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Where is the lifestyle medicine in the Canadian undergraduate medical education curricula? A content analysis

David Vaz,¹ Sarah Ibrahim,² Aleksandra Pikula¹ 

*Author information is provided in the back matter of this manuscript

Abstract

Background: Lifestyle Medicine (LM) focuses on preventing and managing non-communicable diseases (NCDs) through evidence-based behavioural and therapeutic interventions. Despite the established efficacy of LM, its integration into Canadian undergraduate medical education (UGME) remains largely unexamined.

Methods: We employed a deductive and inductive summative content analysis methodology. We collected publicly available course and program descriptions for each UGME program across Canada. Further, we contacted deans/curriculum leads for additional curriculum documentation. Documents were coded according to references to various domains of LM as defined by the American College of LM and British Society of LM.

Results: The sample comprised 13 UGME programs, with 1327 documents included for the final review. Notable variability across institutions was noted with reference to LM integration. LM topics were more frequently included in pre-clerkship and required courses compared to clerkship and electives. Notably, nutrition, mental wellbeing, and physical activity were most frequently referenced, while sleep health and social connectedness were less represented.

Conclusions: To our knowledge, this study is the first to formally map the current practices of LM integration in Canadian UGME. Although there were some study limitations (e.g., exclusion of 25% of Canadian UGME programs), this mapping is integral to identify the current state of the curricula and inform future educational initiatives to enhance medical trainees' LM-related knowledge and skills. This in turn, may potentially help address modifiable risk factors for NCDs and improve population health outcomes.

Où se situe la médecine du mode de vie dans les programmes d'études médicales de premier cycle au Canada ? Une analyse de contenu

Résumé

Contexte : La médecine du mode de vie (MdV) met l'accent sur la prévention et la prise en charge des maladies non transmissibles grâce à des interventions comportementales et thérapeutiques fondées sur les données probantes. Malgré l'efficacité reconnue de la MdV, son intégration dans les programmes d'études médicales de premier cycle (undergraduate medical education-UGME) au Canada reste largement inexplorée.

Méthodes : Nous avons utilisé une méthodologie d'analyse sommative du contenu combinant des approches déductive et inductive. Nous avons recueilli les descriptions des cours et des programmes accessibles au public pour chaque programme d'UGME à travers le Canada. De plus, nous avons contacté les doyens/responsables des programmes d'études afin d'obtenir des documents supplémentaires sur les programmes d'études. Les documents ont été codés en fonction des références à divers domaines de la MdV tels que définis par l'American College of Lifestyle Medicine (LM) et la British Society of LM.

Résultats : L'échantillon comprenait 13 programmes d'UGME, avec 1327 documents inclus dans la **révision** finale. Une variabilité notable entre les établissements a été observée en ce qui concerne l'intégration de la MdV. Les thèmes liés à la MdV étaient plus fréquemment inclus dans les cours précliniques et obligatoires que dans les stages cliniques et les cours optionnels. Il convient de noter que la nutrition, le bien-être mental et l'activité physique étaient les thèmes les plus fréquemment abordés, tandis que la santé du sommeil et les liens sociaux étaient moins représentés.

Conclusions : À notre connaissance, cette étude est la première à cartographier officiellement les pratiques actuelles d'intégration de la MdV dans les programmes canadiens de premier cycle. Bien qu'il y ait eu certaines limites à l'étude (par exemple, l'exclusion de 25 % des programmes canadiens de formation médicale préclinique), cette cartographie est essentielle pour identifier l'état actuel des programmes d'études et éclairer les futures initiatives éducatives visant à améliorer les connaissances et les compétences des stagiaires en MdV. Cela pourrait à son tour contribuer à réduire les facteurs de risque modifiables des maladies non transmissibles et à améliorer la santé de la population.

Introduction

The prevalence of non-communicable diseases (NCDs) such as heart disease and stroke are rapidly increasing worldwide and in Canada.^{1,2} Worldwide, NCDs account for over 70% of deaths each year.³ In Canada, one in two Canadians live with at least one NCD and 88% of all deaths are attributable to NCDs.¹⁻⁵ In addition to the substantial human cost, NCDs impose an annual cost of \$190 billion on the

Canadian economy.^{4,6-8} The etiology of NCDs is complex, though largely attributed to modifiable risk factors (MRFs),^{7,9} which are categorized into three classes: (i) *biological factors* (e.g. overweight, hypertension, dyslipidemia), (ii) *behavioural factors* (e.g. poor diet, physical inactivity, substance use), and (iii) *societal factors* which is a complex interplay of interacting cultural, environmental, socioeconomic, and structural parameters/determinants.³ These classes also have the potential to further exacerbate the risk of poor mental health.¹⁰ Neverthe-

less, MRF reduction is complex, and developing a pragmatic approach remains one of the key challenges to modern healthcare.¹¹⁻¹³

Lifestyle medicine

Lifestyle Medicine (LM) is an evidence-based discipline that aims to address NCDs through empowering patients to form and maintain health-promoting habits, while being mindful of patients' biopsychosocial contexts.¹¹⁻¹⁴ For this study, we used a broad definition of LM. In addition to the six pillars as definition by the American College of Lifestyle Medicine (ACLM - nutrition, physical activity, sleep, substance use, stress reduction, and social connectedness), we also integrated two additional domains from the British Society of Lifestyle Medicine (BSLM): knowledge on the social determinants of health, and behaviour change techniques (Figure 1).¹³

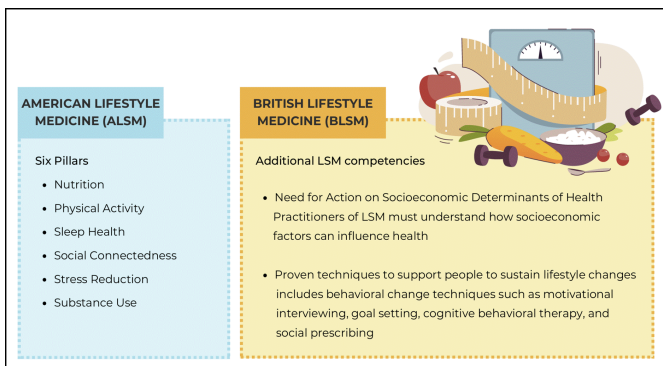


Figure 1. Comprehensive definition of LM used in this study (Adapted from the American College of LM and the British Society of LM).

Over the past 30 years, there has been accumulating evidence of the effect of lifestyle changes on NCDs.¹⁵⁻¹⁸ Landmark studies include: (1) the UK Biobank Study which found that adults practicing a healthy lifestyle (involving non-smoking, adherence to a healthy diet, body mass index <30 kg/m², and regular physical exercise) significantly reduced their stroke risk by an estimated two-thirds over a median follow-up of 7.1 years;¹⁶ (2) the Diabetes Prevention Program demonstrating a lifestyle-mediated intervention leading to a 58% diabetes risk reduction compared to a 31% risk reduction in those who only took metformin;¹⁷ and (3) the Lifestyle Heart Trial conducted in the 1980s which uncovered efficacious treatment and even reversal of coronary

artery disease through lifestyle intervention.¹⁸ As a result of these findings, LM was established as a specialty in 2004 with the formation of the American College of Lifestyle Medicine (ACLM).

Lifestyle medicine and education

While LM is a valuable adjunct to conventional practice, medical trainees and physicians feel ill-prepared to integrate this in their respective practice due to their limited LM-related knowledge and skills.¹⁹⁻²¹ This was illustrated in a USA-based survey ($n = 145$) which found that 90.5% of medical trainees rated their current LM knowledge as inadequate or poor, and 93% were interested in learning more.²⁰ Another Canadian study found comparable results, with 87.2% of medical trainees surveyed ($n = 933$) across nine UGME programs reporting that more nutrition education was warranted.²² Likewise, in a 2019 study ($n = 221$) that explored Canadian medical students' perceptions and motivations to recommend physical activity, trainees were highly motivated, however, reported a lack of confidence to educate and counsel patients on how to do so.²³

The integration of LM concepts in UGME has been increasing in the USA. For example, the ACLM began implementing Lifestyle Medicine Student Interest Groups (LMIGs) in UGME and graduate medical education levels.^{25,26} The LMIGs are student-led organizations with faculty advisors that offer a parallel preventive-health curriculum at individual schools. In the USA, over half (53%) of the medical programs have an associated LMIG, compared to only 12% of Canadian medical schools.²⁶ This is coupled with the development of a LM intensivist fellowship with the intent of expanding this throughout the USA in the coming years, which has not been echoed in Canada.²⁷ National organizations within the USA such as the American Heart Association, National Heart, Lung, and the Blood Institute have also presented curricular frameworks on LM for UGME.²⁵ Additionally, the ACLM recently spearheaded the redesign and modernization of LM in UGME through the creation of numerous resources—e.g. lesson plans, question banks, coordinating student-led LMIGs, and providing LM certifications for medical schools.²⁸

While extensive work is taking place on implementing LM curriculum in UGME in the USA, a paucity of literature and understanding of the current state of LM integration in the Canadian context exists beyond recently published guidelines by the Canadian Medical Association endorsing the prioritization of preventive health practices taught.^{24,25} The purpose of this study was to assess the current state and practices of LM integration in UGME programs in Canada.

Methods

Approach

This study utilized a content analysis methodology to examine LM in Canadian UGME curriculum documents.²⁹⁻³² More specifically, manifest content analysis was used, referring to both quantitative and/or qualitative description of explicit content as reported in written documentation and communication.³³ This methodology has been utilized in similar work that explored the extent to which women's health topics were integrated within Canadian UGME.²⁹ Manifest content analysis was selected over other possible qualitative approaches (e.g., thematic or discourse analysis) due to its structured nature and its alignment with the study's aim to assess explicit LM-related content in UGME programs. Deductive, summative, and inductive content analysis procedures were employed to organize the referenced LM content within categories (deductive), count/compare categories (summative), and analyze the qualitative aspects of the data (inductive).³⁰ There are no reporting guidelines for content analysis, however, the Standards for Reporting Qualitative Research was used.³⁴ Research ethics board approval was not required as the data were provided from publicly available sources. Additionally, school names and locations were deidentified to protect institutional privacy and ensure anonymization in the reporting of our study findings.

Eligibility

We included publicly available UGME curricula documents published in either the English or French language on the websites of schools listed by the Association of Faculties of Medicine of Canada

(AFMC) website (<https://www.afmc.ca/about/#faculties>). We considered satellite campuses as separate institutions if the curricula significantly differed from the main campus. *Documents* included information on webpages and downloadable content. *Program descriptions* included any document(s) which outlined overarching goals, objectives, aims, and themes of the UGME program, and *course descriptions* included outlines of learning objectives and lectures. Eligibility criteria were justified by consideration of information accessibility and consistency with prior literature.²⁹

About Canadian MD programs. Canadian UGME programs certify graduates with a Medical Doctorate (MD) degree, which is a prerequisite to completing medical residency in Canada. Canadian UGME programs admit matriculants after completing—at minimum—a recognized bachelor's degree program. Other admission requirements (e.g. MCAT score, Casper situational judgement test score) vary by program. The program length varies, with most being 4-year programs and two using an accelerated 3-year curriculum. The first half of these programs is called *pre-clerkship* and entails primarily in-class or case-based pedagogy to prepare students for *clerkship* - longitudinal clinical rotations through core and elective medical specialties. While core rotations are completed at one's home school or regional sites, electives can be completed at other medical institutions. Throughout their curriculum, UGME programs must prepare graduates for the Medical Council of Canada Qualifying Examination, and as such share a common framework for core competencies and aptitudes for graduates.²⁹

Searching

We used the navigation options on the respective UGME program websites to browse the curriculum documents between June 17, 2024, and July 31, 2024. Course descriptions were obtained either from the university academic/course calendars (2023/2024 academic year), or faculty/program webpages. The program descriptions and other potentially relevant content were downloaded as files and/or screen captures. When documents were available in French only, a validated online translation resource was used. A sample of 10% of translated documents were validated by a native French speaker to assess accu-

racy. To supplement the information gathered from the UGME program websites, we contacted deans, and curriculum leads across the country by email. The team introduced the study purpose, provided information on the anonymization process, and requested any additional curriculum documents not available on the respective school websites. We sent emails between June 26 and August 15, 2024, and two reminder emails to non-responders in three-week increments, totalling three attempts of contact. If schools did not have publicly available program/course information available, and if they did not respond to emails, they were excluded.

Data extraction and screening

Specific to each *school*, we extracted the following data: (1) type of document (e.g., course description, program overview); (2) the duration of the UGME program; and (3) additional programs offered (MD/PhD, MD/MSc, etc). Specific to the *course descriptions*, we extracted: (1) course title; (2) phase of training (pre-clerkship, clerkship); (3) type of course (e.g., required, elective); (4) instructional approach (e.g., didactic, case-based, or clinical); (5) delivery method (e.g., in-person, virtual), (6) direct quotations from LM-related learning objectives. Each document was coded according to a broad analytic framework for LM which aligns with the ACLM and BSLM's frameworks (Figure 1). Each course included was coded according to its mention of the following LM domains: (1) Social Determinants of Health, (2) Behaviour Change Techniques, (3) LM Pillar 1 - Nutrition, (4) LM Pillar 2 - Physical Activity, (5) LM Pillar 3 - Sleep Health, (6) LM Pillar 4 - Social Connectedness, (7) LM Pillar 5 - Mental Well-being/Stress Management, (8) LM Pillar 6 - Substance Use, (9) LM: Unspecified. The additional category of "LM: Unspecified" was added to accommodate general references to LM and/or preventive health without mention of a specific pillar (e.g., healthy living, health promotion, wellness, lifestyle modification).

Deductive coding occurred in two phases. First, as a pilot-test, DV (a medical trainee and research assistant) and SI (study PI, educator, and researcher) together reviewed 20 documents selected at random

from three schools. Second, DV acquired and screened all the documents and content for the remaining schools. Both DV and SI met on a weekly basis to discuss and resolve any uncertainties by discussion and reaching consensus. Furthermore, SI reviewed the data extraction at different phases of the project to ensure consistency and accuracy.

Data analysis

Summary statistics, using R version 4.3.2 were used to describe the (1) number of documents; (2) type of document; (3) type of course; and (4) specific LM pillar.³⁵ To understand the breadth of content within each LM domain, inductive coding was conducted using NVivo.³⁶

Results

Participants

As of October 2024, there were 18 UGME programs in Canada.³⁷ Of the 18 UGME programs: (1) five (27.7%) were excluded from the review due to the unavailability of sufficient curricular information; and (2) 10 (55.6%) schools responded to the email request of additional documents of which six (33.3%) sent additional curricular documents (LM curriculum maps, relevant learning objectives from coursework). Overall, we included 13 (76.4%) Canadian UGME programs in this review.

Search results

We retrieved 1327 curricula documents. Of the course descriptions reviewed, 687 were required (core) and 640 were elective courses. A total of 403 descriptions were from pre-clerkship, which is the first two years of a 4-year program or the first year and a half of a 3-year program. Additionally, 920 descriptions were from clerkship courses, that is the last two years of a 4-year program or the latter half of a 3-year program. The median number of curricular documents provided by each UGME program was 64 (range: 16-287) (Table 1). A description of the overall scale of the data set is presented in Table 1.

Table 1. Number of curriculum documents acquired by UGME program.

	Program Descriptions	Course Descriptions					
		Pre-clerkship		Clerkship		Longitudinal	Total N(%)
		Required	Elective	Required	Elective		
ME001	1	32	0	17	0	2	51 (3.84)
ME002	1	70	0	24	0	0	94 (7.08)
ME003	1	18	0	22	0	2	42 (3.17)
ME004	1	69	0	15	0	0	84 (6.33)
ME005	1	26	0	38	0	0	64 (4.82)
ME006	1	28	6	32	214	1	281 (21.18)
ME007	1	21	0	33	0	1	55 (4.14)
ME008	1	33	0	43	0	1	77 (5.80)
ME009	1	25	9	35	218	0	287 (21.63)
ME010	1	28	0	7	177	5	217 (16/35)
ME011	1	11	2	17	0	0	30 (2.26)
ME012	1	14	0	13	1	1	29 (2.19)
ME013	1	11	0	5	0	0	16 (1.21)
						Total	1327

LM details

Of all documents reviewed, 1.8% referenced a LM pillar or principle at least once. *Social determinants of health* as a domain was the most prevalent code ($n = 169$, 18.7%) with the second most prevalent being *Lifestyle Medicine: Unspecified* ($n = 64$, 7.1%). The latter category included broad references to “health promotion,” “preventive health”, or “lifestyle modification.” The least prevalent codes were *Sleep* ($n = 14$, 1.1%) and *Social Connectedness* ($n = 10$, 0.7%). Programs varied in proportion of documents referring to LM or related concepts from 2.3%-70.9%. 45% of included UGME programs (6/13) had direct references to 9/10 or 10/10 LM domains at least once. Pre-clerkship course descriptions were more likely to reference LM concepts (96/279, 34.4%, chi square 16.1, $p < 0.0001$) compared to clerkship courses (134/622, 21.5%). Furthermore, core course documents more frequently mentioned LM concepts (153/467, 32.8%, chi square 25.7, $p < 0.00001$) compared to elective course documents (77/433, 17.8%). This is coupled with LM content more likely included in courses with didactic/case-based components (278/821, 33.9%, chi square 21.43, $p < 0.000001$) compared to those with clinical components (132/590, 22.4%). Courses with virtual components were also more likely to include LM content (39/111, 35.1%, chi square 4.50, $p = 0.034$) compared to courses with in-person components (217/861, 25.2%). No significant findings were identified

on the integration of LM content with respect to the timing of courses scheduled in the semester/year (fall vs winter vs summer terms) (chi square 3.58, $p = 0.311$).

LM details

Overall, 1.8% of course documents referenced any component of our comprehensive LM definition. However, our qualitative review of LM-related learning objectives found variability in the referenced content, with many documents providing little specificity. Table 2 provides examples of brief and expanded learning objectives derived from our corpus. As an illustrative example, for the domain of stress management was: “describe healthy coping mechanisms to respond to stress” compared with a more detailed example of “identify common challenges faced by students in medical school...time management, financial stress, etc.” Similarly, for the domain of Behaviour Change Techniques, a brief learning objective included “use of motivational interviewing across disciplines” versus a more detailed example: “in a patient with poorly controlled diabetes, use effective educational techniques to advise about the importance of glycemic control through compliance, lifestyle modification, and appropriate follow-up and treatment.”

Table 2. Examples of descriptive versus brief LM-related learning objectives in Canadian UGME curriculum documents

LSM Pillar or Domain	Learning Objective(s)
Social Determinants of Health	“Discuss the social and physical environmental determinants of health for the patient, and potential Public Health & Preventive Medicine/population health interventions and organizations that you or your team could collaborate with to address these interventions” “Explain social determinants of health and their impact on health outcomes.”
Behaviour Change Techniques	“In a patient with poorly controlled diabetes, use effective educational techniques to advise about the importance of optimal glycemic control through compliance, lifestyle modification, and appropriate follow-up and treatment.” “Use of motivational interviewing across disciplines.”
Mental Wellbeing	“Advise patients about practical strategies for reducing stress and enhancing resilience, including the use of mind body therapies such as simple relaxation techniques, meditation and biofeedback.” “Discuss the promotion of mental health and components of healthy coping”
Substance Use	“This session focuses on the complex psychosocial issues that underlie addictions and is designed to complement your knowledge of the neurophysiological mechanisms of addiction. This session builds on your understanding of trauma as there is a strong connection between trauma and addiction.” “Describe individual and population level strategies to reduce tobacco consumption.”
Social Connectedness	“During this section, focus will be placed on diet/nutrition, physical activity, maltreatment awareness, psychological health and cultural connection, vaccination, dental health, sleep health, and impact of environment/climate change on health.” “Devise approaches for creating and maintaining support systems (personal, peer, and professional) in a safe and inclusive environment.”
Nutrition	“Explain the application of the Dietary Reference Intakes (DRIs) in clinical practice, become aware of age-specific nutrient recommendations including the tolerable upper limit (TUL), acceptable macronutrient distribution range (AMDR)...” “A basic understanding of the upper intake levels of nutrients to prevent adverse health effects.”
Sleep	“Describe changes of sleep patterns in normal aging, and in Alzheimer’s Disease” “Identify the role of lifestyle factors, including exercise, nutrition, and sleep hygiene in the management of mood and anxiety disorders”
Physical Activity	“Explain to how use the Get Active Questionnaire as a pre-screening tool to identify individuals who may require supervision or medical clearance before beginning exercise” “Define physical inactivity and list the benefits of regular exercise”
Stress Management	“Identify common challenges faced by students in medical school - dealing with conflict, imposter syndrome, dealing with failure and stress, dealing with illness and unwellness, time management conflicts, financial stress, etc.” “Demonstrate healthy coping mechanisms to respond to stress.”
LSM: Unspecified	“Introduce health promotion and disease prevention principles and activities appropriate to particular patient populations into the clinical encounter using evidence-based guidelines.” “Describe preventive lifestyle strategies in stroke and TIA.”

Discussion

There is great promise with LM addressing the rise of NCDs. Appreciating that physicians are in a unique position to support patients and lead efforts to reduce the burden of NCDs, this highlights the importance of better preparing them by integrating LM in UGME.³⁸ This study is the first, to our knowledge, to assess the extent to which LM is integrated in UGME programs in Canada. Overall, study findings suggest that LM concepts are being taught to some extent, though with deficiencies in clinical

course curricula, and with reference to sleep health and social connectedness

The study findings are consistent with the limited but growing literature in this field. For instance, a systematic review ($N = 32$) of current practices of LM-related education interventions in UGME programs worldwide showed that nutrition and physical activity were the most commonly included pillars.³⁹ However, smoking cessation, behavioural counselling, stress management, and sleep health were less well-integrated.³⁹ As an illustrative example, while UGME programs in the USA taught an average of 14.3 hours of nutrition content, sleep edu-

cation was noted to be <2.5 hours and about one-third of international schools sampled did not provide education on sleep.²⁵ Prior work suggests that these LM pillars are not as integrated in the curricula due to 1) *human resource factors* such as lack of knowledge among faculty to teach the topic and lack of administrative support; 2) *curriculum factors* in that there is “competition” with other topics for time and space in the curriculum; 3) *attitudinal factors* such as belief that these topics are not the responsibilities of physicians; and 4) *systemic factors* such as social, political, and/or commercial influences.²⁵ These challenges are commonly observed across the provinces and help explain the consistent patterns in the integration of LM in UGME programs nationwide. The challenges also reflect broader tensions around educational priorities, and the evolving boundaries of clinical responsibility and scope of practice, particularly for topics that intersect with public health, nutrition, social work and social determinants of health. Further to the limited integration of LM, findings from this study found vague curriculum objectives surrounding preventative health teaching that varied from program-to-program. While there is a flexible approach that allows schools to tailor their curricula to the specific health needs of their regional populations and institutional priorities, this approach risks not integrating a comprehensive picture of preventive health. Appreciating that 48% of Canadian-trained medical trainees leave their home school for residency (of which 46% match out-of-province⁴⁰), UGME programs should also be teaching about LM concepts that are not as relevant to their social context and more applicable in another settings/regions (Based on 2023 residency matching data).⁴⁰ This variability may inadvertently contribute to uneven preparedness among trainees.

The observed curriculum variability may stem from a lack of specificity on the level of the Medical Council of Canada (MCC) examination objectives, around which Canadian UGME programs are structured. For instance, the “Periodic health encounter/preventive health advice” MCC presentation could have several interpretations/implementations, as it requires learners being able to construct a management plan to (1) effectively community with patients to reach mutually agreed goals with patients related to disease prevention and risk reduction, and (2) recommend prevention strategies and lifestyle prac-

tices such as smoking cessation and engagement in physical activity.⁴¹ Other related MCC presentations vary in their specificity. For instance, the “Substance use or addictive disorders” presentation requires learners to utilize both pharmacologic and nonpharmacologic approaches for substance use disorders.⁴² However, the “Cerebrovascular accident and transient ischemic attack (stroke)” presentation briefly mentions that lifestyle and risk factor modification as a means to prevent such disorders.⁴³ Clarifying the expectations embedded in MCC objectives and standardizing how LM-related strategies are represented may facilitate more consistent integration of this content across UGME programs.

Integrating a new and evidence-based set of guidelines may not be as challenging as one would think. In 2010, the ACLM published a set of baseline LM competencies which have since been endorsed by the American Heart Association and other professional bodies. These competencies have since been revised with the latest update in 2022.^{44,45} Further, a 2024 Delphi study including registered dietitians, PhD nutrition scientists, and MD/DO physicians and educators collaborated to develop a list of competencies surrounding nutrition education in UGME.⁴⁶ Mapping these recently-developed competencies with MCC presentations could provide a standardized preventive health curriculum, and could aid UGME curriculum committees with implementing these changes moving forward. LM education must be delivered with nuance. Its emphasis on modifiable behaviours is both a strength and a limitation. However, without acknowledging the structural and social determinants of health that influence individual choices, there is a risk of reinforcing stigma or placing undue blame on patients. To avoid these pitfalls, LM education should equip trainees to recognize how social norms, systemic barriers, and implicit biases influence both health outcomes and clinical interactions. Without this broader framing, even well-intentioned LM efforts risk exacerbating health inequities in clinical practice.^{47,48}

Recommendations

The integration of curricula reforms in UGME, which often relies on long-standing education models and processes, may lead to challenges and tensions.³⁸ However, while noted gaps in the integra-

tion and practices of LM in UGME programs in Canada exist, the study findings highlight the potential and incremental changes that can be employed to better address these gaps. *First*, is curriculum mapping, which helps identify patterns, overlaps, and gaps in a structured manner.⁴⁹ While this study acts as a starting point, geographic variation in curricula makes a program-specific curriculum mapping approach paramount. *Second*, leveraging pre-existing modules, materials, courses, and professional development opportunities that can be integrated into the curriculum could minimize administrative and faculty overload. As an illustrative example, the ACLM offers an introductory LM course with developed curriculum materials (e.g., slide decks and a teacher's manual) that is available to faculty and trainees.²⁵ Additionally, the Institute of Lifestyle Medicine, affiliated with Harvard Medical School's Department of Continuing Education and the American College of Preventive Medicine, provide a variety of educational resources and materials to be utilized by other schools, faculty, and trainees.^{25,50} *Third*, integrating practical (e.g., lifestyle counseling and coaching) LM education longitudinally throughout the curriculum, through simulation and seminar-type classes is warranted. Such integration would bridge the gap between theoretical and practical knowledge and facilitate more lasting practice changes.²⁵ *Fourth*, recognizing the growing emphasis on incorporating LM into UGME curricula to address physician burnout and enhance student well-being, as highlighted in this study, it is recommended to include extracurricular activities such as webinars, seminars, and cooking classes. For example, at the University of Toronto, over 250 first-year medical trainees participated in a culinary medicine event. This half-day workshop offered hands-on training on purchasing and preparing healthy, cost-effective meals, along with practical tips that students could later share with their patients.⁵¹ *Fifth*, the utilization of available LM-related frameworks, guidelines, and competencies (e.g., ACLM, American Heart Association, nutrition-related competencies, LM-related competencies) to systematically and strategically guide the integration of LM content and education in the UGME curricula.^{46,52} *Finally*, using the Delphi method to develop a consensus curriculum with input from key stakeholders—such as curriculum developers and faculty leaders—can help identify the most effective strategies for implement-

ing LM education in UGME curricula nationwide. Engaging these decision-makers and stakeholders can foster greater buy-in and ensure that curriculum changes are sustainable, addressing the needs of faculty, students, patients, and the broader community. This collaborative approach is a widely accepted practice in education.⁵³

Limitations

This study has several limitations. *First*, the nature of this methodology led to a high exclusion rate of Canadian MD programs (28%). *Second*, there was a reliance on publicly available data, which may not fully reflect the nuances of each institution's curriculum, limiting the depth of the analysis. The exclusion and such reliance on public data may affect the generalizability of the results across all the UGME programs in Canada, although the research team contacted the UGME program deans and curricula leads on several occasions. *Third*, for the curriculum documents presented in French, we used a translation resource, which may have impacted coding accuracy. *Finally*, the UGME programs vary across jurisdictions and licensing bodies, and the findings of this Canadian-based study may not hold true to other schools and countries.

Conclusion

Non-communicable diseases (NCDs - e.g. cardiovascular or cerebrovascular disease, cancer, and diabetes) account for over 88% of Canadian deaths each year. Many of these conditions stem from modifiable risk factors such as poor diet, physical inactivity, and obesity—factors that can be mitigated through lifestyle medicine (LM). This study is the first to formally map the current practices of LM integration in undergraduate medical education (UGME) in Canada. By equipping future healthcare providers with the skills to counsel patients on evidence-based lifestyle interventions, our model of care can shift from reactive treatment to proactive disease prevention and management. Our study demonstrated that LM is inconsistently incorporated across curricula and identifies a need for further curriculum development. Although the Canadian Lifestyle Medicine (CALM) group is emerging as an extension of the American College of Lifestyle medicine, grassroots initiatives continue to play an important role in the

integration of preventive health education. Medical students, faculty, educators, policymakers, healthcare organizations, and clinicians who recognize the importance of LM can take meaningful action by establishing or participating in lifestyle medicine interest groups, organizing grand rounds/extracurricular events focused on LM, and fostering awareness of this specialty within the broader medical community.^{21,36,43} These efforts will not only enhance the visibility of LM as a crucial domain of modern medical practice but also empower the next generation of physicians to become leaders in combating NCDs and improving population health outcomes.²¹ The time to act is now, and collective engagement will drive the momentum needed to make LM an integral part of medical education and practice in Canada.

Author information:

1- Jay and Sari Sonshine Centre for Stroke Prevention and Cerebrovascular Brain Health, Toronto Western Hospital, University Health Network, Ontario, Canada

2- Program for Health System and Technology Evaluation, Toronto General Hospital Research Institute, Ontario, Canada.

Correspondence to:

Aleksandra Pikula

email: Aleksandra.Pikula@uhn.ca

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