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Quality assessment of orthopedic surgery referral request letters from primary care consultation: Evaluation of a Spanish healthcare area

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Abstract:

BACKGROUND: One of the most requested referrals for specialist consultations from primary care (PC) is orthopedic surgery (OS). The purpose of this work was to analyze the number, characteristics, and quality of PC referral request letters in a Spanish healthcare area to their OS reference department.

MATERIALS AND METHODS: The referral rates for 10 years were collected, and a total of 6,225 referral letters issued during the first half of 2019 were analyzed in detail. Gender, age, patient provenance, as well as priority and other process descriptors (type of pathology, suspected diagnosis, exploratory signs, imaging tests) were assessed. A scoring system was developed to evaluate the quality of the referral to an OS consultation: Quality evaluation in OS (QEOS) model.

RESULTS: The rate of referral to OS is rising. The mean age of the referred patient was 53 years and 59.3% were women. Degenerative pathologies justified most referral requests (65.7%), most of which related to the spine (24.2%) or the knee (23.2%). In the QEOS analysis of the referral request letters, we noted that only 36.5% described some physical exploration, 32.9% image tool request, 25.8% indicated the pharmacological treatment, and 11.2% subsequent physiotherapy, resulting in a poor average quality of PC to OS patient referral.

CONCLUSION: There is a growing demand for patient referral from PC to OS, however, the number, content, and quality of referral request letters varies greatly. The QEOS tool can be the germ of a simple evaluation system that would help in the improvement of the process of continuous care.

Keywords:

Orthopedic surgery, patient referral, primary care, public health services, quality, rural health, traumatology, urban health

Introduction

A common feature of all Health Systems, whether public or private, is the distinction between two clearly defined levels of healthcare provision: Primary care (PC), the level of care closest to the users of the Health System, and in most cases, the entry point for patients into the system; and specialized care (SC), whether in or

out of hospital, characterized by specific healthcare provision according to age or pathology.^[1]

In general, the different National Health Systems in Europe include the system of “filtering” or “gatekeeper” of patients from PC to SC,^[2-4] across the patient referral process. As a point of entry to the health system, PC provides healthcare to the population by providing SC to those patients who, due to their pathology or

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resource needs, require assistance at the next level of care.^[1,5]

The Spanish public National Health System is based on universal, equal, and free-of-charge access. Although efficiency and effectiveness are paramount, there is no limit to the quantity of patients' referrals issued from PC to SC. Consequently, the decision of the patient's referral is the family practitioner's.

In Spain, PC activity is developed in basic healthcare zones organized around a healthcare center within a healthcare area (HA) covering larger regions. In these HA are one or more hospitals and specialist care centers where SC is provided. Patients who have received specialist care and treatment are expected to be referred back to their PC doctor, who is able to determine comprehensive clinical therapy, based on the patient's full medical history. This ensures the provision of continuous care under equitable conditions, irrespective of the patient's place of residence, and individual circumstances.^[6] An essential part of continuous care is the "process" of patient referral from PC to SC, which is specified in the issuance of a document (referral flyer) that must provide the necessary information for the proper management of each patient.

One of the most sought after specialties from PC is orthopedic surgery (OS).^[7,8] Indeed, this could be due to the fact that the most frequent area of health problems in the population over 14 years of age attending a PC consultation is the musculoskeletal system.^[9] Both for the volume of referral request letters and the intrinsic peculiarities of this specialty, it is worth considering certain parameters such as physical and radiological examination, that need to be specified in the referral of PC patients to achieve their correct management in OS.

The analysis of referral request letters furnishes the relevant information for the organization of OS healthcare services. It facilitates its proper sizing and the further development of those areas that are in particular demand.

The purpose of this work was to analyze the number, characteristics, and quality of PC patient referral request letters in a Spanish HA to their OS reference department.

Materials and Methods

We designed a time series retrospective observational study covering ten consecutive years. Ethical approval was obtained from the Institutional Review Board (IRB) vide Letter No. 2020 01 415 dated 04/02/2020. The SC Administration of the Salamanca HA provided the historical record of PC referrals to OS between 2009 and 2019, in order to evaluate the trend of its size.

All the referral request letters issued from PC to OS in the public HA of Salamanca during the first half of 2019 (from January 2, 2019, to June 27, 2019) were individually thoroughly analyzed. OS referral request letters from the Emergency Department or other SC Departments were not included in this study.

Throughout the first semester of 2019, a total of 6,246 referral request letters from 364 different PC physicians were received at the OS department. Upon verification of their content, 21 cases of duplicate and erroneously derived referral request letters were detected and eliminated for subsequent analysis. Finally, the content of 6,225 referral request letters were individually assessed.

The actual patients' medical records are electronic and registered using an electronic platform implemented by the HA management. The referral process here studied is also carried out on the same platform, but traditional fax referrals are occasionally issued. PC physicians have the authority to order most investigations required for the diagnosis, apart from advanced techniques (such as CT-scan, or PET), and although there is a defined protocol for patient referral to OS, there is no template for referral request letters. Owing to the variability of the referral request letters issued, an anonymized database was created for the study and analysis of each referral request letter. Gender, age, patient's domicile, as well as priority and other process descriptors (the type of pathology, suspected diagnosis (ICD-10-CM), OS requested unit, etc.) were analyzed.

To analyze the quality of the referral request letters to OS, we considered four basic parameters: the physical examination, the indication for pharmacological treatment, the application for imaging tools, and the physiotherapeutic treatment. We developed a referral quality evaluation system adjusted to the evaluation needs in a Trauma and OS consultation: Quality evaluation in OS (QEOS).

The QEOS model was divided into a scoring system and an evaluation system. The scoring system gives a score to each of the four key parameters of the OS consultation. Each parameter is translated into a dichotomous variable which if described in the referral flyer, adds a score equivalent to that indicated in Table 1. If that part in question is not specified in the referral flyer, the corresponding sum of the score is not obtained. With the obtained score, the QEOS evaluation system classifies the derivation as "very poor," "poor," "acceptable," "good," or "ideal" [Table 2].

An intermediate tool including other parameters such as the priority of the referral or the treatment of pain in complementary units was also evaluated but we found that the final classification of the quality of the referral

Table 1: Quality evaluation in orthopaedic surgery scoring system for quality assessment of orthopaedic surgery referral

Item	Description	Score
Physical exploration	Description or mention of any exploratory sign	+1.5
Pharmacological treatment	Recording of any pharmacological treatment indicated for the process that motivates the referral	+0.5
Image tools	Request and/or completion of any image tool for the episode that motivates the referral (plain x-ray, teleradiography, echography...)	+1.5
Physiotherapy	Prior referral to a physiotherapy unit or rehabilitation department	+0.5

Table 2: Quality evaluation in orthopaedic surgery evaluation system for quality assessment of orthopaedic surgery referral

Quality evaluation	QEOS scoring
Very poor ☆☆☆	≤ 0.5
Poor ★☆☆	1
Acceptable ★★☆	1.5 - 2
Good ★★★	2.5 - 3
Ideal ⊗⊗⊗	3.5 - 4

QEOS=Quality evaluation in orthopaedic surgery

was unchanged by the inclusion of these new variables and we decided to base it on the principle of maximum parsimony (Ockham’s Razor) for the definition of the evaluation model presented here. The final QEOS evaluation tool underwent an inter-rater reliability proof by the researchers of this study.

The statistical analysis was carried out by IBM® SPSS® Statistics v. 25 software. The results are expressed as percentages or mean and standard deviation. Differential analysis was carried out by Chi-square, with Bonferroni correction. Quantitative variables distribution was assessed by Kolmogorov–Smirnov tests, and further compared by non-parametric tests (Kruskal–Wallis or Mann–Whitney-U), according to the nature of the data. Pair comparisons were also performed by the Bonferroni method. In all cases, $P < 0.005$ was the significance cut off point.

Kruskal–Wallis tests were used to compare the monthly referral rates between the different Basic Healthcare Zones, and the mean quality of referral between de Basic Healthcare Zones regarding the gender and age of patients. Kruskal–Wallis test was also used for mean age comparison between the Basic Healthcare Zones. One-Sample Chi-Square test was used for equal probabilities of OS unit consultation assessment, and conventional Chi-square test was used for gender distribution assessment between the different Basic Healthcare Zones. Bonferroni pair wise comparisons were used for the distribution of referral quality assessment between the OS requested units, and among

the different Basic Healthcare Zones attending to their classification, and Mann–Whitney U test. Binary logistic regression was also performed for comparative risk assessment of the quality of referral of older patients.

Results

A detailed analysis shows that the last decade has known an upward trend of referral of patients from PC to OS in the HA of Salamanca [Figure 1]. In the first semester of 2019, a total of 6,225 patient referral request letters were thoroughly analyzed. The rate of monthly derivation to OS was estimated for each Basic Healthcare Zones of the HA of Salamanca and adjusted per thousand inhabitants. The average monthly rate of patient referral was 3.39 ± 1.42 patients per thousand inhabitants for each zone, although they varied a great deal [Figure 2, Kruskal–Wallis $P < 0.001$].

Regarding the characteristics of the referred population, the mean age of the referred patient was 53.05 ± 20.4 years (median of 55 years), and 59.3% were women. Patients’ aged over 65 constituted 31.4% of the cases, while those under 14 years of age represented 6.1% of the cases. We found that the majority of requests were made because of degenerative pathologies (65.7%), followed by traumatic (13.2%), inflammatory (13.1%), and deformity (8.0%) diseases. Of the clinical processes indicated in the referral flyer, we uncovered 496 different reasons for referral. The most frequent reasons for referral were knee joint pain (16.5%), followed by low back pain or sciatica (11.3%) [Table 3].

We then observed that most referral request letters were directed to the OS spine unit (24.2%), followed by the knee unit (23.2%), the upper extremity unit (22.2%), and the hip unit (21.1%), leaving the pediatric orthopedic unit (6.5%) and fractures unit (2.7%) as the least requested units from PC consultation (One-Sample Chi-Square $P < 0.001$).

Referral with “preferential” priority (attendance on the following 15 days) was requested in 30.7% of cases, and “urgent” (attendance on the day) in 1.4%. The priority indicated in the requests could only be verified in 7.8% of these cases.

Table 3: The twenty most frequent reasons for patient referral from primary care consultation to orthopaedic surgery

#	Episode	ICD-10 code	ICD-9 code	Percentage
1	Pain in unspecified knee	M25569	719.46	11.8
2	Low back pain	M54.5	724.2	6.5
3	Osteoarthritis of knee, unspecified	M17.9	715.36	4.8
4	Sciatica, unspecified side	M54.30	724.3	4.8
5	Pain in unspecified shoulder	M25.519	719.41	4.4
6	Hallux valgus (acquired), unspecified foot	M20.10	735.0	3.4
7	Carpal tunnel syndrome, unspecified upper limb	G56.00	354.0	2.9
8	Pain in unspecified hip	M25.559	719.45	2.9
9	Pain in unspecified limb	M79.609	729.5	2.5
10	Encounter for general adult medical examination without abnormal findings	Z00.00	V70.0	2.5
11	Osteoarthritis of hip, unspecified	M16.9	715.35	2.1
12	Other idiopathic scoliosis, site unspecified	M41.20	737.30	2.1
13	Cervicalgia	M54.2	723.1	1.5
14	Trigger finger, unspecified finger	M65.30	727.03	1.4
15	Metatarsalgia, unspecified foot	M77.40	726.70	1.2
16	Unspecified rotator cuff tear or rupture of unspecified shoulder, not specified as traumatic	M75.100	726.10	1.1
17	Trochanteric bursitis, unspecified hip	M70.60	726.5	1.1
18	Other intervertebral disc displacement, lumbar region	M51.26	722.10	1.0
19	Cystic meniscus, unspecified meniscus, unspecified knee	M23.009	717.5	1.0
20	Unspecified disturbances of skin sensation	R20.9	782.0	1.0

ICD=International classification of disease

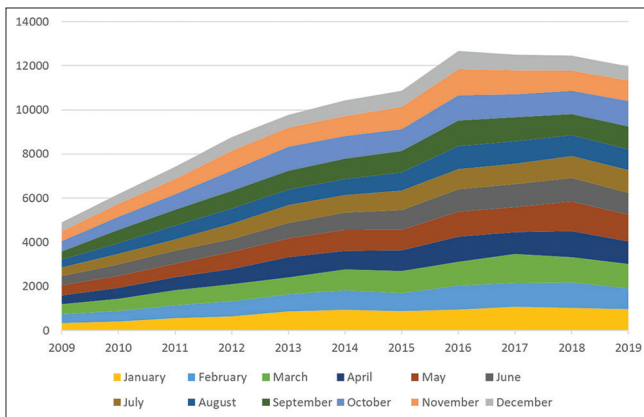


Figure 1: Cumulative monthly patients' referral to orthopaedic surgery from primary care consultation from 2009 to 2019 in the Salamanca healthcare area

In 63.5% of the referral request letters analyzed, no exploratory descriptive sign of the referral episode was described. In 74.2% of the referral request letters, there was no response, recommendation, or an indication of any pharmacological treatment given to the patient for the referral episode. In 67.1% of the referral request letters analyzed, no imaging tool, either conducted or requested, was available for the referral episode. In 11.2% of the referral request letters to OS, a previous consultation to the physiotherapy or rehabilitation units was included.

After the application of the QEOS model to the analysis of derivations in this work, we found an average score of the quality of the analyzed derivations as 1.23 ± 1.04 .

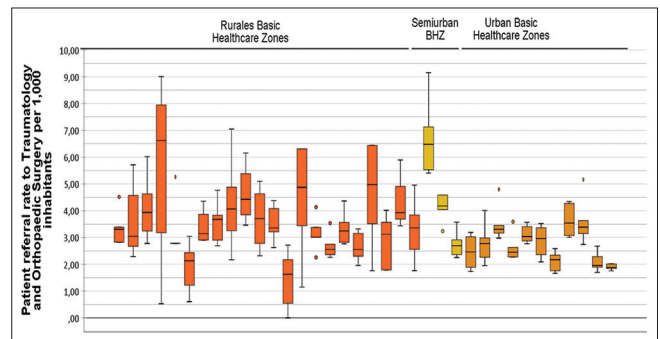


Figure 2: Monthly patient referral rate per thousand inhabitants for each basic healthcare zone on the first semester of 2019 in the Salamanca healthcare area

Regarding the distribution of the quality of the analyzed referral request letters, we noted the quality of 40.7% derivations as “very poor,” 9.8% as “poor,” 36.4% as “acceptable,” 10.2% as “good,” and 2.9% as “ideal.”

Investigating the distribution of the quality of the referral, we observed that referral request letters which were of “acceptable” quality were most frequently directed to the pediatric orthopedic unit and hip unit (Bonferroni $P < 0.05$), while “very poor” quality referral request letters were mainly sent to the spine, knee and fractures units (Bonferroni $P < 0.05$).

Finally, taking into account the variability denoted in the different Basic Healthcare Zones of the HA of Salamanca studied, the differential statistical analysis indicated the lack of uniformity of the quality score of the analyzed derivations in the different demographic classifications

of Basic Healthcare Zones (urban, semi-urban and rural, Kruskal–Wallis $P < 0.001$, Figure 3). The urban zones (QEOS: 1.32 ± 1.06) showed a remarkably better referral quality than the semi-urban (QEOS: 1.14 ± 1.06 , Bonferroni/Mann–Whitney -U, $P < 0.001$), or rural (QEOS: 1.16 ± 1.01 , Bonferroni/Mann–Whitney -U $P < 0.001$); without any statistically significant differences between these two last ones- (Bonferroni/Mann— U $P > 0.05$). “Very poor” quality referral request letters predominated in semi-urban and rural zones than in urban ones, while referral request letters of “acceptable” or “good” quality were more frequently of urban origin (Bonferroni $P < 0.001$).

Given the variability found, we explored the possibility of the effect of gender and age of the referred patients on the quality of the referral to OS. We discovered significant differences in the gender distribution of the patients between the different basic healthcare zones classification (Chi-square $P = 0.013$), although we confirmed that this gender distribution did not influence the QEOS-quality analyzed (Kruskal–Wallis $P > 0.05$). We also observed statistically significant differences in the distribution of age in the different zones (Kruskal–Wallis $P < 0.001$), noting that the quality of the referral of those aged more than 65 years to OS was significantly compromised (B = $-0.010 [-0.017; -0.002]$, Binary logistic regression $P = 0.009$). Nevertheless, the variation in the quality of referral request letters described between the different basic healthcare zones classification was not commensurate with the distribution of the population over 65 years of age (Kruskal–Wallis $P > 0.05$).

Discussion

The present work resumed the analysis of the origin, destination, and quality of a total of 6,225 referral request letters issued from PC to the OS reference department of the HA of Salamanca during the first half of 2019.

The resources available in a National Public Health System are inherently limited, so coordination and efficiency improvements are essential^[10] to maintain a public, universal and free- National Health System. The

analysis of the PC referral request letters here reveals the highlights of findings that may be of interest to National Health System management.

First of all, we discovered that there were significant disparities among the different Basic Healthcare Zones. We noted no minor differences among the demographic definition of each zone (urban, semi-urban, and rural). Certain Basic Healthcare Zones showed a significantly higher referral rate, while the quality of the referral request letters was inferior in the rural or semi-urban areas. It is very difficult to justify these records. Some studies have also reported a higher rate of unnecessary rural patient PC referrals,^[11] perhaps as a result of the higher use of public and non-hospital based consultations by the rural population,^[12,13] but it also could be due to a lack of communication and/or coordination among PC practitioners.^[14]

Our results show a rising trend in the number of referral request letters dealt with by OS in the Salamanca HA in the last decade: double the number of patients referred from PC. Moreover, these years have seen a significant population decline in the region^[15] so the growing number of referral request letters to OS is even more surprising. We noted a gender disparity in the region’s population,^[16] noting that women were more frequently referred, possibly because females are more frequently affected by some pathological processes that are the object of referral, such as osteoarthritis and osteoporosis.^[9,17-20] Likewise, the increase in the mean age of patients referred to OS compared to the mean age of the regional population (48 years),^[16] corresponds to the predominant degenerative character in the pathologies referred to OS.

Nevertheless, the most solicited OS unit to which one in four PC referral request letters was addressed was the spine unit, mainly due to low back pain or sciatica episodes. However, knee joint pain was the most frequent reason for referring patients to OS, representing almost one out of every six referral request letters. These results are in agreement with those reported in previous studies,^[21] which also pointed to spine and knee problems as the main reasons for patient referral to OS.

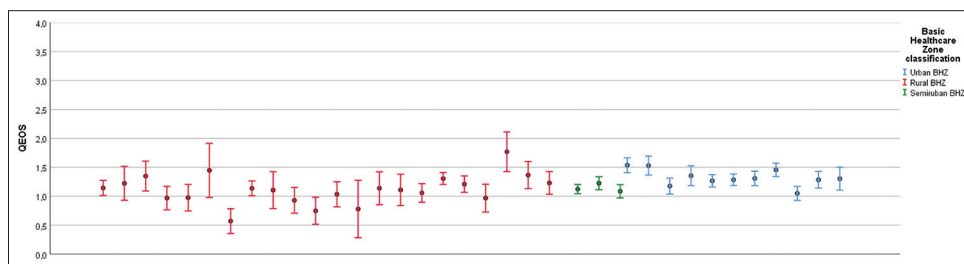


Figure 3: Basic healthcare zone mean quality evaluation in orthopaedic surgery scoring (95% CI) on the first semester of 2019 in the Salamanca healthcare area

When evaluating referral request letters issued from PC to specialized medicine, it is not appropriate to merely quantify these referral request letters, even though the perception might be that a larger number of referral request letters could lead to an overload of demand for care, and a longer delay for patient care.^[22] Till date, no scoring system has been demonstrated in the scientific literature that provides quality guidance or furnishes specific parameters as pointers for referral to OS. Some studies identify some important elements such as legibility and diagnostic output.^[23,24] of referral flyers addressed to different specialties,^[8,25] but without categorization of the main elements that make up a referral to OS, nor a scoring system for it. According to the initial description, the QEOS system here presented attempted to establish a scoring system for the quality of referral request letters issued from PC with simple, basic, and defined criteria, to elucidate the real pattern of quality of the PC-OS referral.

This QEOS evaluation system marked a referral as “acceptable” if it included at least a description of the physical examination or a request for imaging tools. When applying the QEOS system to the studied referral request letters, we found numerous letters that needed much improvement; referral request letters with “good” or “very good” quality were more rare than regular ones. Clearly, we noted the dearth of radiologic explorations requested or performed from PC, and likewise, in a vast majority of cases, even the physical examination of the patient was not described under any heading to indicate the patient’s status. These findings reflect the fact that referrals may have become mechanical resulting in a large number of patients who cannot be offered adequate care for their situation, since the establishment of “high-resolution consultations” is near impossible.^[26,27]

In view of these findings, it is essential to introduce tools and objective criteria for evaluation of the quality of referral request letters. The QEOS quality assessment system proposed in this work can offer relevant information which beyond the critical analysis of referral request letters, would contribute to the improvement of the process of continuous care between PC and OS. It should be borne in mind that the response at the SC level to the request for referral of a PC patient is equally important for continuous care.

Nevertheless, our study has some other limitations. First, socio-demographic data of referring physicians, regarding their age and experience, and individual referral rate could not be addressed and compared to give a deeper insight. On the one hand, we expose the inherent limitations because of the retrospective design. We suggest that a simultaneous application of the QEOS scoring system to the electronic referral process, where

the PC physician has to fill mandatory fields, would reduce the number of “poor” referral request letters. On the other hand, as the QEOS model design is based on simple objective parameters and in a quantifiable manner, it could be broadly used and integrated into diverse Healthcare Systems that rely on SC patient referral. However, it also has some limitations related to its use in pediatric orthopedic consultation, in that it is not always necessary to use an imaging tool;^[28] for fracture unit consultation, in which an image would be mandatory; and for specific diagnosis with relatively high incidence, such as carpal tunnel syndrome, in which not all variables would actually be necessary for the production of a “good” referral request letter. We have addressed a great number of referral flyers, on a single HA, well defining its content on provenance, quantity, and quality. We here present the feasibility of this QEOS scoring and evaluation system, but an extended international validation is necessary for a definitive valuation and implementation.

The results here presented constitute valuable evidence mainly for two purposes. On the one hand, they should facilitate the appropriate organization of care resources in OS SC in order to offer appropriate care in response to the requests sent from PC. In this regard, the relevance of spine and knee pathology should be taken into account and adequate resources allocated for their care. On the other hand, we deem it essential to take into account these findings for the early implementation of programs to counter the situation here revealed. The actors involved in the process of continuous care—health authority, PC teams, and hospital departments— must utilize these data to effect a real change in the process of continuous care. From our point of view, the challenge is based on three fundamental aspects: the improvement of communication channels between the various levels of healthcare, the establishment of clinical guidelines and protocols for referral, and the establishment of a training on common orthopedic pathologies that could be treated at the PC and support strategy for the PC teams.

Conclusion

The present work reveals an increasing monthly referral rate from PC to OS in the HA of Salamanca, with marked geographical differences not attributable to clinical factors. Urban areas show a lower rate of patient referral and better quality of referral than semi-urban and rural areas. The majority of PC patients’ referral request letters dealt with cases of degenerative diseases of the spine or knee.

We developed the QEOS model for the assessment and classification of the quality of OS referral request letters. In the referral request letters analyzed, only

36.5% described some physical examination, 32.9% were accompanied by an image tool request, 25.8% indicated some pharmacological treatment, and 11.2% had been previously evaluated by the physiotherapy or rehabilitation units. The quality of the PC referral request letters to OS in the HA of Salamanca needs much improvement.

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Conflicts of interest

There are no conflicts of interest.

References

- World Health Organization (WHO). European Observatory on Health Systems and Policies. Health System Reviews (HiT Series); 2020. Available from: <http://www.euro.who.int/en/about-us/partners/observatory/publications/health-system-reviews-hits>. [Last accessed on 2021 May 16].
- Sánchez-Sagrado T. Primary care in Portugal. *Semergen* 2018;44:207-10.
- Sánchez-Sagrado T. La atención primaria en Italia. *Semergen* 2018;44:50-3.
- Sánchez-Sagrado T. La atención primaria en Suecia. *Semergen* 2016;42:408-11.
- Gérvás J, García Olmos LM, Simó J, Peiró S, Alberquilla A, Amengual M, *et al.* Paradoxes in primary to specialist referral. *Aten Primaria* 2008;40:253-5.
- Ministerio de Sanidad Servicios Sociales e Igualdad. Madrid: National Health System of Spain; 2012.
- Báez Montilla JM, Sánchez Oropesa A, Garcés Redondo G, González Carnero R, Santos Béjar L, López de Castro F. Reasons for and determinants of interconsultation between primary and specialised care. *Semergen* 2013;39:89-94.
- Franquelo Morales P, García Mateos D, Moya Martínez P, Lema Bartolomé J, Buendía Bermejo J, Sáiz Santos S. Referral Rate and factors associated with the Quality of the Primary Care Referral Form. *Rev Clín Med Fam* 2008;2:199-205.
- Prevalencia de Problemas de Salud en la Población Asignada a Atención Primaria. Madrid: Base de Datos Clínicos – Atención Primaria Sistema Nacional de Salud; 2016.
- Starling A; Health Foundation. Implementing new models of care: Lessons from the new care models programme in England. *Int J Care Coord* 2018;21:50-4.
- Biggerstaff ME, Short N. Evaluation of specialist referrals at a rural health care clinic. *J Am Assoc Nurse Pract* 2017;29:410-4.
- Sarría-Santamera A, Prado-Galbarro J, Ramallo-Farina Y, Quintana-Díaz M, Martínez-Virto A, Serrano-Aguilar P. Use of emergency services in rural and urban areas. *Semergen* 2015;41:63-9.
- Rodríguez SO, Fosas MR, Condón PV, Alcántara AF, López CB, Burriel LG, *et al.* Rural medicine: A vision for the future. *Aten Primaria* 2013;25:457-8.
- Vassbotn AD, Sjøvik H, Tjerbo T, Frich J, Spehar I. General practitioners' perspectives on care coordination in primary health care: A qualitative study. *Int J Care Coord* 2018;21:153-9.
- Estadística Del Padrón Continuo. Madrid: INEbase; 2019.
- Indicadores de Estructura de la Población [Population Structure Indicators]. Madrid: Instituto Nacional de Estadística; 2019.
- Noh JY, Yang Y, Jung H. Molecular mechanisms and emerging therapeutics for osteoporosis. *Int J Mol Sci* 2020;21:E7623.
- Bakri K, Moran SL. Thumb carpometacarpal arthritis. *Plast Reconstr Surg* 2015;135:508-20.
- Maradit Kremers H, Larson DR, Crowson CS, Kremers WK, Washington RE, Steiner CA, *et al.* Prevalence of total hip and knee replacement in the United States. *J Bone Joint Surg Am* 2015;97:1386-97.
- Hecht PJ, Lin TJ. Hallux valgus. *Med Clin North Am* 2014;98:227-32.
- Alcalá FJ, Fuertes JC, Tudela ME, Fernández NV, De Castro FL, Ramiro AS. AS. Reasons for referrals between primary and second level care. *Aten Primaria* 2005;36:137-43.
- Balazs GC, Doria RB, Yow BG, Anderson AB, Ahmed SI, Jex JW. High rate of inappropriate referrals to pediatric orthopedics in an egalitarian healthcare system. *J Pediatr Orthop B* 2019;28:509-13.
- Morera Montes J, Custodi i Canosa J, Sánchez Perruca L, Miaja de Sárraga F. Analysis of the quality of the information transmitted between Primary Care and Specialised Care. *Med Fam* 1991;1:132-40.
- Rubio Arribas V, Rodríguez Ibáñez ML, Sampedro Martínez E, Victores Benavente C, Alechiguerra García A, Barrio Gamarra JL. Evaluation of the quality of communication between levels of care using the inter-consultation document. *Aten Primaria* 2013;26:681-4.
- Holland K, McGeoch G, Gullery C. A multifaceted intervention to improve primary care radiology referral quality and value in Canterbury. *N Z Med J* 2017;130:55-64.
- Zambrana-García JL, Torres-Jiménez M, Rubio-Sánchez JM, Montijano-Cabrera A, Peña-Ojeda JA, Velasco-Malagón MJ. Medical processes susceptible to high resolution in outpatient clinics. *Rev Calid Asist* 2017;32:82-8.
- Almendro MH; High Resolution Hospitals. A Realistic Strategic Contribution. 1st ed. Sevilla: Servicio Andaluz de Salud – Consejería de Salud – Junta de Andalucía; 2017. p. 46.
- Luan FJ, Wan Y, Mak KC, Ma CJ, Wang HQ. Cancer and mortality risks of patients with scoliosis from radiation exposure: A systematic review and meta-analysis. *Eur Spine J* 2020;29:3123-34.