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Nursing training and their approximation to the assumptions of the National Curriculum Guidelines and Primary Health Care

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Abstract *This article describes the characteristics of offer for job vacancies, curricular structure and competency profile of students from nursing undergraduate courses, seeking to identify elements that are in line with the assumptions of the National Curricular Guidelines (NCG) and of the nurses' work in primary health care. Applying a computer-assisted survey by telephone interviews with 94 course coordinators, it was verified: provision of job vacancies distant from the national needs; curricular structure focused on fragmented disciplines in the basic and vocational cycles, in disagreement with recommendations by the NCG; and competency profile potent for the development of actions of promotion, prevention, management and nursing techniques, which are predicted in the scope of general skills and abilities recommended for the exercise of the generalist professional nursing practice, according to the NCG, and compatible with the main demands of primary health care.*

Key words *Higher Education, Nursing, Unified Health System, Curriculum, Primary Health Care*

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Introduction

The profession emerges as an instrument of response to the historically presented collective needs. Thus, like the other professions in the health area, nursing had, in its constitution, the influence of the care demands of the population and the political and social movements for health, as well as the hegemonic manifestations of power[1]. Therefore, the construction of the profession and, consequently, of nursing education, goes through the changes experienced throughout the historical trajectory of health[2].

In the 1920s, nursing education and practice aimed predominantly at public health through primary preventive health practices performed outside the hospital environment and associated to the government. In the 1940s, they suffered the effects of the consolidation of industry and the emergence of large hospitals, focusing on the clinical model of fragmented practice, focused on the hospital area[3].

In these circumstances, the nursing teaching curriculum now focuses on specialized clinics, focusing on disease and cure, and public health is no longer a compulsory subject[4]. During the military government, there was a decrease in government spending on public health, with a reduction in programs aimed at controlling mass diseases and allowing the increase of the medical-industrial complex, consolidating the hospital-based biomedical health model[5].

In the 1980s, the country went through political changes, leading to a series of proposals for reforms in the organization of health services and the nurses' labor market, which reflected on their education[6]. After the creation of the Brazilian Unified Health System (SUS), discussions arose about the competency profile that nurses should assume, culminating in the approval of the National Curriculum Guidelines for Undergraduate Nursing Courses (DCENF) in 2001[7].

The DCENF deals with the profile of nurses who should, from now on, have a generalist, humanistic, critical and reflective training, in addition to elucidating the curricular contents that should include the Biological and Social Sciences of Health, the Human Sciences and the Nursing Sciences, which includes the basics, administration, teaching and nursing care[7].

Considering the specificities of SUS and its prioritization of promotion and prevention actions, primary care was considered a primary and fundamental level for the entire organization of this system. From this perspective, the DCENF brings robust definitions in the approach of specific competencies to act at this level of care, highlighting the performance in a multidisciplinary team, comprehensive care, emphasis on health promotion, focus on individuals, family and community, and health planning skills. According to this logic, the insertion of students in the community and in different spaces and levels of health care and the creation of bonds are important assumptions for the training of nurses[7].

Health needs, which have become increasingly dynamic and complex, especially characterized by the emergence and reemergence of diseases, as well as the population aging that has increased the prevalence of chronic diseases, demand more resolute primary care and, therefore, nurses with a generalist and competent profile, able to do interdisciplinary and collective teamwork, capable of developing effective actions, especially preventive ones[8,9].

Therefore, this study aimed at describing the characteristics of the job offer and the curriculum structure, as well as the competency profile of recently graduated nursing professionals in Brazil, seeking to identify elements that are close to the assumptions of the DCENF and the professional performance of nurses in basic care.

Method

This is a national, descriptive and quantitative study, developed between December 2015 and June 2016. Data were collected through a survey carried out with managers of undergraduate nursing courses (coordinators and principals), through a Computer-Assisted Telephone Interview (CATI).

The research universe corresponded to the number of undergraduate nursing courses in Brazil (n = 868), according to the 2013 Higher Education Census[10]. To determine the sample, a simple random sample calculation was performed, considering 90% of the level of confidence, confidence and 6% margin of error, resulting in 154 courses.

The coordinators of the courses were randomly contacted, aiming to reach the calculated sample number. After six months, 357 courses were engaged: more than ten attempts were made with 130 of them, unsuccessfully; 129 coordinators refused to participate in the study or rescheduled the interview more than five times; 94 interviews were completed; and 04 courses were no longer active. Due to the prolonged data collection period, it was decided to finish it even if the

desired final sample was not reached, which consisted of 94 undergraduate courses, representing a proportion of 61.0% of the calculated sample and 10.8% of the research population.

To perform the CATI, a semi-structured questionnaire was created in an electronic form, including questions related to the identification of the interviewee, location, job offers and curriculum structure. Moreover, in order to understand the professional training empirically offered to the students, different competencies and skills were mentioned, classified as health actions, managerial actions, technical procedures and diagnostic support procedures and prescriptions, to which the interviewees should agree (3), partially agree (2), or disagree (1) about the course preparing students to perform them, using a point scale. It is noteworthy that some of them are not part of the scope of legal nursing practice but were added to investigate whether the training process includes the expansion of nurses' field of action. Competencies and skills were listed based on the DCENF[7], health ministry documents describing professional attributions to members of primary care teams, and Federal Nursing Council resolutions on regulated nursing activities[11].

The data were tabulated and statistically processed using the Statistical Package for Social Sciences (SPSS), version 21.0. Descriptive analyses were used, with the calculations of frequencies, percentages and weighted average, as well as inferential analysis by Kendall's coefficient (W_a) to evaluate the association of responses between respondents, of which values may vary from 0 to 1 (0-100%). Statistical significance was set at 5%.

Following the directives of Resolution 466 of December 12, 2012, the study project was submitted to the Research Ethics Committee.

Results

Respondents' profile

The respondents' sample (n = 94) comprised mostly women (n = 79; 84%); nurses (n = 89; 94.7%); those with a Master's degree (n = 53; 56.4%) and Ph.Ds. (n = 33; 35.1%). The mean age was 47 years and average time of training and occupying the management position was 21.7 and 4.5 years, respectively.

Location and legal status of courses

Most courses are located in the Southeast region and in non-capital municipalities with more than 100,000 inhabitants, as shown in Table 1. Regarding the legal status, most courses are linked to private higher education institutions (n = 70 74.5%); the public ones totaled 24 (25.5%).

Job offers

The courses offer, on average, 124 job vacancies per year, with an average filling rate of 80%, which means that 20% of vacancies remain open. The private ones offer, on average, 146 job vacancies / year, of which 75.3% are filled; of the 60 vacancies / year offered, on average, by public courses, 93.6% are filled.

Table 1. Undergraduate nursing courses in the sample, located by region and population size of the municipalities. Brazil, 2015-2016 (n=94).

Location of courses	Private (n=70)	Public (n=24)	Total	
			N	%
Regions				
North	5	0	5	5.3
Northeast	13	7	20	21.3
Southeast	38	3	41	43.6
South	8	10	18	19.1
Midwest	6	4	10	10.6
Population size (inhabitants)				
Capital cities	28	6	34	36.2
More than 100,000 (non-capitals)	25	11	36	38.3
More than 50,000 to 100,000	12	5	17	18.1
More than 20,000 to 50,000	5	2	7	7.4

Source: Data from the research.

Curriculum Structure of Undergraduate Courses

Most respondents (n = 43; 45.7%) declared there was no external consultancy for the creation of the Pedagogical Political Project (PPP); however, it should be considered that part of the respondents (n = 15) could not answer this question. Of the total, 76 (80.9%) PPPs were last modified/updated in the 2013-2016 period.

Regarding the pedagogical structure, the managers were asked what the emphasis was regarding the course training in relation to some areas of nursing performance and, to answer that, the interviewee had to classify each area using an increasing scale from 1 (less emphasis) to 6. The weighted averages indicated primary care as the one receiving the most emphasis (5.6), followed by hospital care (4.8), service management (3.9), specialized / outpatient care (3.6), research (3,2) and, finally, teaching (2.7).

The curricular structure is organized by disciplines (n = 88; 93.6%) and in cycles – the basic cycle, including broader disciplines related to Health Sciences, and vocational, with more specific disciplines related to the profession (n = 58; 61.7%). Nevertheless, of the total courses, 73 (77.7%) include integrated and shared activities; of these, 59 are private.

Regarding the total workload, the computed average was 5,364 hours, of which 2,491 are spent on theoretical content, 1,967 on theoretical -practical content and 907 on graduate training/ internships. Among the private ones, the overall average was 5,579 hours and, among the public ones, the overall average was 5,148 hours.

Regarding the places where students take practical classes and / or internships, it was found that the scenarios are varied, and all courses use primary care units and general hospitals (Table 2). Questioned about the actors who accompany the students in these scenarios, they mentioned: the teachers themselves (n = 93; 98.9%), health professionals (n = 60; 63.8%), and hired preceptors (n = 42; 44.7%). This last strategy is mostly used by private institutions (n = 34).

Table 2. Nursing undergraduate courses according to the use of practical activity scenarios and internships. Brazil, 2015-2016 (n=94).

Scenario	n	%
Primary Care Units	94	100
General Hospitals	94	100
Adult Psychosocial Care Center (CAPS)	85	90.4
Specialized Hospitals	83	88.3
Family Health Support Center (NASF)	80	85.1
Nursing home institutions	80	85.1
Emergency Care Units (UPA)	77	81.9
Daycare and / or schools	67	71.3
Polyclinics / ambulatories / clinics	67	71.3
Institutions for people with disabilities	61	64.9
Companies	51	54.3
Therapeutic Residence	37	39.4
Others*	07	7.4

* Laboratories, health surveillance centers, rehabilitation centers, Mobile Emergency Care Service (SAMU), home care and public spaces for the development of social actions.
Source: Data from the research.

Competency profile of graduated professionals

Based on the calculation of weighted averages ($\overline{x}_w$) shown in Table 3, it can be observed that the courses prepare nursing students to perform most of the researched health actions ($\overline{x}_w$=2.73), especially those of health promotion and education and anthropometric assessment. The ones with the least training are oral health guidelines, high-risk prenatal care and psychiatric emergency care.

As for the management actions ($\overline{x}_w$=2,86), most respondents considered that the course prepares students to perform all listed actions, except attesting death. Regarding technical procedures ($\overline{x}_w$=2,35), more than 95% of managers agreed that the course prepares students to perform wound dressings, insert nasogastric, nasoenteric tubes and urethral catheters, administer medications and vaccines. The procedures assigned to medical professionals showed lower percentages of agreement regarding the students' preparation to perform them, especially local anesthesia and sutures.

Among the diagnostic support procedures and prescriptions ($\overline{x}_w$=2,33), the following stand out: perform and interpret Pap smear results, perform electrocardiogram and perform and interpret the tuberculin skin test. The prescription of medications and the request for imaging exams, on the other hand, obtained lower averages.

The response agreement between the evaluators for the set of health actions was only 30.3%

Table 3. Weighted averages calculated for the competencies and skills assessed by respondents regarding whether the undergraduate course prepares students to perform them. Brazil, 2015-2016 (n=94).

Verified competencies	$\bar{x}_w$*
Health actions	**2.73**
Performs health promotion actions	2.98
Conducts health education groups	2.98
Performs anthropometric assessment	2.96
Works in a multidisciplinary team	2.94
Conducts childcare consultation	2.94
Performs low-risk prenatal care	2.93
Performs family planning	2.87
Performs risk classification consultation	2.86
Performs follow-up of psychiatric patients	2.67
Performs psychiatric urgency and emergency care	2.44
Performs high risk prenatal care	2.21
Conducts oral health guidelines	2.04
Management actions	**2.86**
Performs compulsory notification	2.93
Plans and performs vaccination campaigns	2.92
Manages Materials and Sterilization Center	2.87
Manages Cold Chain	2.80
Supervises other professionals	2.80
Attests death	1.30
Technical procedures	**2.35**
Inserts nasogastric tubes	2.96
Performs wound dressing	2.96
Administers medications	2.94
Administers vaccines	2.92
Inserts urethral catheters	2.90
Inserts nasoenteric tubes	2.88
Prescribes wound dressings	2.76
Removes sutures	2.72
Inserts superficial venous catheter	2.69
Performs arterial puncture	2.61
Performs immobilizations	2.49
Performs emergency vaginal delivery	2.01
Performs vaginal delivery	1.98
Performs abscess drainage	1.97
Inserts deep venous catheter	1.56
Performs tracheal intubation	1.45
Performs sutures	1.32
Performs local anesthesia	1.26

it continues

Table 3. Weighted averages calculated for the competencies and skills assessed by respondents regarding whether the undergraduate course prepares students to perform them. Brazil, 2015-2016 (n=94).

Verified competencies	$\bar{x}_w$*
Diagnostic support procedures and prescriptions	**2.33**
Performs Pap smear	2.97
Interprets Pap smear result	2.88
Interprets tuberculin skin test (TST) result	2.79
Performs the Newborn Bloodspot Screening Test	2.78
Performs the tuberculin skin test (TST)	2.78
Performs electrocardiogram	2.77
Interprets laboratory tests	2.68
Interprets imaging exams	2.41
Interprets ECGs	2.40
Requests laboratory tests	2.28
Requests electrocardiogram	2.19
Communicates nosological diagnosis to patients	2.12
Treats nutritional deficiencies	2.11
Renews Medical Prescription	2.08
Requests imaging exams	2.07
Prescribes anthelmintic drugs	2.04
Prescribes drugs for cases of previously diagnosed chronic disease	2.03
Prescribes anti-inflammatory drugs	2.01
Prescribes antifungal drugs	1.99
Prescribes psychoactive medications	1.98
Prescribes medications for acute respiratory failure	1.95
Prescribes antibiotics	1.94

* Values of 1 (discordance) to 3 (concordance).
Source: Data from the research.

(W_a = 0.303; p = 0.000), close to the values verified for the groups of private, and public courses and by region, except for the Midwest, of which agreement was over 50%. There was no statistical significance only among respondents from the Northern region, suggesting that these respondents, in particular, significantly disagree regarding student preparation, which refers to very specific training realities between the courses. Other results can be seen in Table 4.

Discussion

In this study, the profile of managers of undergraduate nursing courses who were interviewed, considering that 95% of them were nurses,

Table 4. Percentage of agreement between respondents regarding students' preparation during the undergraduate course to develop specific competencies and skills, according to pooling of respondents. Brazil, 2015-2016 (n = 94).

Pooling of respondents	Percentage of agreement (%)*			
	Health actions	Management actions	Technical procedures	Diagnostic support and prescriptions
Administrative sphere				
Public	29.3	54.2	46.2	46.2
Private	31.6	76.7	54.7	54.7
Regions				
North	30.3#	100	53.1	57.3
Northeast	25.4	61.9	60.9	47.9
Southeast	31.8	74.8	54.4	53.5
South	33.6	69.0	53.4	61.5
Midwest	54.8	68.1	53.0	45.9
Total sample	30.3	65.4	70.5	51.8

* Kendall's coefficient of agreement; #p>0.005.
Source: Data from the research.

confirms the data found in the National Nursing Workforce Survey. According to the survey, 85.1% of the 1,804,535 nursing professionals are women and 40.1% are aged between 36-50 years, an age group said to be, based on the sociology of the professions, at the "professional maturity phase". This phase includes the nursing professionals who, in most cases, have already achieved full development of their professional skills and have a postgraduate degree[12].

As for the courses in which respondents operate, their regional distribution and concentration follow the national panorama of the total nursing courses, total health courses and, more broadly, of the total courses in all areas[10]. The data confirm the hegemony of the Southeast region as the storehouse of professional formation and retention, since, of the total of nurses registered in the regional councils of the profession, 46.1% graduated in the states of São Paulo, Rio de Janeiro and Minas Gerais and 48.2% work in this region[12].

The proportion of private courses included in the sample is also justified in the Brazilian scenario, which has a higher number of courses from educational institutions administered by this legal sphere, of which proportion increased exponentially in the late 1990s, following the promulgation of the Law of Directives and Bases of 1996[13]. This sphere, in 1991, was responsible for 46 nursing courses; in 2016, it increased to 791, equivalent to 82.2% of the total nursing courses[14]. This scenario reflects the fact that 57.4% of the current nurses in Brazil graduated from private institutions[12].

Another consequence of the proliferation of nursing courses was the increased supply of job offers, disproportionate to the demand for them, which is confirmed by the progressive increase in the rates of unmet job offers. In 2004, this rate was 15.8%, rising to 62.9% in 2016, corresponding to over 158,000 unmet job vacancies, of which approximately 155,000 are from private courses[14].

The current inequalities in adequacy between the availability and demand of job vacancies are due, in part, to the poor regulation of the training system and the persistent dissociation between the provision of training and the human resources needs for SUS[15]. This mismatch leads to the distortion in professional preparation by emphasizing training that does little to favor the health system[16], so that, establishing an articulation between the educational institutions and SUS has been a persistent challenge[17,18].

It is in this context that the DCENF is included as a guide for nursing education, which makes a graduated nurse into an agent of change, capable of subsidizing the transformation of health problems of the Brazilian population[7]. Ba-

sed on this premise, this study sought to identify characteristic elements of the curricular structure and the profile of graduated nurses that are close to the DCENF assumptions and the nurse's action in primary care, level of priority attention and guiding element of SUS.

It was observed that, according to the interviewees, the greatest emphasis of the training process of nurses is primary care, different from what was found by a study that conducted in-depth interviews with teaching managers from different regions of Brazil. According to that study, the courses have a varied emphasis, but which tend mainly towards the tertiary level or basic level of attention[19].

It was also observed that the curricula are organized by disciplines distributed in the basic and vocational cycles, as verified by previous studies[19-21]. This characteristic dates back to the Flexnerian proposal of fragmentation of medical education – adopted by all health courses –, which defends the mastery of theory in the basic cycle, for further understanding of practice in the professional cycle. Historically these cycles are disassociated, so that what is taught in the former has little practical applicability in the latter. Thus, the maintenance of this model of curriculum structure still reveals a mismatch to that proposed by the DCENF[19,22].

Most of the courses, especially the private ones, include activities integrated with other courses, a characteristic that may be based on the ascension of the proposal for Interprofessional Education (IPE), pointed as a principle for the reorientation of the training and health care model[23]. On the other hand, as this part of the questionnaire did not require details, the answers may be related only to the fact that, in most private courses, the basic subjects (initial periods) are taught together for several health courses. This does not necessarily imply the development of the assumptions of interprofessional education nor, therefore, the development of teamwork skills.

In relation to the total workload of the courses, the computed average is higher than the minimum of 4,000 hours required by the National Council of Education[24]. Likewise, the average time allocated to graduate training / internships is also higher than the minimum hours required by DCENF[7].

Regarding the practical activities, the courses make their students interact with different health devices and community spaces, in accordance with what the DCENF proposes[7]. This diversification of scenarios beyond the hospital environment suggests the understanding of the extended concept of health, contrary to the historically hegemonic process of formation, which focuses on the care of the disease and the hospital as a privileged site for healing and teaching[21]. It also suggests an approximation between the world of education and that of work, so necessary for the development of skills that allow professionals to intervene in the epidemiological profile, thus contributing to improving the quality of life of the populations[20,25,26].

Other studies have pointed to this reality; however, there are many difficulties that permeate the introduction of students in the reality of SUS, such as resistance, unpreparedness and insufficient number of teachers and preceptors, precarious infrastructure of the units and even field disputes by different institutions[9,19,27].

From this perspective, for these scenarios to favor the formation of nurses that are more aware of their social role, it is necessary to invest, minimally, in the qualification of care networks and the professionals who accompany students, and in the establishment of contracts related to objectives and goals between educational institutions and SUS services. Moreover, the legacy of fragmented, vertical health policies, practices and education[28] needs to be addressed, in favor of comprehensive and good quality health care and the development of competencies that allow graduated nurses to diagnose and solve health problems of different complexities[7,9].

In primary care, the demands are diverse, but concentrated on few socially-related health problems, benign diseases commonly found in a community, and controllable, noncommunicable chronic diseases. Thus, professional performance at this level of care requires the use of high-complexity and low-density technologies, that is, it requires deep knowledge and generalist technical input, supported by procedures that are simpler and less costly for the health system[8,29].

Considering the abovementioned facts, the students' preparation for the development of common health actions was assessed. The analysis pointed to a professional profile capable of developing mainly health promotion and education, management and technical actions. This comprehension was statistically confirmed by the existence of agreement, although low, among the respondents, suggesting that the formative processes of the different courses resemble each other.

In primary care, in accordance with the health model advocated by SUS, educational actions

play a fundamental role and permeate the entirety of nursing care, requiring a training process that brings them closer to this perspective[30,31]. Also highlighted are the administrative and managerial competencies advocated by DCENF, which are characteristics of the nurse's work, who are shown to be more prepared to assume such functions[32].

The little-invasive care to different population groups, such as gynecological preventive care, childcare, anthropometric and low-risk prenatal assessment, is also a skill that is well worked during the course, confirming the care of children and women as priorities in the field of public health. Studies have found that these practices are the most commonly developed by primary care nurses[33,34], confirming that this professional's performance was and is crucial for the implementation of policies aimed at these populations, which historically resulted in reduced maternal-child mortality[35].

As for the attributions of requesting complementary exams and prescribing medications according to care protocols, although predicted by the legislation that regulates the nursing profession[36] and the National Primary Care Policy[37], they are less emphasized during undergraduate training. This perspective is not a surprise, considering that in Brazil there is still much controversy about the legal and ethical basis for nurses to perform these attributions. And despite this scenario, the implementation of advanced nursing practices is already being considered in the country[38].

This strategy has been introduced in different countries to improve accessibility to primary health care, based on research findings showing that it provides similar or more effective care than medical care[39-41].

In Brazil, the discussion on the subject is especially motivated by the scarcity of physicians in primary care, especially in places that are difficult to reach, which has a direct impact on the inefficiency and poor problem-solving characteristic of this level of care[42,43]. Given this perspective, other evidence on nursing education needs to be produced and explored, aiming at implementing advanced functions for nurses in the future.

Conclusions

This study aimed to present an overview of the offer and characteristics of nursing education in Brazil, identifying elements that are in line with the assumptions of the DCENF and the competencies required for nurses' performance in primary care.

We observed the provision of job vacancies that was distant from the national needs; the curricular structure focused on fragmented disciplines in the basic and vocational cycles, in disagreement with recommendations by the DCENF; and from the perspective of comprehensive care, so important for the SUS care model.

As for the competency profile, the training prepares students mainly for the development of actions of health promotion, prevention, management and nursing techniques, which, in addition to being predicted in the scope of overall competencies and skills recommended for the generalist nursing professional practice, are compatible with the main primary care demands. On the other hand, practices legally permitted to nurses, but historically understood as exclusive to doctors, are less emphasized, such as the request for examinations and drug prescriptions for common diseases.

Although the research did not reach 100% of the intended sample, it is considered that the study was able to provide data for the description of the national panorama of nursing education, taking into account the precautions related to data generalization.

For these reasons, the following is recommended: greater government intervention regarding the offer of job vacancies without prior assessment of local needs; establishment of a review process of the DCENF, in an attempt to define specific competencies that can meet the main demands of SUS; and new investigations that combine professional training, practice and legislation.

Collaborations

C Magnago participated in the study conception and design, analysis and interpretation of data, writing of the manuscript and approval of the version to be published. CR Pierantoni participated in the study conception and design, critical review and approval of the version to be published.

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