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## Implementing Nutrition Education into Physician Assistant Curriculum; What is the Best Method?

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Implementing Nutrition Education into Physician Assistant Curriculum; What is the Best Method?

Implementing Nutrition Education into Physician Assistant Curriculum; What is the Best Method?

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Doctor of Medical Science Program

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DMSc 730A: Advanced Research Project III

Implementing Nutrition Education into Physician Assistant Curriculum; What is the Best Method?

**TITLE:**

The title for this scholarly project is: Implementing Nutrition Education into Physician Assistant Curriculum; What is the Best Method?

**ABSTRACT:**

**Purpose:** The primary purpose of this article is to review an effective to implement nutrition education within an already established PA curriculum.

**Method:** The search strategy was devised in consultation with a university medical librarian. Five databases were searched and included PubMed, EBSCO, SCOPUS, Google Scholar and Education Source. The literature search was conducted using subject headings (MeSH), as well as words and phrases, including but not limited to nutrition education, graduate medical education, medical students, physician assistant, nutrition curriculum, lifestyle medicine, culinary medicine and education assessment. The search was conducted from February 2022 through July 2022 and was limited to articles pertaining to US medical and PA schools from 2016 onward. Fourteen pertinent articles were retrieved and will serve as the basis for this article.

**Results:** Currently, ample research has been conducted which shows the inadequacy of nutrition education within graduate medical education. However, there is little research regarding the best practice for implementation of nutrition education within the PA curriculum. Lifestyle Medicine appears to be a promising avenue for this deficit.

**Conclusion:** Nutrition curriculums are varied and heterogeneous among graduate medical education programs. However, there is good evidence to show that the inclusion of a nutrition curriculum within a lifestyle medicine curriculum are an effective way to improve competencies regarding nutrition education. Despite the evidence of how to best provide nutrition education,

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there is little information regarding the appropriate timing of such curriculum as well as a standardized assessment of knowledge. These parameters remain an area of continued research.

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### **INTRODUCTION:**

A healthy lifestyle is a well-recognized component of preventative medicine, and chronic conditions such as heart disease, diabetes and cancer are largely preventable with the implementation of healthy lifestyle parameters such as healthy eating, tobacco cessation, physical activity and limiting alcohol intake.<sup>1</sup> Primary care providers, including physician assistants (PA), are uniquely positioned to elicit improvements in nutrition behavior and reduce risk factors in individuals with lifestyle-related chronic disease, as well as be powerful role models for behavior change.<sup>2</sup> However, most healthcare professionals are not adequately trained on nutrition-related issues and often rely on referrals to nutrition experts such as a registered dietitian nutritionist (RDN).<sup>3</sup> Despite support and interest by medical providers for RDN care, there remain significant barriers to RDN services including the uncertainty in how and whom to connect with for RDN services and the potential cost for the patient.<sup>3</sup> The irrefutable role of nutrition and a healthy lifestyle in disease prevention, management, and treatment coupled with barriers to RDN services has resulted in increased attention by medical schools to implement nutrition training into their curriculum.<sup>4,5</sup> With nutrition education programs being successfully implemented in medical schools,<sup>6</sup> PA educators must determine whether nutrition education is adequate within their program and if it is not, how do they best implement it? PAs are expected to counsel and educate patients regarding the prevention of chronic disease as set forth by standards of education set by the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA).<sup>7</sup> Though “nutrition” is not explicitly stated in the ARC-PA accreditation standards, many of the competencies required during the didactic year implicitly require foundational knowledge and skills in behavior assessment and patient education.<sup>4</sup> For example, all accredited PA programs are required to provide “instruction about basic counseling

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and patient education skills that are patient centered, culturally sensitive and focused on helping patients adhere to treatment plans [and] modify their behaviors to more healthful patterns (B2.12).” An additional required competency states programs “*must* include instruction in patient evaluation, diagnosis and management...including: patient education and referrals.<sup>7</sup> A complete representation of the ARC-PA accreditation standards for didactic curriculum is represented in Table 1. This paper will aim to review different methods of curriculum development with regards to nutrition education.

### **CURRENT STATE OF NUTRITION EDUCATION IN PA SCHOOL**

Nutrition plays an important role in nearly all physiologic processes and relates to the prevention and management of many chronic disease processes. It has traditionally been poorly integrated into medical school curriculum via systems-based didactic coursework with an average of <20 contact hours despite recommendations by the National Academy of Sciences of 25 hours and the American Society for Nutrition of 44 hours.<sup>8</sup> A systematic review by Crowley et al.<sup>9</sup> showed that nutrition is insufficiently incorporated into medical education, regardless of country, setting, or year of medical education, and that the education provided was inadequate in developing confidence in providing nutrition care despite the perceived importance of nutrition education, especially as it relates to chronic disease.<sup>10</sup> Furthermore, a scarcity of faculty for teaching nutrition and limited collaboration with nutrition professionals has been a continued barrier to the implementation of nutrition education within graduate medical education.<sup>5</sup> In a 2022 survey, Wolf et al.<sup>10</sup> further showed that working PAs are dissatisfied with the nutrition education that was provided during their training as a PA student and what is provided for continuing education following graduation.<sup>10</sup> Interestingly, they also found that graduates in the past ten years reported a greater dissatisfaction than PAs with over 21 years of experience.<sup>11</sup> With the current state of

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nutrition education curriculum across PA programs widely unknown,<sup>11</sup> and the last study explicitly looking at program curriculum having been completed in 1985,<sup>9</sup> one has to wonder about the quantity and quality of nutrition education being provided presently to PA students. Additionally, there is no consensus on the required level of nutrition knowledge for either medical students or PA students.<sup>10</sup> This leads to challenges in determining the curriculum as well as how to appropriately assess student knowledge. Furthermore, with regard to PA school education, there are perceived challenges to implementing additional coursework into an already intense course load. Given the lack of standardization in nutrition competencies, a curriculum built on the tenets of Lifestyle Medicine has been proposed as an alternative to a systems-based didactic curriculum. Lifestyle Medicine, as its own definition by the American College of Lifestyle Medicine, is defined as “the evidence-based practice of helping individuals and families adopt and sustain healthy behaviors that affect health and quality of life”.<sup>4</sup> Lifestyle Medicine places a relatively large emphasis on nutrition however provides guidance on other core competencies that are in line with the CDC Healthy People 2030. These include smoking cessation, physical activity, and reducing risky alcohol use. With both strong scientific support and PA student interest in learning, a Lifestyle Medicine-based curriculum offers a unique education opportunity for PA schools to implement nutrition education.<sup>11</sup> Improvement of diet could potentially prevent one in every five deaths globally and there is a potential for doctors and other first-line healthcare providers, including PAs, to support nutrition care as they are often the first point of contact for patients.<sup>2</sup> Despite the growing body of evidence regarding the impact of nutrition on the prevention and management of chronic disease, PAs outside of specialty care such as emergency medicine, critical care and wound care, report a greater dissatisfaction with regards to the nutrition education they received.<sup>10</sup> Lifestyle Medicine offers a unique opportunity

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for PA programs to implement nutrition education while also focusing on other required competencies, such as tobacco cessation, stress management, physical activity, and alcohol reduction evidenced by ARC-PA Standards B2.11, B2.12, B2.15 (Table 1).<sup>7</sup> Lifestyle Medicine competencies for physicians have been previously established, and include knowing the evidence of lifestyle behaviors on health outcomes and collaborating with patients to develop action plans, including a lifestyle prescription.<sup>11</sup> In addition to the American College of Lifestyle Medicine education topics, The Goldring Center for Culinary Medicine (GCCM) at Tulane University School of Medicine has developed an evidenced-based nutrition curriculum. GCCM was created in 2012 as the world's first culinary medicine program with the goal of addressing the cardiovascular disease epidemic through sustainable, scalable culinary medicine education.<sup>6</sup> Through collaboration with 45+ medical schools, they developed the Cooking for Health Optimization (CHOP) curriculum that consists of 28 hours of instruction provided over eight classes and includes pre-class lecture videos, hands-on cooking classes, and post-class problem-based learning sessions, and has been successfully implemented in over 20 US medical schools.<sup>6</sup> The CHOP study has provided robust evidence that hands-on cooking and nutrition education compared to traditional medical school curriculum improves student competencies in nutrition as well as improving the students own diet and lifestyle behaviors.<sup>6</sup> It therefore stands to reason that similar competency skills should be upheld and curriculum development addressed for physician assistants as they are frequently primary care providers for patients. Despite the literature suggesting poorly perceived competencies of PA students with regards to nutrition education, coupled with student desire to learn more, there is a minimal amount of evidence regarding how to effectively fit Lifestyle Medicine into PA curriculum.<sup>2,4,9-12</sup>



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## **LIFESTYLE MEDICINE IN PA SCHOOL**

With substantive evidence supporting Lifestyle Medicine in both the prevention and reversal of chronic disease,<sup>11</sup> the implementation of such a curriculum in an already intensive academic schedule must be addressed. To date, there have been three pilot studies conducted on the provision of a nutrition and Lifestyle Medicine based education curriculum to PA students which will be reviewed here and are further represented in Appendix 1. The three studies were conducted during the time from of 2016-2021 and were provided to students in various stages of PA education; Keyes et al.<sup>13</sup> focused on a didactic curriculum for all first-year students, Wetherill et al.<sup>4</sup> aimed for the month between didactic and clinical year for all students and lastly Stauffer et al.<sup>12</sup> reviewed a nutrition and Lifestyle Medicine elective offered to second-year students while completing a rotation in Physical Medicine and Rehabilitation (PM&R). All programs developed a curriculum with the American College of Lifestyle Medicine core competencies in mind<sup>4,12,13</sup> while one also implemented a culinary medicine component from GCCM<sup>4</sup> and another was co-developed using Veteran Affairs Whole Health (VA-WH) program as the clinical rotation was held within the VA clinical system.<sup>12</sup> All curriculums were limited to 4-5 weeks and lectures were either in-person<sup>13</sup> or pre-recorded and viewed virtually.<sup>4,12</sup> Two of the three programs included an experiential culinary component and, not surprisingly, these were the two programs whose curriculum was delivered outside of the rigorous didactic year.<sup>4,12</sup> Student assessment by the programs included a variety of modalities including mock patient write ups,<sup>13</sup> role play interview of a peer,<sup>13</sup> small group critical thinking,<sup>13</sup> self-assessment of the delivery of the 5 A's (assess, advise, agree, assist, arrange),<sup>4</sup> assessment of personal behavior following a culinary medicine experience,<sup>12</sup> and a multiple choice test.<sup>12</sup> Despite the variations in curriculum, program delivery and assessment, all programs showed self-reported improved

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self-efficacy and competency with regards to nutrition education and improved confidence in providing nutrition counseling upon graduation and advancement into clinical practice.<sup>4,12,13</sup>

### **CONCLUSION**

Nutrition education provided within a lifestyle medicine curriculum may be an effective means to improve nutrition education for PA students. While the three studies reviewed all showed improved self-reported competency in nutrition education, their design, implementation, delivery and assessment were heterogeneous.<sup>4,12,13</sup> Despite the differences in the provision of the curriculum, there have been lessons learned about how to best provide nutrition education to PA students. PA educators should aim to make curriculums that are educationally and clinically relevant to the needs of PA students with the goal of chronic disease prevention and management, as identified in Lifestyle Medicine competencies. Given the substantive amount of information regarding nutrition, it can be overwhelming to educators to identify the most pertinent information. Lifestyle Medicine offers PA educators a framework for which to approach the development of such a curriculum. In addition to explicit nutrition education, the inclusion of interprofessional education is also vital to ensure PA students are well equipped to identify when a higher level of nutrition education is needed and appropriate referrals are made.<sup>14</sup> Collaboration with nutrition professionals within the community, such as RDNs, may be an option for programs to overcome barriers to available faculty to teach while also familiarizing students with various healthcare roles. Lastly, improving the skills, self-efficacy and attitudes of learners through skill development rather than pure knowledge gain has been shown to improve student confidence and sense of mastery in the task they performed.<sup>14</sup> With a robust amount of evidence to support the idea that healthcare providers with favorable health behaviors are more likely to counsel patients on lifestyle habits,<sup>2</sup> the inclusion of experiential learning, whether it is

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through role play, mock interviews, oral presentations or cooking classes, should be considered a vitally important part of curriculum development and is an important distinction between a Lifestyle Medicine trained recommendation and general health recommendations. Lifestyle Medicine helps provide students with the knowledge and ability to write a ‘prescription’ for health counseling that is generally provided in a broad context. An example of a Lifestyle Medicine competency is that learners are expected to collaborate with patients to develop action plans, including learning how to write a nutrition or physical activity ‘prescription’ instead of broadly telling a patient to improve their diet or physical activity.<sup>11</sup> Such collaboration with regard to lifestyle behaviors has been shown to help prevent and potentially treat many chronic diseases.<sup>11</sup> Though, a less cost-intensive didactic curriculum may diminish the established benefit of experiential learning increasing the financial requirements placed on students in relation to increased tuition and fees is also not desirable.<sup>2,4,6</sup> While no studies reported on total cost to either the program or to the students in the form of tuition increases or additional fees, the addition of a stand-alone nutrition course is likely to increase credit hours and thus cost to both students and programs. However, including nutrition and lifestyle medicine coursework through either already established didactic courses or clinical clerkships can help prevent additional costs.<sup>12,13</sup> Currently, there are no explicit ARC-PA requirements for PA programs with regards to nutrition education though standards B2.07, B2.08 and B2.12 are all potential options that could encompass a Lifestyle Medicine and nutrition curriculum.<sup>7</sup> However, without formal requirements set by ARC-PA for nutrition education, it remains unlikely that such a curriculum will be added to the majority of PA programs and those that do will lack formal guidance on curriculum development. Additionally, it is important for those designing PA education curriculum to know that a recent study of working PA’s reported that they had an overall

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dissatisfaction with the nutrition education they received during their education.<sup>10</sup> Interestingly, despite the overall dissatisfaction, many reported a slight increase in knowledge areas pertaining to the role of nutrition in bone health and vitamin D, nutrition for diabetes and sodium consumption for hypertension.<sup>10</sup> Though not much is known about the current state of nutrition education within PA programs, this information seems to reflect that some manner of education regarding these topics is already being provided, whether directly by PA programs or through postgraduate continuing education. With substantive evidence to support Lifestyle Medicine as well as a strong desire of PA students to learn,<sup>11</sup> Lifestyle Medicine offers a unique opportunity for PA programs to build upon their current curriculums with a formal, evidence-based curriculum to holistically address the needs of patients with regards to chronic disease prevention, treatment, and management. Such a curriculum can be provided in a variety of ways, as reviewed in the presented studies,<sup>4,12,13</sup> with consideration for individual program needs, the community they serve, cost to students, time constraints, and available faculty and resources.

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### REFERENCES

1. Leading health indicators. Leading Health Indicators - Healthy People 2030.  
<https://health.gov/healthypeople/objectives-and-data/leading-health-indicators>. Accessed June 15, 2022.
2. Crowley J, Ball L, Hiddink GJ. Nutrition in medical education: a systematic review. *Lancet Planet Health*. 2019;3(9):e379-e389. doi:10.1016/S2542-5196(19)30171-8
3. Sastre LR, Van Horn LT. Family Medicine Physicians' report strong support, barriers and preferences for registered dietitian nutritionist care in the primary care setting. *OUP Academic*. <https://academic.oup.com/fampra/article/38/1/25/5918283>. Published October 6, 2020. Accessed June 30, 2022.
4. Wetherill MS, Davis GC, Kezbers K, et al. Development and Evaluation of a Nutrition-Centered Lifestyle Medicine Curriculum for Physician Assistant Students. *Med Sci Educ*. 2018;29(1):163-172. Published 2018 Dec 6. doi:10.1007/s40670-018-00655-4
5. Lepre B, Mansfield KJ, Ray S, Beck E. Reference to nutrition in medical accreditation and curriculum guidance: A comparative analysis. *BMJ nutrition, prevention & health*. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8258055/>. Published March 8, 2021. Accessed June 30, 2022.
6. Monlezun DJ, Dart L, Vanbeber A, et al. Machine Learning-Augmented Propensity Score-Adjusted Multilevel Mixed Effects Panel Analysis of Hands-On Cooking and Nutrition Education versus Traditional Curriculum for Medical Students as Preventive Cardiology: Multisite Cohort Study of 3,248 Trainees over 5 Years. *Biomed Res Int*. 2018;2018:5051289. Published 2018 Apr 15. doi:10.1155/2018/5051289

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7. Syllabi, program competencies, learning outcomes & instructional objectives: Standards 5th edition. ARC-PA. Updated March 2022. Accessed June 22, 2022. <http://www.arc-pa.org/accreditation/resources/accreditation-manual/>
8. Frame LA. Nutrition, a Tenet of Lifestyle Medicine but Not Medicine?. *Int J Environ Res Public Health*. 2021;18(11):5974. Published 2021 Jun 2. doi:10.3390/ijerph18115974
9. Perkin JE, Crandall LA. A survey of nutrition education in curricula of physician assistant training programs. *Journal of Nutrition Education*. 1985;17(5):185-187. doi:10.1016/s0022-3182(85)80117-5
10. Wolf C, Mandel E, Peniuta M, et al. Do physician assistant training programs adequately prepare PAS to address nutritional issues in clinical practice? *Journal of Physician Assistant Education*. 2022;33(2):94-100. doi:10.1097/jpa.0000000000000426
11. Abreu A, Keyes S-AK, Faries MD. Physician assistant students' perceptions and competencies concerning lifestyle medicine. *Journal of Physician Assistant Education*. 2021;32(2):97-101. doi:10.1097/jpa.0000000000000355
12. Stauffer CM, McGlynn SM, Topor DR, Fiore L, Phillips EM. Evaluation of a Whole Health-Lifestyle Medicine Curriculum for Physician Assistant Students: a Mixed Methods Analysis. *Med Sci Educ*. 2021;32(1):57-61. Published 2021 Nov 18. doi:10.1007/s40670-021-01460-
13. Keyes SA, Gardner A. Educating physician-assistant students as agents of lifestyle medicine. *Clin Teach*. 2020;17(6):638-643. doi:10.1111/tct.13152
14. Mogre V, Scherpbier AJ, Stevens F, Aryee P, Cherry MG, Dornan T. Realist synthesis of educational interventions to improve nutrition care competencies and delivery by doctors and other healthcare professionals. *BMJ Open*. 2016;6(10). doi:10.1136/bmjopen-2015-010084

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**APPENDIX**

**Table 1**  
ARC PA *Standards*, 5<sup>th</sup> Edition

B1	Curriculum
B1.01	The curriculum <i>must</i> : a) be consistent with the mission and <i>goals</i> of the program, b) be consistent with program <i>competencies</i> , c) include core knowledge about established and evolving biomedical and clinical sciences and the application of this knowledge to patient care, and d) be of <i>sufficient</i> breadth and depth to prepare the student for the clinical practice of medicine.
B1.02	The curriculum design <i>must</i> reflect content and course sequencing that builds upon previously achieved student learning.
B1.03	For each didactic and clinical course (including <i>required</i> and <i>elective</i> rotations), the program <i>must</i> define and <i>publish</i> for students the following detailed information in syllabi or appendix to the syllabi: a) course name, b) course description, c) faculty instructor of record, d) course goal/rationale, e) <i>learning outcomes</i> and <i>instructional objectives</i> , in measurable terms that can be assessed, that guide student acquisition of required competencies, f) outline of topics to be covered that align with <i>learning outcomes</i> and <i>instructional objectives</i> , g) methods of student assessment/evaluation, and h) plan for grading.
B1.04	The program <i>must</i> ensure educational equivalency of course content, student experience and access to didactic and laboratory materials when instruction is: a) conducted at geographically separate locations, and/or b) provided by a different pedagogical and instructional methods or techniques for some students.
B2	Didactic Instruction
B2.01	While programs may require specific course(s) as prerequisites to enrollment, those prerequisites <i>must</i> not substitute for more advanced applied content within the professional component of the program.
B2.02	The curriculum <i>must</i> include instruction in the following areas of medical sciences and their application in clinical practice: a) anatomy, b) physiology, c) pathophysiology, d) pharmacology and pharmacotherapeutics, and e) the genetic and molecular mechanisms of health and disease.
B2.03	The curriculum <i>must</i> include instruction in clinical medicine covering all organ systems.
B2.04	The curriculum <i>must</i> include instruction in interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families and other health professionals.
B2.05	The curriculum <i>must</i> include instruction related to the development of clinical reasoning and problem-solving abilities.
B2.06	The curriculum <i>must</i> include instruction to prepare students to provide medical care to patients with consideration for: a) disability status or special health care needs, b) ethnicity/race, c) gender identity, d) religion/spirituality, e) sexual orientation, and f) social determinants of health.

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B2.07	The curriculum <i>must</i> include instruction in patient evaluation, diagnosis and management across all age groups and from initial presentation through ongoing follow-up, including: a) interviewing and eliciting a medical history, b) performing complete and focused physical examinations, c) generating differential diagnoses, d) ordering and interpreting diagnostic studies, e) patient management including acute and chronic care plans, and f) patient education and referral.
B2.08	The curriculum <i>must</i> include instruction in: a) the provision of medical care across the life span including prenatal, infant, children, adolescents, adults and elderly, b) preventive, emergent, acute, chronic, and rehabilitative patient encounters, c) pre-, intra-, and post-operative care, d) psychiatric/behavioral conditions, and e) palliative and end-of-life care.
B2.09	The curriculum <i>must</i> include instruction in clinical and technical skills including procedures based on then current professional practice.
B2.10	The curriculum <i>must</i> prepare students to work collaboratively in <i>interprofessional</i> patient centered teams. Instruction must: a) include content on the roles and responsibilities of various healthcare professionals, b) emphasize the team approach to patient centered care beyond the traditional physician-PA team approach, and c) include application of these principles in <i>interprofessional</i> teams.
B2.11	The curriculum <i>must</i> include instruction in the following areas of social and behavioral sciences and their application to clinical practice in: a) death, dying and loss, b) human sexuality, c) normal and abnormal development across the life span, d) patient response to illness or injury, e) patient response to stress, f) substance use disorders, and g) violence identification and prevention.
B2.12	The curriculum <i>must</i> include instruction about basic counseling and patient education skills that is patient centered, culturally sensitive and focused on helping patients: a) adhere to treatment plans, b) modify their behaviors to more healthful patterns, and c) develop coping mechanisms.
B2.13	The curriculum <i>must</i> include instruction to prepare students to search, interpret and evaluate the medical literature to include: a) framing of research questions, b) interpretation of basic bio statistical methods, c) the limits of medical research, d) types of sampling methods, and e) the use of common databases to access medical literature.
B2.14	The curriculum <i>must</i> include instruction about the business of health care to include: a) coding and billing, b) documentation of care, c) health care delivery systems, and d) health policy.
B2.15	The curriculum <i>must</i> include instruction in concepts of public health as they relate to the role of the practicing PA and: a) disease prevention, surveillance, reporting and intervention, b) the public health system, c) patient advocacy, and d) maintenance of population health.



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B2.16	The curriculum <i>must</i> include instruction in: a) patient safety, b) prevention of medical errors, c) quality improvement, and d) risk management.
B2.17	The curriculum <i>must</i> include instruction about the PA profession to include: a) credentialing, b) historical development, c) laws and regulations regarding professional practice and conduct, d) licensure and certification, e) the PA relationship with the physician and other health care providers, f) policy issues that affect practice, and g) professional organizations.
B2.18	The curriculum <i>must</i> include instruction in the principles and practice of medical ethics.
B2.19	The curriculum <i>must</i> include instruction in: a) intellectual honesty, b) academic integrity, and c) professional conduct.
B2.20	The curriculum <i>must</i> include instruction about provider personal wellness including prevention of: a) impairment and b) burnout.

**Table 2**

Author	Design and Participants	Curriculum Design	Outcomes Assess	Findings
Wetherill et al., <sup>4</sup> 2018 OU-TU School of Community Medicine PA Program	Surveys comparing second year students (n=23) who received LM education to second year students (n=24) who did not	<ul style="list-style-type: none"> <li>Delivered in the 4 weeks before clinical rotations began</li> <li>4-week, 2 credit hour curriculum</li> <li>Didactic lectures developed by a RDN using ACLM competencies with emphasis on nutrition including micronutrients, macronutrients, weight management, specific diets, food allergies, pediatrics, diet and inflammation, glycemic load, motivational interviewing and interprofessional teams</li> <li>Recommended readings from ACLM and GCCM</li> <li>Weekly cooking classes</li> <li>Weekly group case study written reflections and quiz</li> </ul>	Knowledge and confidence to apply modified 5 A's framework of lifestyle counseling for behaviors of nutrition, physical activity, weight, smoking cessation and alcohol use	Improved knowledge and confidence in all of the 5 A's for nutrition counseling ( $p=0.044$ to $0.01$ ) for students who received the intervention compared to those who did not
Keyes et al., <sup>13</sup> 2020, site not specified	Measure impact of LM curriculum on student confidence and applied skills related to LM. First year students (n=40)	<ul style="list-style-type: none"> <li>Delivered during didactic year of PA school</li> <li>4, 50-minute modules</li> <li>Curriculum developed based on ACLM core competencies and included nutrition, physical activity, stress management and smoking cessation.</li> <li>Nutrition competencies included prevention of cardiovascular disease, diabetes, hyperlipidemia, hypertension and cancer, national dietary guidelines, limitations of nutrition studies, shortfall nutrients of concern, dietary patterns associated with health outcomes, basic nutrition assessment and basic nutrition prescription.</li> </ul>	Prevention and lifestyle write up (PLWU) following a peer, role-play interview with assessment by an ACLM certified faculty. Critical thinking sessions to provide lifestyle prescription for a mock patient. Pre- and post-curriculum self-competency evaluation.	Improved student ability to write lifestyle behavior prescriptions for lifestyle 'vital signs' like nutrition, tobacco use and cardiovascular risk factor screening. Improvement in self-perceived competency related to LM, nutrition and physical activity prescriptions.

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<p>Stauffer et al.,<sup>12</sup> 2021, VA Boston Healthcare System (VABHS)</p>	<p>Assess outcomes of a LM curriculum that is augmented with the VA-WH approach to care that was provided to second year PA students (n=39) from six PA schools during a PM&amp;R clinical rotation</p>	<ul style="list-style-type: none"> <li>• Delivered during the 4-5 week PM&amp;R clinical rotations at VABHS</li> <li>• 12-hr curriculum embedded in PM&amp;R rotation</li> <li>• Curriculum developed using both LM and VA-WH competencies including physical activity, nutrition, behavior change and stress reduction.</li> <li>• Nutrition competencies not explicitly stated</li> <li>• Experiential learning components included personalized exercise session with a physical therapist, cooking class, observation of a certified health coach and motivational interviewing and sessions with a health coach</li> </ul>	<p>Students were required to give a post-rotation presentation, complete a pre- and post-rotation clinical vignette response and reflect on an attempted self-care behavior change. Students were not formally graded.</p> <p>Pre and post-rotation performance on a 54-question multiple choice test and a 9-item self-efficacy questionnaire</p>	<p>A paired <i>t</i> test comparing pre- and post-test total scores on a 54-item multiple choice test showed modest improvement in WH-LM knowledge (<math>p&lt;0.001</math>) and robust improvement in perceived ability to practice WH-LM (<math>p&lt;0.001</math>).</p>
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*OU-TU: Oklahoma University Tulsa, PA: Physician Assistant; LM: Lifestyle Medicine; RDN: Registered Dietitian Nutritionist; ACLM: American College of Lifestyle Medicine; GCCM: Goldring Center for Culinary Medicine; VA-WH: Veteran Affairs-Whole Health; PM&R: Physical Medicine and Rehabilitation*