

Full Length Research Paper

Inclusion of courses on phytotherapy in undergraduate curriculum of health-related courses

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Since 2006, complementary therapies, including phytotherapy, have been offered to patients in Brazil through the public health system. This indicates that health-care professionals, mainly those responsible for prescribing medications, should be prepared to provide the best information to their patients. Therefore, this study aimed to evaluate the inclusion of courses on phytotherapy in the undergraduate curricula of health-related courses. This was a transversal study in which information was gathered from federal universities offering undergraduate courses on health-related courses. Websites of higher education institutions, which were screened initially, were searched to access the syllabus of each offered course. Analysis of the obtained data showed that only the pharmacy curriculum offered mandatory courses on medicinal plants, herbal medicines, and/or phytotherapy. Of the surveyed higher education institutions, 36 offered elective courses on medicinal plants and phytotherapy. The obtained data indicated that the pharmacy curriculum offered the largest number of elective courses on the selected topics, while physical therapy and dentistry curricula offered the least number of elective courses. Thus, it is concluded that few undergraduate curricula of health-related courses offered mandatory courses on medicinal plants, herbal medicines, and/or phytotherapy.

Key words: Herbal medicine, undergraduate medical education, curriculum.

INTRODUCTION

Phytotherapy is a less expensive and easier therapeutic approach to increase the coverage of primary health care in undeveloped and developing countries (WHO, 2013). More than half of European and North American populations use herbal medicines. Brazilian market for herbal medicines was USD 1.1 billion in 2011, and the turnover of its pharmaceutical industry was USD 43 billion. On an average, the market for herbal medicines grew by 13% in 2011, that is, an increase of 10.5% over

its value in 2010. Brazilian market for synthetic drugs is estimated to grow at a rate of 8 and 11% each year (Gadelha, 2010; Torres, 2013).

Brazil has the highest biodiversity share and is home to approximately 20% of all species found on the planet. Brazil has approximately 55,000 species of higher plants, of which only approximately 1,100 have been studied thus far to determine their medicinal properties (BRASIL, 2006a).

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Table 1. Regulations from Brazilian federal professional councils about practicing phytotherapy as a specialty by health-care professionals

Council	Regulation	Year
Federal Council of Medicine	Comments 04/1992: Recognized phytotherapy as a therapeutic method (CFM, 1992)	1992
Federal Council of Nursing	Resolution 197/1997: Established and recognized as a specialty alternative therapies and/or professional qualifications of nursing (COFEN, 1997)	1997
Federal Council of Dentistry	Resolution 82/2008: Recognized and regulated the use of complementary and integrative oral health, including herbal medicine practices (CFO, 2008)	2008
Federal Council of Physical and Occupation Therapy	Resolution 380/2010: Regulated the use of integrative practices by physiotherapist (COFFITO, 2010)	2010
Federal Council of Pharmacy	Resolution 572/2013: Established complementary and integrative health, which includes specialties such as acupuncture, anthroposophy, herbal medicine, homeopathy and hydrotherapy, as a practice (CFF, 2013)	2013
Federal Council of Nutrition	Resolution 525/2013: Regulate the practice of phytotherapy by nutritionists, giving them jurisdiction to prescribe medicinal plants, herbal drugs, and herbal medicines to complement dietary prescription (CFN, 2013)	2013

Institutionalization of the Brazilian Unified Health System (SUS) by the 1988 Constitution (BRASIL, 1988) resulted in the inclusion of some complementary and alternative medicine (CAM) in public health-care services (Pinheiro et al., 2003). One of the included CAM is phytotherapy; therefore, the need to establish specific policies geared to medicinal plants and herbal medicine was noted (Di Stasi, 1996; Simões et al., 2002; Udry, 2001; Yunes et al., 2001). A breakthrough in this direction was the ordinance (No. 971) of the Ministry of Health of 3 May 2006, that approved the National Policy on Integrative and Complementary Practices (PNPIC) in the SUS (BRASIL, 2006a). This policy brings together the guidelines for medicinal plants and herbal medicines, elaborates the national list of medicinal plants, and provides people access to phytotherapy through the SUS.

In addition, the Federal Decree No. 5,813 of June 22, 2006, established the National Policy on Medicinal Plants and Herbal Medicines (PNPMF) that encouraged research in this field and established guidelines for deploying services by health departments on a national basis in states, district federal, and municipalities (BRASIL, 2006b). This policy has 17 guidelines, of which guideline 2 is noteworthy because it refers to promoting technical and scientific education and providing training on the use of medicinal plants and herbal medicines.

Primary health care requires the use of all available resources to provide effective health care and high-solving resources. Therefore, proper use of medicinal plants or herbal medicines is important to improve the health and quality of life of the target population (Silva et

al., 2006). Health-care professionals should ensure that such therapeutic resources are based on the cultural and traditional knowledge of the community and should provide community members with proper information to improve their health. Health-care professionals can only do this if the necessary knowledge on the use of medicinal plants and on their proper preparation, care, dosage, and indication is available (Silva et al., 2008).

In clinical medicine, non-hegemonic practices can be used to improve the wellbeing of patients and alleviate their symptoms. These practices are called complementary and alternative medicine (CAM), that is, medical approaches that complement the knowledge acquired in conventional medical schools. However, these practices are not taught in most medical schools (Christensen et al., 2010). Therefore, lack of communication between physicians and patients regarding CAM can be dangerous, particularly when patients use herbal medicines and natural products (Karpa, 2012).

For many years, knowledge on ethnomedicine, medicinal plants, and herbal medicines has been neglected while imparting training to health-care professionals. However, with Brazilian policies that include phytotherapy in the SUS, university teachers, researchers, and professionals working in the SUS have perceived the need for the inclusion of this content in undergraduate curricula of health-related courses.

Several councils of professional health care recognize complementary practices, including phytotherapy, as a specialty and/or a qualification of health-care profession (Table 1). Although these professional councils have been regulating the phytotherapy practice and prescription

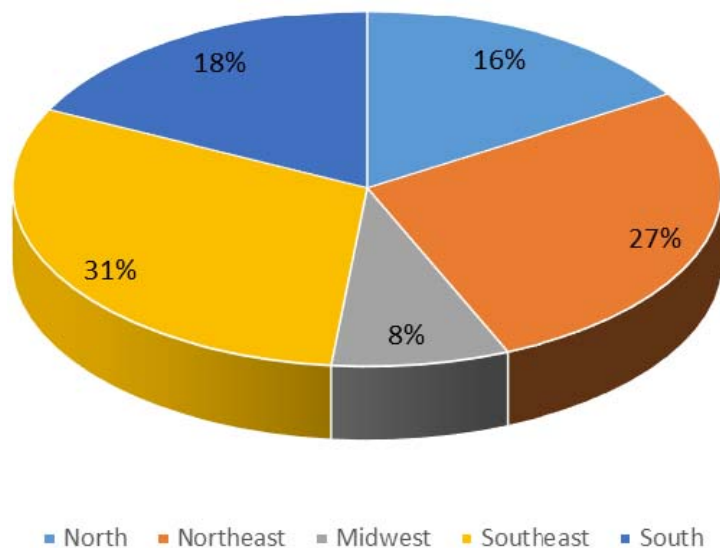


Figure 1. Percentage of federal universities according to the geographical region of Brazil.

of herbal medicines, health-care professionals have realized that a gap exists in their training on the therapeutic bases of such practices (Christensen et al., 2010; Duraz et al., 2011; Freymann et al., 2006; Harris et al., 2006; Johnson et al., 2008; Tiralongo et al., 2008; Xu et al., 2008). Therefore, they do not feel self-confident while practicing phytotherapy.

A study showed that in 2002, 86% Cuban physicians practiced some form of CAM. Theoretical and practical training on the use of many CAM modalities is a part of the core curriculum in all 23 medical schools in Cuba (Appelbaum et al., 2006).

In this study, Brazilian higher education institutions (HEIs) offering undergraduate courses on medicinal plants and herbal medicines as a part of their curricula of health-related courses were surveyed to assess whether the training provided to health-care professionals met the guidelines of the PNPIC and PNPMF.

METHODOLOGY

In this transversal study, information was obtained from federal universities offering undergraduate courses on health-related courses between October and December, 2013.

First, the website of the Brazilian Ministry of Education (through the channel e-MEC [<http://emec.mec.gov.br/>]) was searched to identify all public HEIs belonging to the "federal" category that offered undergraduate courses on health-related courses (that is, Medicine, Pharmacy, Nursing, Dentistry, Nutrition, and Physical Therapy). The criteria for selecting HEI federal public character was that the institutions offering undergraduate courses should have been better evaluated by the Brazilian Ministry of Education.

Next, website of each HEI, which was selected in the first step, was searched to access the corresponding syllabus of courses. From the available information, courses related to medicinal plants,

herbal medicines, and phytotherapy were determined. Next, it was checked if the courses were mandatory and/or optional.

For institutions whose curriculum was not available on their website, a pedagogical project of the career program was used to obtain information related to the selected topics. This study sought on the website itself or when the pedagogical project was not present, researched on search sites using the term: "course name and the name of HEI and pedagogical project."

Information acquired on the curriculum by using pedagogical projects was limited and could only identify whether the courses were mandatory or elective. It was not possible to acquire more details with the instrument used.

RESULTS

According to the e-MEC website, there were 2,650 authorized HEIs in Brazil in 2013. Of these, 2,271 were isolated faculties, 182 were university centers, and 197 were universities *strictu sensu*. Of the authorized HEIs, 107 were federal HEIs; of these, four were isolated faculties or schools, 40 were university centers, and 63 were universities. Moreover, 5 of these federal HEIs did not offer any undergraduate course on health-related courses. All the federal HEIs were distributed in the Brazilian territorial dominion (Figure 1), with 19 (31%) of these HEIs present in the Southeast region.

Southeast Brazil is the most economically developed region in the country. Therefore, as expected, it is the region with the largest number of federal HEIs. The distribution of HEIs in other regions follows the ratio of the number of states per region.

This study only considered HEIs offering courses on health-related courses and investigated courses related to medicinal plants and herbal medicine in medicine, pharmacy, nursing, dentistry, physical therapy and nutrition

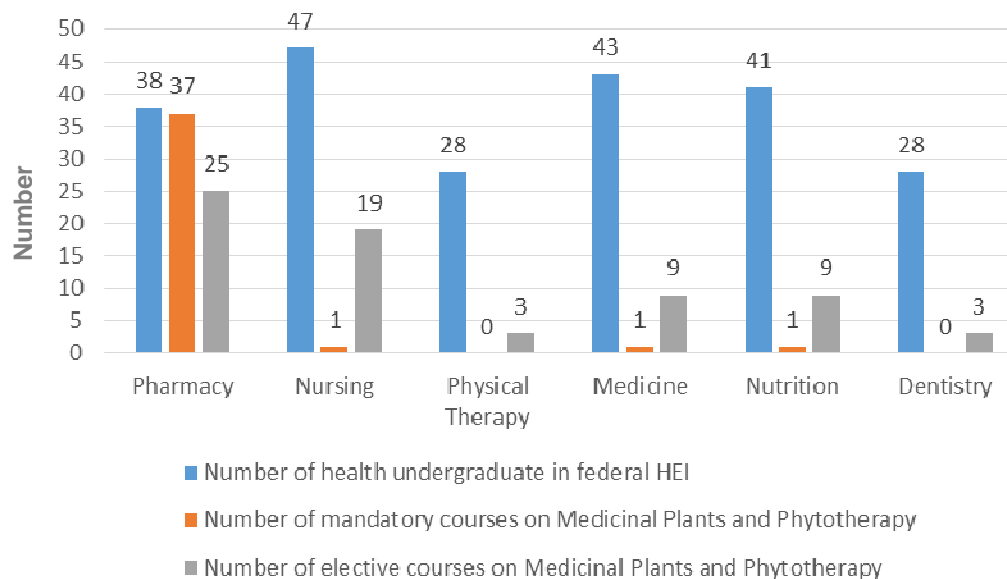


Figure 2. Mandatory and elective courses on medicinal plants and phytotherapy and number of Federal HEIs offering undergraduate courses on health-related courses.

curricula.

Website search of each HEI indicated that some HEIs did not publish their curricula online. Hence, this study sought pedagogical projects of courses offered by these HEIs to obtain information on their curriculum.

Analysis of the obtained data showed that the Pharmacy/Pharmaceutical Sciences curriculum offered mandatory courses on medicinal plants, herbal medicines, and/or phytotherapy. Syllabus on the application of botany in pharmacy (or pharmacobotany) and pharmacognosy were traditionally present in Pharmacy/Pharmaceutical Sciences curriculum. Pharmacy/Pharmaceutical Sciences curriculum of some HEIs included other related courses such as phytochemistry or natural product chemistry.

At least one federal HEI in each Brazilian state offered courses in medicine. However, only medicine curriculum at the Federal University of Mato Grosso (UFMT) offered a course on herbal medicine. Nursing curriculum at the Federal University of Pernambuco (UFPE) included a mandatory course of integrative and complementary practices. Table 2 lists mandatory courses offered by various HEIs (Figure 2).

Although pharmacognosy is considered as a discipline that is exclusive to Pharmacy and Pharmaceutical Sciences curricula, Nutrition curricula at the Federal University of Mato Grosso do Sul (UFMS) offered pharmacognosy as a mandatory course.

Of the surveyed HEIs, 36 offered elective courses on medicinal plants and phytotherapy. Examination of the syllabus of each course showed that various issues were addressed in courses on integrative practice (especially in the Nursing curriculum) and on pharmaceutical

technology, with an emphasis on herbal medicines and phytochemistry (in the Pharmacy/Pharmaceutical Sciences curriculum). These curricula also included other courses such as complementary and alternative therapies in nutrition, fundamentals of phytotherapy applied to dentistry, phytotherapy applied to nutrition, alternative practices or complementary health, and nursing (Table 3).

Thus, the obtained data indicated that the Pharmacy curriculum offered the highest number of elective courses on the selected topics, while Physical Therapy and Dentistry curricula offered the least (approximately 10% courses in all federal HEIs) number of elective courses on the selected topics.

Comparison of the number of mandatory and elective courses in each undergraduate curriculum showed a statistical difference ($p < 0.01$). This is probably because of the high number of courses included in the Pharmacy curriculum compared with those included in other curricula. Table 3 lists the elective courses included in the curricula of undergraduate courses offered by federal HEIs.

DISCUSSION

Considering the biodiversity of Brazil and the goal of improving the health of its population, the Brazilian Ministry of Health has encouraged the use of herbal medicines to complement the SUS. However, to ensure a rational and safe use, these medicines should be prescribed by health-care professionals who are well trained on the subject and who understand the chemistry,

Table 2. Mandatory courses on medicinal plants and herbal medicine in the curricula of health-related courses offered by federal HEIs in Brazil.

HEI	Career	Compulsory course
University of Brasília (UnB)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Mato Grosso do Sul (UFMS)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
	Nutrition	Pharmacognosy
Federal University of Goiás (UFG)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
	Medicine	Fundamentals of Phytotherapy
Federal University of Mato Grosso (UFMT)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
Federal University of Amazonas (UFAM)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Amapá (UNIFAP)	Pharmacy	Pharmacobotany Pharmacognosy Phytotherapy
Federal University of Oeste do Pará (UFOPA)	Pharmacy	Botany Pharmacognosy Phytochemistry
Federal University of Pará (UFPA)	Pharmacy	Phytotherapy Phytochemistry
Federal University of Alagoas (UFAL)	Pharmacy	Pharmacobotany Pharmacognosy Phytotherapy
Federal University of Bahia (UFBA)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
Federal University of Ceará (UFC)	Pharmacy	Pharmacognosy I Pharmacognosy II
Federal University of Maranhão (UFMA)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II Phytotherapy
Federal University of Paraíba (UFPB)	Pharmacy	Pharmacobotany Pharmacognosy

Table 2. Cont'd.

Federal University of Campina Grande (UFCG)	Pharmacy	Pharmacobotany Pharmacognosy Phytotherapy
	Nursing	Integrative and Complementary Practices
Federal University of Pernambuco (UFPE)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Vale do São Francisco (UNIVASF)	Pharmacy	Pharmacobotany Pharmacognosy Phytotherapy
Federal University of Piauí (UFPI)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Rio Grande do Norte (UFRN)	Pharmacy	Pharmacognosy
Federal University of Sergipe (UFS)	Pharmacy	Pharmacobotany Pharmacognosy Phytochemistry
Federal University of Paraná (UFPR)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II Phytochemistry III
Federal University of Health Sciences of Porto Alegre (UFCSPA)	Pharmacy	Pharmacognosy Herbal medicines
Federal University of Pelotas (UFPEL)	Pharmacy	Botany Pharmacognosy I Pharmacognosy II
Federal University of Santa Maria (UFSM)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Pampa (UNIPAMPA)	Pharmacy	Botany Pharmacognosy
Federal University of Rio Grande do Sul (UFRGS)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Santa Catarina (UFSC)	Pharmacy	Pharmacognosy
Federal University of Sergipe (UFES)	Pharmacy	Botany Pharmacognosy
Federal University of Rio de Janeiro (UFRJ)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II

Table 2. Cont'd.

Federal University Fluminense (UFF)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
Federal University Rural do Rio de Janeiro (UFRRJ)	Pharmacy	Pharmacobotany
Federal University of São Paulo (UNIFESP)	Pharmacy	Pharmacobotany Pharmacognosy
Federal University of Alfenas (UNIFAL)	Pharmacy	Pharmacobotany Pharmacognosy Phytotherapy I
Federal University of Juiz de Fora (UFJF)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
Federal University of Minas Gerais (UFMG)	Pharmacy	Botany Pharmacognosy I Pharmacognosy II Phytochemistry
Federal University of Ouro Preto (UFOP)	Pharmacy	Pharmacobotany Pharmacognosy I Pharmacognosy II
Federal University of São João del Rei (UFSJ)	Pharmacy	Pharmacobotany Internship III: Medicinal Plants and ESF Pharmacognosy I Pharmacognosy II Internship IV: Medicinal Plants Phytochemistry
Federal University of Vales do Jequitinhonha e Mucuri (UFVJM)	Pharmacy	Pharmacobotany Pharmacognosy Herbal medicines

toxicology, and pharmacology of medicinal plants and their active compounds without ignoring the popular (Santos et al., 2011).

The PNPIC states the need to encourage the adoption of practices and internships in phytotherapy by health-care professional and undergraduate students studying health-related courses and to encourage universities to offer undergraduate and postgraduate programs that include courses on medicinal plants and herbal medicine (BRASIL, 2006a).

Guideline 2 of the PNPMF states the need for scientific and technical education as well as training of health-care professionals in phytotherapy and medicinal plant and herbal medicine practices. For this purpose, “the Ministry

of Education proposes the inclusion of the topic Medicinal Plants in technical and higher education” and “the Ministry of Education suggests the inclusion of specific courses in the curricula of training careers for health professionals and others involved in the production and use of medicinal and herbal medicines plants” (BRASIL, 2009).

Some studies report that the main difficulty perceived by health-care professionals to practice phytotherapy is the lack of knowledge on the subject. A study on Family Health Program in Recife verified the perception of health-care professionals (physicians, dentists, and nurses) on medicinal plants for treating oral diseases. The study concluded these health-care professionals

Table 3. Elective courses on medicinal plants and herbal medicine in the curricula of undergraduate courses offered by federal HEIs.

HEI	Career	Elective course
University of Brasília (UnB)	Pharmacy	Internship in Pharmacognosy Herbal Medicines Medicinal Plants
	Physical therapy	Pharmacobotany
Federal University Grande Dourados (UFGD)	Nutrition	Phytotherapy
Federal University of Mato Grosso do Sul (UFMS)	Pharmacy	Technology of Herbal Medicines Etnopharmacobotany
Federal University of Goiás (UFG)	Nutrition	Medicinal Plants and Herbal Medicines
Federal University of Mato Grosso (UFMT)	Nursing	Integrative and Complementary Practices and Nursing
	Pharmacy	Medicinal and Aromatic Plants Phytotherapy e Homeopathy
Federal University of Acre (UFAC)	Nursing	Medicinal Plants in Amazonia
Federal University of Amazonas (UFAM)	Pharmacy Nutrition	Phytotherapy Medicinal Plants
Federal University of Tocantins (UFT)	Nursing	Integrative and Complementary Practices in Unified Health System
Federal University of Alagoas (UFAL)	Nursing Pharmacy	Complementary and Integrative Practices in Health care Phytotherapy
Federal University of Bahia (UFBA)	Pharmacy	Chemistry of Natural Products
Federal University of Ceará (UFC)	Nursing Pharmacy	Alternative Health Practices Phytotherapy
Federal University of Maranhão (UFMA)	Nursing Pharmacy	Complementary Therapies Phytochemicals

Table 3 cont'd

Federal University of Paraíba (UFPB)	Nursing Pharmacy	Phytotherapy Phytotherapy
	Medicine	Phytotherapy I Phytotherapy II
Federal University of Campina Grande (UFCG)	Nursing Pharmacy Nutrition Dentistry	Phytotherapy Herbal Pharmacy Alternative and Complementary Therapies in Nutrition Fundamentals of Phytotherapy Applied to Dentistry
	Nursing	Medicinal Plants: Of the Collection to Therapy
	Pharmacy	Introduction to the Study of Herbal Medicines Production and Quality Control of Herbal Medicines
	Nutrition	Medicinal Plants: Of the Collection to Therapy
Federal University of Vale do São Francisco (UNIVASF)	Medicine	Phytotherapy
Federal University of Piauí (UFPI)	Pharmacy Nursing	Technology of Herbal Medicines Complementary Health Therapies
	Federal University of Rio Grande do Norte (UFRN)	Pharmacy
Federal University of Sergipe (UFS)		Pharmacy
	Nursing	Unconventional Practices in Health care
Federal University of Paraná (UFPR)	Medicine	Medical Rationalities and Complementary and Integrative Health Practices Fundamentals of Phytotherapy and Homeopathy
Federal University of Pelotas (UFPEL)	Pharmacy	Ethnopharmacology Phytotherapy

Table 3 cont'd

Federal University of Santa Maria (UFSM)	Nursing	Complementary Therapies in Health
Federal University of Rio Grande (FURG)	Nursing	Alternative Therapies
	Nursing	Complementary and Integrative Health Practices
	Pharmacy	Quality Control of Raw Materials Plant Herbal Medicines
Federal University of Rio Grande do Sul (UFRGS)	Physical therapy Medicine Nutrition Dentistry	Integrative Health Practices
	Nursing Pharmacy	Medicinal Plants in Health Practices Phytotherapy and Homeopathy in the Health System
Federal University of Santa Catarina (UFSC)	Medicine	Introduction to the Study of Medicinal Plants Medical Rationalities in the Context of PNPIC
Federal University of Fronteira Sul (UFFS)	Nutrition Nursing	Phytotherapy Applied to Nutrition Alternative or Complementary Health Practices and Nursing
Federal University of Rio de Janeiro (UFRJ)	Pharmacy	Applied Botany Medicinal Plants Introduction to Natural Products Chemistry
	Nursing	Botany I Introduction to Natural Therapies in Health Poisonous Plants
Federal University Fluminense (UFF)	Pharmacy	Chemistry of Natural Products Technology Phytochemicals and Natural Products
	Medicine	Phytotherapy: Fundamentals and Introduction to Practical
Federal University of São Paulo (UNIFESP)	Pharmacy	Technology of Herbal Medicine
Federal University of Alfenas (UNIFAL)	Pharmacy	Phytotherapy II

Table 3 cont'd

Federal University of Juiz de Fora (UFJF)	Nursing Pharmacy Physical therapy Medicine Nutrition Dentistry	Notions of Phytotherapy
Federal University of Minas Gerais (UFMG)	Medicine Nutrition	Herbal Medicines Medicinal Plants
Federal University of Ouro Preto (UFOP)	Pharmacy	Quality Control of Herbal Inputs Phytotherapy
Federal University of São João del Rei (UFSJ)	Medicine	Phytotherapy
Federal University of São João del Rei (UFSJ)	Nursing	Phytotherapy
Federal University of Viçosa (UFV)	Pharmacy	Phytochemistry and Pharmacological Bases of Natural Products Medicinal and Aromatic Plants
Federal University of Vales de Jequitinhonha e Mucuri (UFVJM)	Pharmacy	Phytochemistry

had limited knowledge on the use of medicinal plants, which hindered the provision of guidance to patients (França et al., 2007).

Another study at Juiz de Fora, MG, determined the perceptions of health-care professionals in primary health care on the inclusion of herbal medicine in the SUS. The results of the study showed that lack of training of qualified professionals was the main challenge for structuring phytotherapy in the health system. Therefore, it is mandatory to make changes in the curricula of majority of health-related courses to address the public policies related to phytotherapy and herbal

medicines in a proper and safe manner (Barreto, 2011).

The most common observation in this study was the lack of courses related to phytotherapy in the Medicine curriculum. In a survey conducted in São Paulo on medical training, 60% of the interviewed physicians defended the inclusion of themes related to unconventional therapies in the official Medicine curriculum (Kasuzei, 2004).

Given the recent increase in the interest in integrative practices, studies on the understanding, perception, and use of such practices among students studying health-related courses have

been conducted in England, Australia, and Canada (Freyman et al., 2006; Harris et al., 2006; Johnson et al., 2008; Tiralongo et al., 2008). A pilot study involving Canadian medical residents showed that they had limited contact with patients during their training and lacked information, which limited their ability to deal with such issues in practice (Xu et al., 2008).

Physicians should be able to prescribe herbal medicines and medicinal plants and should guide patients on their proper use. Moreover, because herbal medicines and medicinal plants can have undesirable effects, physicians should be aware

of their toxicity and severe interactions with conventional medicines to detect such adverse events. Active participation of physicians is mandatory for the success of the public policies on phytotherapy.

According to literature, most medical students are in favor of integrating CAM into the medical system. Generally, first-year medical students tend to view CAM more favorably than senior-level students perhaps reflecting the curricular emphasis on Evidence Based Medicine and randomized, clinical trials during training (Karpa, 2012).

According to Sena et al. (2006), faculty members of Nursing and Medical curricula in the HEIs in the State of Rio Grande do Sul associate the topic of medicinal plants with scientific knowledge and recognize their value as medicines (Sena et al., 2006).

The results obtained in the present study indicate that the number of courses on phytotherapy and herbal medicines in the curricula of health-related courses are very less, which does not encourage the training of professionals in this area. Despite this, it is clear that college students and health-care professionals are interested in this topic, as reported by several studies.

A systematic review on the inclusion of CAM in medical teaching concluded that the rationale for teaching CAM in medical schools is to add complex diagnostic and therapeutic tools to medical practice for patient care, disease prevention, and health promotion (Christensen et al., 2010).

In the context of public and private higher education in Brazil, studies have suggested that there is growing interest among college students (both undergraduate and postgraduate students) to obtain knowledge on CAM. These findings do not reflect in the official syllabus of health-related courses, despite recent speeches and changes in curricula that have occurred in some institutions (Teixeira et al., 2004; Trovo et al., 2003).

A study involving undergraduate students studying Pharmacy and Biological Sciences in HEIs in various regions of Brazil determined the interest of these students in the information on medicinal plants. The results of this study showed that students recognize the importance of this topic for their future performance as professionals and are interested in improving this area (Brandão et al., 2001).

Use of herbal medicine in the SUS requires a series of studies involving the cycle of pharmaceutical care, treatment, and awareness; acceptance by users, professionals, and managers; and quality services and tools to evaluate this practice (De la Cruz, 2005).

Law No. 9394 of December 20, 1996, laid down the guidelines and bases for national education and highlighted the purpose of educating students, who are qualified for inclusion in professional sectors and participation in the development of Brazilian society, in different fields of knowledge to promote and publicize cultural, scientific and technical knowledge and communicate

this knowledge through teaching, publication, or other forms of communication (BRASIL, 1996).

The results of the present study highlight the need for urgent changes in the education provided by HEIs that offer health-related courses. Without the inclusion of the selected topics in the undergraduate curricula, it is difficult to obtain and maintain qualified professionals in this area.

Preliminary analysis of the current frame of the government, institutions, and academic contributions on health-related courses indicates that an appropriate dialogue between educational and health institutions is necessary to strengthen the use of phytotherapy in the health system, especially in primary health care. A more committed effort will potentially enrich the official therapy, increase access to pharmaceutical services, and promote practices that offer complete health care.

Conclusion

It is concluded that few undergraduate curricula of health-related courses offer mandatory courses on medicinal plants, herbal medicine, and phytotherapy and that the number of elective courses is less for training of health professionals in herbal medicine. In general, it was noted that only Pharmacy curriculum included courses related to medicinal plants, herbal medicine, and phytotherapy.

It is essential that the Brazilian Ministry of Education as well as HEIs offering undergraduate programs on health-related courses should discuss the need for the inclusion of mandatory and/or elective courses on medicinal plants, herbal medicine, and phytotherapy. This will create qualified health-care professionals who can practice herbal medicine.

Conflicts of interest

The authors declare that they have no conflict of interests.

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