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ORIGINAL ARTICLE

Examining the influence of professional identity formation on the attitudes of students towards interprofessional collaboration

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ABSTRACT

An expectation of introductory interprofessional education (IPE) is improvement in attitudes towards other professions. However, the theory surrounding professional identity formation suggests this expectation may be premature. The objective of this study was to quantify first-year health professional students' attitudes towards their own and other professions and to investigate the relationship between strength of professional identity and attitudes towards other professions and interprofessional learning. Using a pre/post-test design, researchers administered the Readiness for Interprofessional Learning Scale (RIPLS) and the Interdisciplinary Education Perception Scale (IEPS) to 864 first-year healthcare students in the Academic Health Center (AHC) at the University of Minnesota. The findings showed a decline in student attitudes towards their own and other professions. Additionally, a positive correlation between a weakened professional identity and readiness for interprofessional learning was demonstrated. This study found that an introductory IPE course did not positively affect student attitudes towards other professions, or strengthen professional identity or readiness for interprofessional learning. Analysis of the findings support the successive stages of professional identity formation.

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Introduction

The Patient Protection and Affordable Care Act (ACA) is a 2011 United States healthcare reform law that aims to provide healthcare benefits, rights, and protections for all Americans, besides curbing healthcare spending and improving health outcomes (Obamacare Explained, 2015). The ACA promulgates new approaches to healthcare delivery such as team-based care to achieve better health outcomes (Henry, J. Kaiser Family Foundation, 2011). At the core of patient-centred care is collaboration among the patient, caregiver, and an interprofessional team of healthcare professionals (Institute of Medicine, 2001). However, collaborative skills are not necessarily intuitive, demanding the need for interprofessional education (IPE) experiences.

Interprofessional interactions are influenced by the attitudes and stereotypes healthcare professionals hold towards other professions (Cameron et al., 2009; Rose et al., 2009; Tun stall-Pedoe, Rink, & Hilton, 2003). Professional identity along with the perceptions or stereotypes students hold of other profession have shown to be key factors in either enhancing or inhibiting effective teamwork (Tunstall-Pedoe, Rink, & Hilton, 2003). Hind et al. (2003) found students who hold positive stereotypes of other professional groups tended to be more positive towards IPE. Whether or not IPE fosters positive attitudes and dispels negative stereotypes among healthcare students has been extensively investigated. Some studies have demonstrated significant changes in students' attitudes and perceptions (Cameron et al., 2009; Hind et al., 2003; Ruebling et al., 2014), while others (Coster et al., 2008; McFadyen et al., 2010; Pollard, Gilchrist, Miers, & Sayers, 2006; Tunstall-Pedoe et al., 2003) have argued that there is no change in negative student attitudes and perceptions.

In order to create learning opportunities that promote the development of the skills necessary for interprofessional cooperation, it is important to understand student attitudes and stereotypes towards other professions prior to and following any interprofessional experience and the impact attitudes have on the development of an interprofessional identity.

Turner has defined stereotypes as, "…social categorical judgments; perceptions of people in terms of their group memberships" (Turner, 1999, p. 26). Individuals construct stereotypes to describe, explain, and create meaning of intergroup relations. Stereotypes are also affected by the readiness of the individual for interaction with the group and will vary with the expectations, needs, values, and purposes of those individuals (Turner, 1999). Stereotypes result in the formation of attitudes, which, in turn affect interprofessional collaboration and teamwork (Davies et al., 2011; Hind et al., 2003; Khalili, Hall, & DeLuca, 2014). Attitudes also serve as a means to assert our identity and play an important role in the socialization process. When these attitudes are negative in nature, the result is a lack of communication and collaboration, an unsatisfying work environment, and interference with teamwork (Lim, Bogossian, & Ahern, 2010; Verhovsek, Byington, & Deshkulkarni, 2009).

According to the Social Identity Theory (SIT), a person's self-concept is partially derived from his/her membership in a social group. The significant social group in IPE is the

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professional group. Because this group membership is important to self-concept, people adopt attitudes held by the in-group (the group they belong to or identify with) and/or out-group (groups other than their own) (Tajfel, Billig, Bundy, & Flament, 1971; Turner, 1999). Comparisons are then made between the in-group and the out-group during interactions. Generally, people are motivated to represent the self positively; thus, in-groups are favoured over out-groups (Haslam, Powell, & Turner, 2000). This specific type of comparison is called intergroup differentiation (Tajfel, Billig, Bundy, & Flament, 1971). Stereotypes are the actualization of this intergroup differentiation. Those individuals who identify strongly with their in-group may be more apt to display negative behaviour towards the out-group when their identity is threatened. In addition, negative attitudes can lead to competition and conflict between groups. Conversely, individuals who hold weaker in-group identification are able to reclassify themselves as members of a broader social group that includes both the in-group and out-group (Branscombe, Ellemers, Spears, & Doosje, 1999). For example, students see themselves as healthcare professionals rather than being a member of a particular profession exclusively. However, not all in-group/out-group attitudes are negative, but may actually help understand roles and responsibilities of members in other groups.

Membership in a professional group allows the formation of professional identities through socialization, thereby enabling members to acquire the knowledge and skills required of a profession. Several studies suggest healthcare students entering their professional programmes already have a strong professional identity prior to their training (Adams, Hean, Sturgis, & McLeod Clark, 2006; Hind et al., 2003). As a result, students may have already formed in-group/out-group attitudes, including stereotypes of other professions, whether positive or negative. However, it has also been discussed that professional identity does not develop or progress in a linear manner, but instead, strength of professional identity may experience ebbs and flows as an individual's identity is challenged (Niemi, 1997). In light of this, it is believed that IPE should be introduced in the early stages of professional training, in order to inhibit the formation of negative attitudes and stereotypes of other professions (Adams et al., 2006; Coster et al., 2008).

Bebeau and Monson (2012) have adapted Robert Kegan's Constructive-Developmental Theory of Self for the professions to describe the levels of professional identity formation. Kegan's theory postulates that humans progress through developmental stages of constructing meaning. Each stage builds upon the previous stage and progression to the next stage is not achieved until the person determines that the current stage is too narrow and simplistic for adaptation to the environment. Progression through successive stages is prompted by challenges to one's current stage of development. The levels Bebeau and Monson (2012) used to describe *aspiring professionals* are the Independent Operator, the Team-Oriented Idealist, and the Self-Defining Professional. Table 1 summarizes each level of professional identity formation according to Kegan's (1982) Theory of Self.

Attitudes towards interprofessional learning have been extensively researched. The two most widely used, psychometrically validated evaluation instruments include the Readiness for Interprofessional Learning Scale (RIPLS) (Parsell & Bligh, 1999) and the Interdisciplinary Education Perception Scale (Luecht, Madsen, Taugher, Petterson, 1990), including revised versions of both (McFadyen et al., 2005, 2006, 2007). Studies using these instruments have reported mixed results in attitude improvement (DiVall et al., 2014; Gunaldo et al., 2014; Rose et al., 2009; Ruebling et al., 2014; Thannhauser, Russell-Mayhew, & Scott, 2010). However, whether or not attitudes towards other professions impact a student's readiness for interprofessional learning as well as the development of a student's professional identity to include an interprofessional identity remains to be seen.

This article presents the findings from a study that aimed to examine students' attitudes and stereotypes towards their own and other healthcare professions following an IPE intervention, in order to ascertain how those attitudes may affect their readiness for interprofessional learning and strength of professional identity.

Methods

Study design

This study used a pretest-post-test design to measure changes in students' attitudes and perceptions towards IPE and readiness for interprofessional learning following participation in a semester-long IPE course.

Sample

The research setting was the Academic Health Center (AHC) at the University of Minnesota. Subjects were students enrolled in an introductory interprofessional course, Foundations of Interprofessional Communication and Collaboration (FIPCC). FIPCC is a required course for all first-year students (n = 864) and the first of three phases of 1Health, an IPE programme in the AHC. In 2011, a student cohort representing 10 different healthcare professional programmes participated in FIPCC, including occupational therapy (n = 47), clinical laboratory science (n = 66), dentistry (n = 98), dental hygiene (n = 24), dental therapy (n = 10), medicine (n = 230), nursing (n = 129), pharmacy (n = 160), public health (n = 1), and veterinary medicine (n = 100). The learning objectives of FIPCC aligned with the Interprofessional Education Collaborative (IPEC) core competency guidelines and were created at the awareness stage of entry-level health professions students (IPEC, 2011). Students were divided into interprofessional groups consisting of a facilitator and 12 students. The majority of the students met face-to-face on the Twin Cities campus, with the exception of five cohorts who attended remotely (pharmacy and medical students from Duluth; nursing, occupational therapy, and clinical lab science from Rochester). The groups met for student-led discussions five times throughout the semester. Online components were used to enhance the face-to-face sessions.

In the fall semester of 2011, students were required to complete two online questionnaires designed to assess students' attitudes towards IPE and professional perceptions relative to their own profession and other health

Table 1. Levels of professional identity.

Stage of development	Underlying structure of meaning making	Understanding of professionalism/professional identity
Independent operator	– Black and white role expectations – Personal success paramount – High regard for others' opinions – Need to be correct and fit in with "in-group"	– Narrow view, does not include roles outside their profession – Measured by their performance in meeting specific role behaviours
Team-oriented idealist	– Becoming more independent from professional group – Can distinguish others' opinions from their own – View world through own and others' lenses simultaneously – Can articulate own agenda, but allow themselves to be guided by societal expectations	– Begin to take on multiple identities, but have difficulty balancing responsibilities of each – Identity characterized by entrenchment in shared identity defined by the professional group – Measured by how well they meet expectations of those deemed as exemplars of profession
Self-defining professional	– Able to construct a system that integrates external expectations with own internal values – Can negotiate and resolve tensions among various roles, while remaining strongly committed to chosen profession	– Able to take on multiple identities – Able to incorporate an interprofessional identity complementary to identity of the chosen profession

Information from Bebeau & Monson, 2012

professions. Students completed the questionnaires prior to the first session and again after the fourth session. For the purposes of this research, questionnaire data was stripped of all personal identifiers ensuring anonymity for all subjects prior to data analysis by the investigator. Professional programme was the only identifier retained.

Instruments

The two attitudinal instruments that were used have both been confirmed to demonstrate the reliability and acceptable levels of content and construct validity (Luecht, Madsen, & Taugher, 1990; Parsell & Bligh, 1999). These instruments were chosen for longitudinal study purposes as they had been previously used in earlier iterations of this course. The first data collection instrument used was the RIPLS. This 19-statement questionnaire has been used extensively to explore differences in students' attitudes towards IPE and assess readiness for interprofessional learning. The creators of the instrument reported that a principal component analysis of the 19-item questionnaire resulted in a three-factor scale or subscales (see Figure 1) (Parsell & Bligh, 1999; Rose et al., 2009). Students evaluated statements on a five-point Likert-type scale from strongly agree to strongly disagree, including a midpoint/neutral rating with higher scores indicating greater agreement with the item. The summated range of scores, from a minimum of 19 to a maximum of 95, shows low scores as indicating negative attitudes towards shared learning and high scores indicating positive attitudes towards readiness for interprofessional learning. Maximum possible scores for each subscale are 45, 35, and 15 respectively.

The second instrument, the Interdisciplinary Education Perception Scale (IEPS), consisted of 19 separate statements and was designed to measure professional perceptions of students exposed to interprofessional collaboration, relative to their own profession and other health professions (Luecht et al., 1990). The authors report a high overall reliability with a Cronbach's alpha of 0.872 as well as a high reliability for factor 1 at 0.823. However, the reliabilities for the individual factors 2–4 are marginal, ranging from 0.518to 0.563, which may be a reflection of the small number of items loading on each factor.

The IEPS has been found to be valid and reliable (Hawk et al. 2001; Mu, Chao, Jensen, & Royeen, 2004; Neill, Hayward, & Peterson, 2007) in measuring four components considered crucial to interdisciplinary settings (see Figure 2). A six-point Likert-type rating scale was used, which included a spectrum of choices from strongly agree to strongly disagree, with no neutral or midpoint rating, forcing an agreement or a disagreement with the statement. A higher score indicates greater agreement with the statement. Summated scores range from a low (negative) of 18 to a maximum of 108 (positive).

Analysis

Participants with incomplete questionnaires were excluded from analyses. SAS V9.1.3 (SAS Institute Inc., Cary, NC) was used for the statistical analyses. RIPLS items 10, 11, 12, 17, and 19 were reverse scored prior to any calculations as agreement with these statements indicates negative attitudes towards interprofessional learning. Means and standard deviations were calculated for each questionnaire's subscales in both the pre- and post-test scores as well as for the change scores. Paired t-tests were used to compare

Readiness for Interprofessional Learning Scale Subscales

Subscale 1: Teamwork and Collaboration. Includes items 1-9; items represent a strong belief that shared learning is beneficial in a number of ways. (Score range 9-45)

Subscale 2: Professional Identity. Includes items 10-12 and 13-16; items relate to both positive(13-16) and negative(10-12) aspects of professional identity. (Score range 7-35)

Subscale 3: Roles and Responsibilities. Includes items 17-19; items pertain to the roles and responsibilities of one's own and other professions. (Score range 3-15)

Figure 1. Readiness for interprofessional learning scale subscales.

Interdisciplinary Education Perception Scale Subscales

Subscale 1: Competence and Autonomy. Includes items 1, 3, 4, 5, 7, 9, 10, 13; items pertain to perceived autonomy competence within one's own profession. (Score range 8-48)

Subscale 2: Perceived Need for Cooperation. Includes items 6 and 8; items relate to understanding the relative need for interprofessional cooperation as it impacts one's own profession. (Score range 2-12)

Subscale 3: Perception of Actual Cooperation. Includes items 2, 14, 15, 16, 17; items involve the perception of actual cooperation between one's own profession and other professions. (Score range 5-30)

Subscale 4: Understanding of Others' Values. Includes items 11, 12, 18; items are associated with understanding or a willingness to understand the value of other professions. (Score range 3-18)

Figure 2. Interdisciplinary education perception scale subscales.

pre- and post-test scores. The correlation between all subscale scores was calculated using Pearson's correlation coefficient.

Ethical considerations

Because this study involved normal educational practices, the University of Minnesota Institutional Review Board deemed this study exempt from review.

Results

The final response rate for completed pre- and post-test RIPLS questionnaire was 85% (n = 740), with the per discipline response rates being: CLS (82%), DH (67%), DT (70%), Dent (95%), Med (74%), Nurs (79%), OT (87%), Pharm (98%), PH (100%), and VetMed (98%). The final response rate for the IEPS questionnaire was 83% for completed pre- and post-test questionnaires, with the corresponding per discipline response rates being: CLS (80%), DH (75%), DT (70%), Dent (91%), Med (73%), Nurs (74%), OT (81%), Pharm (95%), PH (100%), and VetMed (95%).

RIPLS

Table 2 encapsulates changes in students' stereotypes and attitudes towards the factors in each subscale in the RIPLS survey, showing the means, standard deviations, and p-values for pre-, post-, and change (post-pre) scores. A statistically significant ($p \leq 0.05$) negative difference was found between summated pretest and post-test scores for all subscales (specifics to follow), suggesting a decline in attitudes towards the concepts in all subscales following participation in FIPCC. Mean scores for all professions showed a statistically significant negative change of −2.67 ($p < 0.0001$). Despite this negative change, the total mean score (74.64) was close to the favourable range (agree/strongly agree), considering scores in this range fall between 76 and 95, suggesting somewhat positive attitudes towards interprofessional learning.

Scores on subscale 2, Professional Identity, could range from 7 to 35. A negative change in the scores on this subscale (−1.35) was found, with the mean of post-test scores at 27.25, slightly below the favourable range of 28–35. A shift in negative professional identity signifies an increase (0.73), in negative attitudes towards the need for interprofessional learning, or a more insular view of professional identity. Negative changes in Subscales 1 (Teamwork and Collaboration) and 3 (Roles and Responsibilities; range 3–15) were also shown (see Table 2).

IEPS

Table 3 shows the scores for all subscales in the IEPS survey and includes the means, standard deviation, and p-values for pre-, post-, and change in scores from pretest to post-test. Mean scores were quite high, with most scores falling within the agreement range of the rating scale for both pretest and post-test results. The total mean score for all subscales across professions for both pretest and post-test results (86.93 and 86.87, respectively) fell within the agreement range (agree/strongly agree) of 72–108. However, the change in scores was statistically significant for subscale 2 (Perceived Need for Cooperation) only (p = <0.0001) at −0.31, which revealed a negative change in the perception of the need for cooperation. The change in scores for subscale 1 (Competence and Autonomy in one's own profession) at 0.25, subscale 3 (Perception of Actual Cooperation) at −0.10, subscale 4 (Understanding Others' Value) at 0.13, and total mean score at −0.04 were not statistically significant (see Table 3).

Pearson correlation coefficients were calculated for all subscales in both the RIPLS and the IEPS questionnaires to determine correlations between subscale factors. Correlations in change scores were mostly small to moderate positive correlations (greater than 0.5 or less than −0.5 are considered large correlations) (see Table 4).

Discussion

There is sufficient evidence to suggest that IPE has the potential to move a student through the successive levels of professional

Table 2. *RIPLS results (scoring based on Parsell);* mean (SD) of subscale scores.

Scale	Pre N = 846	Post N = 749	Change (post–pre) N = 740
1. Teamwork and collaboration (score range 9–45)	39.62 (4.07)	38.67 (4.64)	−0.86 (4.16)
2. Professional identity (score range 7–35)	28.64 (3.99)	27.25 (4.52)	−1.35 (3.89)
Negative ID (10–12)	12.14 (1.98)	11.39 (2.35)	−0.73 (2.15)
Positive ID (13–16)	16.50 (2.41)	15.87 (2.73)	−0.61 (2.41)
3. Roles and responsibilities (score range 3–15)	9.17 (1.75)	8.71 (1.76)	−0.47 (1.66)
Mean of total scores (score range 19–95)	77.43	74.63	−2.68
Agreement: 76–95			

† T-test p-values for SS1, SS2, and SS3 are <0.0001, <0.0001, and <0.0001, respectively
SS2 Negative $p < 0.0001$; SS2 Positive $p < 0.0001$

Table 3. *IEPS results (scoring based on Luecht);* mean (SD) of subscale scores.

Scale	Pre $N = 834$	Post $N = 736$	Change (post–pre) $N = 715$
1. Competence/autonomy (score range 18–48)	39.61 (4.93)	39.85 (5.46)	0.25 (5.75)
2. Perception of need for cooperation (score range 2–12)	10.51 (1.60)	10.17 (1.99)	−0.31 (1.88)
3. Perception of actual cooperation (score range 5–30)	24.87 (3.47)	24.79 (3.74)	−0.10 (3.86)
4. Understanding others' value (score range 3–18)	11.94 (2.23)	12.06 (2.48)	0.13 (2.33)
Total (score range 18–108)	86.93 (9.54)	86.87 (11.15)	−0.04 (11.54)

† T-test *p*-values for SS1, SS2, SS3, and SS4, total are 0.2415, <0.0001, 0.4857, 0.1518, and 0.9299, respectively.

identity formation (Bebeau & Monson, 2012) and can facilitate the elimination of barriers to effective teamwork and collaborative practice, which include preconceived attitudes and stereotypes of other professions (Reeves, Goldman, Burton, & Sawatzky-Girling, 2010). The results of the study found students in Kegan's first stage of professional identity development as adapted by Bebeau and Monson (2012), in which new professional roles had just been acquired. In order to construct an understanding of what it means to belong to their professions, students began to examine the attitudes and stereotypes they held towards other professions. As Kegan's (1982) theory posits, students during their first IPE course, first stage, viewed professionalism as meeting the delineated role expectations and viewed themselves and others operating individually, each with their own goals and agendas. This explains why, after participation in FIPCC, students may not yet perceive the need for contact with other healthcare students and felt less of a need to acquire specific skills in teamwork and collaboration. The negative change in RIPLS subscale 3, Roles and Responsibilities, suggests that students recognize and embrace the fact that others may share the same roles and responsibilities for effective teamworking, but may view this as a threat to their professional identity and their future job security (Baker, Egan-Lee, Martimianakis, & Reeves, 2011; Solimeo, Ono, Lampman, Paez, & Stewart, 2015).

The negative change in the professional identity subscale scores was statistically significant. Statistical analysis of the correlation between professional identity and the other subscales in both instruments found significant small to moderate positive correlations in the change scores, which indicates that as the professional identity scores decreased, so did the scores in the other subscales. The strongest correlation observed was between the RIPLS subscale 1 (Teamwork and Collaboration) and RIPLS subscale 2 (Professional Identity). As Kegan suggests, learners at this stage tend towards insecurity in their roles and, in an attempt to protect their identities, any positive stereotypes initially held of the other professions may begin to weaken and students perceive less of a need for teamwork and interprofessional collaboration.

Kegan's theory postulates positive change should not be expected in the first stage of professional identity development. In order to move along the continuum, students must be provided with experiences that contradict and challenge their attitudes and past experiences. These contradictory experiences cause a change in the way they currently view their professional role, thus propelling them to the next stage of professional identity development. Each transitional stage creates insecurity as students struggle with understanding the prospect of a new interprofessional identity. Kegan's first stage of professional identity development offers an explanation for the decline in post-test questionnaire scores. Students may have been in a transitional state between the Independent Operator and the Team-Oriented Idealist and experiencing the struggle of assimilating their current uniprofessional identity into the broader interprofessional identity. Negotiating several different identities at the same time is difficult and may create confusion or even push-back in students with an immature identity (Bebeau & Monson, 2012). Hind et al. (2003) also reported a positive correlation between the strength of professional identity and the readiness for interprofessional learning, suggesting that "the lack of a strong professional identity creates role insecurity and that this insecurity may inhibit readiness for interprofessional working and learning" (p. 32).

Students in this study showed a sense of belonging to their chosen profession prior to entry into their programme of study. This was evidenced by the high pre-course scores on the professional identity subscale of the RIPLS. Findings also showed a statistically significant (<0.0001) increase in negative professional identity scores (0.73) in the RIPLS questionnaire, a finding that has previously been reported in the literature

Table 4. Pearson correlation coefficients between all subscale change scores (post–pre).

	IEPS				RIPLS				
	SS1 competence and autonomy	SS2 perceived need for cooperation	SS3 perception of actual cooperation	SS4 understanding others' values	SS1 teamwork and collaboration	SS2 professional identity	SS2 (neg)	SS2 (pos)	SS3 roles and responsibilities
IEPS									
SS1	1				0.18	0.19	−0.18	0.15	*0.07*
SS2	0.54	1			0.15	0.20	−0.21	0.14	*0.04*
SS3	0.71	0.55	1		0.20	0.23	−0.25	0.15	*0.02*
SS4	0.48	0.36	0.53	1	0.09	0.14	−0.13	0.11	−0.08
RIPLS									
SS1					1				
SS2					0.64	1			
Neg					−0.42	–	1		
Pos					0.66	–	−0.46	1	
SS3					*0.04*	0.10	−0.13	*0.05*	1

The majority of these correlations are small to moderate and significantly different than 0 ($p < 0.05$). The italicized ones are not.

(McFadyen et al., 2010; Pollard et al., 2006). Funnell (1995) explained that overlapping professional roles and responsibilities with other professions can be threatening to the immature professional identities of first-year students, thus leading to inflexibility in sharing roles in interprofessional collaboration. In addition, insecurity in perceived status and the knowledge and skills required by respective professional roles manifest in negative professional identity traits (Hind et al., 2003; Lloyd, Schneider, Scales, Bailey, & Jones, 2011). However, according to Kegan, because their professional identity may have been immature, making group comparisons was threatening to the students. Students at this stage are insecure in their professional roles, particularly if they do not perceive distinctions between in-group and out-groups or if they do not feel themselves to be on an equal footing with the students from the other professions (Parsell & Bligh, 1998). Students in this study may have feared a dilution of their uniprofessional identity as they became members of the larger interprofessional group.

Kegan's theory suggests attainment of IPE goals cannot be achieved after one course and, therefore, conclusions regarding success or failure of the FIPCC course would be premature. Kegan's theory provides a framework for understanding phenomena that occurred during the introductory IPE course. The FIPCC IPE course, which promoted team-based, other-oriented professionalism, presented contradictory experiences and concepts for students at this level of professional identity formation. These contradictory experiences stimulated self-reflection, leading to a questioning of one's point of view. As FIPCC challenged preconceived attitudes, students were forced to grapple with the notion of a broader definition of their professional identity, thus providing the impetus to transition to the next stage of identity. Ascribing to Kegan's theory, each future phase of 1Health should be constructed, using a constructivist-developmental framework. Educational experiences in each phase would serve as a transitional period for students to progress into a new stage of meaning in their professional identity, with the end goal being the sharing of primary professional identity with an interprofessional identity.

Research has shown that college-age students may be transitioning between the Independent Operator and the Team-Oriented Idealist stages, and the progression to the Self-Defining Professional is characteristic of an early to mid-career professional (Bebeau & Monson, 2012). If the goal for the Self-Defining Professional (early- to mid-career) is to integrate interprofessionalism into their identity, it should be the intent of stakeholders invested in interprofessional collaboration to continue to provide interprofessional training opportunities for practicing professionals.

It's important to understand that Kegan's theory does not make judgments about one level being "better" than another. It simply provides a description of human development, informing us of phenomena associated with the varying levels of human thinking. Integrating that intellection into the findings of this study, it can be proffered that it is not necessarily an unfavourable reflection of IPE when attitudes remain unchanged or even decline following early IPE experiences.

This study had several limitations and barriers. This short-term study used a quasi-experimental design with no control group. In addition, students met on Friday afternoons for two hours and 30 minutes, a difficult time for any class, as all educators are well aware. This was a common complaint of students across all professions. Finally, although the small negative changes in scores for both the RIPLS and the IEPS were statistically significant, the practical significance of this change can be questioned.

Concluding comments

Participation in an IPE course yielded deteriorating attitudes towards students' own and other professions and attitudes towards IPE. A positive correlation was found between declining attitudes and a weakening of professional identity. The results of the study supported Kegan's theory of professional identity formation, which describes a process by which individuals move through stages of identity in an effort to construct an understanding of what it means to belong to their professions. Students in the study were found to be in the first stage of professional identity formation, which is characterized by self-orientation and lacking a broader view of professionalism that includes roles outside of their profession. Application of Kegan's theory to IPE may inform faculty of students' stage of professional identity, which may be instrumental in planning IPE courses and setting realistic expectations for IPE outcomes.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the writing and content of this article.

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References

Adams, K., Hean, S., Sturgis, P., & McLeod-Clark, J. (2006). Investigating the factors influencing professional identity of first-year health and social care students. *Learning in Health and Social Care*, *5*(2), 55–68.

Baker, L., Egan-Lee, E., Martimianakis, M. A., & Reeves, S. (2011). Relationships of power: Implications for interprofessional education. *Journal of Interprofessional Care*, *25*, 98–104.

Bebeau, M. J., & Monson, V. (2012). Professional identity formation and transformation across the lifespan. In A. McKee & M. Eraut (Eds.), *Learning Trajectories, Innovation and Identity for Professional Development* (pp. 135–162). Dordrecht, the Netherlands: Springer.

Branscombe, N. R., Ellemers, N., Spears, R., & Doosje, B. (1999). The context and content of social identity threat. In N. Ellemers, R. Spears & B. Doosje (Eds.), *Social Identity: Context, Commitment, Content* (pp. 35–58). Oxford, UK: Blackwell Publishers, Ltd.

Cameron, A., Ignjatovic, M., Langlois, S., Dematteo, D., DiProspero, L., Wagner, S., & Reeves, S. (2009). An interprofessional education session for first-year health science students. *American Journal of Pharmaceutical Education*, *73*(4), 1–7.

Coster, S., Norman, I., Murrells, T., Kitchen, S., Meerabeau, E., Sooboodoo, E., & d'Avray, L. (2008). Interprofessional attitudes amongst undergraduate students in the health professions: A longitudinal questionnaire survey. *International Journal of Nursing Studies*, *45*, 1667–1681.

Davies, K., Harrison, K., Clouder, D., Gilchrist, M., McFarland, L., & Earland, J. (2011). Making the transition from physiotherapy student to interprofessional team member. *Physiotherapy*, *95*(2), 139–144.

DiVall, M., Kolbig, L., Carney, M., Kirwin, J., Letzeiser, C., & Mohammed, S. (2014). Interprofessional socialization as a way to introduce collaborative competencies to first - year health science students. *Journal of Interprofessional Care, 28*(6),*576–578*.

Funnell, P. (1995). Exploring the value of interprofessional shared learning. In K. Soothill, L. Mackay & C. Webb (Eds.), *Interprofessional Relations in Health Care* (pp. 163–171). London, UK: Edward Arnold.

Gunaldo, T. P., Andrieu, S. C., Garbee, D., Giovingo, L. K., Mercante, D. E., Tortu, S., & English, R. (2014). Student perceptions about interprofessional education after an elective course. *Journal of Interprofessional Care*, *29*, 370–371. doi:10.3109/13561820.2014.969836

Haslam, S. A., Powell, C., & Turner, J. C. (2000). Social identity, self-categorization, and work motivation: Rethinking the contribution of the group to positive and sustainable organisational outcomes. *Applied Psychology: An International Review*, *49*(3), 319–339.

Hawk, C., Buckwalter, K., Byrd, L., Cigelman, S., Dorfman, L., & Ferguson, K. (2001). Health professions students' perceptions of interprofessional relationships. *Academic Medicine*, *77*(4), 354–357.

Henry, J. Kaiser Family Foundation. (2011). *Ensuring access to care in Medicaid under health reform*. Retrieved from http://www.kff.org/healthreform/8187.cfm

Hind, M., Norman, I., Cooper, S., Gill, E., Hilton, R., Judd, P., & Jones, C. (2003). Interprofessional perceptions of health care students. *Journal of Interprofessional Care*, *17*, 21–34.

Institute of Medicine (U.S.). (2001). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: National Academy Press.

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

Kegan, Robert. (1982). *The evolving self: Problem and process in human development*. Cambridge, MA: Harvard University Press.

Khalili, H., Hall, J., & DeLuca, S. (2014). Historical analysis of professionalism in western societies: Implications for interprofessional education and collaborative practice. *Journal of Interprofessional Care*, *28*, 92–97.

Lim, J., Bogossian, F., & Ahern, K. (2010). Stress and coping in Singaporean nurses: A literature review. *Nursing and Health Sciences*, *12*, 251–258.

Lloyd, J., Schneider, J., Scales, K., Bailey, S., & Jones, R. (2011). Ingroup identity as an obstacle to effective multiprofessional and interprofessional teamwork: Findings from an ethnographic study of healthcare assistants in dementia care. *Journal of Interprofessional Care*, *25*, 345–351.

Luecht, R., Madsen, M., Taugher, M., & Petterson, B. (1990). Assessing professional perceptions: Design and validation of an interdisciplinary education perception scale. *Journal of Allied Health*, *19*, 181–191.

McFadyen, A. K., Maclaren, W. M., & Webster, V. S. (2007). The Interdisciplinary Education Perception Scale (IEPS): An alternative remodeled sub-scale structure and its reliability. *Journal of Interprofessional Care*, *21*, 433–443.

McFadyen, A. K., Webster, V. S., & Maclaren, W. M. (2006). The test-retest reliability of a revised version of the Readiness for Interprofessional Learning Scale (RIPLS). *Journal of Interprofessional Care*, *20*, 633–639.

McFadyen, A., Webster, V., Maclaren, W., & O'Neill, M. (2010). Interprofessional attitudes and perceptions: Results from a longitudinal controlled trial of pre-registration health and social care students in Scotland. *Journal of Interprofessional Care*, *24*, 549–564.

McFadyen, A. K., Webster, V., Strachan, K., Figgins, E., Brown, H. & McKechnie, J. (2005). The readiness for interprofessional learning scale: A possible more stable sub-scale model for the original version of RIPLS. *Journal of Interprofessional Care*, *19*, 595–603.

Mu, K., Chao, C., Jensen, G., & Royeen, C. (2004) Effects of interprofessional rural training on students' perceptions of interprofessional health care services. *Journal of Allied Health*, *33*, 125–131.

Neill, M., Hayward, K., & Peterson, T. (2007). Students' perceptions of the interprofessional team in practice through the application of servant leadership principles. *Journal of Interprofessional Care*, *21*(4), 425–432.

Niemi, P. (1997). Medical students' professional identity: Self-reflection during the preclinical years. *Medical Education*, *31*, 408–415.

ObamaCare Explained. An explanation of ObamaCare. (n.d.). Retrieved February 8, 2015, from http://obamacarefacts.com/obamacare-explained/

Parsell, G., & Bligh, J. (1998). Interprofessional learning. *Postgraduate Medical Journal*, *74*, 89–95.

Parsell, G., & Bligh, J. (1999). The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Medical Education*, *33*, 95–100.

Pollard, K., Gilchrist, M., Miers, M., & Sayers, A. (2006). A comparison of interprofessional perceptions and working relationships among health and social care students: The results of a 3-year intervention. *Health & Social Care in the Community*, *14*, 541–552.

Reeves, S., Goldman, J., Burton, A., & Sawatzky-Girling, B. (2010). Synthesis of systematic review evidence of interprofessional education. *Journal of Allied Health*, *39*(3, pt 2), 198–203.

Rose, M., Smith, K., Veloski, J., Lyons, K., Umland, E., & Arenson, C. (2009). Attitudes of students in medicine, nursing, occupational therapy, and physical therapy toward interprofessional education. *Journal of Allied Health*, *38*(4), 196–200.

Ruebling, I., Pole, D., Breitbach, A., Frager, A., Kettenbach, G., Westhus, N., & Carlson, J. (2014). A comparison of student attitudes and perceptions before and after an introductory interprofessional education experience. *Journal of Interprofessional Care*, *28*, 23–27.

Solimeo, S., Ono, S., Lampman, M., Paez, M., Stewart, G. (2015). The empowerment paradox as a central challenge to patient centered medical home implementation in the veteran's health administration. *Journal of Interprofessional Care*, *29*, 26–33.

Tajfel, H., Billig, M. G., Bundy, R. P. & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology*, *1*, 149–177.

Thannhauser, J., Russell-Mayhew, C., & Scott, C. (2010). Measures of interprofessional education and collaboration. *Journal of Interprofessional Care*, *24*, 336–349.

Tunstall-Pedoe, S., Rink, E., & Hilton, S. (2003). Student attitudes to undergraduate interprofessional education. *Journal of Interprofessional Care*, *17*, 161–172.

Turner, J. C. (1999). Some current issues in research on social identity and self-categorization theories. In N. Ellemers, R. Spears & B. Doojse (Eds.), *Social identity: Context, Commitment, Content* (pp. 6–34). Oxford, UK: Blackwell.

Verhovsek, E., Byington, B., & Deshkulkarni, S. (2009). Perceptions of interprofesssional communication: Impact on patient care, occupational stress, and job satisfaction. *The Internet Journal of Radiology*, *12*(2). doi:10.5580/74c