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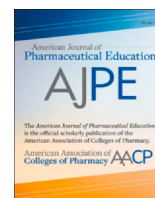
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Research

Effect of an Educational Video Miniseries on Interprofessional Preceptor Development

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ABSTRACT

Objective: Experiential rotation preceptors may lack confidence in instructing interprofessional learners. This study examined the effect of a 12-episode, professionally produced video miniseries on attitudinal, satisfaction, and confidence outcomes in a cohort of interprofessional preceptors comprising pharmacy, medicine, nursing, and other allied health professionals.

Methods: An invitation to view the miniseries was distributed to all health science preceptors within 1 large, public health science university. Participants were asked survey questions addressing their attitudes toward the miniseries, their comfort in precepting, and their satisfaction with the miniseries.

Results: A total of 61 interprofessional preceptors enrolled in the study, with 33 completing the entire miniseries. Participants displayed highly positive attitudes toward the miniseries. In addition, members of all professions enrolled demonstrated an increase in precepting confidence after viewing the miniseries episodes (2.31 vs 2.7 on a 3-point Likert scale). Subgroup analyses demonstrated that preceptors with > 10 years of professional experience displayed less positive attitudes toward the miniseries than those with 2–10 years of professional experience.

Conclusion: The miniseries model proved effective as a preceptor development strategy for a group of health professional preceptors. Given the diversity of learners, a collection of training options that allows preceptor self-selection of programming may be beneficial.

1. Introduction

Implementation of interprofessional education (IPE) experiences for various health science professions has become notably important to maintain compliance with accreditation standards.^{1,2} The venue of IPE implementation into health science curricula is heterogeneous and can include the experiential setting.³ During experiential rotations, students perform various tasks within the scope of their profession, gaining real-world practical experience. Experiential IPE allows students the opportunity to apply knowledge and skills gained during didactic and laboratory instruction while working with other health care professionals.

The qualifications needed to be a preceptor differ between professions and the state of practice.^{4–9} Common requirements between all professions include competence in the preceptor's professional scope of practice. Pharmacy accreditation standards additionally promote

educational development of preceptors to ensure quality rotation experiences.¹⁰ Preceptors may have full-time faculty appointments at a university or be a practicing clinician holding an adjunct preceptor title, with varying levels of teaching experience.¹¹

Preceptors are increasingly being asked to work with and/or train learners from various professions, either formally or informally, to provide patient care.^{12,13} Previous research has shown that individuals may lack confidence in serving as an interprofessional preceptor, thus expansion and growth of preceptor training programs in this area are warranted.¹⁴

Recently, a model for preceptor development was published using an innovative approach termed a video miniseries.¹⁵ A miniseries is a professionally produced movie divided into 6–12 brief video episodes. Each miniseries tells a fictional story with individual episodes containing realistic preceptor-student scenarios, preceptor commentary, and teaching pearls. It has a sequential process of its presentation,

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which actively incorporates various principles of adult learning. Each episode within a series is between 7 and 11 min in length to minimize the possibility of monotony and disengagement for viewers. Each episode begins with an introduction where the expert preceptor and student narrators use humor to gain the attention of the viewer. After the introduction, a scene is played, showing various situations that highlight the points of educational benefit for preceptors. Immediately after, the narrators discuss what the preceptors and students did well and the areas in need of improvement. Questions are then posed directly to the viewer about the scene. After the viewer has been provided adequate time to formulate their response, expert advice is given to further add to the learning experience. These miniseries have previously shown positive effects in educating pharmacists in a diversity of practice settings, including an interprofessional environment.¹⁶

The objective of this study is 3-fold: (1) to identify whether an interprofessional video miniseries can serve as a viable medium for preceptor training in an interprofessional setting; (2) to determine if this format provides positive attitudinal, satisfaction, and confidence results in the immediate and long-term setting; and (3) to identify the impact of preceptor-specific demographic factors on these results.

2. Methods

The miniseries used in this study was titled *A Change of Heart: An Interprofessional Miniseries*. The story follows a patient admitted to a hospital for myocardial infarction and, through a series of unchecked medication errors, inappropriately receives fibrinolytic therapy, leading to a devastating hemorrhagic stroke. The 12-episode series follows the patient through hospital stabilization, discharge, admission to a skilled nursing facility, and ends with the patient's death. The series highlights numerous health professionals, including nurses, occupational therapists, physical therapists, physicians, pharmacists, and speech-language pathologists. Through a combination of inappropriate and quality interprofessional interactions, participants learn the key principles regarding orientation, feedback, teamwork, and dealing with difficult preceptors or students. At moments throughout each episode, 2 preceptors and 2 student experts provide humorous interactions and share insight on how they would deal with each learning situation. Each individual episode ends with preceptor and student pearls. The miniseries was written and produced by an interprofessional health care team.

The study population consisted of Texas Tech University Health Sciences Center (TTUHSC)-affiliated health professional preceptors located in the Abilene, Amarillo, Dallas/Fort Worth, or Lubbock campuses. Preceptors from the schools of medicine, nursing, pharmacy, and health professions were eligible if they took students on experiential rotations. Health professions included speech-language pathology, physical therapy, and occupational therapy. Preceptors who had previously viewed the *Change of Heart* miniseries and/or participated in its production were excluded.

3. Steps of Study

Recruitment took place by sending an email to all qualifying TTUHSC faculty, with instructions on how to register for the study. Eligible participants were not incentivized or rewarded for participating in the study. Recruitment goals were not met through the initial email series. Thus, the study investigators personally contacted both individual faculty members and their respective department heads. Immediately after agreeing to participate, individuals received instructions on how to access the video miniseries online. Recruitment took place between January 19 and March 31, 2017.

Subjects were asked to watch each of the 12 video episodes. Participants were able to watch videos asynchronously over multiple days. After viewing an episode, participants were prompted to answer a series of questions: 2 open-ended reflection questions focused on the individual objectives of the episode, 4 Likert scale confidence-based

questions focused on the individual objectives for the episode, and 3 Likert scale questions focused on their attitudes at the end of each video. Attitudinal questions remained uniform throughout the miniseries, whereas confidence-based questions were unique to each episode. They followed this same process for each episode until they had successfully completed all 12. After the twelfth episode, the participants were given an additional 12-question survey designed to assess their satisfaction of the miniseries (8 questions) and the impact on their comfort precepting students in an interprofessional environment (4 questions). Questions used in each survey were based on previously published studies assessing the impact of miniseries viewing on preceptor outcomes and modified to match the context of the story told within *A Change of Heart: An Interprofessional Miniseries*.^{15,16} Participants were given 30 days to complete the series. All participants that successfully completed all these tasks were considered to have finished phase 1 of the project.

All participants that finished phase 1 then entered a 3-month washout period with no communication with the study investigators. After 3 months, the participants received an email asking them to complete a 13-question follow-up survey. The purpose of this follow-up survey was to assess attitudes, confidence, and impact 3 months after the completion of the training video miniseries. The 24 confidence-based questions (2 per episode) that were asked during the initial surveying period served as a foundation for the creation of 11 questions used in the follow-up survey. These 11 questions were developed through consensus decision-making within the investigator team. The team considered which specific skills would have the greatest impact on preceptor development. The remaining 2 questions inquired about the impact the miniseries had on the participant's comfort precepting learners in a uniprofessional and interprofessional environment.

Data were collected through the TTUHSC Jerry H. Hodge School of Pharmacy Learning Express website: <http://tuhsc.learningexpressce.com/>. Subjects were assigned usernames and passwords to log in to the online survey software for data collection. To ensure appropriate blinding, investigators randomized the username and password combinations to the participating subjects.

Data from any participant who completed 1 or more assessments of the study were analyzed. To answer research questions, descriptive analysis, correlation analysis, 1-way analysis of variance (ANOVA), and 2-way mixed ANOVA were conducted. This study was approved by the TTUHSC Institutional Review Board.

4. Results

Sixty-one individuals agreed to take part in the study, with 43 health professional preceptors completing an assessment for at least 1 episode. Details of the study participation according to profession may be seen in [Table 1](#). Of the 43 health professionals, 33 (77%) completed all 12-episodes of the miniseries. The participant's attitude toward all episodes was highly positive (mean [M] = 4.53 SD = 0.561), as seen in [Table 2](#). Attitude levels were significantly different between health professions ($P < 0.001$, $F [3] = 9.964$ for statement 1, $F [3] = 27.289$ for

Table 1
Professions of Participants.

Profession	Enrolled in study <i>n</i> = 61 (%)	Started miniseries <i>n</i> = 43 (%)	Completed miniseries <i>n</i> = 33 (%)
Medicine	19 (31)	9 (21)	6 (18)
Nursing	16 (26)	12 (28)	10 (30)
Pharmacy	18 (30)	17 (40)	14 (42)
Other ^a	8 (13)	5 (12)	3 (9)

n: number of responses

^a Inclusive of occupational therapists, physical therapists, and speech-language pathologists.

Table 2
Attitude Scores by Professions.

Statements	n	M ^a	Profession	M
1. The reflection questions were appropriate for this activity.	462	4.47 (0.557)	Pharmacy (n = 193)	4.60 (0.492)
			Medicine (n = 87)	4.29 (0.663)
			Nursing (n = 131)	4.34 (0.537)
			Others ^b (n = 51)	4.59 (0.497)
2. I am very satisfied with the contents of this episode.	462	4.54 (0.568)	Pharmacy (n = 193)	4.78 (0.414)
			Medicine (n = 88)	4.26 (0.686)
			Nursing (n = 131)	4.36 (0.556)
			Others ^b (n = 50)	4.58 (0.499)
3. The knowledge provided in this episode is meaningful and important to me.	461	4.58 (0.586)	Pharmacy (n = 192)	4.80 (0.399)
			Medicine (n = 87)	4.30 (0.779)
			Nursing (n = 131)	4.41 (0.580)
			Others ^b (n = 51)	4.67 (0.476)

n: number of responses, M: mean (standard deviation).

^a Agreement measured on a scale of 1 (strongly disagree) to 5 (strongly agree).

^b Inclusive of occupational therapists, physical therapists, and speech-language pathologists.

statement 2, and $F [3] = 22.573$) for statement 3, with pharmacy having a higher positive attitude than participants from medicine and nursing.

Given the low number of participants, we were not able to conduct a statistical analysis to compare the satisfaction of the 4 different professions. However, medicine and nursing had lower satisfaction levels than pharmacy participants on all 8 satisfaction survey questions.

The average reflection word count in the postepisode reflection questions was statistically different between professions ($F (3) = 16.890, P < 0.001$). Pharmacy participants had the highest number of reflection words ($M = 46.12$) whereas medicine was the fewest ($M = 27.55$).

Confidence levels were significantly increased in all episodes (Table 3; preconfidence level: $M = 2.31 [0.561]$; postconfidence: $M = 2.70 [0.460]$, $t[922] = -23.397, P < 0.001$). The 2-way mixed ANOVA was conducted to determine whether the confidence improvement was the same for the different professions. The results showed that there was significant main effect for confidence level change ($F = 473.361, P < 0.001$) with medium effect size ($\eta^2 = 0.340$). Also, there was a significant interaction between confidence level change and profession type ($F = 14.376, P < 0.001$) with small effect size ($\eta^2 = 0.045$), indicating that the magnitude of confidence change was different between professions. Examination of simple effect for each profession indicated that the confidence level change was smallest in the nursing profession.

Seventy-six percent ($n = 25$) of those completing all 12 episodes of the entire miniseries responded to the 3-month follow-up survey, which assessed the long-term confidence and overall impact of training. The number was too small to conduct a statistical analysis for either confidence levels or impact; however, the confidence level was 2.65/3 for all professions combined, with pharmacy the highest at 2.71 and medicine the lowest at 2.18. The average impact level for all professions was 6.38/10, with pharmacy participants reporting the highest at 6.77 and medicine the lowest at 5.00.

Correlations between subject-specific variables and outcomes were assessed. The difference of professions in confidence, attitude, and

reflection word count were significantly correlated with age for all 12 episodes. The average age for participants was 44.7 years for medicine, 53.71 years for nursing, and 33.6 years for pharmacy. There were negative correlations between age and confidence, $r = -0.174, P < 0.001$; age and reflection word count: $r = -0.167, P < 0.001$; and age and attitude. Each of the 3 attitude questions showed a strong correlation with age: question #1 $r = -0.206, P < 0.001$; question #2, $r = -0.285, P < 0.001$, and question #3 $r = -0.282, P < 0.001$. For participants who completed the 3-month follow-up survey, no significant relationship between age and either long-term confidence and impact were found.

Table 4 shows that attitude levels were significantly different based on years of experience for all 3 questions ($P < 0.001$). Participants who had > 10 years of experience had less positive attitude than other groups with 2–10 years of experience. The average reflection word count was significantly different when evaluating the years of experience ($F [3] = 12.529, P < 0.001$). Participants with 2–10 years of experience had a higher number of reflection words (2–5 years: $M = 41.98$, 6–10 years: $M = 46.11$) than groups with < 1 year ($M = 25.44$) or > 10 years of experience ($M = 34.18$), respectively. There was no significant difference in satisfaction based on the years of experience.

The 2-way mixed ANOVA was conducted to determine whether the confidence improvement was the same for the different years of experience. There was a significant main effect for confidence level change ($F = 530.692, P < 0.001$) with medium effect size ($\eta^2 = 0.366$). The confidence level was significantly higher than before taking the instruction regardless of years of experience. Also, there was a significant interaction between the confidence change and years ($F = 9.315, P < 0.001$) with a small effect size ($\eta^2 = 0.030$), which indicated that the magnitude of confidence change was different depending on the years of experience. Examination of the simple effect for each group indicated that the confidence levels were significantly increased in all groups, but there was a nonsignificant difference among groups in terms of the confidence level change (Table 5). No significant differences between years of experience and long-term confidence or impact (follow-up) were found.

Table 3
Confidence Level Change in Professions^a.

Professions	Preconfidence	Postconfidence	t value	Cohen's d
Pharmacy (n = 386)	2.31 (0.60)	2.76 (0.43)	$t(385) = -17.023$	0.862
Medicine (n = 177)	2.22 (0.49)	2.66 (0.48)	$t(176) = -11.515$	0.944
Nursing (n = 259)	2.41 (0.53)	2.63 (0.48)	$t(258) = -8.347$	0.435
Others ^b (n = 101)	2.18 (0.54)	2.66 (0.48)	$t(100) = -9.344$	0.939

n: number of responses.

^a Assessed on a scale of 1 (not confident) to 3 (very confident).

^b Inclusive of occupational therapists, physical therapists, and speech-language pathologists.

Table 4
Attitude Scores by Years of Experience^a.

Statements	Years of Preceptor	M
1. The reflection questions were appropriate for this activity.	0–1 years (n = 58)	4.34 (0.664)
	2–5 years (n = 171)	4.61 (0.524)
	6–10 years (n = 83)	4.58 (0.521)
	More than 10 years (n = 150)	4.29 (0.509)
2. I am very satisfied with the contents of this episode.	0–1 years (n = 58)	4.45 (0.502)
	2–5 years (n = 171)	4.64 (0.560)
	6–10 years (n = 83)	4.75 (0.437)
	More than 10 years (n = 150)	4.35 (0.602)
3. The knowledge provided in this episode is meaningful and important to me.	0–1 years (n = 58)	4.59 (0.497)
	2–5 years (n = 171)	4.65 (0.609)
	6–10 years (n = 83)	4.75 (0.437)
	More than 10 years (n = 150)	4.41 (0.625)

n: number of responses, M: mean (standard deviation).

^a Agreement measured on a scale of 1 (strongly disagree) to 5 (strongly agree).

5. Discussion

Formal training programs on how to optimally instruct students in an experiential setting have been developed.¹⁷ Although, the need for more preceptor education and training programs have been identified as a gap in the integration of IPE into clinical education.^{18–21} This study sought to explore whether an interprofessional video miniseries can serve as a viable medium for preceptor developmental programming.

The first study question evaluated if interprofessional preceptors had a positive attitude and were satisfied with the video miniseries. All professions exhibited a positive attitude (Table 2) and satisfaction toward each individual episode and the miniseries as a whole. Pharmacy had the most positive attitude and greatest satisfaction with the miniseries, with medicine reporting the least. Although medicine, nursing, and pharmacy all promote preceptor development in their accreditation standards, pharmacy has a greater emphasis, which may explain the difference in responses between professions.^{5,9,10} Specifically, in the state of Texas, where this study was conducted, pharmacy preceptors are required to complete 3 h of preceptor education every 2 years.²² Given this, one could suggest that pharmacy preceptors may be more likely to be motivated to complete this type of program and to have completed other programs, which they could compare the miniseries to. Conversely, without a legal or accreditation requirement in the state where the study occurred, medicine and nursing preceptors may be less motivated to participate in preceptor training. This could result in a finding wherein pharmacy preceptors find the miniseries format novel and engaging, whereas nursing and medicine do not. All professions reported the lowest satisfaction in the length of the miniseries. The observation that all professions perceived the miniseries episodes and total body of work as being excessively long gives direction for future miniseries production. Previous studies have shown that a miniseries with episodes as brief as 5–8 min may confer beneficial effects on viewers, substantially shorter than the 7- to 11-minute episode length within this miniseries.^{15,16}

The second study question was to evaluate if the miniseries resulted in improved confidence and comfort related to precepting skills. The data suggest that each individual episode and the miniseries as a whole conferred an increase in overall preceptor confidence. This was shown

for all professions, with pharmacy having the greatest increase, followed by medicine and nursing. Participants also expressed increased comfort level in precepting students and residents in an interprofessional environment after the completion of the miniseries. The results led us to question why the pharmacy profession had the greatest confidence increase relative to other professions. This may be explained by 3 different factors: the age of participants, previous experience with other preceptor development programs, and baseline self-perceived confidence in precepting. A negative correlation was noted between participant age and the factors of attitude, confidence, and level of engagement with the miniseries. This may be explained by generational differences in their approach to learning. Most pharmacy participants were representative of the Generation Y (ie, “Millennials”), whereas other professions were of the Generation X and the Baby Boomer generations. Learners from Generation Y are considered to be “digital natives”, having grown up in a world of personal computers and instant access to information.²³ Logically pursuant to this, Generation Y learners have an increased tendency to multitask, which may lead to a greater engagement in the variety of teaching and learning modalities (eg, expert commentary, takeaway pearls) contained within the miniseries.²⁴

The emphasis pharmacy accreditation places on preceptor development could be an additional factor that influenced participant’s engagement and confidence gained from the miniseries. In contrast to medicine and nursing, pharmacists in some states are required to complete preceptor training before teaching learners on experiential rotations, which may have provided an additional context for pharmacy participants to compare the miniseries against. In addition, the nursing cohort demonstrated the highest previewing confidence. With a small, 3-point Likert scale, this could explain why the magnitude of change for nursing was smaller relative to other professions because at baseline, they were already approaching a level of “very confident”. This high baseline self-assessment may indicate a grassroots effort by the nursing profession to promote preceptor education and mentorship that is not mandated by regulatory or legal requirements.

An analysis was conducted to see if there were differences in outcomes based on participant’s years of preceptor experience. Previous studies have used free response question or open forum discussion word

Table 5
Confidence Level Change by Years of Experience.

Years of Experience	Preconfidence ^a	Postconfidence ^a	t value	Cohen’s d
0–1 years (n = 118)	2.16 (0.51)	2.72 (0.45)	t(117) = –11.788	0.480
2–5 years (n = 341)	2.30 (0.57)	2.73 (0.45)	t(340) = –14.895	0.524
6–10 years (n = 166)	2.29 (0.53)	2.69 (0.47)	t(165) = –10.183	0.503
More than 10 years (n = 298)	2.37 (0.58)	2.66 (0.48)	t(297) = –10.545	0.467

^a Assessed on a scale of 1 (not confident) to 3 (very confident).

count as a surrogate marker of participant engagement.^{25–30} We observed a bell-shaped curve regarding participant engagement, as measured by reflection word count. Midcareer participants (2–10 years of experience) demonstrated higher engagement than those with < 2 or > 10 years of experience. Similarly, midcareer participants displayed a more positive attitude toward the miniseries than participants with more experience. For both satisfaction and confidence, there were no statistically significant differences. However, preceptors with > 10 years of experience showed a smaller increase in confidence precepting students than participants with less experience. These findings may be partly explained by generational differences, as described previously because participants with more professional experience are likely to be older. In addition, participants, early in their career, may have had fewer experiences to reflect upon, resulting in a lower measured engagement, despite positive attitudes toward the miniseries.

At the 3-month follow-up survey, medicine displayed a notable decline in confidence precepting comfort relative to all other professions. No firm conclusions can be made because of the small sample size in our study; however, we suggest that this may have resulted due to medicine's lower engagement and satisfaction with the miniseries.

Strengths of this study included enrolling participants from a diversity of health care professions, age ranges, and levels of precepting experience. In addition, 76% of participants who watched all 12 episodes also completed the 3-months follow-up survey. Another strength of the study included a list of questions that consistently appeared for each episode of the miniseries, allowing a functionally larger sample size, with initial miniseries viewing results. Our study may also be of particular interest to the Academy considering the modern health care landscape's attitudes toward interprofessional collaboration. In the time since data were collected, additional data has been published detailing a general positive interest in interprofessional collaboration between physicians, nurses, and pharmacists.^{31–33} Although exceptions have been noted in the time since data collection, a literature review yielded barriers and opportunities for interprofessional collaborations.^{31,34–36}

Limitations of the study include a small sample size, a population that was predominated by the pharmacy profession, the lack of direct comparison between the miniseries and other traditional forms of preceptor development, and an inability to assess miniseries completion time course. In addition, the 3-month follow-up survey was compiled through informal consensus decision-making as opposed to through a prespecified validated algorithm, this, coupled with the small sample size completing the follow-up, decreased our ability to conduct robust statistical testing on this data. The overrepresentation of pharmacists within this study and pharmacy's overall positive view of the miniseries may have been due to the miniseries addressing a medication error and the study team comprising pharmacists. In addition, recent published models of a webinar-based interprofessional preceptor development program indicate that a research team comprising multiple professions may yield more homogeneously positive results between professions enrolled in the program.³⁷ Lastly, the software within the Learning Express platform used to distribute the miniseries did not generate reports detailing participant viewing habits. It may be that engagement was higher in participants who were able to view the miniseries in 1 sitting because they may have more easily appreciated the flow of the fictional story depicted over the course of its 12 episodes. Watching the miniseries in multiple installments, pursuant to investigator reminders, may have induced a situation where a participant resumed viewing the miniseries in the middle of the story with limited recollection of the sequence of events that preceded it, potentially limiting participant engagement and learning.

The miniseries was positively received and led to increased precepting confidence in those preceptors who completed it. Furthermore, we identified variables that may influence a preceptor's response to the miniseries. This observation suggests that preceptors each have their own developmental needs and preferences. A method by which preceptor areas for growth are identified would help to facilitate this

process. One suggestion could be to design a series of assessments that incorporate feedback from students, peers, and one's self to inform these training needs. The creation of a diversity of programming that uses a variety of teaching and learning modalities would allow preceptors to select training based on their personal preferences and opportunities for growth. This “choose your own adventure” design may motivate more preceptors to participate in preceptor training.

6. Conclusion

Overall, the miniseries had a positive immediate and long-term impact on the preceptors' attitudes and satisfaction with the training medium, as well as confidence toward precepting in an interprofessional collaborative practice environment. We challenge the Academy to continue to find innovative ways to promote preceptor development.

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Author Contributions

Conceptualization, Methodology, Investigation: Herman Joseph Johannesmeyer, Craig D. Cox. *Formal analysis:* Jongpil Cheon. *Writing – original draft, writing – review & editing:* Herman Joseph Johannesmeyer, Jongpil Cheon, Craig D. Cox. *Supervision:* Craig D. Cox.

Declarations of Competing Interest

None declared.

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