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Implementation of clinical assistants in a pediatric oncology department: An impact analysis

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Abstract

Bureaucratic and administrative tasks associated with health care provision have historically fallen on health care professionals, which is one among the factors contributing to low job satisfaction and lower productivity. Incorporating new professional roles that help to better respond to the needs of both patients and professionals can increase the quality and efficiency of service provision. This article aims to evaluate the impact of the clinical assistant's introduction in the Sant Joan de Déu Barcelona Children's Hospital's pediatric oncology department, in terms of (i) displacement of activity loads carried out by this new professional role and the consequent time freed up for physicians, (ii) physicians' satisfaction and (iii) efficiency of the new care model. This is an observational and retrospective study using administrative data based on the type of activity performed by clinical assistants and the measurement of the time freed up in favor of the physicians. The potential skill mix productivity increase, survey of physicians' satisfaction, and reduction in costs with the new model was analyzed. During the first year of its implementation in the pediatric oncology department, clinical assistants have performed 13,553 requests (69% of the total), representing a total saving of 266.83 hours or 6.67 workweeks of 40 hours. They performed 74% of outpatient surgical requests in the oncology department, 87% of day hospital requests and 54% of total requests in the outpatient consultations area. Physicians are overall satisfied with the new role and think they can use the time gained to do other things such as research or improving the quality of care. The role change allows reducing the cost per request by 56% in relation to the conventional model. In conclusion, the introduction of clinical assistants in the oncology department could be efficient to the extent that it displaces a significant part of the bureaucratic and administrative tasks previously performed by health care professionals and thus enables to reduce the cost of these processes. This delegation allows them to work more closely to the maximum of their competences and the physicians to have more time for higher added value clinical tasks and increase professional satisfaction.

Keywords

Clinical assistants, pediatric oncology, assistance activity, new roles, skill mix

Introduction

Historically, task shifting in healthcare has taken place due to several reasons such as changes in the pattern of diseases, technological innovations, professional norms, shortages of health professionals and willingness to increase efficiency. Nowadays, it is an adequate moment to reexamine task shifting in healthcare systems, considering it can contribute to increase health workforce and healthcare system's financial sustainability, improve healthcare quality, and strengthen healthcare system's resilience.[1]

At the macro or health policy level, many European countries report a situation of professionals' shortage,[2] this being one of the greatest challenges it faces. By 2030, a net global shortage of 15 million health workers is expected.[3] As a consequence, several approaches have been proposed to address the workforce gap. Studies point to any comprehensive solution combining several strategies including improving retention of professionals, incentivizing the

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competency growth of existing roles, maximizing current staff's efficiency, and creating new professional roles.[4]

At the micro or organizational level, professionals are the primary agents of change within an organization. Improvements in care come, in part, from redefining the current role of practitioners, focusing on what brings value.[5] In addition, some evidence shows that factors related to increased bureaucratic workload linked to electronic health records (EHR)-such as not having enough time for documentation or elevated message volumes-are associated with higher healthcare professionals' burnout rates.[6] A study conducted in the context of the British National Health Service suggests that 20% of the work of general practitioners is devoted to administrative tasks.[7] Other works point out that more than 75% of the professionals (79% of nurses and 76% of practitioners) declare to be over-skilled to perform part of their work.[8] In order to redefine providers' roles, it is necessary to incorporate new professional roles into healthcare institutions that help to better respond to the needs of patients and healthcare professionals themselves. In the United Kingdom, some studies have proposed the implementation of multidisciplinary teams in primary and community care consisting of pharmacists, physiotherapists, and management staff among others.[9] Other countries have introduced new professional roles such as Clinical Assistants (CA), or expanded or modified the competencies of existing professionals, as is the case of advanced practice nurses.[10]

Some evidence shows that support workers give good-quality and patient-focused care while they contribute to reduce the more qualified staff's amount of work.[11] Other studies have estimated the potential increase in productivity of primary care physicians by quantifying the amount of time saved if they delegated tasks to other types of professionals, or they could be performed in an automated manner, showing between 25% and 77% of the tasks performed by these physicians could be delegated to other professionals, increasing their capacity to attend users by 41–98%.[12]

Previous literature identifies three barriers to adopting new models of care: limited evidence (given that many changes are not evaluated), established hierarchies that some professional groups want to maintain and legislation or regulation.[1] Several studies notice that new roles are not always well accepted by existing staff in the team.[11,13–16] Other research show the payment system is identified as another potential barrier to task shifting, for instance, if reimbursement is only possible when a procedure is done by a concrete category of health worker.[17]

Task shifting in Europe has been majorly centered in the growth of tasks assumed by nurses that were formerly performed by physicians. This is also the case for Spain, where nurses are now able to perform routine procedures and tasks related to prevention.[18] For instance, the development of the role of Advanced Practice Nurse (APN) is a global trend.[19] In Spain, the case management nurses, among other roles, can be considered as APNs.[20,21] However, the authors have found task shifting from clinical roles to administrative roles to be less common, or, at least, less documented. An example could be documentation assistants or scribes, which are professionals who grant documentation assistance to a clinical practitioner,[22] a role that has been mainly evaluated in the USA.[23] The Spanish healthcare system is known for its good health outcomes, although it is far from other European countries in terms of healthcare productivity.[24] This may be partly due to the high bureaucratic burden associated with care tasks (request for tests, scheduling of visits, completion of supporting documents, etc.) which accounts for a significant number of working hours of medical professionals.[25] A considerable number of Spanish professionals who work in oncology departments have burnout symptoms, mainly due to work overload, organizational problems and communication and emotional topics related with patients and other professionals.[26] The oncology department of Sant Joan de Déu Children's Hospital is the first Spanish department that has introduced the role of clinical assistants, a new administrative role, with the aim of shifting tasks from clinical professionals to administrative personnel.

The Triple Aim model recognizes clinical projects which simultaneously achieve three objectives: improving patient experience (satisfaction and quality), improving clinical results in the population, and reducing the cost per capita in healthcare.[27] Bondenheimer and Sinsky[28] add a fourth aim: increasing professional satisfaction. In this context, the aim of this article is to evaluate the global impact of the introduction of the clinical assistant role in the pediatric oncology department of the Sant Joan de Déu Children's Hospital. The three dimensions to be evaluated are: (1) the workload's displacement due to this new professional role, and the consequent time freed up in favor of the physicians, as a measure of its level of implementation, (2) physician's satisfaction, and (3) the reduction in the cost per task.

Methodology

Context of the investigation

The Sant Joan de Déu Barcelona Children's Hospital is the pediatric center of reference at the Spanish level and the first in oncology activity.[29] It was the first center in the state to introduce the Clinical Assistant (CA) professional role. At the beginning of 2020, it incorporated two support professionals to the physicians who perform complementary tasks to the medical processes in the oncology department. Throughout the period analyzed, there have been up to seven different administrative assistants who have provided support in requests to 35 physicians. The CA is the patient's reference on administrative issues and is responsible for coordinating the different phases of the care process, making requests, scheduling tests and procedures, communicating with families, and being the professional liaison for the different team members, the reference point among the professionals for

queries and changes management, as well as other bureaucratic tasks, among other functions, always acting under physician's delegation. This professional combines direct patient care tasks with back-office tasks. In order to decide which tasks were going to be shifted to CA, the hospital performed an analysis of low-value physicians' practices and decided that those of an administrative kind were the ones better fitted to be shifted to another professional category. Their profile may vary according to the needs of each service, but they are mainly clinical documentation technicians or administrative staff with previous experience in the healthcare field. These professionals received specific training for three weeks, sharing a consultation with the physicians among others. CAs are administrative personnel and so, because of their profile and training, it was decided that it was most adequate to shift the administrative tasks to them. In the future other possibilities are planned to be explored, such as shifting less complex clinical tasks to CAs (which should be accompanied by an adequate training) or other type of clinical tasks to other new roles such as Advance Practice Nurses (APNs).

Data collection and analysis

The Lean methodology is based on the "elimination of operations that do not add value to the company's product or service from the viewpoint of the costumer".[30] In healthcare, it is applied with the objective of reducing actions that do not generate added value from the patient's point of view. Based on this aproach, this article calculates the time released by clinical assistants to physicians to approximate the increase in skill mix productivity. For this purpose, the 19,406 requests made in the outpatient department (day hospital, outpatient consultations and outpatient surgical requests) in the period from 1 February 2020, to 17 March 2021, have been analyzed by comparing the number of requests made by physicians and CAs. As a measure of the time needed to make a request, this article uses the in situ and systematic timing of each type of procedure.

Requests made by administrative staff who are not CAs, nursing staff and resident physicians were excluded from the analysis since, for the time being, the clinical assistant mainly makes requests by delegation of the attending physicians. Likewise, physicians who made fewer than 10 requests during the period analyzed and those who had delegated less than 5% of the requests to CAs were excluded. Finally requests which can only be made by physicians, such as analytical tests performed after surgery or requests to the blood bank, were also excluded. Tasks performed by physicians before the introduction of CAs and which of them were delegate are shown in Table 1.

This article evaluates the introduction of clinical assistants from a "quadruple aim" perspective[27,28] measuring their impact on healthcare costs and professional satisfaction. In order to assess the first, the economic saving of the new model was measured through the task-shifting observation and reduction of the cost per request, estimated using mean annual salaries for each professional category. In order to evaluate the satisfaction of the professionals and based on previous research,[5,16,31] a survey was carried out among the physicians of the service after the introduction of the figure, during the period of study. The survey consisted of nine questions with a rating scale from 0 to 10, two questions with two response options, and four open-ended questions. Seventeen physicians responded to the survey shown in Annex 1. The answers to open-ended questions were categorized by topics to analyze which were more relevant to the professionals, counting the number of professionals that mentioned each one. Issues that were mentioned only by one professional were not considered relevant enough thus are not shown.

Table 1. Tasks performed by physicians before the introduction of CAs and which of them were delegated.

Tasks previously performed by physicians	Tasks delegated to CAs
Exploration of patients	No
Communication of test results	No
Writing in the electronic clinical record	No
Appointments' follow-up and coordination	Yes
Appointments' requests to other departments	Yes
Appointments' programming	Yes
Communication with families and patients	Yes, CAs answer administrative doubts, and send clinical doubts to physicians. They also inform patients of their appointments
Research	No
Teaching	No

Results

Types of requests made

Clinical assistants made 13,553 requests in the outpatient area, which represents 69.93% of the total number of requests subject to the study period (19,381). Table 2 breaks down the administrative activity of the outpatient area according to the types of requests and their corresponding time dedication.

Clinical assistants performed 74.25% of outpatient surgical requests and 87.5% of day hospital requests, this being the area in which this professional profile is most widely used (and whose requests consist mostly in laboratory tests). Regarding outpatient consultations, requests made by clinical assistants account for 54.13% of the total. Results show that the percentage of requests made, in relation to the total, varies substantially depending on its type. On the one hand, clinical assistants perform few interconsultations (10.00%) and requests for laboratory tests (33.74%) since these are still mostly

Table 2. Activity and times summary.

	Total	Clinical Assistant	Seconds per request	Time released for the physicians by the CAs (hours)
Surgery requests	1,274	946 (74.25%)	94	24.70
Day hospital requests	8,407	7,356 (87.5%)		138.17
Diagnostic imaging	38	12 (31.58%)		0.25
Magnetic resonance imaging (MRI)	6	4 (66.67%)	98	0.11
Radiology (RX)	8	1 (12.5%)	54	0.02
Echography (ECO)	10	3 (30%)	52	0.04
Computerized axial tomography (CT)	14	4 (28.57%)	74	0.08
External tests	9	9 (100%)	74	0.19
Laboratory tests	8,338	7,334 (87.96%)	60/98[a]	137.72
Referrals and interoconsultations	22	1 (4.55%)	60	0.02
Outpatient consultation requests	9,700	5,251 (54.13%)		103.96
Diagnostic imaging	2,742	2,249 (82.02%)		48.82
Magnetic resonance imaging (RMI)	1,422	1,158 (81.43%)	98	31.52
Radiology (RX)	278	202 (72.66%)	54	3.03
Echography (ECO)	758	656 (86.54%)	52	9.48
Computerized axial tomography (CT)	284	233 (82.04%)	74	4.79
External tests	676	571 (84.47%)		11.74
Gammagraphy	6	6 (100%)	74	0.12
Whole-body scanning	186	183 (98.39%)	74	3.76
Other external tests	484	382 (78.93%)	74	7.85
Laboratory tests	4,057	*1,369 (33.74%)*	60/98[a]	25.71
Referrals and interconsultations	2,225	*1,062 (47.73%)*	60	17.7
Visits	1,891	895 (47.33%)	60	14.92
Complementary tests	170	149 (87.65%)	60	2.48
Interconsultations	160	16 (10%)	60	0.27
Exploration and function testing rooms	4	2 (50%)	60	0.03
Total	**19,381**	**13,553 (69.93%)**		**266.83**

[a]It was considered that it took 60 seconds to do 80% of requests and 98 seconds for the remaining 20%.

performed by physicians. On the other hand, clinical assistants perform most diagnostic imaging requests (82.02%), external tests (84.47%) and complementary tests (87.65%).

Calculation of time released

The time released for physicians from administrative tasks due to the introduction of the clinical assistant has been calculated. The 13,553 requests made by clinical assistants accounted for 266.83 hours (6.67 forty-hour workweeks). Most of these (138.17; 51.78%) were in the day hospital area, mainly due to the displacement of requests for laboratory tests previously performed by the attending professional. In the outpatient consultation area, they released 103.96 work hours (38,96%) for all the physicians in the department. Of these, almost 49 hours were released by requests for diagnostic imaging tests and around 26 hours by laboratory tests requests. Finally, surgical requests made by clinical assistants released 24.7 physicians' work hours. In economic terms, due to the per hour salary difference between professional profiles, this role change enables to reduce the cost by 56% with respect to the conventional model.

Evolution over time

The temporal analysis of the delegated tasks shows that, since the introduction of the new professional role, the physicians displaced about 80% of the requests to the clinical assistants. In October 2020, there was a decrease of this percentage (due to an increase in the total number of requests) and a posterior recovery during the following months, until representing up to 72.5% in February 2021. No differences are observed in the evolution of the proportion according to the type of requests made by clinical assistants (Figure 1).

In terms of efficiency, the role change allows optimizing the clinical process, reducing the cost per request by 56% in relation to the conventional model.

Physician's satisfaction

70.6% of the professionals rated their degree of satisfaction with the reduction in the workload of administrative tasks thanks to the CA as 9 or 10. The physicians were very satisfied with the help provided by the CA in carrying out the different types of requests. Satisfaction with the help

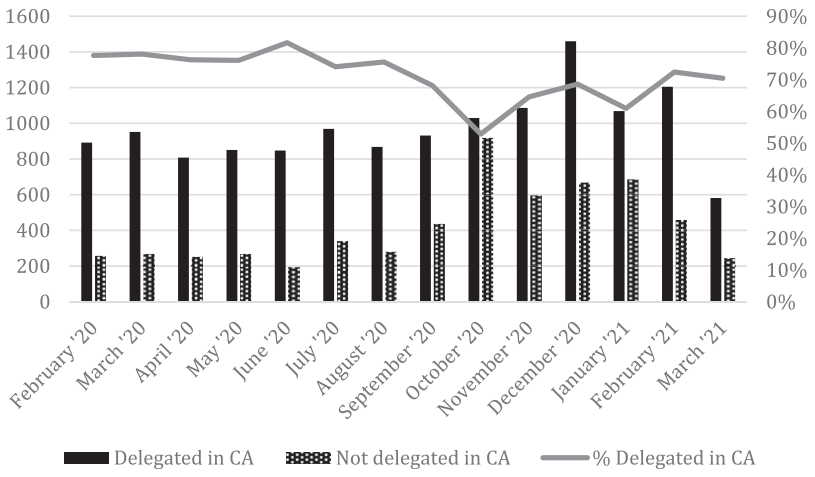

Figure 1. Evolution of the proportion and number of requests made by the clinical assistants. *Data is only available until mid-March 2021, this is why this month's total number of requests is inferior to the rest.

provided in communicating with patients and families is slightly lower than for the other tasks, but still receives an average of 8.76. All the physicians agree that CA make it possible to reduce the time of visits, and 82.4% consider that this allows them to devote more time to other tasks such as research or improving the quality of care.

On the other hand, 70.6% of the physicians gave a score of 9 or 10 to the question on whether they considered that this professional role allowed them to improve the quality of the consultation and 52.9% gave one of the two highest scores to the question on whether the CA had contributed to improving the satisfaction of patients and families with the care received. The degree of satisfaction with the improvement in the coordination of the oncology service thanks to the clinical assistant is 8.69 on average. Physicians mentioned support to families and professionals with administrative and/or assistance issues and reduction in time devoted to administrative tasks as the main value-added aspects thanks to the incorporation of the clinical assistants. Table 3 shows the rating-scale and two options questions and a summary of physicians' answers.

Discussion

The clinical assistants' introduction at the Sant Joan de Déu Children's Hospital is part of an institutional strategy, one of the objectives being to ensure that all professionals act to the best of their abilities. This is a step forward for healthcare teams to make the best use of their experience and knowledge, so that more specialized skills and competencies are appropriately reserved for more complex needs.[15] As OECD states, "Only with the right numbers of health workers, equipped with the right skills and providing services in the right places, will it be possible to respond equitably and effectively to the changing health needs of ageing populations."[10] The CA incorporation goes in this direction, allowing physicians to focus on the care tasks for which they have unique training and experience, while administrative staff also increase their competencies, performing more complex bureaucratic and administrative tasks and further interacting with patients and their families, empowering them in the decision-making. This model change should have a direct impact on care, as patients benefit from higher quality care, focused on the clinical practice.

This evaluation shows that the new model enables physicians to reduce their administrative workload, allowing them to gain time which they can use to improve the quality of care or to other activities such as research. Physicians are satisfied with the new role and the model reduces the cost of the request-making process. Being the first department to introduce the role of clinical assistants in Spain, these results could encourage the widening of this role to other healthcare organizations, as well as contribute to widen the evidence in the field. Further research is needed to state if the new model has an impact in organizational terms and on patients and families' satisfaction, as well as to know CA and other administrative personnel's opinions on the change.

The results of this evaluation are consistent with previous evidence.[1] The new model contributes to the sustainability of health workforce, given that it is less time-consuming for physicians, which could have both an impact on productivity and physicians' satisfaction (and therefore, alleviating the burnout problem). It is also more efficient since it enables to do the same tasks at a lower cost. Further research is needed to state whether it also contributes to improving the quality of care and enhancing resilience.

In terms of evaluating the implementation of the new role, this study shows the introduction of CA has been successful, since it has achieved the objective of displacing tasks traditionally done by physicians. Altogether, CA have performed around 70% of the requests since their implementation in the oncology department, representing a

Table 3. Survey results.

Question	Result
Degree of satisfaction with the CA role (average[a], 17 answers)	9.47
Degree of satisfaction with the reduction in administrative workload by virtue of CAs (average, 17 answers)	8.88
Degree of satisfaction with the CAs help for the following tasks	
Programming requests (average, 17 answers)	9.47
Tests requests (average, 17 answers)	9.24
Visits requests (average, 17 answers)	9.41
Communication with the patient and families (average, 17 answers)	8.76
Others (open-ended question, 0 answers)	—
Improvement of the care given by the professional during consultation by reason of the CA (average, 17 answers)	9.06
Aspects in which the role of the CAs has improved the care given by the professional during consultation (open-ended question, 5 answers)	Support to families for administrative aspects (6) reduction in time devoted to administrative tasks and/or increase in the time devoted to assistance (3)
The role of the CA has reduced consultation time (yes, 17 answers)	17 (100%)
The role of the CA has contributed to improve patients and families' satisfaction with the attention received (average, 16 answers)	8.69
Degree of satisfaction with the improvement of the oncology service's coordination thanks to the CA (average, 16 answers)	8.69
The role of the CA enables to devote time to develop other competencies (research, assistance, etc.) (yes, 17 answers)	14 (82.35%)
Competencies that professionals are able to develop by virtue of the role of the CA (open-ended question, 3 answers)	Assistance and/or improvement of consultations' quality (3) research (3)
Aspects that could be improved in the deployment of the CA role (open-ended question, 5 answers)	The channel of communication between families' and the oncology service professionals (2)

[a]Average of the answers given to the rating-scale questions. All of them were rated between 0 and 10, being 0 the most negative answer and 10 the most positive answer (ex: 0 for "not satisfied at all" and 10 for "very satisfied"). The Annex provides more information about the formulation of the questions.

nearly seven forty-hours workweek saving. Even though the literature reviewed showed some evidence of existing barriers to the implementation of new roles, in this case these barriers have been overcome, specially the one related to former staff not accepting the new role.

It can be observed that some of the request types that have shifted the most are those that imply a more administratively complex process, such as surgical requests, external tests, MRIs or CT scans. In contrast, the types of procedures that physicians continue to perform the most are outpatient consultation laboratory tests, visits and interconsultations. This could be due to the fact that these are less complex requests and, therefore, physicians have a lower incentive to delegate them. Further research is needed to test this hypothesis. The area where this new professional role has been best implemented has been in the day hospital, where they have made a very high percentage of requests during the entire analyzed period. Likewise, CA have made significant proportion of surgical requests.

Even though new roles are sometimes not well accepted by existing staff in the team,[11,13–16] and established hierarchies can be a barrier to their implementation,[1] the satisfaction survey shows that physicians are satisfied with the new role introduction. They particularly appreciate the reduction in consultation time and the improvement in the quality of consultations, and that this reduction in time spent on administrative tasks allows them to devote themselves to other care activities, as well as to research. In terms of efficiency, this role change allows to optimize the clinical process reducing the cost by 56% in relation to the conventional model. Other tasks performed by CA -such as being the responsible for coordinating the different phases of the care process and being the families' referent for administrative aspects- should improve patients' experience in the hospital. Further research is needed to better understand patients and families' satisfaction with the organizational change.

Limitations

The study has some limitations. First, the database may present errors due to mistakes in the electronic medical record data introduction that may result in requests being incorrectly coded. This may have some impact both on the requests that have been included in the study and those that have been excluded, as well as on the subsequent division between the day hospital area and the outpatient consultation area. In addition, this article might have not detected all the requests that are not yet made by CA in this area. In this case, the results would have been even more positive of the advantages and capabilities of the CA. In relation to the economic evaluation, the costs related to coordination, control or training have not

been considered. Second, professional's satisfaction is analyzed according to a non-validated questionnaire. Further research should focus on the assessment of this issue. Third, the "quadruple aim" model developed by Berwick[27] and Bondenheimer and Sinsky[28] has been followed. However, the study lacks an assessment of the "patient experience" and "healthcare quality" aims. Fourth and last, this is the first time that CA have been introduced in a healthcare setting in Spain. The type of setting -an oncology department in a tertiary children's hospital- is very specific. More evidence is needed to state whether the results of this study are generalizable to other types of healthcare centers and departments.

Conclusion

The implementation of the clinical assistant' analysis shows that this new professional role has been able to make 69.93% of the requests. They made 74.25% of the outpatient surgical requests in the oncology department, 87.5% of the day hospital requests and 54.13% of the total requests in the outpatient consultation area. Physicians are satisfied with the new role and think they can use the time gained to other tasks such as research or improving the quality of care. The role change allows optimizing the clinical process, reducing the cost by 56% in relation to the conventional model. This results suggest that the introduction of clinical assistants in the oncology department has a positive impact and is efficient as it displaces a significant part of the bureaucratic tasks previously performed by the health care professionals. As a result, the task delegation implies that both act more closely to the best-of-their-abilities and the physicians have more time available for more value-added tasks. Altogether, this results in an excellent and patient-focused higher quality care, increasing professional's satisfaction, and reducing the healthcare costs in relation to the conventional model.

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Appendix

Annex 1: satisfaction survey about clinical assistants in the oncology department

In order to assess the figure of the clinical assistant in the oncology service, we turn to the different professionals in the area to find out your opinion:

1. Rate from 0 to 10 (0 not satisfied, 10 very satisfied) the degree of satisfaction with the figure of the clinical assistant
2. Rate from 0 to 10 (0 disagree, 10 agree) if the figure of the clinical assistant has decreased the workload of administrative tasks
3. Assess from 0 to 10 (0 not satisfied, 10 very satisfied) to what degree the Clinical Assistant helps you in the following tasks: Making Requests Scheduling;; Making Test Requests; Schedule visits; Communication with patient/families;

   Other: (open answer)

4. Do you think that the clinical assistant figure has improved the quality of care by the professional at the consultation? (0 = nothing, 10 = a lot)

   In what aspects: (open answer)

5. Do you think that the figure of the clinical assistant has reduced the time of the visits? (YES/NO)
6. Do you think that the role of the clinical assistant has helped to improve the satisfaction of patients and families with the care received? (0 = nothing, 10 = a lot)
7. Rate from 0 to 10 (0 not at all satisfied, 10 very satisfied) to what extent has the figure of the clinical assistant facilitated the coordination of the oncology service
8. Do you think that the role of the clinical assistant allows you to dedicate time to developing other skills (r19esearch, care ...)? (YES/NO)
9. Looking to the future, what aspects do you think could be improved in the deployment of the clinical assistant figure? (open answer)