INTER-HEALTHCARE PROFESSIONS COLLABORATION: EDUCATIONAL AND PRACTICAL ASPECTS AND NEW DEVELOPMENTS

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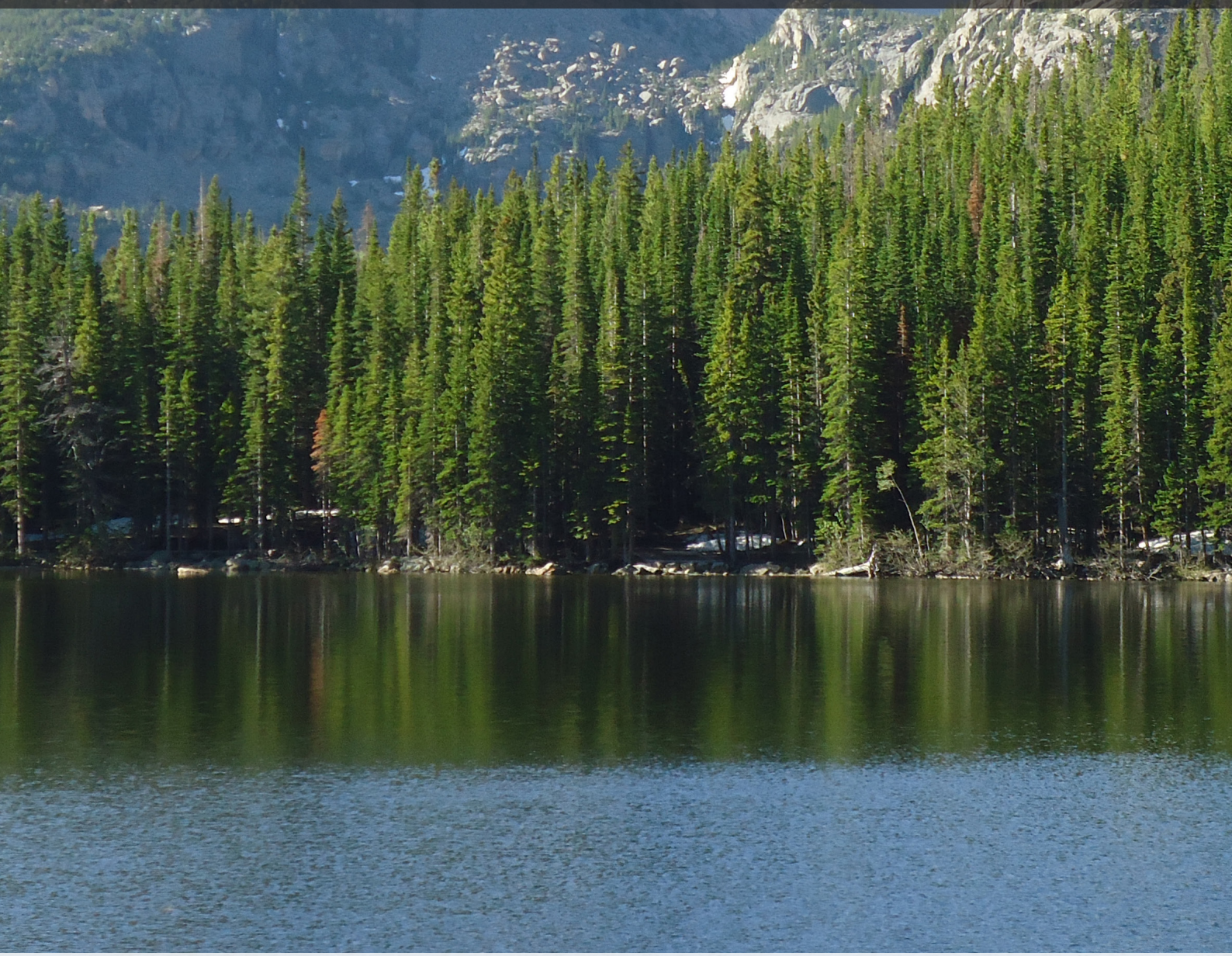

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INTER-HEALTHCARE PROFESSIONS COLLABORATION: EDUCATIONAL AND PRACTICAL ASPECTS AND NEW DEVELOPMENTS

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Photograph by Teresa Van Winkle of Bear Lake, Colorado (USA) and surrounding mountains. The photograph is intended to show the need to reflect before continuing a journey toward higher interprofessional collaboration among healthcare professions and their providers.

Settings, such as patient-centered medical homes, can serve as ideal places to promote inter-professional collaboration among healthcare providers (Fjortoft et al., 2016). Furthermore, work together by teams of interprofessional healthcare students (Van Winkle, 2015) and even

practitioners (Stringer et al., 2013) can help to foster interdisciplinary collaboration. This result occurs, in part, by mitigating negative biases toward other healthcare professions (Stringer et al., 2013; Van Winkle 2016). Such changes undoubtedly require increased empathy for other professions and patients themselves (Tamayo et al., 2016). Nevertheless, there is still much work to be done to foster efforts to promote interprofessional collaboration (Wang and Zorek, 2016). This work should begin with undergraduate education and continue throughout the careers of all healthcare professionals.

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EDITORIAL
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Editorial: Inter-healthcare Professions Collaboration: Educational and Practical Aspects and New Developments

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The Editorial on the Research Topic

Inter-healthcare Professions Collaboration: Educational and Practical Aspects and New Developments

NF is a 62 year old female patient in good health. She is seeing her family physician for routine care, including managing her high blood pressure, annual check-ups, immunizations, and standard screenings. She also sees a podiatrist regarding a heel spur on her right foot, a GI specialist for GERD, an ophthalmologist for follow-up care after cataract surgery, a physical therapist for left knee pain, a dentist for a new crown, and her pharmacist manages all of her medications. She has a preferred provider organization (PPO) insurance plan so she can select her own care givers without going through her primary care physician. As a result, her "team" does not share any network, nor do they share an electronic medical record. Is her investment in health care seeing optimal results? Who is managing her care? The likely answer to this question is no one and everyone.

The United States spends more per capita on health care than any other nation, yet ranks below other comparable countries on key criteria such as access, efficiency, and most importantly, health outcomes (Davis et al., 2014). For a primary care physician to take care of all needs, chronic and preventative, for an average panel of 2500 patients, they would need to work 21 h a day (Altschuler et al., 2012). Clearly this practice is not sustainable, nor is it seeing optimal results.

Interprofessional collaboration, in particular, in patient-centered medical homes, is designed to deliver high-quality, team-based, patient-centered primary care. Evidence indicates that this approach increases health outcomes, in particular, those related to chronic diseases, and reduces emergency room visits, length of stay, specialty provider visits, all at tremendous cost savings (Nielsen et al., 2016).

How do we as educators prepare our students for this new world of team-based patient-centered care? Interprofessional education is described as occurring when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes (Health Professions Networks Nursing and Midwifery Human Resources for Health, 2010). The interprofessional education collaborative identified four domains of core competencies for interprofessional collaborative practice: values/ethics for interprofessional practice; roles and responsibilities; interprofessional communication; teams and teamwork (Interprofessional Education Expert Panel, 2011).

A number of efforts to foster these core competencies are presented in this topic. For example, Tamayo et al. point out that, if efforts to improve empathy and attitudes toward interprofessional

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collaboration are included early in the curricula of healthcare professional students, they would likely foster work to reinforce the values for interprofessional practice later on. Van Winkle adds, that interdisciplinary teams of healthcare professional students reflecting together on their attitudes toward each other, helps to mitigate their biases toward one another. Although work needs to be done to help small numbers of healthcare professional students whose negative biases are increased by the experience (Van Winkle). In these ways, the roles and responsibilities of each healthcare professional are also clarified. Similarly, Stringer et al. remind us that we continue to need to learn more about the roles and responsibilities of other professionals. Clearly the work in teams used in these studies (e.g., Van Winkle; Van Winkle) fosters the communication needed to acquire all of the competencies listed above. Nevertheless, Wang and Zorek emphasize that a concerted effort of experiential learning followed by reflection followed by another round of learning should be implemented best to foster interprofessional education through deliberate practice theory. Thus, it is clear there remains much to be done. Interprofessional education is still in its infancy, but for true interprofessional collaboration in practice to occur, students must learn the four core domains in their academic programs.

Let's go back to NF our 62 year old patient and imagine how her care would be different if she was in a team-based patient-centered medical home.

- Her care is centered on her. She is treated as a person with a life not as a set of medical conditions. Her team communicates with each other and shares all information regarding her health. They are incentivized to make sure her blood pressure is controlled, that she is getting the services needed, and there is no duplication of services. Her team ensures that she understands her conditions, her medications and her role in her path to better health.
- NF is now receiving comprehensive care. Nothing gets missed because everyone is working together. She is able to develop long term relationships with her providers.
- NF is now receiving coordinated care. Her information is shared and communicated. Her team is coordinated, making all her clinic visits smooth and seamless. The team works with everyone connected to her health in her community and connects her with resources she may need.
- NF now has better access to care. When she needs someone or has a question she can get them answered in a timely manner.
- NF is experiencing a systems based approach to quality and safety. Her team is rewarded for helping NF reach her health goals, and NF saves money and achieves better health.

As educators, we have the privilege and the responsibility to prepare our students for practice today and tomorrow. We need to keep patient NF in mind and focus on teaching the four core competencies of values/ethics, roles and responsibilities, interprofessional communication, and teams and teamwork.

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Dr. NF was the lead author, with substantial contributions from Drs. MK and LV, and some contributions from Dr. SC.

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OPINION
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The Ethics of Teaching: Critical Thinking and Reflection to Promote Professionalism by Mitigating Biases Including those against other Healthcare Professions

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Keywords: professionalism, inter-professional collaboration, critical thinking, critical reflection, mitigating biases, healthcare professions students

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In the USA I see bumper stickers and t-shirts that declare "Critical thinking: the other national deficit." Unfortunately here, and elsewhere in the world, these words are often true. Not only does the internet give us ample opportunity to express ourselves without much reflection or thought, but college and university courses do not always expect and foster critical thinking and reflection on the part of students, particularly when the courses have lecture formats and large enrollments. In my view, this is especially true of the basic and even the clinical sciences in healthcare professional education. Many of the latter educators do not heed well the admonition in McKeachie's Teaching Tips (McKeachie and Svinicki, 2014) "Teach your students to reflect both in and out of class. That reflection should never stop, because conscious reflection on values is perhaps the cornerstone of the ethics of teaching."

But why is such thought and reflection important in education? Major struggles for all people are the biases and judgments they hold against others especially those outside their own personal groups. For example, in the New York Times a couple of years ago, Kristof (2014) wrote in his editorial "Some readers collectively hissed after I wrote a week ago about the need for early-childhood interventions to broaden opportunity in America. I focused on a 3-year-old boy in West Virginia named Johnny Weethee whose hearing impairment had gone undetected, leading him to suffer speech and development problems that may dog him for the rest of his life. A photo of Johnny and his mom, Truffles Weethee, accompanied the column and readers honed in on Truffles' tattoos and weight (instead of possible opportunities to help Johnny and other such children)...Why didn't readers see a caring mom instead of her…tattoos?"

We believe that such biases can be mitigated through exposure of students in our courses to people outside their groups especially when the students then write critical reflections about their experiences. Our evidence, from surveys of healthcare professional students (as well as from using formally validated instruments as discussed below), indicates that such activities by students in interdisciplinary teams seem to mitigate biases not only against patients but also against other healthcare professions. For example, 76% of medical students agreed whereas only 10% disagreed with the survey statement "Encounters with people in our team community service project helped me to see my potential biases toward patients more clearly regardless of the setting." Similarly, 77% of pharmacy students and 66% of prospective health-care professions students agreed with the statement. An extremely important aspect of these service projects included regular and written critical thinking and reflection by students about their projects throughout the term in which the projects were performed.

We have shown elsewhere that such thought and reflection also foster patient-centered beliefs among students and even student-centered beliefs in faculty members (Van Winkle et al., 2011a,b,c). Similarly, critical thinking and reflection about elderly patients (Van Winkle et al., 2012a) and patients in minority groups (Van Winkle et al., 2013a) improved healthcare professional students' empathy scores. Empathy scores also improved among healthcare professional students performing critical thinking and reflection on their team service learning projects (Van Winkle et al., 2013b, 2014).

More important to the present theme, this critical thinking and reflection also likely mitigate biases against other healthcare professions students, when the thinking and reflection are performed as members of interdisciplinary healthcare professional teams. In a single 50-min biochemistry workshop, teams of medical and pharmacy students shared their critical thoughts and reflections on the roles of the other profession in the care of two patients (Van Winkle et al., 2012b). Completion of the workshop was associated with an increase in the physician-pharmacist collaboration scores of both groups of healthcare professions students, although the effect on pharmacy students was greater than the influence on medical students. When the time working on interdisciplinary teams was extended, from a single workshop, to 18 workshops over two quarter-term biochemistry courses, the collaboration scores of prospective healthcare professional students (primarily prospective medical and dental students) increased much more dramatically and approached the already high scores of pharmacy students (Van Winkle et al., 2013b). More revealing are the written thoughts and reflections of students about their work on inter-professional teams. As shown in the samples below, these reflections often dealt with mitigation of biases against the other profession. Nearly full reflections are included to give the reader the full depth of the sample students' experiences, thoughts and feelings. Such mitigation by most inter-professional team members likely contributed to the improved collaboration scores of all groups of healthcare professional students (Van Winkle et al., 2012b, 2013b).

For example, a pharmacy student wrote that "in life it is easy to recognize when you are right, but admitting you are wrong can be a different story…Going into workshop I had a negative preconception about doctors and their role within the healthcare team. I have spent years working in a pharmacy and I have become familiar with the drama that follows the doctors…The arrogance that comes with that position is often times too much to stomach…Every time a call had to be put into the doctor's office from the pharmacy it (was) like summoning the king/queen for a meeting with the local pauper. Returned calls often were short and degrading for something as simple as a forgotten signature or number of refills. With that said I felt as though I was in for a long 50 min meeting with the future doctors from Midwestern…When we read the Henrietta Lacks book I was not surprised with the way the doctors treated Henrietta because I felt that coincided with my ideas of doctors I have dealt with. However, a change was about to take place that altered my view of doctors for the better.

The Cameron Lord video really struck me because for the first time I saw a doctor act on the family's wishes rather than his own agenda. The doctor in the video took the time to find out what the best treatment options were based on the family's wants and made sure that decisions were made on their terms. In my opinion he seemed like a friend or neighbor first and a doctor second. Furthermore, the medical students from Midwestern understood my position, and surprisingly agreed with me about the current attitudes (of) doctors in the healthcare team. I was shocked when they used words like collaborate, incorporate, and teamwork when talking about the doctors of the future. While I initially felt (that) maybe they were putting on a show it hit me when one of the medical students said "on behalf of my profession I'm sorry." It was at that moment I understood that I was the one who was being unfair to the doctors not the other way around.

Going forward, I feel that I can better live up to my values in future collaborations with other health care professionals by listening first and judging later. Too often I feel that I allow my previous misconceptions to determine how I treat others in the medical field. In order to better serve my patients I need to realize that the patient comes first and I come second. I need to create my feelings for others based on my individual interactions rather than the (previous) feelings I have created based on (prior) meetings with others. No two people are the same and while the saying goes "one bad apple spoils the bunch" in order to provide exceptional patient care I must understand that when I judge others I am the "bad apple." Looking at the bigger picture of patient care and understanding that we are all working toward the same goals I can accept others on their own actions and not on the actions of those whom have come before."

Similarly, an aspiring physician said "my first exposure to a faculty clinician left me with an impression. I quoted him as saying in my notes "everyone is very big on this team mentality toward healthcare, but be wary of this. The pharmacist, physical therapist, nurse, etc…will increasingly press for more responsibility and more input on decision making, but as soon as the lawsuit comes in, the buck stops with you, the physician." This left me quit hardened. In the moment, I built a barrier when dealing with healthcare teams…to make sure that I would not be troubled by…the input of someone with training other than mine. I don't doubt that I am egotistical. I think all medical students are in a way, after all we are a select few that made it to this point but after talking with the pharmacy students, I think I need to work less on building barriers and more on giving our patients the superior care they deserve. This requires that we work with other professionals as a team.

The beginning of our conversation (with pharmacy students) was very cordial, after all, at this point we are all students and we talked about the rigors of our education. It was a rallying point that we all enjoyed, basically complaining about the number of tests, lectures, etc…to someone other than a student going through the same thing. It didn't take long however, for that early compatibility to fade. The pharmacy student I spoke with first was the person that changed me most…Initially I figured the conversation would go like this:

Pharmacy student: "I want to be included in more decision making and to not be treated like a subordinate."

Medical student: "That's fine but are you willing to take the responsibility for say, the drug choice you recommend for me to prescribe to my patient?"

Pharmacy student: "Well in the end you prescribe so you should still have to take the repercussions."

As you can see from the conversation I was expecting, I was cynical. What really happened was more like this:

Pharmacy student: "I want to be included on rounds in the hospital, I think my expertise on medications would be of great use to the medical team."

Medical student: "Are you then willing to take the responsibility for the drug you recommended?"

Pharmacy student: "Absolutely, if the team makes the decision, the team should be responsible for the outcome. Besides that, if we work together, you concentrating on diagnosing, and deciding what the patient needs to get better, and I giving you the drug to complete the (treatment), we can then be more efficient in healing patients, and be more successful…The responsibility we share will be for…success, instead of failure."

Medical student: "Wow…"

I was stunned, it was so far from what I was expecting. He was completely right…We share a goal, I want to be successful in treating patients as does he. I realized that my egotistical viewpoint, that everyone wants power but no responsibility was grossly unfounded. I realized that it's not fair to myself to place all of the responsibility on myself. It is also unethical to my patient, as giving them the best treatment, requires me to be more willing to work with other professionals like pharmacists. This certainly was eye-opening. With utmost respect, I think that even…seasoned clinicians should get a lesson like this."

In the same spirit, I suggest the following modification of the quote above from McKeachie's Teaching Tips (McKeachie and Svinicki, 2014). This revision is intended for all healthcare professionals whether they are students or practitioners. The modification is: Learn to reflect alone and in teams when patients are present and when they are not. That reflection should never stop, because conscious and critical thought and reflection on values is perhaps the cornerstone of mitigating biases against patients and other healthcare professions.

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The author confirms being the sole contributor of this work and approved it for publication.

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Pharmacists and family physicians: improving interprofessional collaboration through joint understanding of our competencies

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Interprofessional collaboration (IPC) is an integral part of the practice of Medicine and Family Medicine. The World Health Organization (WHO) defines IPC as occurring when "multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care" (WHO, 2010). To provide effective, patient-centered care, family physicians must collaborate with other health and social care providers. This is especially true in Canada where there is an increasing level of chronic care and multimorbidity. Between 1998/99 and 2008/09 the prevalence of diagnosed diabetes among Canadians has increased by 70%. Over 36.5% of Canadian adults with diabetes report two or more other serious chronic conditions (hypertension, heart disease, chronic obstructive pulmonary disease, mood disorder, and/or arthritis) in addition to diabetes, and 12.5% report having three or more (Frank, 2005). The Collaborator role has therefore appropriately been included in the CanMEDS framework of competencies by the College of Physicians and Surgeons of Canada (Frank, 2005) and the College of Family Physicians of Canada (CFPC) (Tannenbaum et al., 2009). These frameworks are used in the design and accreditation of undergraduate and family medicine curricula as well as to improve patient care by ensuring that training programs in family medicine are responsive to societal needs (Tannenbaum et al., 2009).

The delivery of responsive, effective, and high-quality patient care is indeed a complex activity. It demands health care professionals collaborate in an effective manner (Reeves et al., 2013). IPC can be challenging and barriers such as role identification and clarification of expectations continue to be experienced in practice (Lapkin et al., 2013).Interprofessional education (IPE) offers a possible way to improve IPC and patient care and now forms an essential part of medical school curricula in many countries including Canada, USA, UK, and Australia (Reeves et al., 2013). IPE is described as occurring when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes (WHO, 2010). A fundamental premise of IPE is that if health professional students learn together they will be better prepared for IPC and teamwork. IPE is a therefore considered a necessary step in preparing a "collaborative practice-ready" workforce that is better prepared to respond to local health needs. A collaborative practice-ready health provider is someone who has learned how to work in an interprofessional team and is competent to do so (WHO, 2010). The duration of the positive effects of IPE programs for medical and health care students, however, and their transferability to clinical practice is still unclear.Recent meta-analyses report inconclusive evidence on the effectiveness of IPE on outcomes such as collaborative professional practice or patient care (Lapkin et al., 2013; Reeves et al., 2013). In order to understand what needs to be improved upon in IPE, a deeper understanding of the essential components of a successful collaborative relationship is required (WHO, 2010).

Competence, or the knowledge and skills base underlying a particular profession, can also be considered a profession's "cognitive map." Good teamwork relies on a joint understanding of one's own as well as other team members' cognitive map (Drinka and Clark, 2000). In clinical practice this requires that a profession not only clearly describe their own roles and responsibilities to other professionals but also have an awareness of other professions' competencies in relation to their own (Drinka and Clark, 2000); This is a key competency that has been linked with improving team communication, coordination of care and patient safety and is included in the CanMEDS description of a collaborator (Frank, 2005; CMPA, 2007; Prada et al., 2007; Frank and Brien, 2008).

Defining one's own professional competencies is therefore an important first step in effective IPC. One approach to gathering the necessary information to determine what competencies are required for a particular profession is to ask those already active and skilled in the profession itself. This approach was used by the CFPC in the development of the competency–based objectives in family medicine using practicing family physicians as their source of information (Allen et al., 2011). This is now the standard used to define competence for the purpose of certification in family medicine by the CFPC.

Another approach includes consultation with others. Realizing the importance of patients, physicians, and other health care professionals in the delivery of health care, research in the 1990's by the Ontario provincial government in Canada sought

both public and other health care professionals input in an attempt to define the expectations of physicians performance. The results showed significant difference of opinion between physicians and other health care professionals on items referring to distribution of responsibility, control, and authority of physicians within the health care system at that time (Neufeld et al., 1998). Recently, research on the perceived roles of internal medicine postgraduate trainees (self and other health care professionals) at patient discharge, illustrates a similar lack of consensus (Card et al., 2013).

Pharmacists represent the one health care profession all family physicians are most likely to collaborate with in providing optimal patient care. A recent UK study on the collaborative relationship between community pharmacy and general medicine, highlighted the dynamic nature of the relationship and the key components of collaboration. These included the importance of trust, communication, professional respect, and "knowing each other" when referring to roles, abilities and responsibilities (Bradley et al., 2012). Just as the medical profession has it's own set of defined competencies, so does pharmacy. The National Association of Pharmacy Regulatory Association includes professional collaboration and teamwork in its professional competencies for Canadian pharmacists (NAPRA, 2007). As part of the recent extension of prescribing rights to pharmacists in Canada, there has been extensive research conducted around family physicians' knowledge, perceptions and expectations of pharmacists' competencies and how this impacts the collaborative relationship (Farris, 2005; Bryan et al., 2009; Farrell et al., 2010; Dey et al., 2011). To date, however, there has been little work undertaken on pharmacists' or other professions' knowledge, perceptions or expectations of family physician competencies and how this may inform the collaborative relationship to further develop IPE curricula and ensure better patient care.

Our research team is exploring pharmacist's expectations of the competent family physician using an adaptation of the CFPC's original competency questionnaire distributed to practicing family physicians (Allen et al., 2011). An iterative approach using the Delphi method will seek to examine the perspectives of pharmacists on family physicians' competencies. A series of Delphi questionnaires will be administered to a panel of experts including rural, urban, academic, and non-academic collaborating pharmacists. Questions will focus on disease states, decision-making, judgment, and clinical situations requiring collaboration. The resultant definition of family medicine competencies from the viewpoint of collaborating pharmacists will then be compared to that defined by the CFPC. Commonalities and discrepancies will be analyzed to identify gaps and develop IPE methods to enhance collaborative competence in family medicine and pharmacy trainees.

Continued research in this area is essential to deepen our understanding of the essential components of the interprofessional relationship. Understanding and clarifying role expectations is central to this and can provide valuable information when designing and reviewing professional competency frameworks and IPE curricula. As more research becomes available, the effectiveness of these programs on outcomes such as IPC in clinical practice and patient care should be reviewed.

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Do interprofessional education programs produce dissension that destroys them?

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A commentary on

Interprofessional workshop to improve mutual understanding between pharmacy and medical students
by Van Winkle, L. J., Bjork, B. C., Chandar, N., Cornell, S., Fjortoft, N., Green, J. M., et al. (2012). Am. J. Pharm. Educ. 76:150. doi: 10.5688/ajpe768150

Critical thinking and reflection exercises in a biochemistry course to improve prospective health professions students' attitudes toward physician-pharmacist collaboration
by Van Winkle, L. J., Cornell, S., Fjortoft, N., Bjork, B. C., Chandar, N., Green, J. M., et al. (2013) Am. J. Pharm. Educ. 77:169. doi: 10.5688/ajpe778169

We have shown that healthcare professional students attitudes toward interprofessional collaboration improve in association with their work together on interdisciplinary teams in single courses (Van Winkle et al., 2012, 2013). Anecdotally, however, a few students complained that at least one team member from another healthcare professions program did not contribute their share to the success of the team. To test the possibility that these interventions to improve attitudes toward interprofessional collaboration might also have negative effects on some participants attitudes, we examined a new set of data more carefully for both positive and negative changes. Such a negative effect on students attitudes might also have a negative impact on establishment of interprofessional education programs.

Ninety five percent of first-year pharmacy students (202 of 213 students) and 100% ($n = 96$) of first-year prospective health professions students (defined in Van Winkle et al., 2013) completed the newly developed Jefferson Scale of Attitudes Toward Interprofessional Collaboration (JeffSATIC, Hojat et al., 2014) at orientation to their programs in August and September, respectively, 2014 (pre-course administrations of the scale). They then worked together in interdisciplinary learning teams to complete weekly biochemistry workshop exercises and regular discussions concerning the challenges and rewards of healthcare delivery. Eighty one percent of pharmacy students and 91% of prospective health professions students completed the scale again at the end of the 11-week fall academic quarter (post-course administration of the scale). Most students marked their survey forms with personal, four-digit ID codes so that their post-course survey scores could be matched to their pre-course scores for more powerful, paired statistical analyses. Statistical analyses were performed using GraphPad Prism 6 Software, Inc. (LaJolla, CA). This study was reviewed and found to fulfill the criteria for exemption by the Midwestern University Institutional Review Board.

Most students became more eager to collaborate after working in teams ($p = 0.02$, Effect Size (ES) $= 0.21$, paired t-test for first-year pharmacy students; $p < 0.0001$, ES $= 0.55$, paired t-test for prospective health professions students). However, the distributions of survey scores also broadened after post-course vs. pre-course administration of the scale to pharmacy and prospective healthcare professions students ($p < 0.0001$, F-tests to compare variances). The post-course distributions of scores appeared to be composed of at least two populations of students. Thus, the changes in some students survey scores were highly negative statistical outliers of the populations of score changes (Tukey, 1977; Ben-Gal, 2005). These sets of student outliers became much less eager to work with students from other programs ($p = 0.0004$; $ES = 0.98$, paired t-test for first-year pharmacy students; $p = 0.004$, $ES = 0.95$, paired t-test for prospective health professions students). While the latter groups of bona fide outliers comprised less than 8% of pharmacy and prospective health professions students in the study, the magnitudes of their negative changes in attitudes were relatively large. The average magnitudes of these negative changes exceeded the increases in mean scores among the remaining majority of students by more than six-fold. In our view, such highly negative experiences among a minority of healthcare professions students working on interdisciplinary teams could disproportionately influence administrators overseeing work toward establishing interprofessional education programs. Those with strongly negative feelings are likely to be much more vocal than students who favor such programs. The later social dynamic would undermine efforts to institutionalize existing pilot programs. In this regard, these students also worked on teams with other healthcare professions students in at least one other course during the same quarter term of 2014.

Thus, interprofessional education programs may themselves elicit dissension among participants about the desirability of such programs. While most participants in these programs become more eager to collaborate with members of other healthcare professions, some may become disenchanted with this collaboration. Such disenchantment might emerge, say, from negative experiences while working on teams with other healthcare professionals. The resultant greater dissension among participants could lead decision-making administrators to feel that the cost is not worth the benefit of supporting interprofessional education programs especially in the context of a healthcare education system that already seems to function adequately.

To counter such dissension, those of us who train healthcare professions students may have an obligation to help students examine changes in their feelings about collaboration especially if these changes are negative. Techniques, such as conflict transformation, likely are needed fully to resolve the complex social clashes among the cultures of various healthcare professions and their training programs. Conflict transformation has been used successfully to resolve and even to reconcile deeply-rooted, identity-based conflicts in the field of wildlife conservation (Madden and McQuinn, 2014).

The levels of conflict model of conflict transformation, discussed by Madden and McQuinn (2014), seems particularly appropriate to reconcile the identity-based differences that are likely to arise within interprofessional healthcare teams. Items on the JeffSATIC, that measure the factors "working relationship" and "accountability" (Hojat et al., 2014), include "All health professionals can contribute to decisions regarding the well-being of patients/clients" and the reverse-scored "The primary function of other health professionals is to follow, without question, orders by the physician who are treating the patients/clients." Reconciliation of the deeply-rooted, identity-based feelings students may have toward the hierarchy implicit in these items is unlikely to be trivial but also unlikely to be thoroughly examined in most healthcare professions education programs. Instead, the faculty indicates to students how they should feel by promoting interprofessional healthcare professions training in the first place.

In the levels of conflict model, discussions should begin with a thorough and balanced discussion of the dissension and disagreement inherent in work by interprofessional healthcare students on the same team. What does each healthcare professional stand to lose through full and equal interprofessional collaboration? What will they each gain? How will patients/clients suffer because of such collaboration? How will patients/clients benefit from these efforts? Only through full resolution and reconciliation of these issues can the best vision be discovered and implemented for the long-term benefit of all concerned. Our bias is that this vision will include institutionalization of interprofessional education programs, but articulation of any vision should be the responsibility of all participants not just us.

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Deliberate Practice as a Theoretical Framework for Interprofessional Experiential Education

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Objective: The theory of deliberate practice has been applied to many skill-based performance activities. The primary aim of this project was to integrate synergistic principles from deliberate practice and consensus-derived competencies for interprofessional education into a framework upon which educational models to advance interprofessional experiential education (IEE) might be built.

Methods: CINAHL, ERIC, and MEDLINE databases were searched using the keywords "deliberate practice" and "interprofessional education," both individually and in combination. Relevant articles were selected from the catalog based on support for the premise of the project. Defining characteristics of deliberate practice were distilled with particular emphasis on their application to the Interprofessional Education Collaborative's (IPEC) core competencies. Recommendations for IEE development were identified through the synthesis of deliberate practice principles and IPEC competencies.

Results: There is a high degree of synergy between deliberate practice principles and IPEC competencies. Our synthesis of the literature yielded a cyclical four-step process to advance IEE: (1) implement an IEE plan guided by the student's strengths/weaknesses and in consideration of the collaborative practice skills they wish to develop, (2) engage in IPE experiences that will challenge targeted skills according to the IEE plan, (3) embed frequent opportunities for student reflection and preceptor/team feedback within IEE plan, and (4) revise the IEE plan and the IPE experience based on insights gained during step 3.

Conclusion: The cyclical four-step process synthesized through this literature review may be used to guide the development of new IEE models. The purposeful development of IEE models grounded in a theory that has already been operationalized in other skill-based performance areas is an important step to address expanding accreditation standards throughout the health professions mandating interprofessional education for pre-licensure health professional students.

Keywords: deliberate practice, interprofessional education, interprofessional collaboration, interprofessional relations, clinical education

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INTRODUCTION

Interprofessional practice and education (IPE) has been identified as a mechanism capable of impacting the Triple Aim in healthcare; namely, improving the patient experience with care, improving the health of populations, and reducing the per capita cost of health care (Berwick et al., 2008). The IPE movement in the United States is well underway, bolstered by decades of work from the National Academy of Medicine (formerly the Institute of Medicine; IOM, 1972, 2001a,b, 2003), professional academic associations [Interprofessional Education Collaborative (IPEC, 2011a)], and federal legislation [House Office of the Legislative Counsel (HOLC, 2010)] that gave rise to the National Center for IPE based in Minneapolis, Minnesota [National Center for Interprofessional Practice and Education (NCIPE, 2016)]. Accrediting bodies across the health professions have also joined the IPE movement [Zorek and Raehl, 2013; Health Professions Accreditors Collaborative (HPAC, 2014)], mandating that academic institutions prepare their students for team-based care. Accreditation standards for pharmacy education, for example, require IPE across the continuum of the curriculum, from early didactic educational experiences through terminal experiential (i.e., clinical) ones [Accreditation Council for Pharmacy Education (ACPE., 2016)]. Interprofessional experiential education (IEE) holds particular promise to advance IPE, given its proximity to what the National Center refers to as the "Nexus," where education and practice intersect [National Center for Interprofessional Practice and Education (NCIPE, 2016)].

Anderson and colleagues have argued that despite labor and cost barriers, the primary focus of IPE in the health professions should be within the experiential education setting (Anderson and Thorpe, 2010). We subscribe to this argument for several reasons. First, experiential learning allows students to be fully immersed in their future professional environment and learn aspects of their job beyond that which can be learned passively in classroom settings (Anderson and Thorpe, 2010). Students in this environment can experience interprofessional teamwork first hand, in the context of direct patient care. This may allow students to develop and hone skills specific to their career path. Moreover, as the healthcare system in the United States continues to evolve, the need for interprofessional collaboration will only increase [Interprofessional Education Collaborative (IPEC, 2011b)]. Shortages of resources, an aging population with multiple chronic conditions, as well as new scientific discoveries require both providers and non-clinical members of the healthcare team to work together in a cooperative manner [Interprofessional Education Collaborative (IPEC, 2011a; Nandan and Scott, 2014)]

As expectations for interprofessional practice increase, so too does the importance of new educational practices to prepare pre-licensure health professional students for collaborative practice upon entry into the workforce. A deeper exploration of potential best practices highlights the need for theoretical frameworks upon which to build novel interprofessional education interventions. Since consensus exists, in the form of the Interprofessional Education Collaborative's (IPEC's) core competencies expert panel report, on the skills required for interprofessional collaborative practice, we sought to identify a skill-based theoretical framework that might serve as a foundation to foster advancement of interprofessional experiential education (IEE). The theory of deliberate practice surfaced quickly in our cursory search, as it has been applied to the development of expertise in a wide array of skill-based disciplines, including chess, music, sports, and healthcare (Krampe and Ericsson, 1996; Moulaert et al., 2004; Ericsson, 2005, 2007a). The primary aim of this project, thus, was to integrate synergistic deliberate practice principles and IPEC competencies into a framework upon which educational models within IEE might be built.

METHODOLOGY

A literature search of CINAHL, ERIC, and MEDLINE databases was completed using the keywords "deliberate practice" and "interprofessional education," both individually and in combination. Articles that discussed deliberate practice or interprofessional education were cataloged for review. Relevant articles were selected from the catalog based on support for the premise of the project; that is, the integration of deliberate practice and interprofessional education principles into a framework to support development of IEE. Defining characteristics of deliberate practice were distilled with particular emphasis on their application to the Interprofessional Education Collaborative's (IPEC) core competencies. Recommendations for IEE development were identified through the synthesis of deliberate practice principles and IPEC competencies.

RESULTS

The findings guiding our proposed framework were derived from a total of 37 articles and reports with 27 pertaining to deliberate practice and 10 discussing IPE. The key elements of deliberate practice identified across these 27 articles are best described in narrative form. The theory of deliberate practice emphasizes, in the pursuit of expertise, quality over quantity of experiences and values the student's holistic ability to process, and integrate improvements in targeted skills (Ericsson et al., 1993). While the initial concept originated long ago, psychologist K. Anders Ericsson has published pioneering work in recent decades establishing the components of deliberate practice and the characteristics it entails (Ericsson and Charness, 1994; Ericsson, 1998, 2007b, 2008, 2015; Ericsson et al., 2009).

Fundamentally, the theory of deliberate practice posits that development of expertise requires incorporating a self-reflective feedback loop into the skill delivery or development (i.e., practice) process, rather than simply performing a task repetitively until mastered. To achieve maximal efficiency, time for self-reflection, and instantaneous feedback are vital for allowing the learner to self-adjust and make improvements before engaging in the next task. Mastery is thus achieved through repeated cycles of focused practice and self-editing, with each cycle emphasizing one or more aspects of a desired skill.

With sufficient investment of time and dedication to the principles of deliberate practice, individuals can develop expertise in targeted areas (**Figure 1**). However, if the individual abandons these principles during the course of their career, arrested development can cause mastery to languish (Ericsson, 1998). This self-aware method of learning and evaluation is applied as a lifelong learning process toward developing expertise (Krampe and Ericsson, 1996). One important requirement for successful implementation of deliberate practice is a qualified teacher or preceptor to guide the process, shaping the student's reflections, and providing feedback. Preceptorship of students on clinical rotations in the latter stages of degree programs is a hallmark of health professions education. Thus, at least conceptually, the educational infrastructure exists for the integration of deliberate practice principles into IEE.

The IPEC competency framework includes 38 competencies dispersed across the following four domains: values/ethics for interprofessional practice (10 competencies), roles/responsibilities (9 competencies), interprofessional communication (8 competencies), and teams and teamwork (11 competencies) [Interprofessional Education Collaborative (IPEC, 2011a)]. Synthesis of deliberate practice principles and these competencies yielded seven areas of overlap, with at least one overlapping area from each IPEC domain. All of these, importantly, are conducive to learning opportunities present within the experiential education setting:

- Values/Ethics
  - *Competency 7:* Demonstrate high standards of ethical conduct and quality of care in one's contributions to team-based care.
- Roles/Responsibilities
  - *Competency 5:* Use the full scope of knowledge, skills, and abilities of available health professionals and healthcare workers to provide care that is safe, timely, efficient, effective, and equitable.
  - *Competency 8:* Engage in continuous professional and interprofessional development to enhance team performance.

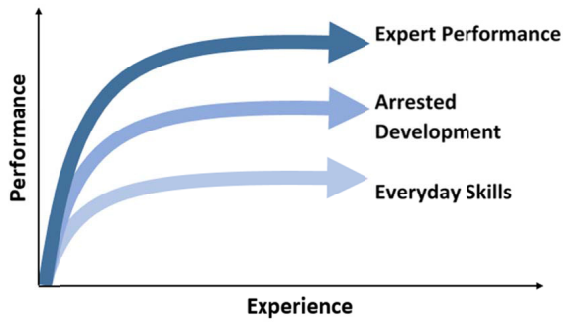

FIGURE 1 | Deliberate Practice and Performance. Visual representation of processes leading to expert performance, arrested development, and automaticity involved in everyday skills. Adapted from Ericsson (2008).

- Interprofessional Communication
  - *Competency 4*: Listen actively, and encourage ideas and opinions of other team members.
  - *Competency 7:* Recognize how one's own uniqueness, including experience level, expertise, culture, power, and hierarchy within the healthcare team, contributes to effective communication, conflict resolution, and positive interprofessional working relationships.
- Teams and Teamwork
  - *Competency 8:* Reflect on individual and team performance for individual, as well as team, performance improvement.
  - *Competency 11:* Perform effectively on teams and in different team roles in a variety of settings.

Having identified synergistic competencies, the next step involved creating a process through which the student might begin developing competence in these areas during a clinical rotation. We propose a cyclical four-step process to achieve this aim: (1) implement an IEE plan guided by the student's strengths/weaknesses and in consideration of the collaborative practice skills they wish to develop, (2) engage in IPE experiences that will challenge targeted skills according to the IEE plan, (3) embed frequent opportunities for student reflection and preceptor/team feedback within IEE plan, and (4) revise the IEE plan and the IPE experience based on insights gained during step 3. A visual overview of this process is provided in **Figure 2**, and a detailed stepwise schematic is provided in **Figure 3**.

DISCUSSION

The four-step process identified through this literature review and synthesis may be used to guide the development of new models of interprofessional experiential education. The purposeful development of new IEE models rooted in an established theory that has already been applied to other skill-based performance areas is an important step to address looming accreditation mandates throughout the health professions.

We believe that robust, meaningful IEE experiences require an intentional effort to design the educational experience in accordance with students' strengths/weaknesses and their specific learning goals. It is not enough to simply place a student on a team and expect them to develop competence in interprofessional practice. Principles of deliberate practice possess a high degree of synergy with IPE and, as we have attempted to demonstrate with this project, can be integrated into the interprofessional clinical learning environment as an educational framework upon which meaningful, intentional IEE experiences can be built. Our hope is that this framework will help clinical educators tailor their clinical rotations to best train students in interprofessional collaborative practice. The educational model proposed offers a mechanism through which preceptors might help their students begin to develop competence in this area through a proactive

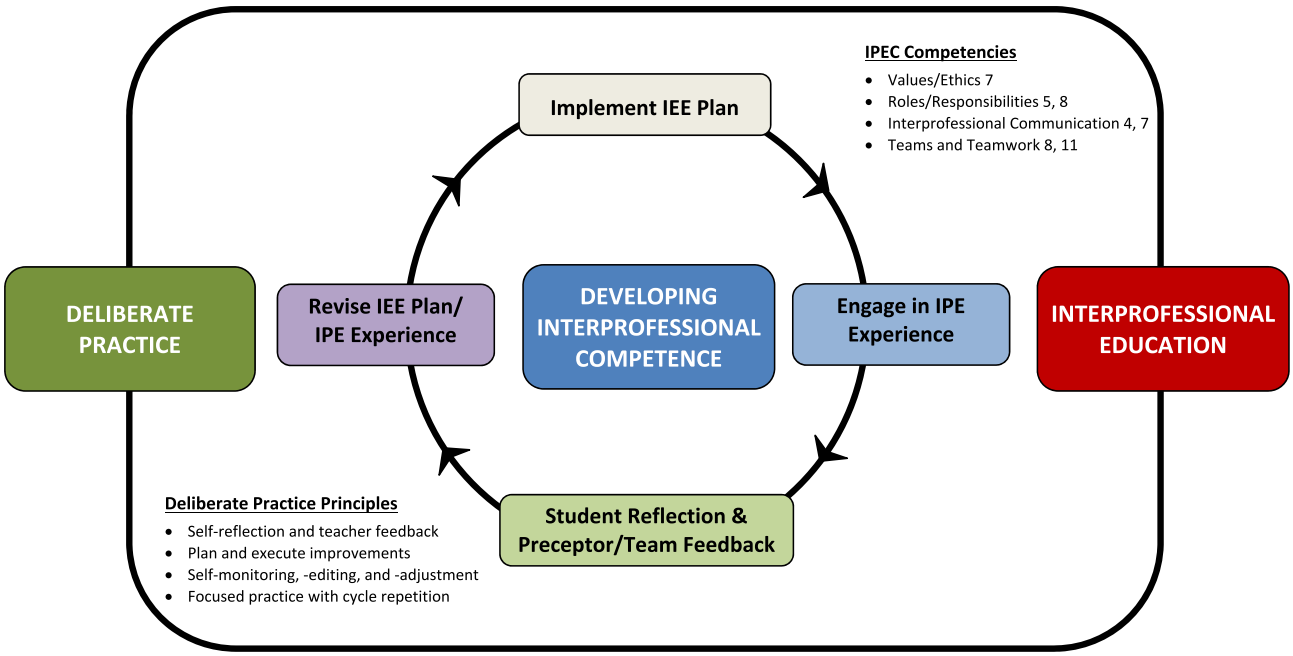

FIGURE 2 | Overview of Process Integrating Deliberate Practice and Interprofessional Experiential Education. Developing interprofessional competence on clinical rotations begins with an individualized interprofessional experiential education (IEE) plan that is tailored to each student's unique strengths and weaknesses, followed by active participation in an interprofessional education (IPE) experience. Post-experience self-reflection is completed and preceptor/team feedback is obtained. Using this information, the student and preceptor collaborate to revise the IEE plan, and IPE experience before repeating the cycle again. This cycle is grounded in principles of deliberate practice and interprofessional education and targets Interprofessional Education Collaborative (IPEC) competencies. The specific text from each targeted IPEC competency follows: **Values/Ethics 7**, Demonstrate high standards of ethical conduct and quality of care in one's contributions to team-based care; **Roles/Responsibilities 5**, Use the full scope of knowledge, skills, and abilities of available health professionals and healthcare workers to provide care that is safe, timely, efficient, effective, and equitable; **Roles/Responsibilities 8**, Engage in continuous professional and interprofessional development to enhance team performance; **Interprofessional Communication 4**, Listen actively, and encourage ideas and opinions of other team members; **Interprofessional Communication 7**, Recognize how one's own uniqueness, including experience level, expertise, culture, power, and hierarchy within the healthcare team, contributes to effective communication, conflict resolution, and positive interprofessional working relationships; **Teams and Teamwork 8**, Reflect on individual and team performance for individual, as well as team, performance improvement; **Teams and Teamwork 11**, Perform effectively on teams and in different team roles in a variety of settings.

process; not only to observe the tasks of practitioners, but also to gain direct, customized experience to develop and continually refine critical skills that will help prepare them for team-based practice upon licensure. This model provides a pathway for activities to be tailored to fit each student's individual needs in order to maximize their professional development.

Educators in medicine and nursing have already used deliberate practice to teach and train their students (Clapper and Kardong-Edgren, 2012; Durning et al., 2013; Gauthier et al., 2015; Modi et al., 2015), and studies show a variety of direct and tangential benefits. These include improved expertise in taking care of critically ill patients (Whyte and Cormier, 2014), neonatal resuscitation (Cordero et al., 2013; Hunt et al., 2014), laparoscopic surgical competence (Crochet et al., 2011), surgical residency training (Bhatti and Ahmed, 2015), and improving communications during shift changes (Sawatsky et al., 2013). By incorporating all four aspects of deliberate practice into the training of future doctors and nurses, randomized controlled trials, and observational studies demonstrate that students develop expertise more rapidly. We believe that deliberate practice can hasten the acquisition of interprofessional competence, and that our framework can guide clinical educators on the creation and/or improvement of their interprofessional clinical rotations.

CONCLUSION

Quality patient care is increasingly dependent on collaborative teamwork. While general consensus and accreditation guidelines underscore the importance of interprofessional education, to our knowledge, no specific theoretical frameworks have been proposed to facilitate students' acquisition of the core competencies for collaborative practice outlined by the Interprofessional Education Collaborative. Motivated by the growing trend of integrating interprofessional education into health professional education, we attempted through this project to develop such a framework, which we believe clinical educators can use to help their students begin the process of developing interprofessional expertise. The model

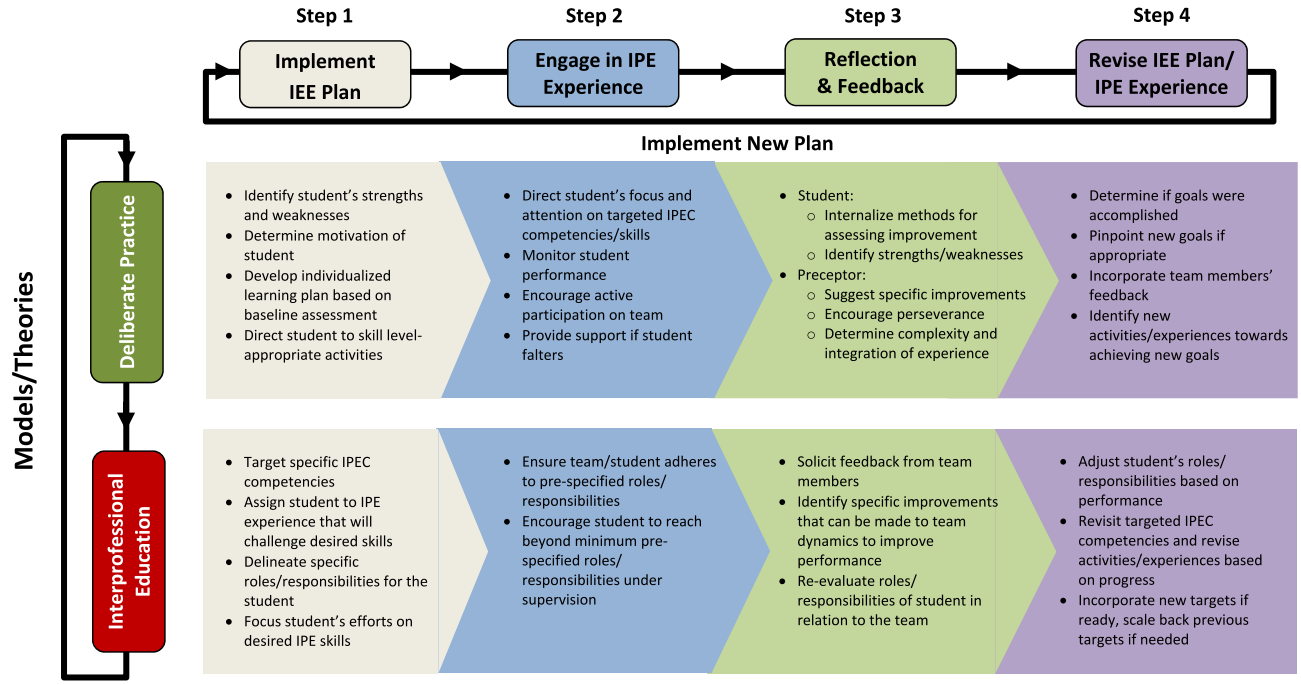

FIGURE 3 | Cyclical Stepwise Approach with Model/Theory-Specific Activities. This figure is designed to begin in the Step 1 column. Here, the preceptor and student create and then implement the student's individualized interprofessional experiential education (IEE) plan based on a baseline assessment of the student at the beginning of the clinical rotation, including which Interprofessional Education Collaborative (IPEC) competencies he/she would like to target. Guidance for each step is presented in bullet form, with attribution of recommendations identified according to model/theory according to rows. The stepwise approach continues until Step 4, at which point the IEE plan and IPE experience are evaluated and revised according to student progress. Once Step 4 is complete, the cycle begins anew with Step 1. This process is followed throughout the clinical rotation.

proposed herein integrates principles of deliberate practice with synergistic interprofessional practice competencies suitable for skill development in an experiential education setting. We encourage clinical educators preparing their students for interprofessional collaborative practice to utilize this framework and to study/disseminate educational outcomes from its use.

AUTHOR CONTRIBUTIONS

JZ conceived, designed, and directed this study, and JW completed the literature review. Both authors analyzed and synthesized results. The proposed model and manuscript were developed collaboratively.

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Cognitive, Behavioral and Emotional Empathy in Pharmacy Students: Targeting Programs for Curriculum Modification

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Introduction: Empathy is an essential trait for pharmacists and is recognized as a core competency that can be developed in the classroom. There is a growing body of data regarding levels of empathy in pharmacy students; however, these studies have not measured differences in behavioral, cognitive, and emotional empathy. The goal of this study was to parse the underlying components of empathy and correlate them to psychosocial attributes, with the overall goal of identifying curriculum modifications to enhance levels of empathy in pharmacy students.

Methods: IRB approval was obtained to measure empathy levels in pharmacy students attending Midwestern University. An online, anonymous survey administered through a secure website (REDCap) was used. This survey utilized the Jefferson Scale of Empathy (Medical Student version) and included questions regarding demographics and personality traits. Empathy questions were sub-divided into behavioral, cognitive, and emotional categories. Data are presented as mean ± SEM with significance set at $P \leq 0.05$.

Results: Three hundred and four pharmacy students at Midwestern University participated in a fall survey with an overall response rate of 37%. The average empathy score was 110.4 ± 0.8 on a scale of 20–140; which is comparable to empathy scores found by Fjortoft et al. (2011) and Van Winkle et al. (2012b). Validating prior research, females scored significantly higher than males in empathy as well as behavioral, cognitive, and emotional subcomponents. For the entire population, emotional empathy was significantly higher than cognitive and behavioral empathy ($P < 0.05$). Furthermore, negative correlations to empathy were observed for self-serving behavior ($R = 0.490$, $P < 0.001$), medical authoritarianism ($R = 0.428$, $P < 0.001$), and experience of coercion ($R = 0.344$, $P < 0.001$).

Conclusion: Overall, empathy levels in pharmacy students are similar to prior studies with females scoring higher than males. Emotional empathy may play a greater role than cognitive and behavioral empathy in this group of students. Targeted programs that promote volunteerism and activities that foster responsiveness to patient needs may attenuate self-serving behavior and medical authoritarianism and, therefore, improve empathy levels in pharmacy students.

Keywords: education, pharmacy, empathy, behavioral empathy, emotional empathy, cognitive empathy, interdisciplinary, Jefferson scale of medical student empathy

INTRODUCTION

Pharmacy is a human service profession with a unique position in providing health and functionality to patients. As with all humanistic professions, empathy is an essential trait for pharmacists and is recognized as a core competency that should be developed throughout graduate school. Consistent with this notion, the Accreditation Council for Pharmacy Education mandates that humanistic values and empathy be enriched and assessed as a core educational activity in graduate pharmacy education (Education, 2015).

Empathy is a multidimensional construct with behavioral, cognitive, and emotional domains (Larson and Yao, 2005). Cognitive empathy describes an individual's capacity to understand another person's perspective (Fjortoft et al., 2011; Shamay-Tsoory, 2011) as opposed to being self-oriented (Kohut, 1969; Basch, 1983; Eisenberg and Miller, 1987). Emotive empathy describes an affective characteristic, which involves experiencing and internalizing the feelings experienced by others (Eisenberg, 1989; Nunes et al., 2011). Behavioral empathy is action-oriented; it involves the outward expression of internally experienced (cognitive and emotive) processes which can be directed at improving clinical outcomes (Larson and Yao, 2005).

Prior research has sought to delineate the relative contribution between each of these empathy domains on clinical skills. One perspective is that cognitive empathy is the most predominant type of empathy in the medical setting (Halpern, 2003; Hojat, 2009); while others highlight the importance of both the behavioral and emotive aspects (Benbassat and Baumal, 2004; Manolakis et al., 2011). Yet it is also plausible that empathy, in its totality as a trinity, is the ideal vehicle that allows health care providers to practice patient-centered care, in which the patient's body, mind, and spirit can be evaluated comprehensively. Neuroscientists (Haas et al., 2015), empathy researchers (Hojat et al., 2009), and pharmacy educators (Maine and Vogt, 2009; Vogt and Finley, 2009; Education, 2015) continue to identify a significant need to examine empathy with greater scientific rigor.

The subcomponents of empathy originate at the neural level. Cognitive empathy is an executive function that recruits higher-order brain regions in the prefrontal and temporal cortices (Frith and Singer, 2008; Van Overwalle and Baetens, 2009) that enable "perspective taking," a process of materializing another's thoughts and intentions, known as the "Theory of Mind" (Baron-Cohen, 2009). In contrast, emotional empathy is a primitive function that recruits brain regions in the inferior frontal and parietal cortex (Shamay-Tsoory, 2011). This network, collectively known as the mirror neuron system, is instinctive and involved in emotional recognition (Shamay-Tsoory et al., 2009; Shamay-Tsoory, 2011). Behavioral empathy is a construct that is defined as actions taken in response to the internal experience of cognitive and/or emotional empathy. Although behavioral empathy may be triggered by both cognitive and emotional processes (Shamay-Tsoory, 2011), the exact trigger must be distinguished, as they lead to very different clinical behaviors (Nightingale et al., 1991). For example, a cognitively empathetic pharmacist would be more inclined to act upon the content and quality of patients' symptoms, whereas an emotionally empathetic pharmacist would be more inclined to sympathetically respond to patients' feelings of pain and suffering.

The current project grew out of a theoretical model that recognizes cognitive empathy as an adaptive function that can be taught. For example, by increasing 'perspective taking,' a pharmacist is better equipped to predict motives and health/risk behaviors such as medication compliance and substance abuse (Darbishire et al., 2012). Therefore, cognitive empathy emphasizes the appropriateness of the biopsychosocial model to health care, wherein the full realization of health is achieved within the context of a complex interaction of biological, psychological, and social factors. Theoretical models have hypothesized a linear relationship between cognitive empathy and positive outcomes, meaning that the outcomes progressively improve as a function of an increase in cognitive empathy. In contrast, excessive emotional empathy can cloud the neutrality that is necessary in clinical practice, thus cultivating compassion fatigue, exhaustion, and vicarious traumatization (Linley and Joseph, 2007). The relationship between emotional empathy and clinical outcomes is characterized by a bell-shaped curve, meaning that emotional empathy can be beneficial to a limited extent, but then becomes detrimental in excess (Hojat et al., 2009).

Empathy levels in health related professions can be measured by: self-assessment (first person assessment), patient-rating (second person assessment), and observation (third person assessment) (Hemmerdinger et al., 2007). When large sample sizes are evaluated, self-assessment questionnaires are the most efficient and the Jefferson Scale of Physician Empathy (Hojat et al., 2001), and student empathy (Hojat et al., 2004) were developed for this purpose. Prior research has assessed empathy levels and tracked its temporal and individual psychosocial differences in medical (Mehrabian et al., 1988), paramedic (Nunes et al., 2011) and allied health professionals (Williams

et al., 2014), and similar research on pharmacy students is rapidly growing (Vogt and Finley, 2009; Fjortoft et al., 2011; Manolakis et al., 2011; Nunes et al., 2011; Darbishire et al., 2012; Van Winkle et al., 2012a,b, 2013a; Wilson et al., 2012; Chen et al., 2015; Jeon and Cho, 2015; Kerr et al., 2015; Lor et al., 2015). However, very little is known about individual differences in emotional, cognitive, and behavioral empathy. Consequently, sufficient attention has not been directed toward the malleability and enhancement of the subcomponents of empathy in pharmacists-in-training. The goal of this study was to parse the components of empathy and correlate them to psychosocial attributes, thereby elucidating the composition of empathy in pharmacy students and advancing our understanding of what traits promote or erode empathy. A better conceptualization of empathy will not only provide an innovative framework for studying empathy in pharmacy students, but will also help to identify curriculum modifications to optimize empathy subcomponents.

MATERIALS AND METHODS

Midwestern University Institutional Review Board (IRB) approval was obtained to measure empathy levels in pharmacy students attending Midwestern University. A voluntary, online, anonymous survey was administered through a secure web-based application called REDCap (Research Electronic Data Capture) hosted at Midwestern University (Harris et al., 2009). This survey utilized the Jefferson Scale of Empathy (Medical Student version). These questions were then sub-divided into behavioral (action), cognitive (perspective-taking), and emotional (expressed feeling), categories and the responses were tabulated (Appendix). Questions targeting personality traits utilized the same seven point Likert scale used by the Jefferson empathy survey. Data was organized with Microsoft Excel and statistical significance determined with Sigma Stat 12.5 software. For group comparisons, normality and variance were tested and appropriate Analysis of Variance (ANOVA or ANOVA on Ranks) and *post hoc* tests (Holm-Sidak or Tukey) were used to determine significance ($P \leq 0.05$).

RESULTS

Three hundred and four pharmacy students at Midwestern University participated in the fall survey with an overall response rate of 37%. The response rate for each class year (1st to 4th) was: 31, 29, 74, and 13%, respectively. The average empathy score was 110.4 ± 0.8, on a scale of 20–140 which is comparable to empathy scores found by Fjortoft et al. (2011) and Van Winkle et al. (2012b). To compare the effect of gender and class year on the Jefferson Empathy score, a 2-way ANOVA was used. Validating prior research, females scored significantly higher than males overall (112.7 ± 0.9 vs. 106.1 ± 1.5; $P < 0.001$) and specifically in the 2nd and 4th year $P < 0.05$ (**Figure 1**). Empathy scores did not change in male students between class year, but were

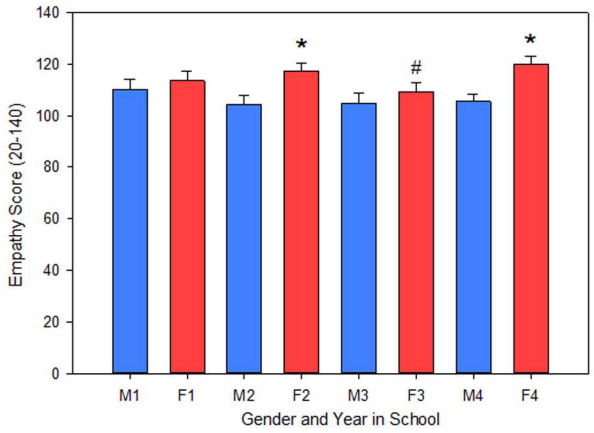

FIGURE 1 | A 2-way ANOVA was used to examine the effect of gender and class year on the Jefferson Empathy score. Females, as an overall group, scored higher than male students ($P < 0.001$). By class year, females scored higher than males in the 2nd and 4th class years ($P < 0.05$). Additionally, 3rd year female empathy scores were significantly lower than 2nd and 4th year female scores ($P < 0.05$). M, male; F, female; 1–4, year in School; *significant difference vs. Male in class year; #significant difference vs. Female in 2nd and 4th year.

significantly lower in 3rd year female students vs. 2nd and 4th year female students $P < 0.05$ (**Figure 1**). There was no effect of age ($P = 0.67$), ethnicity ($P = 0.09$), religion ($P = 0.40$), marital status ($P = 0.17$), birth order ($P = 0.22$), highest family education ($P = 0.53$), or debt ($P = 0.68$) on Jefferson empathy scores.

Empathy questions were sub-divided into emotional, cognitive, and behavioral categories and answers were scored and ranked on a scale of 0–100%. To compare the effect of gender, year in pharmacy school, and empathy sub-components (behavioral, cognitive, and emotional), a 3-way ANOVA was used. As a graduate population, pharmacy students scored significantly higher in emotional empathy $78.1 \pm 0.8\%$ vs. cognitive empathy $73.9 \pm 0.7\%$ ($P = 0.005$) as well as behavioral empathy $73.8 \pm 0.9\%$ ($P = 0.011$). The distribution of emotional, cognitive, and behavioral empathy scores and student numbers are presented in **Figure 2**. There was not a significant interaction between individual subcomponents of empathy and class year ($P = 0.441$) or gender ($P = 0.441$). However, subcomponent scores were significantly lower in the 3rd year class ($P < 0.05$); **Table 1**. Similar to the Jefferson empathy scores, females scored significantly higher than males in the 2nd, 3rd, and 4th class years ($P < 0.05$); and 3rd year females scores were lower than 1st, 2nd, and 4th year female scores ($P < 0.05$); **Table 1**. Additionally, female 4th year empathy scores were greater than 1st year female scores ($P = 0.02$; **Table 1**). In male students, empathy scores were greater in 1st year vs. 3rd year ($P = 0.024$; **Table 1**).

Questions targeting personality traits such as self-serving motive, coercion, medical authoritarianism, elitism, and egalitarianism were correlated to empathy scores. The self-serving statement, "I do not volunteer because it hinders (or

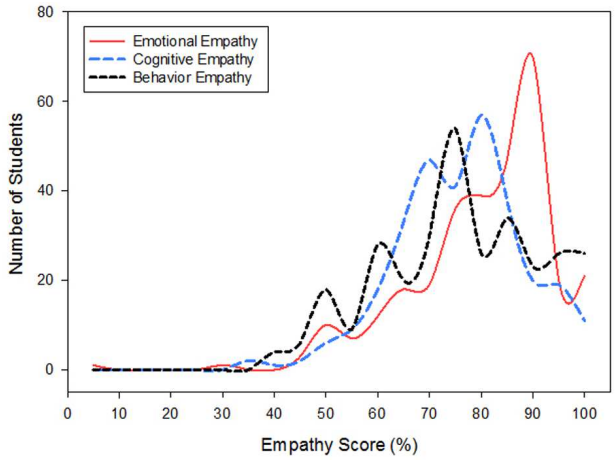

FIGURE 2 | Emotional empathy was greater than Cognitive ($P = 0.005$) and Behavioral empathy ($P = 0.01$) in Pharmacy students. Scores and population distributions are shown.

partially hinders) my ability to get ahead." was negatively correlated to empathy ($R = 0.49$, $P < 0.001$) and the behavioral subcomponent of empathy ($R = 0.371$, $P < 0.001$; **Figure 3**, **Table 2**). The experience of coercion to enter a health related profession was assessed with the statement "I feel pressured to enter the health professional field." Answers to this statement were negatively correlated to empathy ($R = 0.344$, $P < 0.001$) and closely related to the emotional subcomponent of empathy ($R = 0.334$, $P < 0.001$, **Table 2**). Medical authoritarianism was assessed by responses to "Conscientious patients deserve better health care than those with self-inflicted conditions." and negatively correlated to empathy ($R = 0.428$, $P < 0.001$). This question had a strong cognitive empathy component ($R = 0.396$, $P < 0.001$, **Table 2**). There was a negative association between empathy scores and elitism as assessed by the question "Those who contribute the most to society should get better health care" ($R = 0.426$, $P < 0.001$). On the other hand, egalitarianism, assessed by the question, "We should do what we can to equalize health care for different groups," was positively associated with empathy scores ($R = 0.29$, $P < 0.001$) with strong associations to behavioral empathy ($R = 0.265$, $P < 0.001$), cognitive empathy ($R = 0.283$, $P < 0.001$), and emotional empathy ($R = 0.212$, $P < 0.001$).

The categorization of the 20 Jefferson empathy questions into subcomponents of empathy were not equally distributed (Behavioral 20%, Cognitive 45%, and Emotional 35%). Therefore, correlations to behavioral empathy had less power because fewer Jefferson empathy questions are related to behavior. Nonetheless, questions that targeted subcomponents of empathy were effective. Of three questions targeting behavior, cognition, or emotion; the *R*-value for behavioral empathy was greatest for the question targeting behavior (**Table 2**). The question targeting cognition had the highest *R*-value for cognitive empathy, and the question targeting emotion had the highest *R*-value for emotional empathy.

DISCUSSION

To the best of our knowledge, no psychometrically sound research instrument is available to measure empathy specifically among pharmacy students. Consistent with this, researchers continue to identify a significant need to develop instruments to measure empathy (Hojat et al., 2009). The Jefferson scale for empathy possesses strong psychometric properties (Hojat, 2007), including construct validity (Hojat et al., 2001, 2002b) criterion validity (Hojat et al., 2002a), test–retest reliability, and internal consistency (Hojat et al., 2001, 2002b). The Jefferson scale is also amenable to word adaptations to match the student audience, while still retaining such properties (Hojat et al., 2009). Accordingly, we adapted the Jefferson Scale of Physician Empathy to pharmacists-in-training and identified questions within the survey that target empathy subcomponents.

The present study assessed three subcomponents of empathy and how they relate to various personality and psychosocial traits in pharmacy students. Our study demonstrated that, as a graduate population, emotional empathy scored highest while overall empathy scores were lower in the 3rd year class. The observed decline in graduate health care student empathy supports prior research in nursing students (Wilson et al., 2012) as well as in medical students (Neumann et al., 2011); however, it contradicts previous data for pharmacy students (Wilson et al., 2012). One important implication of the differences observed between emotional and cognitive empathy relates to how amenable these characteristics are to change. Based on the neurological underpinning, it can be assumed that emotional empathy is less amenable to

TABLE 1 | Empathy subcomponent scores %, gender, and class year are presented.

	M1	F1	M2	F2	M3	F3	M4	F4
Behavior (%)	75.2 ± 2.5	78.0 ± 2.2	65.2 ± 4.4	80.5 ± 2.1	67.1 ± 2.0	71.7 ± 1.5	72.1 ± 3.0	85.3 ± 2.7
Cognitive (%)	72.3 ± 3.0	75.4 ± 1.9	69.8 ± 3.0	79.2 ± 1.3	70.8 ± 1.8	73.3 ± 1.2	70.9 ± 3.1	78.9 ± 2.6
Emotional (%)	78.8 ± 2.8	81.0 ± 1.8	73.8 ± 3.4	83.9 ± 1.3	72.5 ± 2.4	76.9 ± 1.4	71.0 ± 2.7	87.6 ± 1.8

M, male; F, female; 1–4, year in School. Student scores for Emotional empathy were significantly greater than Cognitive empathy ($P = 0.005$) as well as Behavioral empathy ($P = 0.011$). Third year subcomponent empathy scores were significantly lower vs. year 1 ($P < 0.001$), year 2 ($P = 0.048$), and year 4 ($P = 0.004$). Overall, females scored higher than males ($P < 0.001$; Year 1: $P = 0.147$; Year 2: $P < 0.001$; Year 3: $P = 0.003$; Year 4: $P < 0.001$). First year male students had a higher overall empathy score than 3rd year male students ($P = 0.024$). Third year female students had a lower overall empathy score than female 1st, 2nd, and 4th year students ($P < 0.01$). Additionally, female 4th year scores were significantly higher than 1st year female students ($P = 0.023$).

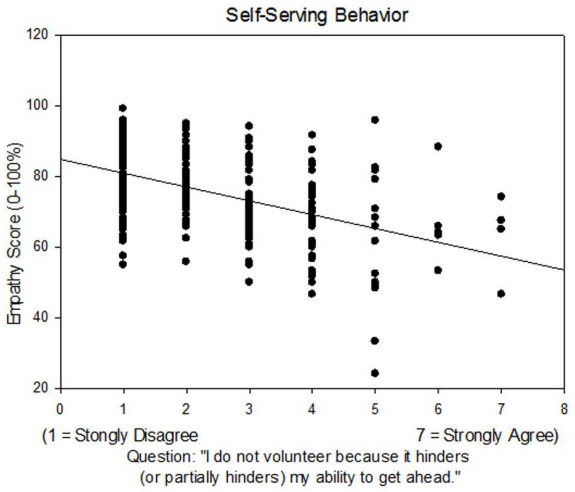

FIGURE 3 | Jefferson empathy scores were correlated to Likert scaled responses to the question, "I do not volunteer because it hinders (or partially hinders) my ability to get ahead." Linear regression: $R = 0.490$, $P < 0.001$.

change, as it is the most primitive and elicits automatic neural processes (de Waal, 2008; Rizzolatti et al., 2009). In contrast, cognitive empathy may be substantially enhanced by education, which is supported by a body of research on controlled neural processes and cortical-based plasticity. That is, as students gain academic experience and work with patients, they develop constructs that alter their empathetic system that may either increase or decrease their empathetic response. This neurological distinction leads most investigators to hypothesize that cognitive empathy can be augmented while emotional empathy is less likely to change with time and experience.

Our additional questions revealed three personal(ity) characteristics (coercion, self-serving behavior, and medical authoritarianism) that significantly correlated with empathy scores. These characteristics were selected for two reasons. First, each characteristic independently relates to different aspects of empathy: emotional, behavioral, and cognitive, respectively. Second, these characteristics are a product of life experience, and thus may still be responsive to education and intervention programs.

Students who felt coerced to enter a health professional field demonstrated lower emotional empathy. At the same time, there was a decline in emotional empathy in 3rd vs. 2nd year students. This contradicts the theory that emotional empathy is highly embedded in our neuronal construct and less likely to change. These results suggest emotional empathy levels could be changed in the academic setting. Secondly, the data indicate that coerced students may be less equipped for pharmacy because of its consequential association with lower emotional empathy. Potential mechanisms linking coercion to depressed emotional empathy levels may be increased stress, anxiety, and general unhappiness in their chosen career. Taken together, coercion may be a dispositional factor that moderates responsiveness to educational programs, meaning that students who were coerced into the field may learn from, and benefit differently, than those who were not coerced.

In the present study, self-serving behavior was negatively correlated with behavioral empathy, as suggested by responses to a question on volunteerism. By definition, individuals who are self-serving inherently have less comfort with, and preference against, extending themselves to outreach programs. Volunteering activities may be particularly stressful because they engage the student in a process that is contrary to their dispositional tendency. This dispositional discomfort may be compounded by the fact that volunteering competes with the students' studies for limited time, effort, and attention. Therefore, academic requirements that promote volunteering as a method to enhance empathy levels may cause more anxiety in students with a low reservoir of behavioral empathy.

Students who endorsed statements of medical authoritarianism scored lower on cognitive empathy. Recent studies have confirmed that elitist attitudes predict lower empathy and patient-centeredness[32,33]. Doctoral training explains the complex pathophysiology of and risk behaviors causing disease. Thus, treatment is simplified to pharmaceutical and behavioral modification. However, patient compliance is often substantially hindered by a myriad of psychological, social and educational barriers. Without a solid appreciation for this multilayered etiology, it becomes increasingly difficult to cognitively empathize with patients. Furthermore, studies demonstrate that medical authoritarianism increases over the course of graduate training, while empathy decays (Tsimtsiou et al., 2007). This pattern of heightened medical authoritarianism and decaying empathy may be changed by encouraging circular

TABLE 2 | The Jefferson empathy score and subcomponents of empathy (behavioral, cognitive, and emotional) were correlated to responses from questions that targeted self-serving motivation, medical authoritarianism, and coercion.

	Self-serving motive (behavioral)	Medical authoritarianism (cognitive)	Coercion (emotional)
Jefferson: empathy	$R = 0.490$; $P < 0.001$	$R = 0.428$; $P < 0.001$	$R = 0.344$; $P < 0.001$
Behavioral empathy	$R = 0.371$; $P < 0.001$	$R = 0.335$; $P < 0.001$	$R = 0.211$; $P < 0.001$
Cognitive empathy	$R = 0.442$; $P < 0.001$	$R = 0.396$; $P < 0.001$	$R = 0.321$; $P < 0.001$
Emotional empathy	$R = 0.447$; $P < 0.001$	$R = 0.373$; $P < 0.001$	$R = 0.334$; $P < 0.001$

Answers to each question were negatively correlated with empathy and subcomponents. For behavioral empathy correlations, the highest R-value was associated with the question targeting a behavioral component. Correlations to cognitive and emotional empathy were greatest in the questions emphasizing cognitive and emotional aspects, respectively.

activities that offset other experiential factors that contribute to the decline in empathy during graduate training (Van Winkle et al., 2013b).

Educational Implications

Educational reform that prevents the decline in empathy and embraces measureable outcomes should be considered a mandate in pharmacy training. In an effort to advance this mission, we set out to identify the relationship between individual traits and the subcomponents of empathy. In identifying these relationships, we are better positioned to target specific characteristics that either enhance or impinge upon students' development and maintenance of empathy.

The present study demonstrated that emotional empathy was greater than cognitive or behavioral empathy. Given the relationship between excessive emotional empathy and negative clinical outcomes, it may be important for educational programs to intervene to moderate this trait, while concurrently working to enhance cognitive empathy. Whilst workshops lay the foundation and keep empathy afloat in primary years (Van Winkle et al., 2009, 2012b), a cynical transformation appears to creep in during latter years. This escalation of cynicism has long been recognized in neighboring healthcare professions (Becker, 1961; Wolf et al., 1989) and has been described as "traumatic deidealization" (Kay, 1990) and "dehumanization." (Hojat et al., 2005). Explanatory models for this decline, may be: the development of biases against some patient populations, frustration with the health care system, or simply exhaustion from academic workload. As an extension of Midwestern University's previous initiative, buffer programs in the 3rd year may refresh students' cognitive empathetic abilities. Finally, a concerted effort to facilitate volunteerism and foster responsiveness to patient needs, may prevent declines in behavioral empathy (Van Winkle et al., 2013b).

Implications for Inter-Professional Healthcare Collaborations

A prominent feature of effective healthcare providers is interdisciplinary collaboration. Collaborative models are demonstrated when traditional disciplinary boundaries are crossed through a pooling of information. Inter-professional collaboration has seen growing support in the empirical literature for its use in addressing multi-faceted problems and for enhancing therapeutic outcomes.

There are successful examples of interdisciplinary learning that result in improved collaborative scores. For example, Van Winkle et al. (2012a, 2013a) have promoted inter-disciplinary educational programs to enhance cognitive empathy and to improve collaborative scores between pharmacy and medical students. Apart from demonstrating the interdependency of cognitive empathy and collaborative attitudes, their findings also demonstrate that pharmacy students have significantly greater physician-pharmacist collaborative tendencies. In this regard, pharmacy students could favorably influence medical students toward collaboration in critical thinking/reflection exercises (Van Winkle et al., 2013a).

The academic setting is an ideal environment to foster empathy levels in graduate students pursuing health related professions. Early implementation in preclinical years may be the most effective implementation strategy, as these students are a captive audience wherein mandatory group workshops could be controlled and optimally delivered.

Study Limitations

This exploratory survey does not have longitudinal data. Therefore, changes in class year may be due to a unique class population and/or the time course of pharmaceutical graduate education. Survey data are unique to Midwestern University and may not be reflective of all pharmacy students. Future, longitudinal studies will provide repeated measures and greater population numbers adding to the confidence of future results and validation of their educational implications.

CONCLUSION

This exploratory survey of empathy in pharmacy students validates prior literature demonstrating that empathy levels are higher in females and frequently decline during the 3rd year of graduate training. Our data suggest that emotional empathy may play a greater role than cognitive and behavioral empathy in this group of students, and may be amenable to change. Academic programs could be implemented to promote volunteerism, and activities that foster awareness and responsiveness to patient needs; thereby augmenting cognitive and behavioral empathy levels and preparing students to be more effective pharmacists.

AUTHOR CONTRIBUTIONS

KH, MR, and CT were present at the inception of the research idea, contributed to the literature review, the IRB application and approval process, assisted in data collection and interpretation, writing of the manuscript and editing, and can defend the research in public.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: http://journal.frontiersin.org/article/10.3389/fphar.2016.00096

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