

Integrating an Interprofessional Geriatric Active Learning Workshop Into Undergraduate Medical Curriculum

Wanda Jirau-Rosalý¹, Shilpa P Brown¹, Elena A Wood^{1,2} 
and Nicole Rockich-Winston³ 

¹Department of Medicine, Medical College of Georgia, Augusta University, Augusta, GA, USA.

²Educational Innovation Institute, Augusta University, Augusta, GA, USA. ³Department of Pharmacology and Toxicology, Medical College of Georgia, Augusta University, Augusta, GA, USA.

Journal of Medical Education and
Curricular Development
Volume 7: 1–6
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2382120520923680



ABSTRACT

PURPOSE: The aging population in the United States poses a substantial challenge to our health care system, and particularly affects the training of physicians in geriatric care. To introduce undergraduate medical students to a variety of clinical skills and concepts emphasized in geriatrics, we created an interprofessional geriatric workshop and examined changes in student perceptions of working in interprofessional teams, knowledge regarding geriatric concepts, perceptions of the pre-work material, and suggestions for curricular improvement to enhance the workshop for future students.

METHODS: Second-year medical students participated in a 4-hour workshop with tasks that emphasized activities of daily living, geriatric physical assessment, end-of-life discussions, Beers Criteria, and a home health assessment. Pre- and post-surveys were administered including the Students Perceptions of Interprofessional Clinical Education–Revised (SPICE-R) survey and a knowledge assessment. Student perceptions of pre-work and overall program assessment were captured after the workshop. Descriptive statistics and paired *t* tests assessed for significant differences. Emerging themes were analyzed using the Glaser constant comparative method.

RESULTS: Of the 186 medical student participants, 178 students completed the SPICE-R survey, demonstrating significant increases in students' perceptions of the value of interprofessional education ($P < .001$). In addition, 111 students completed the pre- and post-test for the knowledge assessment, demonstrating significant gains in geriatric concepts ($P < .001$). Overall, most students perceived the pre-work as useful and felt prepared to evaluate geriatric patients. Open-ended question analysis supported results, in which 34 students indicated that they felt most comfortable performing a home health assessment and emphasized the usage of the home health simulation.

CONCLUSIONS: Introducing medical students to a variety of geriatric assessments and concepts in an interprofessional environment early in their career positively influences their perceptions of working as an interprofessional team member to deliver comprehensive care to older adults.

KEYWORDS: Interprofessional education, geriatric curriculum, pre-clerkship curriculum

RECEIVED: April 6, 2020. **ACCEPTED:** April 8, 2020.

FUNDING: The author(s) received no financial support for the research, authorship, and/or publication of this article.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CORRESPONDING AUTHOR: Wanda Jirau-Rosalý, Department of Medicine, Medical College of Georgia, Augusta University, 1120 15th St., Augusta, GA 30912, USA.
Email: wjiraurosaly@augusta.edu

Introduction

Many have recognized the critical need for increasing the number of geriatricians in the United States, especially considering that there were 37.8 million older adults in 2017, and by 2060, the number of older adults is projected to be over 94 million.^{1,2} As of 2017, there were 7279 certified geriatricians and only half are practicing full-time in the United States.³ Although pursuing certification as a geriatrician follows an internal or family medicine residency, it is imperative that we ensure that medical students receive exposure to the complexities of health care delivery to older adults. As emphasized recently by Flaherty and Bartels,⁴ our primary care workforce requires increased attention to geriatric training to improve care for older adults. Such experiences will not only increase interest toward the field but also prepare all medical students regardless of their specialty as most will care for an older adult.

In addition, the Association of American Medical Colleges (AAMC) has endorsed the minimum geriatric competencies

for medical students, which include the ability to manage medications, develop a self-capacity management plan evaluating functional abilities, assess safety risks in home environment, and conduct gait assessments.⁵ Recent literature has discussed the inclusion of home evaluations, simulation cases, and real-life patient encounters during the clerkship years of medical school (third and fourth year) or residency as means to meet the geriatric assessment standards outlined by AAMC.^{6–11} Although several studies have described activities and indicated improvements in students' perceptions of the geriatric population, many have occurred outside the United States^{12–15}; thus, comprehensive, geriatric workshops have not been emphasized or evaluated in medical students during pre-clerkship years.

In addition, interprofessional teamwork is essential for patient-centered care in older adults. The World Health Organization has emphasized the significance of training professionals in health care, stating that “[i]nterprofessional



education occurs when students from 2 or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.”¹⁶ Complex medication regimens, referrals to physical therapy, occupational therapy or other specialties, and in-home nursing in older adults have required the need for professionals across the spectrum of health care to improve patient outcomes. Recently, calls for expanded interprofessional opportunities to train the next generation of health care providers has been emphasized for the geriatric population.⁴

As such, our objective of this study was to introduce and apply geriatric care competencies by designing and evaluating an interprofessional workshop as part of the Physical Diagnosis course curriculum for second-year medical (M2) students. Our primary aim evaluated M2 students’ perceptions of interprofessional team interactions before and after a 4-hour geriatric workshop. Secondary outcomes included medical students’ knowledge of geriatric topics, perceptions of self-confidence regarding geriatric patient assessment, drug-related problems, and students’ evaluations of the pre-work content.

Methods

Study design

Our study involved a pre- and post-study design with data initially gathered for curriculum evaluation. Data from M2 student participants were collected through a series of survey instruments and activity worksheets. Data from fourth-year pharmacy (P4) students were not collected for 2 reasons: (1) the pharmacy students were invited as guests from another university system and (2) all data were gathered as a component of curriculum evaluation of the medical students for our required Physical Diagnosis course.

Setting

Second-year medical students at the Medical College of Georgia (MCG) and P4 students from the University of Georgia (UGA) attended and participated in a geriatric workshop in the Spring 2019 that was embedded in the medical curriculum Physical Diagnosis course. As aforementioned, this a required course that takes place in the first and second year of medical school and is designed to teach medical students the fundamentals of taking a comprehensive medical history and performing an accurate and comprehensive/focused physical examination, discussing the differential diagnoses and formulating a management plan. Students are oriented to upcoming sessions using flipped classroom methods, in which students have access to online material before each session to prepare adequately as a means to apply acquired knowledge and skills in a simulated environment. This study’s intervention is the first exposure to geriatric patient care in the pre-clerkship curriculum for medical students at MCG. Fourth-year pharmacy students have taken a similar applications-based course, occurring

in years 1 and 2 of UGA’s College of Pharmacy curriculum and been familiarized with polypharmacy, geriatric pharmacokinetics/pharmacodynamics, and the Beers Criteria.

Participants and eligibility criteria

All M2 students (N = 186) at MCG were eligible and required to participate in the geriatric workshop as a requirement for the Physical Diagnosis course. Pre- and post-session evaluations and surveys were voluntary for M2 students to complete. Pharmacy students were eligible to participate in the geriatric workshop if they were P4 students on rotation at the Augusta UGA campus. Fourth-year pharmacy students were not eligible to complete the pre- and post-session surveys due to their status as UGA students.

Procedure

In total, 186 M2 students participated in the geriatric workshop over a 4-day period. Students were divided into 6 groups each day, and the groups were named after one of the Activities of Daily Living (ADLs). Due to the limited number of P4 students who participated (n = 4), 1 group from each day was assigned a P4 student for all the workshop activities. For purposes of analyses, 32 M2 students experienced the workshop activities with a P4 student (interprofessional group), and 154 M2 students experienced the workshop activities without a P4 student (non-interprofessional group). On average, there were approximately 8 students per group.

Intervention

Similar to other sessions in the Physical Diagnosis course, students accessed pre-work resources including 2 videos demonstrating the Timed Up & Go (TUG) test and end-of-life discussion as well as handouts explaining the Montreal Cognitive Assessment (MoCA), the Mini-Mental State Examination (MMSE), and Beers Criteria, and the Home Health CDC (Centers for Disease Control and Prevention) booklet.¹⁷⁻²⁰

Table 1 provides details regarding the 6 activities and respective learning objectives. The first activity involved an interactive video with a student-driven game, with the goal to introduce and understand the concept of functional assessment. The video incorporated a standardized patient performing the 6 ADLs: eating, bathing, dressing, toileting, transferring, and hygiene.²¹ After each ADL presented in the video, the video was paused and student groups competed to identify the appropriate assistance equipment the patient could use. The second activity centered on a geriatric assessment, in which a geriatrician guided the students through the basics of how to perform a TUG test and MoCA test on a live geriatric patient. Next, students witnessed a live end-of-life discussion between the geriatrician and geriatric patient. The concepts of Beers Criteria, anticholinergic

Table 1. Description of activities and learning objectives.

ACTIVITY LEAD	SETTING	ACTIVITIES	LEARNING OBJECTIVES	TIME (MINUTES)
Geriatrician	Large group	Functional assessment (interactive video game)	Describe baseline and current functional abilities in an older patient according to ADLs	30
Geriatrician	Large group	Geriatric patient evaluation (live demo)	Recognize the complexities of evaluating and treating geriatric patients	30
Geriatrician	Large group	End-of-life demonstration (live demo)	Discuss advanced directives and health care proxies	30
Pharmacist	Large group	Pharmacotherapy/ medication management	Identify medications that should be avoided or used with caution in geriatric patients according to Beers Criteria	60
Pharmacist	Small group ^a	Pharmacotherapy/ medication management	Identify drug-related problems based on Beers Criteria and recommend pharmacotherapeutic changes	50
Geriatrician and internist	Small group ^a	Simulation of a homecare visit for a geriatric patient	Identify home safety issues in a geriatric patient's home	30
Geriatrician and internist	Large group ^a	Discussion of a homecare visit	Recognize fall risks and multidisciplinary approach to home health assessments and safety	20
All clinicians	Large group	Wrap up		10

Abbreviation: ADLs, activities of daily living.

^aRun simultaneously.

effects, and polypharmacy were emphasized with the students by discussing 3 clinical vignettes as an entire class, then breaking down into smaller groups to evaluate simulated cases within an educational electronic health record. For the latter activity, several groups teamed up with a pharmacy student to discuss the medication management of their respective simulated cases. Groups without a pharmacy student had the opportunity to request a clinical consult from a PharmD faculty member. The final activity involved a home assessment for safety risk in a simulation room, which was outfitted with several dozen possible risks. Student groups were tasked with identifying risks in a small apartment that included a living room area, kitchen, and bedroom.

A board-certified geriatrician led the first 3 activities of the workshop, the pharmacy-related activities were led and facilitated by a registered pharmacist, and the final activity was facilitated by the aforementioned geriatrician and an internal medicine physician for the remainder of the workshop (Table 1).

Instruments

Students' perceptions of interprofessional team-based care were assessed using the validated Students Perceptions of Interprofessional Clinical Education–Revised (SPICE-R) instrument.¹⁷ The SPICE-R is a 10-item instrument that assesses interprofessional teamwork (6 items), the roles and responsibilities of health care disciplines (2 items), and patient outcomes due to collaborative practices (2 items) using a 5-point Likert-type scale (1, strongly disagree and 5, strongly agree).¹⁷ All instruments measuring secondary outcomes were developed by the authors. Items were finalized through consensus among

W.J.-R., S.P.B., and N.R.-W., and peer-reviewed by a member of our Educational Innovation Institute (E.A.W.) for accuracy and appropriateness. Second-year medical student knowledge was assessed using the pre- and post-workshop test consisting of 8 single-correct, multiple-choice questions evaluating 4 areas of content: transitions of care, geriatric pathophysiology, Beers Criteria, and end-of-life discussions. During the session, student groups were also asked to identify drug-related problems and recommend changes for geriatric patient cases, which were collected and evaluated for accuracy. And finally, on the post-survey, the M2 students evaluated pre-workshop online content (3, very useful, 1, not useful), perceptions of their abilities (4, strongly agree, 1, strongly disagree) and overall satisfaction with the workshop. The pre- and post-workshop knowledge assessment and post-workshop evaluation responses were captured using the Qualtrics platform, while the SPICE-R pre- and post-workshop responses were distributed via paper before and after the workshop and responses were transcribed into SPSS v25.

Statistics

Descriptive statistics were used to describe means and respective standard deviations for primary and secondary outcomes. Paired *t* tests were used to evaluate pre- and post-study data collected from the SPICE-R instrument and the knowledge assessment. Differences between groups with a pharmacy student regarding SPICE-R data and correctly identifying drug-related problems were calculated using the Welch *t* test of unequal variance due to sample size variation. A *P* value < .05 was considered statistically significant. The effect size for SPICE-R was calculated as the mean difference divided by the

Table 2. SPICE-R results (n = 178).

SPICE-R STATEMENT	PRE-TEST (MEAN [SD])	POST-TEST (MEAN [SD])
Working with students from another health profession enhances my education	4.12 (0.71)	4.31 (0.71)*
My role within an interprofessional health care team is clearly defined	3.49 (0.84)	3.7 (0.82)*
Health outcomes are improved when patients are treated by a team that consists of individuals from 2 or more health professions	4.53 (0.62)	4.67 (0.67)*
Patient satisfaction is improved when patients are treated by a team that consists of individuals from 2 or more health professions	4.23 (0.74)	4.36 (0.76)*
Participating in educational experiences with students from another health profession enhances my future ability to work on an interprofessional team	4.11 (0.83)	4.26 (0.89)*
All health professional students should be educated to establish collaborative relationships with members of other health professions	4.32 (0.72)	4.49 (0.72)*
I understand the roles of other health professionals within an interprofessional team	3.21 (0.91)	3.71 (0.96)*
Clinical rotations are the ideal place within their respective curricula for health professional students to interact	3.79 (0.82)	4.08 (0.83)*
Health professionals should collaborate on interprofessional teams	4.4 (0.67)	4.53 (0.63)*
During their education, health professional students should be involved in teamwork with students from other health professions to understand their respective roles	4.17 (0.72)	4.35 (0.72)*
Total	4.05 (0.47)	4.25 (0.57)*

Abbreviation: SPICE-R, Students Perceptions of Interprofessional Clinical Education–Revised.

* $P < .001$.

standard deviation of the differences (Cohen d). All analyses were calculated using SPSS Version 25 (IBM Corp. Armonk, NY). Themes from open-ended questions were developed using the Glaser²² constant comparative method.

Ethical issues

This study was approved by Augusta University Institutional Review Board. Data were collected as a component of regular curriculum evaluations, and M2 students submitted all data voluntarily. Anonymity of the data were maintained through de-identification and stored over a secure server.

Results

For the SPICE-R survey (Table 2), 178 students submitted completed results, and post-session scores demonstrated a significant ($P < .001$) increase in M2 students' perceptions of the value of interprofessional education (pre-session, 4.05 vs post-session, 4.25). In addition, each element within the SPICE-R survey demonstrated significant increases across all medical students, and the statement regarding the roles of health professionals within a team increased the most overall (0.5 increase). Although the differences between these 2 groups were significant, the effect size was small to medium (Cohen $d = 0.43$). The difference between groups with a pharmacy student (pre-test mean = 4, SD = 0.51; post-test mean = 4.34, SD = 0.48) trended toward significance ($P = .08$). On the contrary, interprofessional groups identified and recommended significantly more drug-related problems in the patient cases,

identifying an average of 8.7 correct drug-related problems as compared with 4.1 in groups that did not include a pharmacy student ($P < .001$).

In total, 111 (60% response rate) students completed both the pre- and post-test knowledge assessment. Post-test results demonstrated a statistically significant ($P < .001$) improvement compared with pre-test scores, as illustrated in Table 3 (71% correct vs 68% correct, respectively). Questions related to the topic to the Beers Criteria demonstrated the most significant gains (pre-test 0.62 vs post-test 0.66, $P < .001$).

Overall, most students reviewed pre-work material and perceived the content as useful, as demonstrated in Table 4. Of those who viewed the Beers Criteria guidelines, they felt this resource as the most useful for the activities. After the session, students felt prepared to perform a variety of geriatric assessments and evaluations and indicated they felt most comfortable performing a home health visit (Table 5). This was reflected in our open-ended question analysis, in which 34 students indicated how the home health visit simulation was very useful and well received.

Discussion

To our knowledge, this research study is the first to design and evaluate an interprofessional geriatric workshop in pre-clerkship medical students that integrated pharmacy concepts, including the Beers Criteria. As the literature has indicated, an interprofessional team approach is crucial for patient-centered care that provides continuity throughout the stages of aging. Providing the opportunity to pre-clerkship medical students to

Table 3. Geriatric knowledge assessment (n = 111).

TOPIC	MEAN PRE-TEST (% CORRECT)	MEAN POST-TEST (% CORRECT)
Transitions of Care	0.44	0.37
Geriatric Pathophysiology	0.80	0.78
Beers Criteria	0.62	0.66*
End-of-Life Discussions	0.94	0.97*
Total (Mean [SD])	0.68 (0.21)	0.71 (0.23)*

* $P < .001$.**Table 4.** Use and value of pre-work material (n = 111).

RESOURCES	REVIEWED MATERIAL, N (%)	USEFULNESS
Timed Up & Go Test	64 (58%)	2.28
Geriatric Pathophysiology	80 (72%)	2.38
Beers Criteria	76 (68%)	2.41
End-of-Life Discussions	43 (39%)	2.02
End-of-Life Discussion Video	52 (47%)	2.25

Table 5. Students' perceptions of abilities (n = 111).

AFTER THE GERIATRIC SESSION, I AM EFFECTIVELY ABLE TO . . .	POST-SESSION (MEAN [SD])
Perform a functional assessment	3.00 (0.61)
Perform an initial evaluation on a geriatric patient	2.99 (0.62)
Lead an end-of-life discussion	2.89 (0.63)
Evaluate pharmacotherapy regimens according to Beers Criteria	2.93 (0.79)
Perform a home health visit	3.21 (0.69)

experience the merits and value of other health professions, and in the case of our study, pharmacy students, will train students to seek out these professionals in such settings. Our study demonstrates an increase in geriatrics knowledge and efficiency in identifying drug-related problems in older adults. In addition, M2 students perceived themselves as having effective skills to perform an initial evaluation, functional assessment, lead an end-of-life discussion, and perform a home health visit for older adult patients. Despite having a high baseline value, our study demonstrated an increase of interprofessional skills. We expected our students to score relatively high at baseline regarding interprofessional education due to previous sessions with dental students and prior volunteering experiences with interprofessional student-led clinics.

Our findings build on previous work that has demonstrated improvements in knowledge, clinical skills, and empathy among undergraduate and graduate medical trainees.⁶⁻¹⁵ In particular, studies designed to evaluate the perceptions of medical and pharmacy students have demonstrated a positive

influence of interprofessional activities with respect to geriatric medicine. Shrader et al²³ described an in-home interview and medication history activity with local volunteers, in which students were assessed on attitudes toward other health professionals before and after the experience, demonstrating gains in the importance in collaboration. The impetus for medical students to understand the complexities of geriatric patients, especially medication management, is crucial, particularly because a recent systematic review revealed a median of only 2 hours dedicated to geriatric pharmacology and a lack of overall effectiveness in medical schools.²⁴ With respect to pharmacy education literature, studies have similarly reported increases in knowledge and positive attitudes toward geriatric patients after interprofessional experiences, and programs here in the United States and abroad have indicated that geriatric topics are included across the curriculum.²⁵⁻²⁷

As the population of the United States continues to age and life expectancy increases, introducing clinical skills crucial for caring for geriatric patients early in the career trajectory of

medical students is essential in influencing their future professional tracks. Providing opportunities to medical students to develop these critical skills should translate not only into trainees excelling in residency competencies but also positively influence their future expertise. End-of-life discussions (advance directives), medication management, and maintaining collaborative interprofessional relationships are foundational for all medical specialties. Based on our experience, the team should include 1 pharmacist, 1 geriatrician, and 1 or more internists to run the hands-on experience successfully. In addition, collecting pre- and post-study data should be distributed among in-class (SPICE-R and drug-related problem identification) and outside of the workshop (knowledge assessment, workshop evaluation).

Although this study demonstrated significant differences in knowledge and attitude toward interprofessional education, there are several limitations. The study did not include evaluation of attitudes toward geriatric patients. Furthermore, we had planned to include more pharmacy students but due to scheduling changes, not all groups were able to collaborate with pharmacy students. In addition, post-evaluations survey response rate was 60% as these were sent out by email and were not mandatory. Thus, our results should be interpreted with caution as students who have favorable perceptions of geriatric medicine may have been more likely to answer the post evaluations and our effect size was small to medium (Cohen $d=0.43$). In addition, limitations of our study include evaluating 1 academic year of M2 students at a single institution, which limits the generalizability. Although we had hoped to include other health professions, scheduling conflicts limited our Spring 2019 session to pharmacy students. As such, we have planned a revised geriatric session, incorporating occupational and physical therapy students, and will increase the number of pharmacy students who will be involved. This upcoming session will also be designed and led by the faculty from the various professions to improve understanding of the roles of different health care professions. Upcoming future sessions will evaluate attitudes toward geriatric patients and empathy through hands-on clinical stations.

Conclusions

Our findings demonstrate that a workshop integrating activities that encompass geriatric care results in significant improvement in perceptions of the value of interprofessional education and knowledge, perceptions, and confidence in performing geriatric assessments.

Author Contributions

WJ-R, SPB, EAW, and NR-W contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

ORCID iDs

Elena A Wood  <https://orcid.org/0000-0003-1231-8473>
Nicole Rockich-Winston  <https://orcid.org/0000-0002-2898-4393>

REFERENCES

1. Ford CR, Brown CJ, Sawyer P, Rothrock AG, Ritchie CS. Advancing geriatric education: development of an interprofessional program for health care faculty. *Gerontol Geriatr Educ*. 2015;36:365-383.
2. Administration for Community Living, U.S. Department of Health and Human Services. 2018 profile of older Americans. <https://acl.gov/sites/default/files/Aging%20and%20Disability%20in%20America/2018OlderAmericansProfile.pdf>. Updated April 2018. Accessed September 30, 2019.
3. American Geriatrics Society. Current number of board certified geriatricians by state. https://www.americangeriatrics.org/sites/default/files/inline-files/Current%20Number%20of%20Board%20Certified%20Geriatricians%20by%20State_3%206%2018.pdf. Updated March 2018. Access September 30, 2019.
4. Flaherty E, Bartels SJ. Addressing the community-based geriatric healthcare workforce shortage by leveraging the potential of interprofessional teams. *J Am Geriatr Soc*. 2019;67:S400-S408.
5. Leipzig RM, Granville L, Simpson D, Brownell Anderson M, Sauvigne K, Soriano RP. Keeping granny safe on July 1: a consensus on minimum geriatric competencies for graduating medical students. *Acad Med* 2009;84:604-610.
6. Golden AG, van Zuijlen MH, Mintzer MJ, Issenberg SB, Silverman MA, Roos BA. A fourth-year medical school clerkship that addressed negative attitudes toward geriatric medicine. *J Am Geriatr Soc*. 2010;58:746-750.
7. McCrystle SW, Murray LM, Pinheiro SO. Designing a learner-centered geriatrics curriculum for multilevel medical learners. *J Am Geriatr Soc*. 2010;58:142-151.
8. Sutin D, Rolita L, Yeboah N, Taffel L, Zabar S. A novel longitudinal geriatric medical student experience: using teaching objective structured clinical examinations. *J Am Geriatr Soc*. 2011;59:1739-1743; quiz 1743-1744.
9. Moran WP, Zapka J, Iverson PJ, et al. Aging Q3: an initiative to improve internal medicine residents' geriatrics knowledge, skills, and clinical performance. *Acad Med*. 2012;87:635-642.
10. Atkinson HH, Lambros A, Davis BR, et al. Teaching medical student geriatrics competencies in 1 week: an efficient model to teach and document selected competencies using clinical and community resources. *J Am Geriatr Soc*. 2013;61:1182-1187.
11. Jurivich DA, Bande D, Theige D, et al. Integrating geriatrics knowledge into a medical student clerkship using Twitter poll. *J Am Geriatr Soc*. 2018;66:2389-2393.
12. Haque AF, Soong DG, Wong CL. Assessing the impact of a geriatric clinical skills day on medical students' attitudes toward geriatrics. *Can Geriatr J*. 2014;17:12-15.
13. You P, Leung M, Xu VYY, et al. Pre-clerkship observerships to increase early exposure to geriatric medicine. *Can Geriatr J*. 2015;18:225-230.
14. Koh GCH, Ling CLH, Ma BHM, et al. Effect of a new longitudinal interprofessional geriatric medicine educational track on knowledge and attitude of medical students: a controlled cohort study. *J Am Geriatr Soc*. 2015;63:558-564.
15. Lucchetti ALG, Duarte BSVF, De Assis TV, Laurindo BO, Lucchetti G. Is it possible to teach geriatric medicine in a stimulating way? Measuring the effect of active learning activities in Brazilian medical students. *Australas J Ageing*. 2019;38:e58-e66.
16. World Health Organization. Framework for action on interprofessional education and collaborative practice. https://www.who.int/hrh/resources/framework_action/en/. Updated 2010. Access September 30, 2019.
17. Centers for Disease Control and Prevention. Timed Up & Go (TUG). https://www.cdc.gov/steady/pdf/TUG_Test-print.pdf. Updated 2017. Accessed September 30, 2019.
18. Nasreddine Z. Montreal Cognitive Assessment (MoCA). <https://www.mocatest.org/paper/>. Updated 2004. Accessed September 30, 2019.
19. Tombaugh TN, McIntyre NJ. The mini-mental state examination: a comprehensive review. *J Am Geriatr Soc*. 1992;40:922-935.
20. American Geriatrics Society Beers Criteria® Update Expert Panel. American Geriatrics Society 2019 Updated AGS Beers Criteria® for potentially inappropriate medication use in older adults. *J Am Geriatr Soc*. 2019;67:674-694.
21. Prizer LP, Zimmerman S. Progressive support for activities of daily living for persons living with dementia. *Gerontologist*. 2018;58:S74-S87.
22. Glaser BG. The constant comparative method of qualitative analysis. *Soc Probl*. 1965;12(4):436-445.
23. Shrader S, Hummel H, Byrd L, Wiley K. An interprofessional geriatric medication activity within a senior mentor program. *Am J Pharm Educ*. 2013;77:15.
24. Keijsers CJPW, Van Hensbergen L, Jacobs L, et al. Geriatric pharmacology and pharmacotherapy education for health professionals and students: a systematic review. *Br J Clin Pharmacol*. 2012;74:762-773.
25. Haddad AR, Coover KL, Faulkner MA. Development and incorporation of an interprofessional experience into a geriatric pharmacy elective: the first-year experience. *Curr Pharm Teach Learn*. 2011;3:116-122.
26. Felton MA, Jarrett JB, Meyer SM. Geriatric care curriculum in US PharmD programs: what's happening. *Curr Pharm Teach Learn*. 2017;9:504-509.
27. Zolezzi M, Sadowski CA, Al-Hasan N, Gad Alla O. Geriatric education in schools of pharmacy: students' and educators' perspectives in Qatar and Canada. *Curr Pharm Teach Learn*. 2018;10:1184-1196.