program in improving the health professionals' skills to identify, assess, and provide care for people with substance use and co-morbidities. Second, we aimed to identify challenges of conducting an IPE program for health professionals in rural areas. The rural area refers to any place that has a population less than 2,500 people (US Census Bureau, 2011). Pennsylvania has 48 out of 67 counties that are considered to be rural areas (Center for Rural Pennsylvania, 2014).

Methods

Description of the IPE Program

This was a Division of Nursing (DN), Bureau of Health Professions (BHPr), Health Resources and Services Administration (HRSA), Department of Health and Human Services (DHHS) funded longitudinal project to increase the number of healthcare professionals (i.e., nurses, public health workers, and behavioral health counselors) in primary care, public health, and addictions settings in rural areas who are skilled in IPCP; and to improve the capacity of healthcare teams to screen, briefly intervene, and refer to treatment (SBIRT) substance users in rural settings. This short, valid, and reliable evidenced-based model, SBIRT, can be used effectively within the time constraints of a health visit in primary care (Mitchell et al., 2013). The IPCP competency domains (i.e., values/ethics for interprofessional practice, roles/responsibilities, interprofessional communication, and teams and teamwork) (Interprofessional Education Collaborative Expert Panel [IECEP], 2011) guided the project. The IPCP program was delivered as a 6-hour online educational experience that was hosted on a web-based, open-source learning platform (i.e., *Moodle*, Moodle HQ, Perth, Australia). The

IPCP program comprises four components: learning modules, case simulation practice, interprofessional dialogues, and sharing resources. See Figure 1 for an example of the appearance and content of one of the IPCP program.
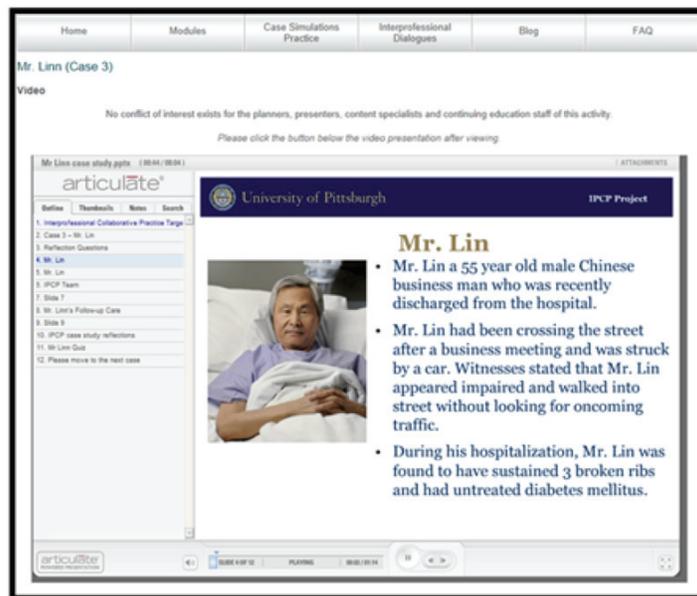
Figure 1. Case Simulation practice from the online module**.**

Learning modules. Six learning modules were delivered via Moodle: (a) introduction to IPCP concepts, (b) continuum of substance use, (c) SBIRT, (d) motivational interviewing strategies, (e) practicing IPCP with cases, and (f) project evaluation. The modules take about 2.5 hours to complete, and train participants to build their knowledge regarding substance use, interprofessional collaborative practice, screening, and the use of brief interventions using motivational interviewing techniques. Moreover, these modules elucidate interprofessional theory through the use of case-simulation imbedded in materials to illustrate roles and responsibilities, discuss common clinical and psychosocial issues associated with the alcohol and other drug using patients, and expand upon the value of interprofessional education and practice to improve patient healthcare outcomes.

Case simulation practice. After completing the learning module, participants completed four case simulations, which provide opportunities to practice the application of SBIRT. These simulations take 1.5 hours to complete. The IPCP competency domains were incorporated into the case simulations**.** Interprofessional communication was enhanced by providing the participants opportunities to identify instances in practice in which interprofessional care will improve client, patient, and family outcomes (IECEP, 2011). The cases emphasized assessment, referral roles of public health, and behavioral health disciplines to improve team care.

Interprofessional dialogues about cases. This part of the IPE program involved the application of the SBIRT model—presented and practiced in the learning modules and case simulations to clinical cases that the participants have encountered during their clinical practice. For example, upon reviewing a case describing a patient recently diagnosed with fibromyalgia, who is incorrectly taking prescribed pain medications and mixing medication with alcohol use, participants were encouraged to review the case with the moderator with and without using the SBIRT process to hypothesize patient outcomes. Discussing the case elucidated participant real-time roles and responsibilities within their IPCP to illuminate both their knowledge and learning needs as well as what worked well in their IPCP and what changes would enhance their system. The dialogue sessions gave participants the opportunity to actively take part in effective decision-making in an interprofessional team using evidence-based assessment and critical thinking. In addition, these case studies and dialogue sessions allowed practicing healthcare professionals the opportunity to assume diverse roles within this interprofessional group and support others in their roles.

Resource sharing. The IPE program includes an online blog that contains a variety of postings that highlight (a) relevant information and resources about interprofessional issues, (b)

new training videos, and (c) emergent topics about interprofessional education and substance use screening. The blog also serves as a dissemination means to access resources created from the project. For example, participants were encouraged to use the blog to obtain updated information on utilizing IPCP, to explore any issues that may have surfaced within their use of IPCP, and to share any novel information or resources with other participants.

Design, Sample, and Settings

This study used a pre-post design with a convenience sample obtained primarily from rural mental health facilities located in the tristate region of PA, WV, and OH in the Eastern United States. The intervention was implemented between 2012 and 2015. Initially the research team visited these clinics and institutions to establish buy-in and provide an introduction to the project, which featured an emphasis on its easy access, free continuing education units (CEUs), and incentives. The importance of the IPCP project was also emphasized. During this phase, onsite *champions* (i.e., participants who advocated IPCP and contributed to the project) and local leaders were identified who agreed to facilitate the project at their particular locations. All sites had the opportunity to utilize technical assistance from the project team. The Institutional Review Board at the University of Pittsburg approved the project protocol (IRB# PRO12090365).

Measures

In addition to collecting demographic information (e.g., age, gender, race/ethnicity, and types of healthcare professionals) from the participants with a questionnaire, the Alcohol and Alcohol Problems Perceptions Questionnaire (AAPPQ) (Shaw, Cartwright, Spratley, & Harwin, 1978) and the Drug and Drug Problems Perceptions Questionnaire (DDPPQ) (Watson, Maclaren, Shaw, & Nolan, 2003) were the instruments used to evaluate the participants' perceptions of

working with patients who may have issues with using alcohol and other drugs. The AAPPQ, a 30-item self-report questionnaire, was used to measure the attitudes of healthcare workers about working with patients with alcohol-related problems. These attitudes are rated by reactions to statements (e.g., "*I feel I have a working knowledge of alcohol and alcohol-related problems"*) from *strongly disagree* (i.e., 1) to *strongly agree* (i.e., 5) on a 5-point Likert scale. The AAPPQ has demonstrated good reliability and validity (Anderson & Clement, 1987). The DDPPQ, a 22-item self-report questionnaire, was used to measure healthcare workers' perceptions of drug-problems. Both the internal consistency (Cronbach's $\alpha = 0.87$) and construct and content validity of these measures have been reported as satisfactory (Watson, Maclaren, & Kerr, 2007). Participants were asked to complete all questionnaires (i.e., demographic, AAPPQ, and DDPPQ) via the Research Electronic Data Capture (REDCap) application, which is a secure, encrypted, web-based application for building and managing online surveys to track participant progress throughout a project (Harris et al., 2009). Data were collected from participants at two time points: upon project entry (i.e., pre-training) and after training.

Analysis

Statistical analyses were performed using SPSS 21 (Armonk, NY: IBM Corp.). Data were checked for outliers before analysis was conducted. The sample included 106 participants who had completed both pre- and post-training data collection. Descriptive statistics were used to present the participants' demographic characteristics. The distribution of the sub-scores of the AAPPQ and DDPPQ were found to be symmetric and approximately Gaussian. Linear mixed modeling was therefore used to examine possible differences over time. The model contained a time effect, with F-values in (Table 2).

Findings

Table 1 displays the demographic information gathered. The average age of the healthcare providers was 39.9 years (SD = 13.6). Participants comprised 37 (34.9 %) nurses, 16 (15.1 %) mental or behavioral health counselors, 11 (10.4 %) substance abuse professionals, and 6 (5.7%) social workers from 10 clinical sites. A total of 240 participants enrolled in the study (i.e., completed the pre-training survey). Of these, 106 successfully completed both the educational intervention program and the post-training surveys.

Table 1

Demographic Data (n=106)

	Mean (±SD) or n (%)
Age (years)	39.9 (±13.6)
Gender	
Women	90 (84.9%)
Men	16 (15.1%)
Race/Ethnicity	
White	99 (93.4%)
Black	5 (4.7%)
Others	2 (1.8%)
Healthcare professionals	
Nurses	59 (55.7%)
Counselors	16 (15.1%)
Social workers	6 (5.7%)
Substance abuse professionals	11 (10.4%)
Other (including pharmacist, health educator)	13 (12.3%)
Missing	1 (0.9%)

Changes in drug problem perceptions

106 participants completed these measures at pre- and post-intervention. The pairs of means of DDPPQ that had a statistically significant difference (p =.01) were found in terms of role adequacy and role support. Role adequacy measured on a scale of 1 to 5 increased during the study, with an average increase of 0.25 (t = 6.56, p = .01) between pre- and post-training. Role

support also increased, with an average increase of 0.25 (p = .04) between pre- and post-training (see Table 2).

Changes in alcohol problem perceptions

One hundred six participants completed these measures pre- and post-intervention. The overall estimate of AAPPQ tended to increase after the intervention. Sub-scores of the AAPPQ questionnaire increased over time. Role adequacy, role legitimacy, and work satisfaction also increased during the study, with an average increase of 0.24 (p = 0.02), 0.22 (p < .01), and 0.16 (p = 0.04), respectively, between pre- and post-training (see Table 2).

Table 2

Changes in alcohol and drug problem perceptions (n=106).

		Mean (SD)		F-value	p-value
		Pre-training	Post-training		
DDPPQ	Role Adequacy	3.47 (0.77)	3.72 (0.67)	6.56	.01
	Role Legitimacy	3.95 (0.71)	4 (0.6)	0.57	.57
	Role Support	3.73 (0.94)	3.98 (0.76)	4.27	.04
	Motivation	3.75 (0.87)	3.8 (0.89)	0.13	.72
	Task-Specific Self-Esteem	3.73 (0.78)	3.79 (0.78)	0.3	.58
	Work Satisfaction	3.33 (0.8)	3.43 (0.73)	0.93	.34
AAPPQ	Role Adequacy	3.6 (0.81)	3.84 (0.65)	5.81	.02
	Role Legitimacy	3.85 (0.67)	4.07 (0.48)	7.4	<.01
	Role Support	3.77 (0.92)	3.98 (0.72)	3.74	.05
	Motivation	3.57 (0.69)	3.72 (0.68)	2.51	.12
	Task-Specific Self-Esteem	3.71 (0.67)	3.77 (0.61)	0.51	.47
	Work Satisfaction	3.42 (0.62)	3.58 (0.57)	4.12	.04

Challenges to Delivering Online IPE

The online IPE program was effective in changing the perceptions of the participants. During evaluation, several themes were provided as challenges in delivering IPE in rural areas. These included competing priorities, leadership support, technology, rural culture, and fiscal issues.

Healthcare professionals who participated in this project reported (through IPCP dialogues) that the concepts of IPCP and SBIRT are indeed essential; however, maintaining these priorities throughout the project was challenging due to competing priorities. Additionally, the dynamic circumstances of the busy clinics negatively impacted the IPCP project completion rate recorded for healthcare professionals. Examples included practice pressures (e.g., time management, workload, and emergent patient issues taking priority over education). Moreover, recruiting nurses to participate in the IPCP project was difficult because the 8–10 hour/day work schedules of many of the nurses hindered both the enrollment and completion rates. During the beginning of the project, enthusiasm and participation were both high, and over 200 participants were initially enrolled in the program. However, participation over the course of the first year gradually decreased. To address this challenge, after the first project year, we elicited participant and healthcare professional's input and made the following program changes: we (1) decreased the number of evaluation measures (i.e., number of questions and time points of data collection), (2) added incentives (e.g., gift cards and CEUs) to encourage participation, (3) provided site champions with a leadership certificate to recognize accomplishments, (4) visited site clinics to encourage continued buy-in of champion leaders, and (5) consulted marketing experts to update and revise website text and presentation.

Another challenge to implementation was securing "buy-in" from the healthcare leadership within the organizations and agencies targeted. In order to change the manner in which health care is delivered with this IPCP model, the leaders of a particular clinic, organization, or institution must agree to support the change which allows for full commitment to the IPCP project components. Challenges also exist for referrals and include (1) acquisition of additional patient services and (2) communication between health professionals, especially if outside their

system or organization. The HIPAA constraints that are inherent with signed consents for referral resulted in limited communication with healthcare professionals making referrals. To address this constraint, IPCP reminds and reinforces the team to communicate within and outside the system for clinical practice.

Our project used a distance-based approach (i.e., an online educational intervention provided through a website platform) to train health professionals to more effectively identify and treat substance use using IPE. In particular, we provided live webinar sessions for participants to discuss their experiences interactively and collaboratively. However, despite the technical support provided by our team, some participants found it challenging to use the online platform because of their limited technical skills and ability to use (and access) the equipment needed for this type of program. Some participants were not familiar with the webinar platform and had difficulty navigating the project due to their lack of knowledge about web-based platforms. In some cases, participants had to use their home computers because work computers were not available.

Another challenge we faced in conducting this project was the role of the regional and local cultures that are unique to the rural areas of PA, WV, and OH, in the Eastern United States. Some healthcare professionals and agencies in these rural areas were skeptical of research activities and researchers, and thus reluctant to provide access to their employees for participation in the study. In addition, as this project aimed to reach busy rural health professionals, webinar and discussion times were scheduled over lunch hour or at the end of the work day to accommodate busy office schedules.

Fiscal concerns also present a challenge. Health professionals in these rural areas, regardless of the clinical setting, are being asked to do more for their clients within the same

clinical time constraints. Administrators and other leaders responsible for making decisions regarding the use of paid time including education and training for professional development is another barrier. With additional requirements placed on healthcare systems for lowering costs, administrators and health professionals may be reluctant to increase educational activities as part of ongoing job responsibilities due to the fiscal consequences resulting from potential loss of patient revenue. The need for professional development to increase interprofessional practice within healthcare teams to improve team effectiveness must be considered.

Discussion/ Implication

Results indicate that the online IPE program improved the participants' perceptions about individuals with substance use. Data from subscales demonstrate role adequacy, role support, role legitimacy, role support, and work satisfaction increased with the online program enhancing overall interprofessional performance. Interpretation of this finding of the increase in these subscales suggests that the participants reported more adequacy and legitimacy in their roles to conduct alcohol/drug use screening. Research demonstrates that increase role security leads to changes in behavior. In addition, the interprofessional dialogues about universal screening reinforced the components of interprofessional collaboration. Prior studies have reported increased knowledge of mental health issues among rural health professionals who have participated in IPE training (Church et al., 2010). The diverse group of healthcare professionals who participated in the project benefited from the content discussed and demonstrated which were relevant and useful to their daily clinical practice in mental health care settings. Through IPE and SBIRT training, healthcare professionals can collaboratively prevent or lower the risks of alcohol and substance use through coordinated and comprehensive patient care interventions,

which can positively impact engagement of patients in self-care, improve quality, and safety for patients.

Regarding application to nursing practice and policy, the study addressed the competing priorities and practices that the participants face in the rural healthcare environment. Prior research that has implemented IPE faced similar challenges, which included logistic and structural issues (Heath et al., 2014; Parker et al., 2013). In particular, rural behavioral health professionals have reported chronic role overload, increased job-related stress, and burnout due to rural culture (e.g., lack of resources, training constraints) (Heath et al., 2014; Parker et al., 2013). The results of this study further demonstrate these trends within this cohort of health professionals. Moreover, our results suggest that traditional hierarchies, policies, procedures, and institutional culture may account for the challenge of implementing IPCP (Parker et al., 2013).

To support the development of collaboration, nurses and other healthcare professionals can be educated about the unique skill sets, competencies, and roles of specific disciplines that can be employed within the context of an interprofessional work environment. Additionally, communication, confidentiality, respectfulness, innovation, team building within interprofessional training activities are key factors in IPCP training. According to a review of 44 articles (Supper et al., 2014), many of these demonstrated barriers to interprofessional collaboration were addressed in our IPE training.

In addition, our team recognized the critical role of policy leaders in clinical and administrative structure within healthcare settings in implementing and sustaining IPCP, which is in agreement with previous studies (Priest et al., 2008; Spencer, Woodroffe, Cross, & Allen, 2014). Many rural health agencies and institutions have no implemented IPCP within clinical settings. Nurse managers, clinical educators, and staff trained in IPCP are in a key position to

assume leadership in promoting and modeling IPCP with rural clinical care settings (Spencer et al., 2014). It is important for sustainability to overcome logistic, motivational and financial barriers to IPCP implementation. Considerations for specific targeted funding for IPCP implementation and monitoring (Supper et al., 2014) would improve sustainability. Certainly, leadership support (e.g., nurse managers) for the implementation of ICPC within clinical units would enhance uptake of this model as standard practice.

Our project took advantage of current distance based education technology in delivering the IPE program in rural areas, a choice based on previous studies that emphasized the benefit of technology to overcome limited access to training and educational resources (Brems, Johnson, Warner, & Roberts, 2006) and accessibility (Skorga, 2002) in rural settings. Nonetheless, the use of technology was reported as being a challenge by some participants consistent with similar reports in the literature (Church et al., 2010).

Conclusion

The results of this study indicate that the our educational intervention improved the health professional participants' attitudes and perceptions in working with individuals with alcohol and other substance use, as well as implementing interprofessional principles within their clinical practice. Improving the health of individuals and communities requires collaborative engagement of professionals from various disciplines, responsibility levels and roles. Thoughtfully planned and coordinated teamwork can improve the delivery, efficiency, and effectiveness of substance use healthcare especially in rural areas.

As we have demonstrated, providing IPE shows promise in promoting this interprofessional teamwork. Nursing practice and policy implications for rural nurse managers include providing fiscal and operational, support for continuing education programs for nurses.

Many nurses have limited IPE and evidence-based screening and brief intervention for substance use in the nursing curriculum which this intervention aimed to address. Furthermore, nurses may benefit from mentoring support to improve interprofessional collaboration within their clinic settings. Integration of IPE into institutional quality management initiatives would also support adoption and sustainability into clinical services. Early exposure to the concept of IPCP, such as in nurse orientation sessions and for other health professionals within the clinical team, has the potential to enhance the expansion of interprofessional practice. Nurse managers' active involvement in developing policies to facilitate IPCP for nurses and their senior management of organizations can assist in resolving challenges to sustain IPCP in rural clinical settings, ultimately improving patients' healthcare outcomes longitudinally.

Funding Agencies

References

Anderson, P., & Clement, S. (1987). The AAPPQ revisited: The measurement of general practitioners' attitudes to alcohol problems. *British Journal of Addiction, 82*(7), 753-759. http://dx.doi.org/10.1111/j.1360-0443.1987.tb01542.x

Brems, C., Johnson, M. E., Warner, T. D., & Roberts, L. W. (2006). Barriers to healthcare as reported by rural and urban interprofessional providers. *Journal of Interprofessional Care, 20*(2), 105-118. http://dx.doi.org/10.1080/13561820600622208

Centers for Disease Control and Prevention. (n.d.). Alcohol and public health. Retrieved from http://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm

Center for Rural Pennsylania (2014). Looking ahead: Pennsylvania popultaion projections, 2010 to 2040. Retrieved from http://www.rural.palegislature.us/publications_fact_sheets.html#

Church, E. A., Heath, O. J., Curran, V. R., Bethune, C., Callanan, T. S., & Cornish, P. A. (2010). Rural professionals' perceptions of interprofessional continuing education in mental health. *Health & Social Care in the Community, 18*(4), 433-443. http://dx.doi.org/10.1111/j.1365-2524.2010.00938.x

Gfroerer, J. C., Larson, S. L., & Colliver, J. D. (2007). Drug use patterns and trends in rural communities. *Journal of Rural Health, 23*(1), 10-15. http://dx.doi.org/10.1111/j.1748-0361.2007.00118.x

Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)--A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics, 42*(2), 377-381. http://dx.doi.org/10.1016/j.jbi.2008.08.010

Heath, O., Church, E., Curran, V., Hollett, A., Cornish, P., Callanan, T., . . . Younghusband, L. (2014). Interprofessional mental health training in rural primary care: Findings from a mixed methods study. *Journal of Interprofessional Care, Epub ahead of print*, 1-7. http://dx.doi.org/10.3109/13561820.2014.966808

Interprofessional Education Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C: Interprofessional Education Collaborative.

Lenardson, J. D., Race, M. M., & Gale, J. A. (2009). Availability, characteristics, and role of detoxification services in rural areas: Working Paper (#41). Portland, ME: University of

Southern Maine, Maine Rural Health Research Center. Retrieved from http://digitalcommons.usm.maine.edu/behavioral_health/14/

MacMaster, S. A. (2013). Perceptions of need, service use, and barriers to service access among female methamphetamine users in rural Appalachia. *Social Work in Public Health, 28*(2), 109-118. http://dx.doi.org/10.1080/19371918.2011.560820

Mitchell, A. M., Puskar, K., Hagle, H., Gotham, H. J., Talcott, K. S., Terhorst, L., . . . Burns, H. K. (2013). Screening, brief intervention, and referral to treatment: Overview of and student satisfaction with an undergraduate addiction training program for nurses. *Journal of Psychosocial Nursing & Mental Health Services, 51*(10), 29-37. http://dx.doi.org/10.3928/02793695-20130628-01

Mitchell, R., Paliadelis, P., McNeil, K., Parker, V., Giles, M., Higgins, I., . . . Ahrens, Y. (2013). Effective interprofessional collaboration in rural contexts: A research protocol. *Journal of Advanced Nursing, 69*(10), 2317-2326. http://dx.doi.org/10.1111/jan.12083

National Institute on Drug Abuse. (January, 2015). The science of drug abuse and addiction. Retrieved from http://www.drugabuse.gov/related-topics/trends-statistics

Ortiz, J., Meemon, N., Zhou, Y., & Wan, T. T. (2013). Trends in rural health clinics and needs during U.S. health care reform. *Primary Health Care Research & Development, 14*(4), 360-366. http://dx.doi.org/10.1017/s1463423612000503

Parker, V., McNeil, K., Higgins, I., Mitchell, R., Paliadelis, P., Giles, M., & Parmenter, G. (2013). How health professionals conceive and construct interprofessional practice in rural settings: A qualitative study. *BMC Health Services Research, 13*(1), 1-21. http://dx.doi.org/10.1186/1472-6963-13-500

Priest, H. M., Roberts, P., Dent, H., Blincoe, C., Lawton, D., & Armstrong, C. (2008). Interprofessional education and working in mental health: In search of the evidence base. *Journal of Nursing Management, 16*(4), 474-485. http://dx.doi.org/10.1111/j.1365-834.2008.00867.x

Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013). Interprofessional education: effects on professional practice and healthcare outcomes (update). *Cochrane Database of Systematic Reviews, 3*, Cd002213. http://dx.doi.org/10.1002/14651858.CD002213.pub3

Rhew, I. C., Hawkins, J.D., & Oesterle, S. (2011). Drug use and risk among youth in different rural contexts. *Health & Place, 17*(3), 775-783.: http://dx.doi.org/10.1016/j.healthplace.2011.02.003

Rosenblatt, R. A., Andrilla, C. A., Curtin, T., & Hart, L. (2006). Shortages of medical personnel at community health centers: Implications for planned expansion. *JAMA, 295*(9), 1042-1049. http://dx.doi.org/10.1001/jama.295.9.1042

Shaw, S., Cartwright, A., Spratley, T., & Harwin, J. (1978). *Responding to drinking problems*. London: Croom Helm.

Skorga, P. (2002). Interdisciplinary and distance education in the Delta: the Delta Health Education Partnership. *Journal of Interprofessional Care, 16*(2), 149-157. http://dx.doi.org/0.1080/13561820220124166

Spencer, J., Woodroffe, J., Cross, M., & Allen, P. (2014). "A golden opportunity": Exploring interprofessional learning and practice in rural clinical settings. *Journal of Interprofessional Care*, 1-3. http://dx.doi.org/10.3109/13561820.2014.970250

Substance Abuse and Mental Health Services Administration [SAMHSA]. (2014). Results from the 2013 National Survey on Drug Use and Health: Summary of national findings. Rockville, MD: SAMHSA.

Supper, I., Catala, O., Lustman, M., Chemla, C., Bourgueil, Y., & Letrilliart, L. (2014). Interprofessional collaboration in primary health care: A review of facilitators and barriers perceived by involved actors. *Journal of Public Health (Oxf)*. http://dx.doi.org/10.1093/pubmed/fdu102

U.S. Census Bureau (2011). Statistical abstract of the United States: 2012, 131st Edition, Washington, DC. Retrieved from https://www.census.gov/library/publications/2011/compendia/statab/131ed.html

Watson, H., Maclaren, W., & Kerr, S. (2007). Staff attitudes towards working with drug users: Development of the Drug Problems Perceptions Questionnaire. *Addiction, 102*(2), 206-215. http://dx.doi.org/10.1111/j.1360-0443.2006.01686.x

Watson, H., Maclaren, W., Shaw, F., & Nolan, A. (2003). Measuring staff attitudes to people with drug problems: The development of a tool. Retrieved from http://www.scotland.gov.uk/Resource/Doc/47133/0013810.pdf

World Health Organization (WHO). (2010). Framework for action on interprofessional education & collaborative practice. Geneva, Switzerland: WHO.