Use of the Core Content Classification in General Practice (3GCP) for qualitative analysis of context and practice. Ten-year study of undergraduate students' final works in the Integrated Master's Degree in Medicine at the University of Coimbra

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Summary **Background.** General Practice/Family Medicine includes approaches to the biological, technological, behavioural, sociological and anthropological domains.

Objectives. To document the domains addressed in the final assignments of the Integrated Master's Degree in Medicine at the Faculty of Medicine, University of Coimbra, in the area of GP/FM.

Material and methods. Observational study of the titles of final assignments, between 2008 and 2017, granted by the Faculty of Medicine of the University of Coimbra. A domain analysis using as codes the International Classification in Primary Care-2 and the Q-Codes, a context classification in Primary Care, year of elaboration and gender of author was carried out for each title of final assignment. A descriptive and inferential analysis was performed through parametric and nonparametric tests.

Results. 169 papers were analysed, 23.1% written by male students, with a positive overall growth dynamics (Δ = +7) between 2008 and 2017. Q-Codes were registered 276 times, while the ICPC-2 codes were used 133 times. Under the Q-Codes, "doctor's issues" is the most frequently addressed (n = 112; 67.2%), and under the International Classification in Primary Care-2 classifications, the chapter "Psychological" was predominant (n = 35; 21%). Under the Q-Codes, subcategories "primary care setting" (n = 26; 15.6%), "health issue management" (n = 23; 13.8%) and "unable to code, unclear" (22; 13.2%) were dominant. Within the International Classification in Primary Care-2, the subcategories "diabetes noninsulin dependent" (n = 22; 13.2%), "depressive disorder" (8, 4.8%) and "hypertension uncomplicated" (8; 4.8%) were predominantly focused on.

Conclusions. The 3CGP may become a professional tool, allowing for more precise identification of final works, for a better communication method in medical activity and for avoiding the loss of previously developed works.

Key words: classification, educational measurement, education, medicine, abstracting and indexing as topic.

Background

General Practice/Family Medicine (GP/FM) is a vast medical area filled with knowledge, and the General Practitioner (GP) is, simultaneously, an incessant user and producer of knowledge. This knowledge is only partly published in medical publications [1]. Studies, abstracts from congresses or dissertations are not available worldwide to professionals, students or researchers due to lack of specific indexation [2].

Many terminologies and classifications supporting existing clinical information and their storage and retrieval have already been drafted [3]. Due to its peculiar dimension, GP/FM includes approaches to the biological, technological, behavioural, sociological and anthropological domains, all of which bear a deep impact on the necessary terminologies [4].

The clinical content of GP/FM is well documented through the *International Classification of Primary Care – 2nd edition* (ICPC-2) as a standard method of clinical classification of reasons for consultation, health problems and due procedures [3, 5]. Even though this classification is close to the taxonomical needs of the GP/FM practice, limitations still exist, namely within the context of practice [6]. Integrating these aspects in the representation of person-centred care [7] and the reflection of due practice by the GP/FM specialist (GPS), according to the European definition of Family Medicine, seems therefore paramount [8].

In 2006, Marc Jamoulle et al. created the terminology to represent the non-clinical or contextual activities of GPs [6]. The author states this contextual addition to the 17 chapters of the ICPC-2 adds accuracy to its domain of applicability [4].

The terminology, named "Q Codes", in its 2.5 version, consists of 182 definitions, divided by 8 domains: person's category, person's issue, doctor's issue, medical ethics, ecological hazard, research and development, structure of practice and knowledge

management. Each domain is further divided into categories and sub-categories [3, 6]. This terminology reflects the result of a cooperative two-year project between participants from 12 countries and 8 languages [3]. Thus, the acronym 3CGP (*Core Content Classification in Primary Care*) is born, as a result of combining the Q-Codes [9] to the ICPC-2 [10].

Each code has a multilingual terminological record, available through the *Health Terminology/Ontology Portal* (HeTOP) website (https://www.hetop.eu), which is a fundamental resource that mainly includes all terminologies in health. In this web portal, each concept is carefully selected and organised and mapped to *Medical Subject Headings* (MeSH) with the possibility of subsequent research in the Medline (PubMed) search engine and in the *Catalogue et Index des Sites Médicaux de langue Française* (CISMef). 3CGP could be searched for in several languages through a dedicated website (http://3cgp.docpatient.net/).

Objectives

The aim of this paper was to apply the 3CGP to documents the domains of which are addressed in the final assignments of the 6th year of the Integrated Masters in Medicine (IMM) of the FMUC (Faculty of Medicine of the University of Coimbra), carried out within GP/FM, since the beginning of the IMM, in order to evaluate the past and foresee the future. Another objective was to identify differences in themes regarding the gender variable and to understand the usefulness of this resource in structuring and investigating the teaching of medical practice.

Material and methods

Observational study analysing the IMM final assignments in GP/FM within the FMUC, carried out between 2008 and July 2017.

The information on the FMUC database, with the theme for each IMM final assignment within GP/FM, was provided by this institution, upon approval of both the institution and the Ethics for Health Commission of the Centre Region Regional Health Administration (ARS – Administração Regional de Saúde) on 31 October 2017.

A database was set up (the authors were made anonymous) and organised by title of final assignment, ICPC-2 classification, Q-Codes, year of elaboration and gender of the author. The title was read and coded using the 3CGP: ICPC-2 for clinical aspects and Q-Codes for contextual aspects by reading the abstract, if necessary and when available.

In addition to the 17 chapters of the ICPC-2 [10], the table list of Q-Codes was applied, set up by Marc Jamoulle, available in the "General Practice/Family Medicine Multilingual Terminology" [6] and as an on-line resource [9] (Table 1).

The coding of all papers was carried out by a single author under consultancy with the 3CGP author, Marc Jamoulle.

A descriptive and inferential analysis of the data was performed according to gender, through parametric (Student's T-Test) and nonparametric (Mann–Whitney U Test) tests.

The designation "person" was used to refer to the subject interacting with the physician, as a synonym for patient/consulter/user/client.

Table 1. Example of titles of 3 final works with the corresponding theme identified and classified using ICPC-2 and Q-Codes version 2.5

Title of the final work	ICPC-2	Q-Codes		
The child victim of physical mal-treatment – the intervention of the family doctor	Z25 assault/ /harmful event	QC12 child	QC52 child abuse	QS41 family doctor
Disease monger-ing in higher education: a study in university medical students	–	QT21 un-dergradu-ate	QR323 cross-sectional study	QD442 disease monger-ing
Breast cancer prevention – knowledge, attitude and praxis	X76 ma-lignant neoplasm breast female	QC22 women's health	QD41 primary preven-tion	QP42 patient knowl-edge

Results

According to Table 2, 169 papers were analysed, of which 23.1% were carried out by male students. Positive overall growth dynamics was verified throughout the period under study ($Δ$ = +7) until the end of 2016.

The Q-Codes were used 276 times, and the ICPC-2 codes were used 133 times.

Table 3 includes the classifications by chapters of the ICPC-2, with reference to the 7 most used codes. The codes referring to chapters H (Ear), R (Respiratory) and S (Skin) were not mentioned in any of the papers, and the P (Psychological) chapter was the most frequent. There was a greater frequency of T90 (diabetes noninsulin dependent), P76 (depressive disorder) an K86 (hypertension uncomplicated).

Table 4 includes the distribution of Q-Codes in the 169 IMM final assignments, with reference to the 8 most frequently used subcategories.

Excepting the QH (planetary health), all other domains were approached, predominantly the QD domain (doctor's issue). Regarding the subcategories, QS1 (primary care setting), QD32 (health issue management) and QO1 (unable to code, unclear) prevail.

According to Table 5, no differences were revealed when analysing the application of the ICPC-2 and Q-Codes by gender.

Table 2. Number of final assignments of the 6th medical year, distributed by year and gender, and number of Q-codes and ICPC-2 codes applied

Year		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017(*)	Total
Final papers		4	12	8	12	13	20	26	23	32	19	169 (100%)
Gender	Male	1	1	1	3	3	3	7	3	9	8	39 (23.1%)
	Female	3	11	7	9	10	17	19	20	23	10	130 (76.9%)
Q-Codes		10	21	13	17	21	34	41	37	51	31	276
ICPC-2 codes		5	11	11	14	12	16	16	16	20	12	133

Note (*) Until July 2017.

Table 3. Analysis of clinical content in 6th medical year final assignments through the ICPC-2

Chapter	n (%)	Code	n (%)
A	8 (4.8)		
B	1 (0.6)		
D	3 (1.8)		
F	2 (1.2)		
H	0		
K	16 (9.6)	K86	8 (4.8)
L	3 (1.8)		
N	1 (0.6)		
P	35 (21.0)	P76 P17	8 (4.8) 7 (4.2)
R	0		
S	0		
T	22 (13.2)	T90 T82	14 (8.4) 4 (2.4)
U	2 (1.2)		
W	14 (8.4)	W78	5 (3.0)
X	10 (6.0)	X75	5 (3.0)
Y	4 (2.4)		
Z	5 (3.0)		
–	7 (4.2)		

A – General and unspecified; B – Blood, blood forming organs, lymphatics, spleen; D – Digestive; F – Eye; H – Ear; K – Cardiovascular; L – Musculoskeletal; N – Neurological; P – Psychological; R – Respiratory; S – Skin; T – Endocrine, metabolic and nutritional; U – Urology; W – Pregnancy, childbirth, family planning; X – Female genital system and breast; Y – Male genital system; Z – Social problems; – procedures; K86 – hypertension uncomplicated; P76 – depressive disorder; P17 – tobacco abuse; T90 – diabetes noninsulin dependent; T82 – obesity; W78 – pregnancy; X75 – malignant neoplasm cervix.

Table 4. Contextual analysis of 6th medical year final assignments, by coding with Q-Codes

Domain	n (%)	Subcategory	n (%)
QC			
QD	112 (67.2)	QD32 QD41 QD11 QD42 QD12	23 (13.8) 15 (9.0) 13 (7.8) 10 (6.0) 11 (6.6)
QE	2 (1.2)		
QH	0		
QP	42 (25.2)	QP42	11 (6.6)
QR	16 (9.6)		
QS	39 (23.4)	QS1	26 (15.6)
QT	10 (6.0)		
QO	22 (13.2)	QO1	22 (13.2)

QC – person's category; QD – doctor's issue; QE – medical ethics; QH – planetary health; QP – patient issue; QR – research; QS – structure of practice; QT – knowledge management; QO – other; QD32 – health issue management; QD41 – primary prevention; QD11 – encounter; QD42 – secondary prevention; QD12 – doctor-person relationship; QP42 – secondary prevention; QS1 – primary care setting; QO1 – unable to code, unclear.

Table 5. Distribution of the application of the ICPC-2 Q-Codes, by gender

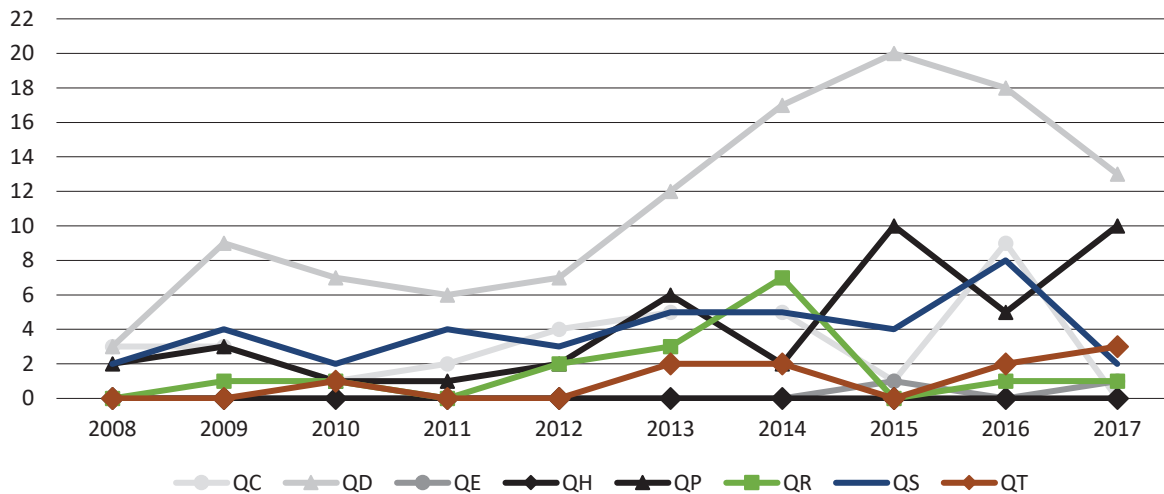| Number of codes	Gender	n	Average	SD	p (*)
ICPC-2	Male	39	0.8	0.9	0.942
	Female	130	0.8	0.7	
Q-Codes	Male	39	1.5	0.6	0.092
	Female	130	1.7	0.7	

(*) Student's T-Test.

Figure 1. Evolution over time of the contextual contents of the 3CGP in 6th medical year final assignments

QC – person's category; QD – doctor's issue; QE – medical ethics; QH – planetary health; QP – patient issue; QR – research; QS – structure of practice; QT – knowledge management.

Figure 1 shows the evolutionary trend of the 8 domains of Q-Codes, excluding the QO (other) category. During the period under study, the predominance of QD (doctor's issue) is verified. Between 2012 and 2015, a gradual increase in this domain is registered, with a later decline. In 2016, the maximal application of QC (person's category) and QS (structure of practice) domains was registered.

Discussion

With this study, we are now able to understand what has been chosen by students as the theme of final work and structure of future research, providing visibility to the papers in this area of medicine in this pre-graduated context.

An article by Salles [11] concerning the role of the doctor within the context of technical and impersonal medicine, oriented towards the market's needs, stimulates the reflection over the study interests of future health professionals. In modern medicine, in which everything is monitored by technology, it is important to understand how future physicians have been adapting to this reality, what they think is important to study and how this evolution has been developing over the last 10 years.

GP/FM has been gradually conquering future physicians, and we have verified a global increase in the number of final assignments in IMM regarding this domain of medicine in the FMUC. However, female students are those who contribute the most to this growth (76.9%) (Table 1). This tendency can be explained by the greater number of female enrolments (65%) in relation to male enrolments (35%) in the FMUC, the overall enrolment being stable since 2007 [12].

When comparing the codification frequency with Q-Codes and the ICPC-2, we verified an overvaluation of Q-Codes. This suggests the importance of non-clinical or contextual aspects in medical assistance, resulting from the will of either the future physicians, their mentors, or both. Hence, the aim was to verify the distribution of ICPC-2 and Q-Codes in detail.

Regarding the ICPC-2 coding, we verified that the P (Psychological), T (Endocrine, metabolic and nutritional), K (Cardiovascular) and W (Pregnancy, childbearing, family planning) chapters are the most represented. Analysing the content of communication abstracts in a congress in Portugal, published in 2013 by Jamoulle [1], the P (Psychological), T (Endocrine, metabolic and nutritional), W (Pregnancy, childbearing, family planning) and Z (Social problems) chapters were the most frequently used. This coincidence in thematic areas may indicate that these domains are the most attractive for both future physicians and the young intern physicians in the GP/MF specialty. This pre-eminence of P&Z domains (psychosocial) is confirmed by content analyse of several congresses in Europe and Brazil [13]. In what extent these results are a function of tutors must be studied. From another perspective, this may be the reflection of a new medicine which, although sophisticated and effective in prolonging life, does not prevent or cure certain diseases. Hence, it is crucial to ponder over the most explored subcategories.

Lobo Antunes states, regarding the modern scientific medicine, that it does not ensure eternity, since "*the burden of disease will continue to consist mostly of cardio-cerebral-vascular diseases, lung diseases, diabetes and certain types of cancer*" [14]. In contrast with "poverty diseases", these are the "risk diseases" which, incidentally, coincide with those that future physicians analyse the most (Table 3), e.g. Diabetes non-insulin dependent (T90), Hypertension uncomplicated (K86), Depressive disorder (P76) and Malignant cervix neoplasm (X75).

Regarding the application of Q-Codes, QD (doctor's issue) is the most frequently addressed (Table 2), and this prevalence was registered throughout the entire period of study (Figure 1). However, a decrease in this domain was registered in 2016 and 2017. In 2016, this decrease coincided with the maximal application of QC (person's category) and QS (structure of practice). Since the real reason for this dynamic is unknown, as a possible hypothesis for justification, we may indicate the curriculum reform in the FMUC from 2015 and the guidance provided by new teachers/tutors, who suggest themes according to their experience, preference or vision for future studies. Since only the papers until June were subject to study in 2017, we cannot fully understand the global number of papers written within that year, in comparison with preceding years, as well as the decrease in papers regarding the QD domain in that year.

Included in the predominant domain (QD), the QD32 (health issue management) subcategory is the most used. This result may stem from the special training of students who want to work in this area, which favours the person-physician bond, since "*it is more important to know the patient affected by the disease than the disease that affects the patient*" [14]. It will be all the more interesting to compare the grades with other papers written in other areas within the FMUC.

Scientific and technological progress has determined a transformation in the role of the individual, who is nowadays more aware of his/her rights, more demanding and better informed. Is the current medical teaching in FMUC preparing students for this paradigm shift, providing future physicians with tools to face people with knowledge [15], adapting the best knowledge available to the circumstances, preferences, needs and aims of the individual person, knowing how to lead medical practice to a new culture of protocols, technical procedures, heavy equipment and scientific evidence in an environment of Evidence Based Medicine [16]?

Will the future physician be aware of the concept of quaternary prevention in a critical observation over medical activities, focusing on the need to not harm [17, 18]? This study's results allow us to understand that, regarding quaternary prevention, the statement of lack of knowledge is corroborated until 2017, although prevention is evident in final assignments. The possibility of great belief in EBM and the added pressure of people may justify these results [18–20]. Nevertheless, there is the need to imbed the Research Agenda for General Practice/Family Medicine and Primary Health Care in Europe [21].

As a limitation of this study, we point out the fact that the final assignments were classified almost exclusively by reading the title, which may have been, at times, insufficient, although with consistent help.

We verified that, for some final assignments, the title was not in accordance with the paper itself, and thus we suggest a rigorous definition of the titles in final assignments. We recommend rigorous definition of the titles, which must be precise and relate to the objective and method of the study, writing such assignments in the IMRAD format. In spite of the valued help of the team who created this taxonomy, attention is needed for the possibility of coding errors.

Conclusions

We verified that contextual aspects are those most frequently addressed in 6th medical year final assignments, in GP//MF within the FMUC. In this area, "doctor's issues" are those that carry the most interest for students. In relation to clinical questions, the chapter referring to "psychological" is the one receiving the most attention.

Female students are those who rely the most on GP/FM for their final assignment.

The importance of reflection, by both the educator and the students, is stressed in order to explore areas of high interest that are still under-investigated, i.e. Quaternary prevention, Research Agenda for General Practice/Family Medicine and Primary Health Care in Europe and Person-centred medicine. Future investigations must be structured by creating relevant lines of research that have an impact on the quality of care.

It is important to develop, through this system, an on-line platform to provide information about the domains which have already been researched and to indicate the domains for future research.

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