Assessment of Epidemiology Courses in Health Management Undergraduate Education in Turkey

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ABSTRACT

In today's ever-changing environment, health managers need to focus on promoting the health of populations. Therefore, they need a specialized understanding of epidemiology, as a requirement for population-based management. Epidemiology is acknowledged as an important component of undergraduate health management education, providing the knowledge and skills that health managers need in their professional lives. This cross-sectional descriptive study aims to assess the epidemiology courses in health management undergraduate programs in Turkey. The current curricula of 75 health management undergraduate programs, listed on the Program Atlas of the Higher Education Council, are reviewed through universities' official websites to profile the characteristics of epidemiology courses. Descriptive statistics was expressed as mean ± standard deviation for continuous variables, frequency and percentage values were used for categorical variables. 60 (80.0%) programs have epidemiology in their curricula. Yet the characteristics of these courses, such as their core/elective status, the semesters they are conducted, the weekly contact hours and ECTS credits, and the topics covered in the syllabus vary across programs. The findings reveal that there are variations regarding how epidemiology courses are conducted across health management undergraduate programs in Turkey. Apparently, this poses a challenge against all efforts to ensure the uniformity of the minimum core competencies among all health management program graduates; and although the Health Management National Core Education Program has been a great starting point towards standardization, there are further steps to be taken to improve the health management undergraduate curricula in Turkey.

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1.INTRODUCTION

A health system, as defined by the World Health Organization (WHO), consists of all organizations, institutions, resources and people whose primary aim is to promote, restore, or maintain health through the efforts to influence determinants of health as well as more direct health-improvement activities, i.e. delivery of preventive, promotive, curative and rehabilitative interventions (WHO, 2010). The scientific advances and innovations in medicine as well as the development and expansion of relevant technologies for prevention, diagnosis, treatment, and rehabilitation of diseases since the middle of the 20th century have led to a rapid increase in the knowledge and understanding of improving population health. Yet the world is still facing many health challenges, including the outbreaks of vaccine-preventable diseases or emerging infections; the ageing of populations, who rely heavily on health care, pensions and social protection; the growing burden of non-communicable diseases; increasing rates of obesity and physical inactivity; health impacts of urbanization, environmental pollution and climate change, multiple humanitarian crises and migration. As these challenges impose another dimension of burden to already complex and complicated health systems, health systems need staff, funds, information, supplies, transport, communications as well as overall guidance and direction to function (WHO, 2010).

Therefore, at all levels of any health system, there is a growing need for managers with expertise in both business and health who would focus on the activities of planning, organizing, controlling, and motivating in order to deal with the financial constraints and the complexity of matrix structures within organizations, making budget and staffing decisions that affect availability and access to services while keeping their focus on promoting the health of greater populations. In the United States, the employment of medical and health services managers is projected to grow 28% from 2022 to 2032, showing a much faster growth than the average for all occupations (U.S. Bureau of Labor Statistics, 2023).

Apart from the numbers, health managers are required to provide guidance and leadership to govern the entire health ecosystem, i.e. at individual, organizational and population levels, and effective health management leads to better health outcomes, improving the health of populations. Health managers execute core functions, including planning, organizing, staffing, controlling, directing, risk-assessing, and decision-making. As decision-makers, health managers need to access complete information and make use of it in order to deliver high-quality and cost-effective health services and making the 'best' choices for the populations they serve. Therefore, they need all the tools to equip themselves with the knowledge and capacity to handle this ever-changing environment, epidemiological measurements being the foremost of these tools.

Health Management Education

Health management education has a relatively short history. Health management has become a career field following the development of medical science and the growth of hospitals in the United States, thus initially had a hospital emphasis. The first degree-granting program of the Marquette University in Wisconsin in 1926, and the first graduate program of the University of Chicago in 1934, were both established in hospital administration. The early programs used the term “hospital administration” in their titles; however, this has changed to “healthcare administration” or some similar phrase, as the field has changed to include a broader range of organizations in which healthcare executives work. The Association of University Programs in Health Administration (AUPHA), founded in 1948, and Commission on Accreditation Healthcare Management Education (CAHME), founded in 1968, accredit undergraduate and graduate programs in the United States and Canada with a focus to develop and continuously improve health management education; and European Health Management Association (EHMA), founded in 1982, focuses on enhancing the capacity and capability of health management in Europe (Haddock et al., 2002; Hilsenrath, 2012).

Globally today, health management education is conducted either as an undergraduate (Bachelor’s) or graduate (Master’s and PhD) degree to provide the skills in organization, leadership, quality assurance, and information technology management, which are all necessary in the field; and both degrees are considered essential in today’s job market. An undergraduate degree is generally the minimum education requirement and may be considered a general business overview. It focuses primarily on entry-level management to equip health managers to direct, plan, and monitor medical and health services, to coordinate and monitor the usage of facilities, services, and staff to ensure best practices and effective resource allocation. Although a graduate degree, which provides more in-depth knowledge, including course work in health policy and law, marketing, organizational behavior, healthcare financing, human resources, and other health topics; is required for advancement to the following or top levels of management in many organizations, a career in health management requires a minimum of a bachelor’s degree. According to AUPHA, the basic curriculum for the health management degree should include the study of management theory, concepts, and skills, such as leadership, financial management, economics, law, organizational behavior, quantitative methods, and planning; the study of the healthcare industry including epidemiology, health and human behavior, and medical care organization; and the demonstration of integration

of course material through application of management concepts to the healthcare industry in a major project, paper, or exam (AUPHA, n.d.).

Today there are many undergraduate and graduate health management programs around the world. However, the breadth and diversity of health management education vary. Weil (2013) claims that "health management education and the role of health managers are patterned and consistent with how the country's healthcare system is organized, managed, and financed in Europe and the United States". Kalangi and Thakur (2018) emphasize that in India "the challenges lie not in the capacity of the education system but in the structure, content, quality, and the distribution of the programs offering training in healthcare management. There is a need for a certain level of consistency among the programs with respect to the structure and content of the curriculum, in order to ensure the inclusion of a base set of competencies for all graduates in this field".

In Turkey, health management education started in 1963 at the Health Administration Vocational School of the Ministry of Health. In 1970, the Health Administration Vocational School was set up under Hacettepe University with a graduate program and in 1975 an undergraduate program was also launched (Yenimahalleli Yasar & Boutsioli, 2011, Çimen, 2010). As of 2023, there are a total of 109 health management undergraduate programs in Turkey as defined in the Higher Education Program Atlas of Council of Higher Education (https://yokatlas.yok.gov.tr/lisans-anasayfa.php). In 2017, the Health Management National Core Education Program is developed in line with the criteria set by AUPHA and in accordance with the adaptation to the Bologna Process as a guide to define the professional competencies that the health management undergraduate degree is required to provide and to ensure the standardization throughout the country. A total of 22 program competencies as well as the topics, content and learning outcomes that set the foundation in health management field are identified in this document (Sağlık Yönetimi Ulusal Çekirdek Eğitim Programı [SAYÇEP], 2017).

Epidemiology in Health Management Education

Epidemiology, as an umbrella term, covers the wide range of public health matters and analyzes the cause, progression and spread of disease using biology and statistics. It is defined by Last (2001) as "the study of the distribution and determinants of health-related states in specified populations, and the application of this study to control health problems". It generates information for decision-making, reassessment of existing knowledge and solutions towards improved quality. Its significance has been recognized back in the 19th Century by Florence Nightingale who recommended that hospitals should collect data on the diagnoses, operations performed and complications including death, age, sex, occupation, date of admission and discharge (Hooker, 2008). Following the recognition of the importance of epidemiology to health planning and administration by many expert educators in the 1970s, it was advised that epidemiology should become part of the curriculum for master's programs in health management education. The importance of epidemiology as a required component of health management education to assess population health and status was also acknowledged by both AUPHA (undergraduate programs) and CAHME (graduate programs) (Caron et al., 2013). AUPHA, in 1982, published a compendium of papers on teaching epidemiology in health administration, and the term 'managerial epidemiology' was used with an emphasis on teaching health administrators how to utilize epidemiology to manage healthcare organizations (Crichton & Neuhauser, 1982; Filerman, 1982).

AUPHA gives external validation to undergraduate health administration programs through its certification process and requires them to have adequate coverage, which refers to fundamental knowledge of specific areas in their curriculum. According to its criteria, epidemiology should be covered under the topic of population/community health, emphasizing the socio-cultural factors associated with the distribution and etiology of health and disease, the use of epidemiologic concepts and principles in the practice of managing the health of populations and communities, methodological skills including the calculation of rates, analysis of vital statistics, and programming data using a basic statistical package (AUPHA, 2023). CAHME also requires the accredited graduate programs to include the "assessment and understanding of the health status of populations, determinants of health and illness, and factors influencing the use of health services" in their curricula (Hooker, 2008).

In consideration with the significance of epidemiology as an acknowledged component of health management undergraduate education to provide the knowledge and skills to health managers for decision-making about utilization of health services, resource allocation, needs analysis, and quality improvement; reassessment of existing knowledge, and developing solutions towards improved health; this study aims to define the current situation regarding the epidemiology courses in the curricula of Health Management Undergraduate Programs in Turkey, and to profile the characteristics of these courses.

2. MATERIALS AND METHOD

Data for this cross-sectional descriptive study were collected in July 2023. The current list of health management undergraduate programs in Turkey was acquired from the Program Atlas of the Higher Education Council website

(https://yokatlas.yok.gov.tr/lisans-anasayfa.php). Of the total of 109 Health Management Undergraduate Programs listed on the website, the programs that are taught in English, in evening education and as open education were excluded, and a total of 75 programs were included in the study. The webpages of each program were browsed and the current curricula, as declared in the universities' Information Package for National Qualifications Framework for Higher Education, were reviewed to see whether there was an epidemiology course in the curriculum; and to profile the characteristics of the existing epidemiology courses, including their core/elective status, semesters, weekly contact hours, European Credit Transfer and Accumulation System (ECTS) credits, how the courses are titled, the topics covered, and the course instructors. Descriptive statistics were presented as numbers and percentages.

3. RESULTS

Of the 75 health management undergraduate programs included in this study, 61 (81.3%) are in public universities and 14 (18.7%) are in foundation universities. 60 (80.0%) health management undergraduate programs include epidemiology courses in their curriculum. Of these, 49 (81.7%) programs are in public and 11 (18.3%) programs are in foundation universities (Figure 1).

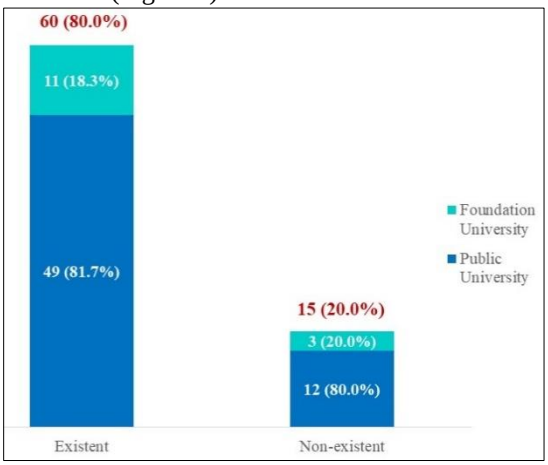

Figure 1. Existence of Epidemiology Courses in Health Management Undergraduate Programs

However, there are variations between programs regarding how epidemiology courses are taught including their compulsory or elective status, the term it is taught, weekly contact hours and ECTS credits.

Epidemiology is taught as a core course in 28 (46.7%) programs and as elective in 32 (53.3%) programs. Of the 49 programs in public universities, 29 (59.2%) conduct epidemiology courses as elective, whereas of the 11 programs in foundation universities, 8 (72.7%) conduct epidemiology courses as core courses (Table 1).

In all 60 programs, epidemiology is taught as a one-semester course. However, the semester that the course is conducted varies from 1st to 8th semesters. Of the 60 programs, 40 (66.7%) programs teach epidemiology in the second year of their curriculum, i.e. 20 (33.3%) programs in the 3rd and another 20 (33.3%) programs in the 4th semesters. The number of programs that teach epidemiology in the third and fourth year of their curriculum dramatically decreases to 10 (16.7%) and 4 (6.7%) respectively; and only 6 (10.0%) programs teach epidemiology in the first year. In public universities, epidemiology is taught mostly in the 3rd and 4th semesters (36.7% and 32.7% respectively); and in foundation universities, 36.4% of the epidemiology courses are taught in the 4th semester (Table 1).

The weekly contact hours of epidemiology courses vary between the programs with a mean value of 2.6±0.6 and a median of 2.5[2-5]. Epidemiology is scheduled for 2 hours/week in 30 (50.0%) programs and for 3 hours/week in 28 (46.7%) programs. A total of 26 (53.1%) programs in public universities and 6 (54.5%) programs in foundation universities teach epidemiology as 2 hours/week courses. (Table 1).

The ECTS credits of epidemiology courses also vary between 60 programs, with a mean value of 3.8±1.1 and a median of 4 [2-7]. Epidemiology courses have 4 ECTS in 24 (40.0%) programs and 3 ECTS credits in 14 (23.3%) programs. A total of 19 (38.8%) of the 49 programs in public universities and 5 (45.5%) of the 11 programs in foundation universities have 4 ECTS credits for epidemiology courses (Table 2).

Table 1. Characteristics of epidemiology courses

Variable	Public University		Foundation University		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Course type						
Core course	20	40.8	8	72.7	28	46.7
Elective course	29	59.2	3	27.3	32	53.3
Semester						
1st	2	4.1	0	0.0	2	3.3
2nd	3	6.1	1	9.1	4	6.7
3rd	18	36.7	2	18.2	20	33.3
4th	16	32.7	4	36.4	20	33.3
5th	3	6.1	3	27.3	6	10.0
6th	3	6.1	1	9.1	4	6.7

7th	1	2.0	0	0.0	1	1.7
8th	3	6.1	0	0.0	3	5.0
Weekly Contact Hours						
2 hours	26	53.1	4	36.4	30	50.0
3 hours	22	44.9	6	54.5	28	46.7
4 hours	1	2.0	0	0.0	1	1.7
5 hours	0	0.0	1	9.1	1	1.7
ECTS Credits						
2	6	12.2	2	18.2	8	13.3
3	13	26.5	1	9.1	14	23.3
4	19	38.8	5	45.5	24	40.0
5	9	18.4	3	27.3	12	20.0
6	1	2.0	0	0.0	1	1.7
7	1	2.0	0	0.0	1	1.7

**Percentage within public universities*
***Percentage within foundation universities*

53 (88.3%) health management undergraduate programs teach epidemiology courses under the title of epidemiology, basic epidemiology or managerial epidemiology; however, in 7 (11.7%) programs, epidemiology is taught as a combined course with either public/community health or statistics. While the most preferred title is "epidemiology" in both public and foundation universities (83.7% and 63.6% respectively), 27.3% of the foundation universities also prefer the title of "managerial epidemiology" (Table 2).

Of the 44 health management undergraduate programs that declared the epidemiology course instructor on their webpage, 19 (43.2%) are taught by Assistant Professors, and in only 2 (4.5%) programs the course instructors are Research Assistants. (Table 2).

Table 2. Titles and instructors of epidemiology courses

Variable	Public University		Foundation University		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Course Title						
Epidemiology	41	83.7	7	63.6	48	80.0
Basic Epidemiology	1	2.0	0	0.0	1	1.7
Managerial Epidemiology	1	2.0	3	27.3	4	6.7
Public Health & Epidemiology	3	6.1	1	9.1	4	6.7
Epidemiology & Health Indicators	1	2.0	0	0.0	1	1.7
Epidemiology Health	1	2.0	0	0.0	1	1.7
Statistics & Epidemiology	1	2.0	0	0.0	1	1.7
Course Instructor's Title†						
Professor	4	11.4	1	11.1	5	11.4
Associate Professor	5	14.3	1	11.1	6	13.6
Assistant Professor	15	42.9	4	44.4	19	43.2
Lecturer	5	14.3	3	33.3	8	18.2
Research Assistant	2	5.7	0	0.0	2	4.5
All Faculty Members	4	11.4	0	0.0	4	9.1

** Percentage within public universities*
*** Percentage within foundation universities*
† Programs that identified the course instructor are included

Among a total of 53 health management undergraduate programs, which had published their syllabus for epidemiology courses on their webpages, 48 (90.6%) programs include epidemiological studies, 47 (88.7%) include the definition and basic concepts of epidemiology, and 35 (66.0%) include health indicators, while the least included topic is epidemics and surveillance with only in 7 (13.2%) programs (Table 3).

Table 3. Basic topics included in the epidemiology course syllabus

Topics	Frequency	Percentage
Epidemiological Studies	48	90.6
Definition and Basic Concepts of Epidemiology	47	88.7
Health Indicators	35	66.0
Uses of Epidemiology	26	49.1
History of Epidemiology	24	45.3
Epidemiology of Communicable Diseases	20	37.7
Epidemiology of Non-Communicable Diseases	14	26.4
Epidemics and Surveillance	7	13.2

4. DISCUSSION

As global health systems struggle to deliver high-value and high-quality services despite rapidly increasing

costs, the need for health managers who could handle the scientific and medical developments; innovative technologies; changing demographics, mortality and morbidity trends; and financial arrangements becomes more prominent. Health managers are essentially responsible for ensuring the continuation of healthcare delivery and for managing both the business and health components of an organization's activities while keeping their focus on promoting the health of greater populations.

In the context of health services where clinical professionals and health managers work in close proximity and under the dominance of evidence-based practice toward improving population health, health management education is needed more than ever. In order to train health managers who can analyze the situation, determine the priorities, plan and evaluate, assess the determinants of health and adopt health promotion as a principle, health management education needs to offer a broad curriculum that provides a foundation in a range of disciplines and reflecting the rich experience that health management can offer as an occupation (Davies, 2006).

Although it is a well-known fact that effective health management education will advance the likelihood of delivering high-quality services and improving population's health, there is an ongoing global debate on how to raise future health managers who are exquisitely skilled in the art and science of management with expertise in both business and health as the breadth and diversity of health management education vary. Fos et al. (1998) stated that health managers need to focus on delivering health services to populations, and this population-based management requires an "appreciation and specialized understanding of epidemiology". Caron (2010) emphasized that managerial epidemiology as "the science of public health management" would utilize the traditional quantitative and causal reasoning methods and incorporate them with the business aspects. Managerial epidemiology is also defined as "the scientific basis for any health system reform" and regarded essential for professional preparation in both clinical and management practice (Roper & Cates, 1993). As recommended by the Commission on Health Research for Development in 1990, national health policies and actions need to be based on epidemiological information; health measures should not be predetermined, but rather guided by epidemiology through local data collection and analysis; and therefore local epidemiological research abilities have to be strengthened (Bryant & Harrison, 1996; Unger & Dujardin, 1992).

As the English scientist Lord Kelvin said in the 19th century, "When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is unsatisfactory" (Bush, 1991). Hooker (2008) quotes that the "assessment and understanding of the health status of populations, the determinants of health and illness, and factors influencing the use of health services" is what CAHME requires the accredited programs to include in their curricula. Caron & Hooker (2011) quote that today health managers are required to be proficient in "…the funding, organization, and management of healthcare services…" as well as "…the analysis of the health needs of the population, health promotion and prevention". In this perspective, epidemiology courses are essential to provide health managers with the knowledge and skills to make decisions about utilization of health services, resource allocation, needs analysis, quality improvement, etc. The findings of this study show that 80.0% of health management undergraduate programs in Turkey include epidemiology in their curriculum.

In an undergraduate program, courses can be classified either as a core course, which is mandatory for students to study in order to meet the requirements of the program; or as an elective course, which allows them to study their topics of interest while making up the total number of credits to complete the degree. SAYÇEP (2017), which describes the professional competencies that health management undergraduate degree requires, states that the core courses covering the competencies should make up 70% of the curriculum and the remaining 30% should be elective courses which are defined according to the specific program objectives. The findings of this study reveal that more than half of the programs (53.3%) teach epidemiology as an elective course. The question that rises here is what happens if a student chooses any course among the elective courses but epidemiology. This would lead to the lack of much needed epidemiological skills for future health managers upon graduation.

In higher education programs, a contact hour includes the time spent in class, be it lecture or laboratory, when the professor is teaching the student, and usually equals to 40 to 50 minutes in real time. However, a more accurate tool regarding the comparison of different programs is regarded as the ECTS, which aims to make national education systems more comparable internationally in accordance with the adaptation to the Bologna Process. ECTS credits represent learning based on defined learning outcomes, skills and competencies that define the qualification and are accepted as the standard way of measuring the student's workload, i.e. the number of classroom hours per week and the hours spent by the student to perform outside assignments in higher education (European Commission, n.d.). This study reveals that both the weekly contact hours and the ECTS credits of

epidemiology courses vary between programs in Turkey.

Unfortunately, there has been no published empirical research on what epidemiological topics should be included in the curriculum for a managerial epidemiology course (Hooker, 2008). Caron et al. (2013) acknowledge that although most undergraduate and graduate health management programs teach epidemiology courses in their curricula, there is still an inconsistency across the programs regarding their goals, objectives, and final content; and that the accreditation and certification criteria to guide what health administration programs should expect of students studying epidemiology are limited. Despite all the efforts, the breadth and diversity of health management education vary globally. Studies have shown that there is variability in what is taught in different programs, as some programs teach only basic public health epidemiology while others have more of a managerial focus to their epidemiology (Singh et al., 1996; Kilpatrick & Romani, 1995). The health management education, both undergraduate and graduate, is expected, even advocated, to change as the health systems evolve; and along with the role of health managers, it is patterned and consistent with how a country's health system is organized, managed, and financed (Counte et al., 2019). The findings of this study show that the topics covered in epidemiology courses in health management undergraduate programs in Turkey are diverse and there is no standardization as to what should be covered in the syllabus. Similarly, a study by Caron & Hooker (2011) found that most undergraduate programs teach introductory epidemiology (16/35, 46%) or epidemiological principles in other courses, while only a limited number of programs offer advanced or managerial epidemiology in their curricula.

As the challenge appears to be celebrating the breadth on one hand while bringing cohesion to the content that would appropriately span health systems and health needs on the other, it is essential that greater value should be attached to health management education and a systematic approach should be taken towards curriculum development (Hooker, 2008; Davies, 2006). There are some insights developed to guide universities in developing health management programs accordingly. The need for a certain level of consistency among the programs regarding the structure and content of the curriculum is emphasized to ensure the inclusion of a base set of competencies for all graduates (Kalangi & Thakur, 2018); and the 'MBA and MPH Joint Degree Program' launched in Yale University in 2014 is regarded as a good example due to its integration of management and public health knowledge in an innovative health management undergraduate program to provide the students with an interdisciplinary perspective and a curriculum that incorporates core competencies in public health, health management and business, involving epidemiology as core courses (Pettigrew et al., 2015). The role of accrediting organizations in promoting competency-based standards for education and how organizations such as AUPHA and EHMA can promote sharing across disciplines and careers as well as learning from others in developing curricula for an effective health management education is also being discussed lately (Glandon, 2019; West et al., 2019).

5. CONCLUSION

In the context of health services where clinical professionals and health managers work in close proximity and under the dominance of evidence-based practice towards improving population health, health management education should offer a broad curriculum that includes the context for practice; research awareness and skills of critical appraisal; a grounding in a range of disciplines and a reflective approach towards general management skills. A central role for epidemiology courses in health management education would be to provide the content and the skills to monitor the trends of access to certain health services, allocate limited resources, plan for surge capacity, and measure clinical outcomes, to gather and assess the information to make the best decisions for population health. to assess their organization's effectiveness in preventing disease and promoting health while maintaining the fiscal vitality of their business.

As the findings of this study reveal, there are variations regarding how epidemiology courses are conducted across health management undergraduate programs in Turkey in terms of the existence of the course in the curricula, its core or elective status, weekly contact hours, ECTS credits, as well as the topics covered in the syllabus. This poses a challenge against all efforts to ensure the uniformity of the minimum core competencies among all health management program graduates, who need a solid foundation in epidemiology to be well-equipped to address and solve the future challenges of the health sector, to better manage organizations, to plan strategically, to implement interventions, and to evaluate the outcomes. Although SAYÇEP has been a great starting point towards standardization of the educational content across health management undergraduate programs in Turkey, there are apparently further steps to be taken, particularly with a special emphasis on epidemiology in the health management curriculum, i.e. to standardize the content, and to guide the development of goals and objectives of epidemiology courses employing vertical integration with a multidisciplinary approach.

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Ethical Approval: The data for this study have been collected by browsing the websites of Higher Education Institutions, and reviewing the curricula of the programs which are public information; therefore, no ethical approval has been sought.

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