DOI 10.18471/rbe.v31i3.22172
Original Article

DEMAND FOR COMPLEMENTARY MEDIUM-COMPLEXITY TESTS FOR PRIMARY HEALTH CARE

DEMANDA DE EXAMES COMPLEMENTARES DE MÉDIA COMPLEXIDADE NA ATENÇÃO PRIMÁRIA À SAÚDE

DEMANDA DE EXÁMENES COMPLEMENTARES DE MEDIA COMPLEJIDAD EN LA ATENCIÓN PRIMARIA A LA SALUD

Isadora Soto Tonelli[1]
Francisco Carlos Félix Lana[2]

How to cite this article: Tonelli IS, Lana FCF. Demand for complementary medium-complexity tests for primary health care. Rev baiana enferm 2017;31(3):e22172.

Objective: to analyze the demand and the presence of justification in the requests of complementary medium-complexity tests by Primary Health Care. Method: descriptive, cross-sectional study, carried out in a small municipality of the state of Minas Gerais, Brazil. Study variables: main types of tests requested, nature of the tests, justification for request and coverage parameters. Descriptive statistics and Pearson's chi-square test were used for analysis. Results: there was a higher proportion of acute and elective tests compared to programmatic ones. The main tests were ultrasonography (19.64%), mammography (16.7%) and radiography (11.5%). Ultrasonography exceeded the coverage parameter by five times. 54.95% of the requests were not justified. There was no statistical difference between the presence of justification and type of tests. Conclusion: there is a need to establish guidelines for the clinical practice of these professionals. The high demand for acute and elective tests to the detriment of programmatic tests reflects a greater emphasis on the disease, indicating the persistence of the biomedical model.

Descriptors: Primary Health Care. Medical Tests. Secondary Health Care. Intermediate Technology.

Objetivo: analisar a demanda e a presença de justificativa na solicitação de exames complementares de média complexidade pela Atenção Primária à Saúde. Método: estudo descritivo, transversal, realizado em município de pequeno porte do estado de Minas Gerais, Brasil. Variáveis do estudo: principais tipos de exame solicitados, natureza do exame, justificativa para solicitação e parâmetros de cobertura. Para análise utilizou-se estatística descritiva e teste de qui-quadrado de Pearson. Resultados: maior proporção de exames agudos-eletivos em relação aos programáticos, sendo os principais: ultrassonografia (19.64%), mamografia (16,7%) e Radiografia (11,5%). As ultrassonografias ultrapassaram em cinco vezes o parâmetro de cobertura. Não apresentaram justificativa, 54,95% das solicitações. Não houve diferença estatística entre presença de justificativa e tipo de exame. Conclusão: há necessidade de se estabelecer diretrizes para a prática clínica desses profissionais. A alta demanda de exames agudo-eletivos em detrimento dos exames programáticos reflete maior ênfase na doença, indicando a persistência do modelo biomédico.

Descritores: Atenção Primária à Saúde. Exames Médicos. Atenção Secundária à Saúde. Tecnologia Intermediária.

Objetivo: analizar la demanda y la presencia de justificativa en la solicitación de exámenes complementares de media complejidad por la Atención Primaria a la Salud. Método: estudio descriptivo, transversal, realizado en un

[1] Nurse. Master Student in Health and Nursing from the Universidade Federal de Minas Gerais. Belo Horizonte, Minas Gerais, Brazil. isadorasotonelli@gmail.com
[2] Nurse. PhD in Nursing. Associate Professor of the Department of Maternal and Child Nursing and Public Health, School of Nursing, Universidade Federal de Minas Gerais. Belo Horizonte, Minas Gerais, Brazil.

municipio de pequeño porte del estado de Minas Gerais, Brasil. Variables del estudio: principales tipos de examen solicitados, naturaleza del examen, justificativa para solicitación y parámetros de cobertura. Para análisis se utilizó estadística descriptiva y test de chi-cuadrado de Pearson. Resultados: mayor proporción de exámenes agudos-electivos en relación a los programáticos, siendo los principales: ultrasonografía (19.64%), mamografía (16,7%) y Radiografía (11,5%). Las ultrasonografías ultrapasaron en cinco veces el parámetro de cobertura. No presentaron justificativa, 54,95% de las solicitaciones. No hubo diferencia estadística entre presencia de justificativa y tipo de examen. Conclusión: hay una necesidad de establecer directrices para la práctica clínica de esos profesionales. La alta demanda de exámenes agudo-electivos por causa de los exámenes programáticos refleja mayor énfasis en la enfermedad, indicando la persistencia del modelo biomédico.

Descriptores: Atención Primaria a la Salud. Exámenes Médicos. Atención Secundaria a la Salud. Tecnología Intermediaria.

Introduction

Complementary tests aim to bring information that goes beyond the data collected through anamnesis and the physical examination performed by the health professional. They are of great importance, since they are requested to offer support or to respond to the necessity of some clinical investigation, either it is diagnostic, prognostic, for establishment or change of conduct[1].

Under the Unified Health System (SUS), complementary tests are present at all levels of health care. The use of these tests in SUS reinforces the integration between the different levels of care.

In Primary Health Care (PHC), the most requested complementary tests are laboratory tests, such as: blood count, glycemia, stool parasitology, urine culture, HIV serologies and rapid pregnancy tests[2]. In secondary care, radiodiagnostic tests, ultrasound tests, clinical pathology, and others are described in the Outpatient Information System (SIA in Portuguese) as of medium complexity. At the tertiary level, there are scintigraphy, MRI, CT scans and others considered more complex.

It should be noted that the highest proportion of the requested tests is classified as of medium complexity, allocated to secondary health care. This situation gives rise to a high repressed demand, constituting an important obstacle to the realization of comprehensiveness in the SUS[3]. However, the difficulty in establishing continuity of care between primary and secondary care is not restricted to Brazil. A study in New Zealand reports this country's concern to create policies that emphasize the integration of care and the need for greater efficiency and cost reduction[4]. Another study, carried out in Norway, portrays the barriers encountered in communication between different levels of health care regarding the exchange of information and financial grants[5].

In Brazil, this high demand is related to the several challenges identified in the coordination between primary health care and other levels of care, which are similar to international challenges, such as: difficulties in performing reference and counter-reference of patients; lack of logistical systems that result in lack of regulatory mechanisms, such as scheduling of appointments and tests, and poor communication among health professionals of different levels of care regarding conduct and clinical records of patients[6].

On the other hand, it is worth noting that despite the high demand, there has been a low supply of medium-complexity tests, which makes it difficult to define the diagnosis or therapeutics to be adopted. This is reflected in the greater number of returns, in the increase of the length of stay of the user until the resolution of his or her case, and has as consequence the limitation of access to new users[7].

The inefficient articulation between the care levels and the problems related to the repressed demand generate implications for the guarantee

of access of a greater number of users to the set of activities offered[8].

Health professionals have important participation in the effort to avoid the problem with respect to complementary tests and other services, since when they do not adhere to the specific clinical indications and/or do not carry out anamnesis and physical examination carefully the requests for complementary tests become a critical issue within the health system.

Abusive request of supplementary tests makes access by the users difficult, accumulates exams, delays the most urgent results, and increases financial expenditure by using resources that could be applied in other sectors. It can be considered that the greater responsibility in the difficulty to access secondary care is more related to this fact than to the said inefficient articulation between care levels.

The author's involvement with the object of study comes from the experience in a health service of a small municipality, in which it was observed that the great demand of medium- and high-complexity tests in PHC put pressure in the flow of requests of the Municipal Health Department (SMS in Portuguese) and generated user dissatisfaction. Thus, the objective of this study was to analyze the demand and the presence of justification in the request of complementary and medium-complexity tests by the primary health care of a small municipality located in Minas Gerais.

Method

This is an exploratory, descriptive and cross-sectional study with a quantitative approach carried out in a municipality located in the Center-West region of the state of Minas Gerais. In 2015, the municipality had an estimated population of 10,609 inhabitants, 5,341 (50.34%) males and 5,268 (49.66%) females[9].

The municipality's PHC has one health center and four family health teams covering the entire area, encompassing its headquarters and six districts. Each team consists of a physician, a nurse, a nursing technician, and six to eight community health workers (CHWs) that vary according to the population covered by the teams. In addition to the PHC, the municipality has a small hospital.

The variables of interest of the study are the main types of tests requested, justification for the request, nature of the test (acute/elective and programmatic) and coverage parameters according to the recommendations of the Ministry of Health and the World Health Organization[10-12].

The sources of data were the *i*saúde system, the Medium- and High-Complexity Complementary Tests Report of the SMS, the records of the Sector for Scheduling Appointments and Tests of the SMS and the Local Information Manager (GIL), an information system that organizes the computerization of the primary outpatient network of the Unified Health System (SUS), allowing the monitoring and continuous planning of actions in the health system in that municipality.

Data collection was performed in four stages. The first one began with the search for complementary and medium- and high-complexity tests in the *i*saúde system since the year of implantation (2011) until the year of experience in health service (2015). The objective was to raise the demand profile and select, for analysis, the tests with the highest number of requests. The total number of tests carried out in the period was 8,486.

In the second stage of the collection, a specific search on the number of the three exams (radiographs, ultrasonography and mammography) selected in the previous stage was carried out in the Medium- and High-Complexity Complementary Tests Report. These data were referring to the tests carried out in the months of January to October 2014, period made available by the SMS.

In the third step, the number of medical appointments performed in the PHC was identified in the period from January to October 2014. These data were extracted from the GIL and used to calculate the Health Care Coverage Parameters of the selected tests, established by the Ordinance no. 1101, of June 12, 2002, by

the Ministry of Health (MoH), namely: from 5% to 8% of the total medical appointments for radiology tests and from 1% to 1.5% for ultrasound scans[10]. The World Health Organization (WHO) recommendation was used for the calculation of the mammography coverage parameter. According to this recommendation, at the beginning of a population-based mammography screening program, at least 70% of the target population needs to be covered by mammography[11].

The fourth stage was structured to identify the presence or absence of justifications in the test requests. The data were collected from the test requesting records of the Sector for Scheduling Appointments and Tests of the SMS, also from January to October 2014.

The analysis variables of this study are: outcome - type of test (ultrasound and radiographic examinations) and explanatory - presence of justification in the request. Mammography was not inserted in this analysis because it is a programmatic exam whose request form is different, having justifications already written to be marked and its completion is mandatory for the accomplishment of the test.

For analysis, the Pearson chi-square test (95% significance level) was performed; for the other variables, a descriptive analysis was performed, by adopting the usual measurements of simple and relative frequency calculations. All analyzes were performed in the STATA software version14.

This study was conducted in accordance with the ethical guidelines proposed by Resolution no. 466/12 of the National Health Council. Anonymity and confidentiality of information accessed from secondary sources were guaranteed. We emphasize that this work was authorized by the Municipal Health Department of the municipality where the investigation was conducted.

Results

The data collected from the *i*saúde system in the period from 2011 to 2015 indicated that 8,486 medium - and high - complexity tests were requested. Of these, 3,535 had a "waiting" status for accomplishment. From the total, it was observed that ultrasonography, followed by mammography and radiography, were the most requested tests (Table 1). This result presented only medium-complexity tests, which excludes the high-complexity category of the study.

Table 1 – Absolute and relative frequency of the most requested medium- and high-complexity tests in the period 2011-2015 enrolled in the *i*saúde system. Minas Gerais, Brazil, 2015. (n= 8486)

Test	n	%
Ultrasonography	2.007	23.7
Mammography	1.420	16.7
Radiography	974	11.5
Tomography	435	5.1
Endoscopy	402	4.7
Ecodoppler	356	4.2
Duplex scan	186	1.9
Resonance	95	1.1
Others	2.608	31.21

Source: Created by the authors.

According to the Medium- and High-Complexity and Complementary Test Report of the SMS, during the period from January to October 2014, 4,517 examinations of medium- and high-complexity were carried out. Ultrasound examinations represented 19.64% (n = 887); X-rays, 3.83% (n = 173); and mammograms, 2.01% (n = 91). In order to deepen this information, we tried to classify the exams in acute/elective (ultrasound and X-ray) and programmatic (mammography).

The calculation of the coverage of the acute/elective tests was performed using the total number of appointments performed during the analyzed period in 2014. According to the calculations of the Health Care Coverage Parameters, 622 to 996 radiodiagnostic tests and 124 to 187 ultrasound tests should have been requested (Table 1). Considering that the MoH Coverage Parameters establish that the simple and contrasted X-ray examinations would represent 94.75% of radiodiagnostic exams, the expected number would be 590 to 943 requests for these tests.

It can be observed that the total of 173 simple and contrasted X-ray examinations carried out represent approximately one-third of the value recommended by the Health Care Coverage Parameter, while the total of 887 ultrasound test performed represent a value approximately five times higher than that recommended.

Chart 1 – Estimate of recommended health care coverage for radiodiology and ultrasound examinations according to total medical appointments. Minas Gerais, Brazil, Jan-Oct 2014

Procedure group	Total of medical appointments	Estimated Health Care Coverage
Radiology exams	12,444	622 to 996 (5 to 8% of total medical appointments)
Ultrasound tests	12,444	124 to 187 (1 to 1.5% of total medical appointments)

Source: Created by the autors.

Regarding the programmatic tests, the mammography was chosen for analysis because it is the second most requested exam in the survey carried out in the *i*saúde system, representing 16.73% of the 8,486 requests in the period from 2011 to 2015.

In the period from January to October 2014, according to the Medium- and High-Complexity and Complementary Test Report of the SMS, 91 mammograms were performed. It should be noted that the source of this data does not present the age stratification for mammograms performed.

According to the Ministry of Health[11], the recommended age range for this test is from 50 to 69 years. The small town under analysis had 1,021 women in this age group in the year 2014, according to preliminary estimates prepared by the Ministry of Health/Secretariat of Health Surveillance/General Coordination for Information and Epidemiological Analysis[9]. However, the minimum coverage recommended by the MoH[11] is 70% of the target population. Thus, considering the number of women in this age group in the municipality in 2014, at least 714 mammograms per year should have been performed in the municipality.

However, the MoH also indicates that, excepting few cases, the group of women indicated above should perform the examination every two years, thus concluding that each year at least 357 mammograms should be performed in the municipality[11-12].

Regarding the variable "Presence of Justification", it can be observed, according to Table 2, that 52.07% of the requests for ultrasound examinations had no justification, which raises a question as to the actual necessity of the tests. However, no statistically significant difference was found in the proportion of the type of examination by the presence of justification.

Table 2 – Presence of justification in the records of requests for radiology and ultrasound tests. Minas Gerais, Brazil, Jan-Oct 2014. (N= 202)

Presence of justification	Tests				Total		p-value*
	Ultrasound		Radiology				
	n	%	n	%	n	%	
Yes	58	47.93	33	40.74	91	45.05	0.314
No	63	52.07	48	59.26	111	54.95	

Source: Created by the autors.

* Pearson's chi-square test.

Discussion

The inversion in the requests of acute/elective tests associated with the high percentage without justification, and the programmatic tests (mammography) requested in a quantity significantly smaller than the expected for the said municipality create space for a critical reflection on the health practice.

It is estimated that 60% of the routine exams performed on the patients could be authorized without any risk to them, and changes in the tests could be seen during the clinical evaluation[12]. Thus, it can be inferred that there has been a substitution of the quality and appropriate clinical examination for complementary tests that may even generate potential injury to patients. The overvaluation of the complementary test is also related to the fear or insecurity of the professionals themselves, who request it and uses it as a support of their practice[13].

These issues are related to the construction of health practices in today's society, in which costly technologies are prevalent and are not always essential for diagnosis and treatment, but modulate the behavior of those who place themselves in the position of in need of such resources[14].

Complementary tests end up being, in some cases, a patient's request other than the professional's request. X-ray and ultrasound examinations are sought by the users themselves, when seeking technologies that enable their improvement, even though they are not fundamentally necessary[14]. Although being simple, X-ray examinations continue to be an important tool for the diagnosis of many diseases and, even in the face of other more recent technologies, are still appropriate to examine bones and dense tissues, being used in the detection of bone fractures, chest X-rays for lung disease and mammography for breast cancer screening[15].

It should be noted that the municipality has an ultrasound and an X-ray service, differentiated by the presence of an expert opinion in the service that offers ultrasound examinations and by the absence of it in the service that offers X-ray examinations. This difference may determine a preference for ultrasonography at the time of request.

Regardless of the factor that directs the professional's choice, it is important to emphasize that it is essential that the request is accompanied by a plausible justification. The results showed that there is no statistically significant difference between the presence of justification by type of examination. However, the numbers showed that the two exams were, for the most part, not justified, making it impossible to perform any type of analysis regarding clinical needs. This fact can evidence that clinical criteria or protocols are not used to justify the requests. Thus, exams with no relevant need compete with exams needing urgency, saturating the health system and making it difficult to schedule them.

The difficulty to scheduling exams also points to a more complex situation: the difficult access

to secondary care, which may be associated with both the characteristics of health care and with organizational and geographical barriers. This narrow access explains the large number of people waiting to be called, setting up a wait that often last several months.

The major challenge to be faced by the health sector is to break with the logic of manifested suffering, complaint-behavior and fragmentation of therapeutic interventions, starting to work from a comprehensive perspective, that is, (re) thinking about health practices based on the extended reading of the reality of individuals' lives, ensuring that the interventions are in accordance with the singularities of each one of them[16]. Accompanying this change of perspective, the reorientation strategy of the health model based on primary care needs to move forward aiming to ensure greater accessibility for the population and greater qualification of health care[17].

The qualification of health services becomes even more important when we analyze the high incidence of serious diseases that can be prevented or at least identified early by primary care, such as breast cancer. This is the type of cancer that most affects women in Brazil – excluding non-melanoma skin cancer[12] –, representing 51.03% of the Brazilian population. Therefore, actions aimed at the control of breast and cervical cancer and at providing comprehensive care combined with early detection actions that guarantee access to therapeutic procedures in a timely manner are of utmost importance and responsibility of managers and health professionals.

As the most commonly used screening tool for breast cancer in Brazil, mammography is a radiological examination for breast evaluation aimed at identifying benign lesions and cancers usually presented as nodules or calcifications. This examination allows the discovery of the disease in its initial stage, enabling a more favorable prognosis and up to 100% chance of cure. Its request in PHC must be made by the professional in the health unit during the appointment or in active search strategies targeted at women[11].

The result of this study pointed to the accomplishment of 91 mammograms in the municipality in the year 2014, which represents 25.49% of the goal of 357 examinations based on the coverage proposed by the MoH. This number stands out because the estimation of 357 mammograms is based only on women aged 50 to 69 years, a group that receives favorable recommendation for the screening of this programmatic examination, not considering high-risk cases that require this examination out of the recommended age range or within time interval of less than two years. In addition to age range and frequency, results from randomized clinical trials suggest that when mammography is offered to women aged 50-69 every two years, with coverage equal to or greater than 70% of the target population, it is possible to reduce mortality from breast cancer from 15% to 23%[11].

Understanding the cut made to reach the minimum coverage, the number of mammograms performed in the municipality becomes even more critical. In view of the fact that these examinations are not distinguished regarding age, we have a number that covers all the age groups of the municipality.

Even though many factors may influence the number of mammograms performed, it is highlighted that the acute/elective exams, as discussed above, are above the proposed level, whereas mammography, an examination that is part of a national program and which is aimed at screening the disease, is below the coverage established by WHO.

The differences between the requests reflect the care model still in force within the health service, namely a hegemonic and medical care model, in which disease treatment and diagnostic research, such as examinations, are more important than screening, disease prevention and health promotion actions.

The results presented in this study go against that proposed by the Family Health Program (FHP), which was formulated as a strategy for transforming the health care model in Brazil in the search to provoke reflections and changes in patterns and behaviors of professionals and

Brazilian citizens[18]. However, the care logic that has permeated health care in the past and for a long time still surrounds the provision of care in PHC, even with the change of the health care model that began in the 90s with the FHP. Thus, the focus remains on the undifferentiated individual, with predominant interventions in the affected or "nonfunctioning part of the body-machine". Emphasis remains on curative actions and treatment of diseases, injuries and damages, medicalization and hospital care with intensive use of technological and material equipment[19].

This model of medicine aimed at assisting the disease in its individual and biological aspects is called biomedical model or the Flexnerian model. This model is frequently associated with the Flexner report (1910), which founded the reform of medical schools in the United States of America and Canada and has still influenced the professional training, organization of services and the production of knowledge in the health field[19].

Significant technological advances often collaborate so that teaching based on the curative-individual care model stands out. Therefore, it is necessary to produce knowledge aimed at the consolidation of the comprehensiveness in the care space by strengthening the bonds provided by the light technologies. This knowledge must penetrate to the maximum in the training of health professionals, definitively releasing the academies from the concepts of an old but still alive Flexner report[16]. Thus, curricular changes in the training of health professionals will be necessary for the transformation of this old model of care into a proposal for production of care, reception and humanization, which are central issues in the process of reorientation of the health work.

Acting according to the principle of comprehensiveness in primary care extends the interfaces to be managed and poses new difficulties and challenges in the field of professional competencies. Therefore, the search for a care model that is aimed at comprehensiveness and at extended health needs, in line with SUS principles, and that overcomes the problems stemming from the hegemony of the biomedicine paradigm is one of the great challenges of the Brazilian health system in our days[20].

Conclusion

The suppressed demand for complementary medium-complexity examinations is related to factors ranging from the structure of care divided into levels of health care to the cultural and professional aspects that permeate the request of these tests.

The results of the present study allow us to affirm that there has been a reversal regarding the requests of acute/elective tests. The demand for ultrasonography is greater than standardized for health services, overloading the whole network, generating months of waiting and the patient's anguish for the result, as well as causing damage to the health system itself. This hampers the comprehensiveness of care, the quality and resolution for the user, who is the most harmed in this circumstance. On the other hand, radiodiagnostic tests are below that standardized, which may indicate a devaluation of a simple examination that, in some cases, may be decisive.

Therefore, there is the need to establish guidelines for the clinical practice of PHC professionals when requesting medium- and high-complexity examinations, aiming at standardization and better organization of the health service and the entire regional network, since the damage caused by inadequate examination requests affect not only the patient, but the whole system, bringing consequences even to the scope of medical offices.

The high demand for acute/elective exams to the detriment of programmatic exams and the absence of justification for the request represent the paradox of investing in the "disease", but not in the health of the population. In this way, there have been more requests of tests seeking diagnosis and treatment than those aimed at health prevention and promotion.

The results reveal the permanence of the hegemonic model of health care, which is

dependent on hard technologies, to the detriment of the health surveillance model - a "new" form of action that has been discussed since the 1990s. There is the need to invest in a professional training that increasingly values the model of care proposed by the FHS.

There is still a long way to go in relation to the Family Health Strategy, to the PHC and its relationship with other levels of care. This study have showed only some points that aim at the gradual improvement of what a health system must be for all and for the comprehensiveness of each one.

Collaborations

1. conception, design, analysis and interpretation of data: Isadora Tonelli and Francisco Carlos Félix Lana;

2. writing of the article and relevant critical review of the intellectual content: Isadora Tonelli and Franciso Carlos Félix Lana;

3. final approval of the version to be published: Isadora Tonelli and Francisco Carlos Félix Lana.

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Receibed: May 4, 2017

Approved: August 2, 2017

Published: November 11, 2017