

Enhancing Geriatric Workforce Competency: Impact of 3 Distinct Geriatric Interprofessional Education Programs

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Abstract

INTRODUCTION An aging population with increasingly complex health care needs necessitates a diverse health care workforce prepared to deliver geriatric care in interprofessional teams. It is unclear what educational approaches effectively prepare health professions students for such practice. This study examines two indicators of preparedness for students from seven professions who participated in at least one of three geriatric interprofessional education (IPE) programs, reflecting different educational strategies.

METHODS Four cohorts of students (n=697) completed pre-post surveys assessing indicators of preparedness for geriatric interprofessional practice. These included self-reported 1) familiarity with the roles and responsibilities of other health professions and 2) their capability to conduct common geriatric health assessments.

RESULTS Students in two programs, and those who participated in multiple programs, reported statistically significant gains in familiarity with other professions (range: familiarity with 0.73 to 1.55 more professions). Students in all three programs, and those in multiple programs, reported gains in their self-reported capability to conduct geriatric health assessments (range: capability with 1.38 to 3.15 more health assessments).

DISCUSSION Each program helped students prepare for future team practice. The gains appeared largest in the program that involved the most direct contacts with an older adult in a community setting. Gains were also larger for students who participated in multiple programs. This suggests that both direct contact with older adults, dose of IPE exposure, and composition of IPE teams may be particularly important in training future health care professionals.

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Implications for Interprofessional Practice

- Increasing student familiarity with the roles of other health professionals appears most effective when the training combines both didactic and experiential components and when the IPE teams are more professionally diverse.
- Improvement in student geriatric health assessment skills may be achieved most effectively by giving students direct and ongoing contact with older adults.

Introduction

An aging population with increasingly complex health care needs necessitates a diverse health care workforce capable of delivering geriatric care. There is evidence this is best accomplished with an interprofessional geriatric workforce (Flaherty and Bartels 2019; Schapmire et al, 2018; Long, Abrams, Milstein, et al 2017; Schottenfeld, Petersen, Peikes, et al, 2016). As a result, interprofessional education (IPE) and geriatric training are now required elements of all health professional training programs (PHAWITTG, 2014).

But how best to prepare students to be part of a geriatric competent interprofessional workforce remains unclear. Previous geriatric IPE training has involved didactic learning (Fulmer et al, 2005), simulation (Wen et al, 2019), hands-on clinical training (Conti et al, 2016), and case studies (Balogun et al, 2015). Yet, there is little guidance on which modalities best achieve even a minimal interprofessional geriatric skill set.

It is also unknown what settings and curricula are most effective to prepare students to meet the future health care needs of older adults. We do not know, for example, the optimal training hours to obtain minimum competency in the care of older adults. And there is little guidance on the best training setting: institutional (Annear et al 2016; *POGOe*-Portal of Geriatrics

Online, 2016; Lee et al, 2021) versus a community-based setting (Giuliante et al, 2018; Reilly et al, 2014).

A better understanding of the effectiveness of various geriatric interprofessional education (IPE) approaches is needed to inform future curricula. To fill this gap, we compare three modalities for training health professional students in interprofessional geriatric care. Specifically, we examine two indicators of preparedness for interprofessional geriatric care of health professional students across multiple disciplines in three geriatric IPE programs offered at a single institution. The Keck School of Medicine Institutional Review Board approved this study (IRB #HS-16-00633).

METHODS

Four cohorts of students (n=697) were included in this analysis (2016-2017 through 2019-2020). Students from eight disciplines--dentistry, medicine, occupational therapy (OT), pharmacy, physical therapy (PT), physician assistant (PA), psychology and social work--participated in one or more of three IPE geriatric experiences, each with a distinct curriculum and training hours (Table 1). Students completed an online survey two weeks prior and one week after the program.

Program	Number of Disciplines	Format	Total Hours	Setting	Didactic Topics
IPEGC	8	5 sessions delivered over 5 months	20	Low-income housing sites	Team building Medications Cognition Mobility Nutrition Resources
SSPP	7	5 sessions delivered over 5 months	14	Home and community	Team building
GAP	8	1 session	4	Clinic	None

Table 1. Description of the Three IPE Geriatric Programs

Geriatric IPE Programs

Participation in each of the three IPE programs was voluntary. Each program aimed to improve student preparedness for caring for older adults using interprofessional team-based care. Each program also had an experiential component involving older adults, but otherwise varied along several parameters (Table 1). Two programs were community-based, involved varying degrees of interaction with older adults, and had didactic education components. The third program was clinic-based and involved observation with no didactic element. The community-based programs were delivered longitudinally, while the clinic-based program involved a single experience.

The *Geriatric Assessment Program (GAP)* involved students from the seven professions in a clinical geriatric IPE experience. Individual students spent three to four hours during a single visit observing an interprofessional team. This team was made up of professionals from six disciplines (medicine, OT, PA pharmacy, psychology, PT) conducting assessments with an older adult. The student participated in the team meeting afterward to discuss the care of that patient. There was no didactic component.

The *Interprofessional Geriatric Curriculum (IPGC)* involved students from seven professions meeting in five half-day sessions (Reilly et al, 2021) over five months. Each session included one to three hours of team building and common geriatric assessment lectures. On three afternoons, mixed discipline student teams met with an older adult resident of a low-income housing site in their apartment for 90 minutes. Each meeting was followed by a faculty-facilitated team debrief.

The *Student Senior Partnership Program (SSPP)* involved students primarily in six professions (i.e., just one student was a PA) paired with an older adult. Each team met with their older adult partner five times over five months. An orientation included team building and didactics on normal aging. Student teams made three visits to the older adult at their home or in the community to discuss aging issues. Meetings were followed by a faculty-facilitated debrief. A culminating workshop allowed students and older adults to share their experience through a creative project.

Measures and Analysis: The study independent variable was the IPE program. There were two study dependent variables. First, students self-reported their familiarity with the seven health professional disciplines using a 5-point Likert-type scale (1=very unfamiliar to 5=very familiar). Second, students reported their capability to conduct nine health assessments using a 5-point scale (1=not capable at all, 5=extremely capable). Covariates were age, gender, race/ethnicity, and discipline. We used Stata (Version 13; StataCorp, College Station, TX) to present changes in mean scores of the dependent variables for each program, and the *p*-values from paired *t* tests.

RESULTS

The proportion of students who completed the surveys at baseline and follow-up was 89% with some variation by program (IPGC =93%, GAP=85%, SSPP=79%). The largest proportion of students participated in IPGC (434/62%), and 5% students completed multiple programs. Most students were female and ages 20-29 years. Participation from the different disciplines varied by program, though medicine and OT were most represented in each (see Table 2).

Roles and Responsibilities: There was a statistically significant increase in the familiarity with roles and responsibilities of other professions among all students in IPGC (Table 3). OT students stood out as the only profession to increase their familiarity across all three programs. Students in GAP and IPGC, reported statistically significant gains ($p<0.001$) in the number of professions with which they were “familiar” or “very familiar” (0.73 and 1.23 professions, respectively) (Figure 1). Students in multiple programs also reported large gains.

Geriatric Assessments: Students in all programs reported statistically significant improvements in their self-reported capability to conduct common geriatric assessments (Table 4). Students in all three programs also reported a statistically significant increase in the number of assessments with which they felt “very” or “extremely capable”. The increase was largest for the students in IPGC and in multiple programs (3.15 and 2.77 more assessments, respectively, $p<0.001$). GAP students appeared to report the least improvement (1.38 more assessments, $p<0.001$) (Figure 2).

	GAP (n= 108) %	IPGC (n= 434) %	SSPP (n= 120) %	Multi (n=35) %	Total (n=697) %
Age (years)*					
20-29	81.48	88.71	80.83	97.14	86.66
30+	18.52	11.29	19.17	2.86	13.34
Female					
	73.15	79.49	80.83	82.86	78.91
Race/ethnicity*					
Asian	51.85	36.87	40.83	48.57	40.46
Black	2.78	4.15	5.83	0	4.02
Latino	8.33	23.73	21.67	14.29	20.52
White	24.07	25.81	20.00	28.57	24.68
More than one	5.56	5.99	6.67	5.71	6.03
Other	7.41	3.46	5.00	2.86	4.30
Profession*					
Dentistry	6.48	10.60	6.67	14.29	9.47
Medicine	26.85	18.20	13.33	5.71	18.08
Occupational Therapy	13.89	15.67	29.17	14.29	17.65
Pharmacy	28.70	9.45	15.00	48.57	15.35
Physician Assistant	3.70	14.98	0.83	2.86	10.19
Physical Therapy	8.33	20.05	16.67	2.86	16.79
Social Work	4.63	8.76	18.33	8.57	9.76
Psychology	4.63	2.07	0	2.86	2.15
Other	2.78	0.23	0	0	0.57

Table 2. Demographics of IP Student Participants (n=697)

* $p < 0.001$ for the difference across programs. Female gender and the two prior IP experience measures were not statistically different across groups. Race/ethnicity and profession could not be tested because of some cells containing zero (0) observations

	GAP (n= 99 of 108)			IPGC (n= 432 of 434)			SSPP (n= 119 of 120)			Multi (n=31 of 35)		
	Pre	Post	p	Pre	Post	p	Pre	Post	p	Pre	Post	p
Dentistry	75.00 (4.53)	78.26 (4.32)	0.533	67.97 (2.38)	82.86 (1.92)	<0.001	72.07 (4.28)	64.86 (4.55)	0.186	65.38 (9.51)	80.77 (7.88)	0.178
Medicine	91.67 (3.28)	1.00 (0.00)	--	80.74 (2.10)	94.02 (1.27)	<0.001	77.88 (4.09)	84.6 (3.56)	0.151	89.66 (5.76)	1.00 (0.00)	--
OT	65.48 (5.22)	84.52 (3.97)	0.005	56.08 (2.61)	84.34 (1.91)	<0.001	50.00 (5.49)	73.81 (4.83)	0.002	57.14 (9.52)	92.6 (5.14)	0.022
Pharmacy	82.86 (4.54)	88.57 (3.83)	0.292	69.51 (2.34)	88.14 (1.64)	<0.001	67.33 (4.69)	71.29 (4.52)	0.494	62.50 (1.25)	93.75 (6.25)	0.295
PA	53.68 (5.14)	70.53 (4.70)	0.009	50.55 (2.62)	76.09 (2.23)	<0.001	55.93 (4.59)	56.78 (4.58)	0.879	60.00 (9.10)	90.00 (5.57)	0.028
PT	76.67 (4.48)	85.39 (0.38)	0.094	74.85 (2.35)	92.38 (1.44)	<0.001	76.77 (4.27)	87.88 (3.30)	0.023	76.67 (7.85)	96.67 (3.33)	0.049
Psychology	71.28 (4.69)	84.0 (3.80)	0.033	63.33 (2.35)	72.33 (2.21)	0.001	71.43 (4.16)	70.59 (4.19)	0.873	73.33 (8.21)	76.67 (7.85)	0.706
Social Work	70.83 (4.66)	78.35 (4.20)	0.142	57.91 (2.50)	79.80 (2.03)	<0.001	60.8 (4.98)	70.10 (4.67)	0.122	46.43 (9.60)	85.71 (6.73)	0.261
Count of professions (mean)	5.08 (0.20)	5.81 (0.17)	0.001	4.52 (0.10)	5.79 (0.08)	<0.001	4.68 (0.22)	5.04 (0.19)	0.122	4.68 (0.42)	6.23 (0.23)	<0.001

Table 3. Familiar or Very Familiar with Roles and Responsibilities of Other Professions, % (Standard Error). (n=681)

Note: Responses are the means of a % saying they are “familiar” or “very familiar” (vs. neutral, unfamiliar and very unfamiliar) with the roles and responsibilities of each profession. Respondents do not answer for their own profession. Count of familiarities is the mean number of professions for which students respond “familiar” or “very familiar”.

Note: Analyses are limited to those with complete data on role familiarity in pre and post surveys.

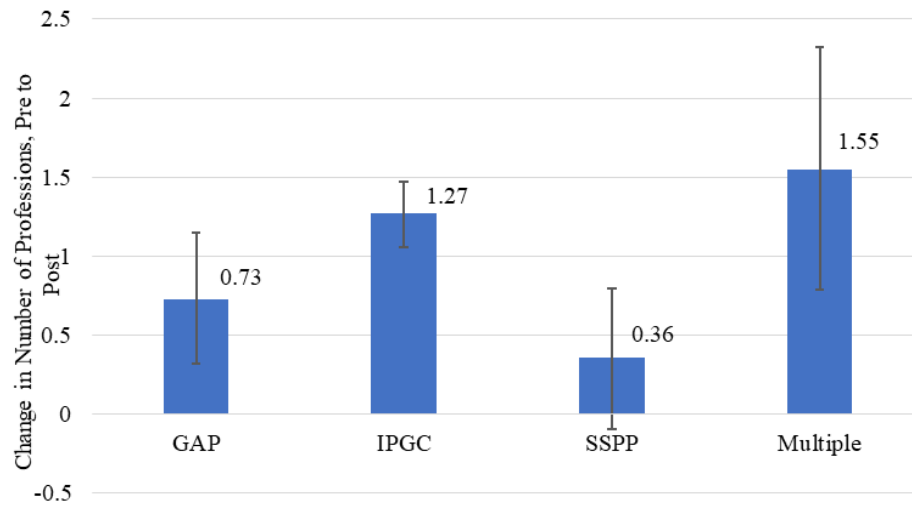


Figure 1. Change in Number of Professions with Which Students are Familiar or Very Familiar by Program (n=681)
 Note: 95% confidence interval is shown for each estimate. Results are statistically significant for GAP (p=0.001), IPGC (p<0.001) and Multiple Programs (p<0.001). The result for SSPP is not statistically significant, p=0.112

	GAP (n= 107 of 108)			IPGC (n= 431 of 434)			SSPP (n= 119 of 120)			Multi (n=35 of 35)		
	Pre	Post	p	Pre	Post	p	Pre	Post	p	Pre	Post	p
Take a history	3.25 (0.08)	3.57 (0.08)	<0.001	3.65 (0.04)	4.24 (0.03)	<0.001	3.66 (0.09)	4.18 (0.06)	<0.001	3.08 (0.14)	3.77 (0.13)	<0.001
Assess medication use	2.76 (0.09)	3.10 (0.10)	<0.001	2.66 (0.05)	3.56 (0.05)	<0.001	2.57 (0.10)	3.13 (0.09)	<0.001	2.71 (0.17)	3.60 (0.18)	<0.001
Assess mental status	2.77 (0.09)	3.12 (0.09)	<0.001	2.91 (0.05)	3.82 (0.04)	<0.001	3.00 (0.09)	3.73 (0.07)	<0.001	2.60 (0.14)	3.51 (0.16)	<0.001
Assess fall risk	2.66 (0.10)	3.28 (0.10)	<0.001	2.95 (0.06)	3.96 (0.04)	<0.001	3.10 (0.11)	3.77 (0.09)	<0.001	2.54 (0.17)	3.29 (0.19)	<0.001
Assess gait and balance	2.64 (0.11)	3.18 (0.10)	<0.001	2.90 (0.06)	3.87 (0.05)	<0.001	2.99 (0.11)	3.53 (0.10)	<0.001	2.31 (0.18)	3.09 (0.18)	<0.001
Assess nutritional status	2.44 (0.10)	2.93 (0.10)	<0.001	2.44 (0.05)	3.67 (0.04)	<0.001	2.48 (0.10)	2.96 (0.10)	<0.001	2.40 (0.16)	3.17 (0.20)	<0.001
Perform a basic oral screening	2.03 (0.12)	2.32 (0.13)	0.001	2.01 (0.07)	3.16 (0.06)	<0.001	1.71 (0.10)	2.10 (0.13)	<0.001	2.20 (0.21)	2.80 (0.22)	0.002
Identify home safety issues	2.77 (0.12)	3.20 (0.10)	<0.001	2.96 (0.06)	3.99 (0.04)	<0.001	3.24 (0.11)	3.78 (0.10)	<0.001	2.54 (0.16)	3.46 (0.21)	<0.001
Identify resource gaps	2.40 (0.10)	2.90 (0.10)	<0.001	2.53 (0.05)	3.68 (0.05)	<0.001	2.83 (0.10)	3.63 (0.09)	<0.001	2.29 (0.16)	3.34 (0.21)	<0.001
Count of assessments (mean)	1.79 (0.22)	3.19 (0.27)	<0.001	2.52 (0.12)	5.68 (0.13)	<0.001	2.94 (0.23)	4.84 (0.23)	<0.001	1.57 (0.39)	4.34 (0.55)	<0.001

Table 4. Student Self-Reported Capability to Do Assessments with Older Adults, Mean Score (Standard Error) (n=692)
 Note: Responses are the means of a 5-point scale from “Not Capable at All” (1) to “Extremely Capable” (5). The count of capabilities is the number of assessments for which students reported being “very” or “extremely” capable (out of 9 possible assessments). Analyses are limited to those with complete data on capability in pre and post surveys.

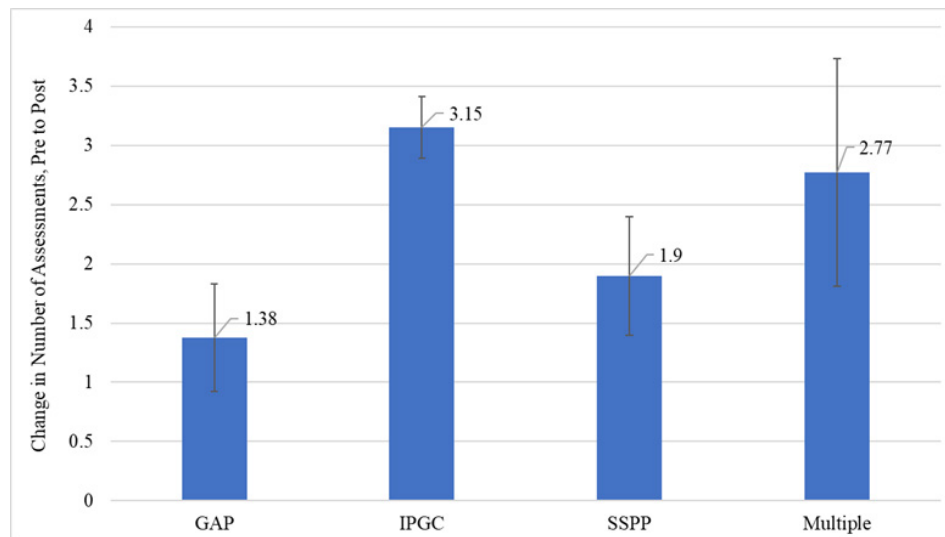


Figure 2. Change in Number of Professions with Which Students are Familiar or Very Familiar by Program ($n=681$)
 Note: 95% confidence interval is shown for each estimate. Results for each program are statistically significant at $p<0.001$.

DISCUSSION

This study uniquely compared the training health professions students across three geriatric IPE programs. We found improved student preparedness for interprofessional practice in each of the three programs, measured by self-reported 1) familiarity with the roles and responsibilities of other professions and 2) capability to conduct common geriatric assessments. Improvement in both indicators appeared largest in IPGC, which offered didactics on geriatric topics and actively engaged students with older adults for the greatest number of hours. This is consistent with adult learning theory (Knowles, 1978), that emphasizes active learning.

Gains in geriatric assessment capabilities appear related to both IPE hours (dose of exposure) and the student role in training. In IPGC and SSPP, the programs that appear to have the first and second highest gains respectively, students have many hours of contact with an older adult partner. In IPGC, students *participate* in conducting geriatric assessments while in SSPP the focus is on relationship-building and observation of aging in place. GAP (which appeared to have the smallest gains in capability) delivered both the fewest hours of exposure to older adults and limited students to passive *observation* of clinical assessments. The GAP results may be more comparable to simulation training, where students more passively engage in learning with less favorable results (Wen et al, 2019).

Gains in student familiarity with the roles and responsibilities of other professions appeared to be more closely related to the *composition* of the IPE teams. The gains appeared greater for students in IPGC and GAP, the two programs with the broadest professional representation (usually six to seven professions). SSPP teams were less broad, with just three to four professions represented. This may explain why there was no overall gain in familiarity in this program. It is consistent that participation in multiple programs appeared to lead to the largest gains, likely because of the combined exposure to other disciplines. Other studies support the benefits of learning together in team practices (Carney et al, 2019).

Overall, this study suggests that indicators of student preparedness for interprofessional geriatric practice improve the most when didactic content is connected to experiential learning. It appears to be further enhanced when the number of opportunities to make this connection increases and when students are exposed to more professionally diverse teams. For optimal impact, educators may want to consider IPE programs that provide the experiences over a period of months, rather than a single IPE experience. From our study, it appears that any exposure has a positive impact, but there appear to be clear strategies that enhance outcomes.

An important aspect, we believe, of both the IPGC and SSPP programs is that they take place in the older adult's home or community. There, students may develop a more holistic understanding of the complex

lives of older adults and more clearly see the need for interprofessional care. This is consistent with studies of other community-based IPE programs (Conti et al 2016; *POGOe*-Portal of Geriatrics Online Ed. 2016, Reilly, 2021). Such contextual components are less readily learned in a clinical environment. Community-based experiences may also be more reproducible, as they do not require the placement of IPE into traditional medical training settings.

This study has several limitations. First, student competence was evaluated by self-report rather than objective measures. Second, we did not statistically test differences across programs (i.e., a difference in difference analysis) because the sample sizes were unbalanced, and very limited for students who completed multiple programs. Third, we did not have longitudinal data that would have illuminated whether improvements are sustained over time. Future studies should include a longitudinal component, ideally determining impact on post-graduation practice.

CONCLUSION

To meet the need for a health care workforce prepared care of older adults, we must identify the best ways to achieve this goal. The three models of geriatric IPE we studied improved student familiarity with other health disciplines. The modality that appeared to most improve familiarity with other disciplines *and* capability to do geriatric assessments was IPGC. It was a team-based program with a broad professional composition, delivered in home or community settings, with 20 hours of direct older adult curriculum and exposure. Whether these changes are lasting and have an impact as students move into professional roles, remains to be studied.

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DISCLOSURE

The authors declare that they have no relevant or material financial interest that relate to this research.

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