

Pharmacotherapeutic Follow-up of Patients in Community Pharmacies

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Objective. To analyse pharmacist intervention (PI) resulting from the implementation of the Dáder Pharmacotherapeutic Follow-Up Program (PFU).

Design. Descriptive study of the findings from the PFU program during the first year.

Setting. Community pharmacists in area of the College of Pharmacists of the Province of Córdoba (Argentina).

Participants. A total of 202 patients were included in the PFU, selected on the basis of the observed needs by each of the participating pharmacists.

Principal measurements. From the resulting PI reports the sex and age were obtained and problems related to medication (PRM) were classified according to the Second Consensus of Granada. The method of resolving PRM, the number of medications used and the number of visits made to the pharmacy to resolve each of them.

Results. 38 pharmacists participated and 108 patients were registered in the PI. The number of PI increased to 280, with 218 PRM resolved (77.9% effectiveness: 95% confidence interval [CI], 70.6-86.2). 25% of the PRM were resolved between the pharmacist and the patient and 75% required the participation of the doctor, the PI achieving an acceptance of 74.6% (95% CI, 67.8-82.6).

Conclusions. A high percentage of resolving PRM was obtained, with a significant acceptance of the PI by the doctors, which demonstrates the feasibility of including community pharmacists in the medical team and the possibility that they could make a significant contribution in decreasing the morbidity and mortality associated with medications by carrying out PFU activities.

Key words: Pharmacotherapeutic follow-up. Problems related to medications. Pharmaceutical care. Dáder Program. Pharmacist interventions.

SEGUIMIENTO FARMACOTERAPÉUTICO DE PACIENTES EN FARMACIAS COMUNITARIAS

Objetivo. Analizar las intervenciones farmacéuticas (IF) resultantes de la aplicación del Programa Dáder de Seguimiento Farmacoterapéutico (SFT).

Diseño. Estudio descriptivo de los hallazgos del programa de SFT durante el primer año.

Emplazamiento. Farmacias comunitarias en el ámbito del Colegio de Farmacéuticos de la Provincia de Córdoba (Argentina).

Participantes. Se incluyó a un total de 202 pacientes bajo SFT, cuya selección se basó en las necesidades observadas por cada uno de los farmacéuticos participantes.

Mediciones principales. A partir del informe de las IF resultantes se consignaron el sexo y la edad de los pacientes y se clasificaron los problemas relacionados con los medicamentos (PRM) de acuerdo con el Segundo Consenso de Granada. Se registraron la modalidad de resolución de los PRM, el número de medicamentos utilizados y la cantidad de visitas a la farmacia necesarias para resolver cada uno de ellos.

Resultados. Participaron 38 farmacéuticos y se registraron IF en 108 pacientes. La cantidad de IF ascendió a 280, con 218 PRM resueltos (efectividad del 77,9%; intervalo de confianza [IC] del 95%, 70,6-86,2). Un 25% de los PRM se resolvieron entre el farmacéutico y su paciente y un 75% requirieron la participación del médico, lográndose una aceptación de las IF del 74,6% (IC del 95%, 67,8-82,6).

Conclusiones. Se obtuvo un elevado porcentaje de resolución de PRM, con una aceptación importante de las IF por parte de los médicos, lo que demuestra la factibilidad de insertar a los farmacéuticos comunitarios en el equipo de salud y la posibilidad de que éstos puedan efectuar una aportación significativa a la disminución de la morbilidad y mortalidad relacionadas con medicamentos por medio de la realización de actividades de SFT.

Palabras clave: Seguimiento farmacoterapéutico. Problemas relacionados con los medicamentos. Atención farmacéutica. Programa Dáder. Intervenciones farmacéuticas.

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Introduction

The success of pharmacological treatment depends on the active participation of the patients, who will require the necessary cooperation of health professionals to obtain maximum therapeutic benefit and to prevent secondary effects of the treatment.¹⁻⁴ When patients use medications different results are possible. Normally patients benefit from pharmacotherapeutic intervention. However, events associated with lack of efficacy or safety of drug treatment can be observed.¹⁻⁴ Any deviation from the desired beneficial effects of medicines causes a problem related to medication (PRM).³⁻⁵ PRM have been defined as health problems, understood as clinically negative results derived from the pharmacotherapy which, due to different reasons, may lead to the therapeutic objective not being achieved or the appearance of undesired effects.⁵ These demonstrate that PRM are the cause of morbidity and mortality associated with medicines⁵⁻¹¹ and strategies need to be implemented to carry out an appropriate approach to this problem.^{10,11}

By using the activities of pharmaceutical care, the pharmacists, in collaboration with the patients and doctors, improve the results of pharmacotherapy by preventing, detecting and resolving PRM, thus avoiding the morbidity and mortality associated with medicines.^{2-4,12-15} One of the activities derived from pharmaceutical care is pharmacotherapeutic follow-up (PFU), which can be defined as the professional practice in which the pharmacist is responsible for the needs of the patient related with their medication by the continuous, systematic and documented detection, prevention and resolving of PRM, in collaboration with the patient him/herself and other health professionals, with the aim of achieving concrete results which will improve the quality of life of the patient.¹⁵ The results of PFU have been demonstrated in different scenarios of pharmaceutical professional practice, achieving an effective solution of PRM.¹⁶⁻²⁴

The Dáder Program of PFU was created by the Pharmaceutical Care Research Group of the University of Granada (Spain), and is essentially a teaching program for practising pharmacists.^{16,17,25,26} The implementation of the Dáder Program in the Province of Cordoba (Argentina) was carried out by a meeting between the Pharmaceutical Care Research Group of the University of Granada, the Faculty of Chemical Sciences of the National University of Cordoba, and the College of Pharmacists of the Province of Cordoba.²⁶ In this study the results obtained during the first year of activity with this work method are presented and analysed.

Patients and Methods

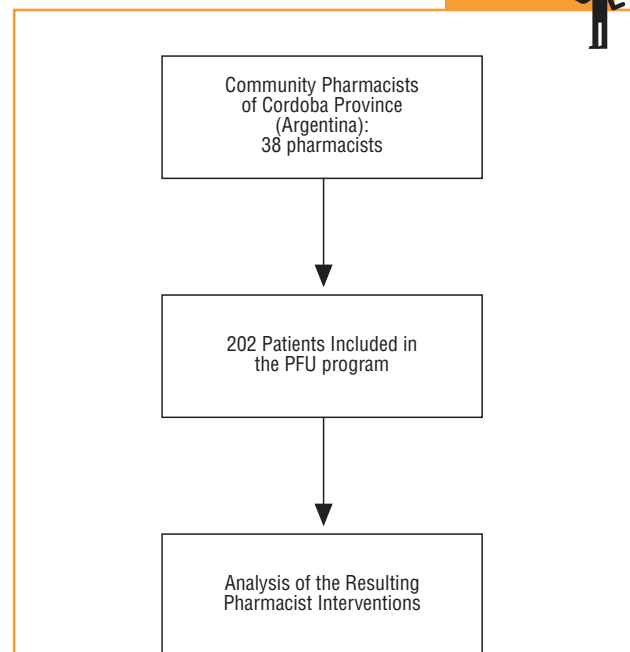
The Dáder Program has produced protocols for the procedures and the ways of recording which must be adopted to provide PFU to patients, with the aim of being more effective in the identification and resolving of PRM.²⁵ It is based on obtaining the pharmacotherapeutic history of the patients, that is, their health problems and the medications used, and the evaluation of the state of the situation at a determined date, to identify and resolve the possible PRM that the patient may be suffering from. Then the necessary pharmacist interventions (PI) are carried out to resolve the PRM, patient involvement being necessary and in the majority of cases, the patient's doctor.^{2,3,14,15,25}

A PI is considered effective when the PRM, which the pharmacist has identified, has been resolved favourably.²⁵

The PFU method consists of the following phases: *a)* offering the service; *b)* first interview; *c)* state of situation; *d)* study phase; *e)* evaluation phase; *f)* intervention phase; *g)* result of the intervention; *h)* new state of the situation; and *i)* successive interviews.

The participating pharmacists are community pharmacists and practice their activity under the auspices of the College of Pharmacists of the Province of Cordoba. As the Dáder Program is a formative program, the registering of drugs is carried out continuously under the guidance of a Scientific Commit-

Material and methods



General Scheme of the Study

Descriptive study which analyses the pharmacist interventions (PI) resulting from the application of the Dáder Program of Pharmacotherapeutic Follow-Up (PFU).

tee created for this purpose. It also coordinates the activities of the program which are basically carried out by having clinical sessions where cases are presented and discussed; the reception and registering of the PI which are generated, and the quarterly sending out of a report to the participating pharmacists where the progress made by everyone is reported and evaluated.^{13,26} The inclusion of pharmacists participating in the program was voluntary and was carried out after an initial training period of 10 hours²⁶.

The inclusion of patients in the PFU program was based on the observed needs of all the participating pharmacists, and involved all their patients and their carers who attended the pharmacy throughout the study talking about any worries or requesting some information as regards their state of health or pharmacotherapy. Those patients were offered the PFU service, and who accepted the appointment for a first interview.^{25,26}

The data which is presented was obtained from the PI records passed on by the community pharmacists and covered the period between September 200 and August 2001, inclusively. A descriptive statistical analysis was carried out using the STATISTICA program (Version 6 StatSoft, Inc. 2001). To classify the PRM the Second Consensus of Granada on the Problems Related to Medications was used (Table 1), which considered the 3 basic needs to complete the whole pharmacological treatment: necessity, efficacy, and safety.⁵

The causes of PRM are listed, such as: interactions, non-compliance, duplication and others. The sex and age of the patients were recorded with PI, the number of medications used and the number of visits to the pharmacy necessary to resolve the PRM. The drugs involved in the PRM were analysed according to the ATC (Anatomical Therapeutic Chemical) classification.

Results

A total of 38 pharmacists took part in the PFU program, of which 68.4% (n=26) recorded PI. A total of 202 patients were included, and PI was recorded in 108 (53.5%) of them. The total number of PI climbed to 280, with a mean PI per pharmacist who notified results of 10.8 (95% CI, 4.4-5.0; range, 0-10) and the number of visits to the pharmacy to resolve a PRM was 4.0 (95% CI, 3.6-4.3).

The number of PRM resolved was 218, and the effectiveness of PI was 77.9% (95% CI, 70.6-86.2).

The distribution of resolved PRM, grouped by age and sex (in patients where the age and sex were recorded) is shown in Table 2. The distribution of the PRM based on the 3 basic requirements of pharmacotherapy was as follows: necessity, 25%; effectiveness, 37%; and safety, 38%.

The percentage distribution of the resolved PRM is shown in Figure 1. Among the related PRM, a predominance of PRM4 (28.0%) is observed in the effectiveness and of PRM5 (28.4%) in the safety.

As regards the causes of resolved PRM, 4.1% (n=9) was due to medication interactions and 16.1% (n=35) to non-compliance of treatment, 1.4% (n=3) due to duplication and 74.8% (n=171) to other causes which were not categorised.

TABLE 1 Classification of Problems Related to Medications (PRM) According to the Second Consensus of Granada⁵

<i>Necessity</i>	
PRM 1:	the patient suffers a health problem due to not receiving the required medication
PRM 2:	the patient suffers a health problem due to receiving a medication which is not required
<i>Effectiveness</i>	
PRM 3:	the patient suffers a health problem due to non-quantitative ineffectiveness of the medication
PRM 4:	the patient suffers a health problem due to a quantitative ineffectiveness of the medication
<i>Safety</i>	
PRM 5:	the patient suffers a health problem due to non-quantitative lack of safety of the medication
PRM 6:	the patient suffers a health problem due to quantitative lack of safety of the medication

TABLE 2 Distribution of Resolved Problems Related to Medications Grouped by Patient Age and Sex

Age Group, Years	No. of Patients (%)	No. dof Males (%)	No. of Females, %
0-9	0 (0.0)	0 (0.0)	0 (0.0)
10-19	1 (2.6)	1 (2.6)	0 (0.0)
20-29	1 (2.6)	0 (0.0)	1 (2.6)
30-39	1 (2.6)	0 (0.0)	1 (2.6)
40-49	2 (5.1)	0 (0.0)	2 (5.1)
50-59	3 (7.7)	1 (2.6)	3 (7.7)
60-69	14 (35.9)	6 (15.4)	8 (20.5)
70-79	13 (2.6)	4 (10.3)	9 (23.1)
80-89	4 (10.3)	2 (5.1)	2 (5.1)
90-99	0 (0.0)	0 (0.0)	0 (0.0)
Total	39 (100)	13 (33.3)	26 (66.7)

In relation to the means of communication employed for the resolving of PRM, 25% were resolved between the pharmacist and the patient, while 75% required the involvement of the doctor, achieving in the latter case an acceptance of PI of 74.6% (95% CI, 67.8-82.6).

The distribution of PRM according to the active agent involved, following the ATC classification is also shown. In Figure 2, where the resolved PRM according to this classification are described, a significant predominance-in descending order-is observed of drugs which act on the cardiovascular system, nervous system and digestive system and metabolism.

In the 2 majority age groups (60-69 and 70-79 years) a high incidence of PRM1 (lack of necessary medication) is observed, as well as in the safety PRM, which are fundamentally related to adverse reactions of medications

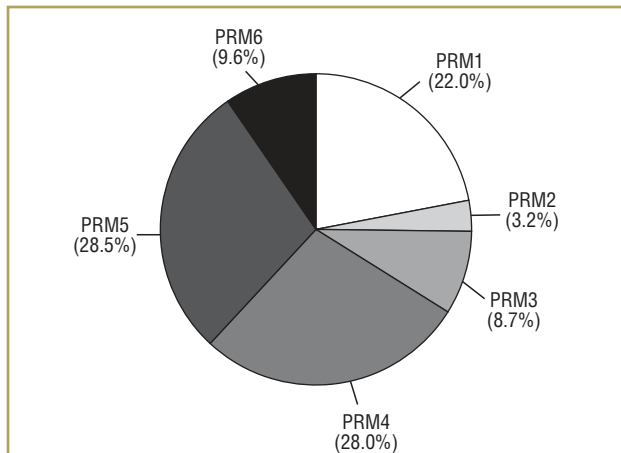


FIGURE 1 Distribution (%) of problems related to medications (PRM), resolved by type, according to the Second Consensus of Granada⁵.

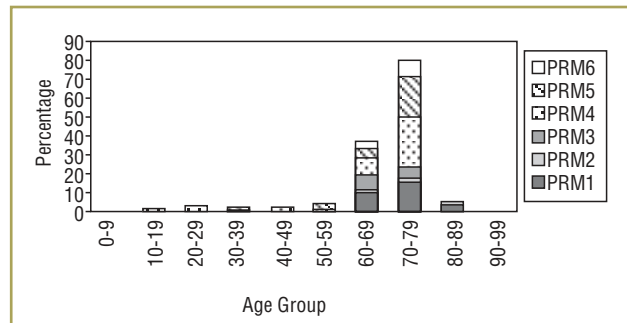


FIGURE 3 Distribution of resolved problems related to medications (PRM) by age group.

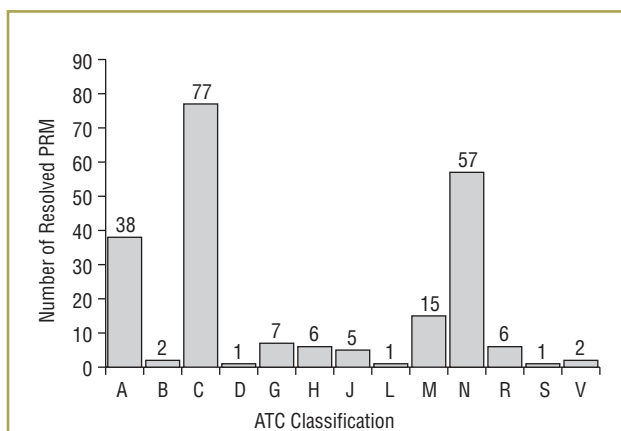


FIGURE 2 Distribution of resolved problems related to medications (PRM) according to ATC (Anatomical Therapeutic Chemical) classification.

(PRM5). It is also worth pointing out that PRM6 (quantitative lack of safety of the medication) and PRM4 (quantitative ineffectiveness of the medication) have a higher frequency in the 70-79 years age group (Figure 3).

Discussion

The carrying out pharmaceutical care activities related to PRU is the first experience in Argentina linked to a group of community pharmacists who worked in an organised way and followed a single work method in identifying and resolving of PRM in their patients. The integration of the

universities in association with professionals for the implementation of these types of activities enables these initiatives to be channelled appropriately, which, on the whole, will benefit society. It is important to highlight the collaboration offered by the Medicines Information Centre of the National University of Cordoba (CIME), for the objective and up to date information which it provided in order that the pharmacists could carry out PI with solid foundations and backed by scientific evidence.

The high percentage of resolved PRM. (77.9%) is similar to other published works^{21,22} which have used the Dáder Program, and could demonstrate that the general use of this activity constitutes a valid means for the prevention of morbidity and mortality associated with medications and has, as a consequence, a positive impact on the health of the population who go to community pharmacists.

The predominance of females (66.7%) among the group of patients could be related to the fact that women form the majority who visit this type of establishment, so there is a direct contact by which the pharmacists can offer the PFU service.

As regards the distribution of the PRM, taking into account the three basic necessities of all pharmacotherapy, a very similar proportion is seen between the PRM related to effectiveness and safety of medications. Among the PRM related to effectiveness, the predominance of type 4 (28%) is highlighted which is basically related to non-compliance. These PRM were resolved between the patients and the pharmacist in 76.2% of cases, which demonstrates the importance of the community pharmacist in resolving these types of problems related to adherence to treatment.

In the field of safety a predominance of PRM5 is seen, related to qualitative insecurity, an aspect which demonstrates the possibility of promoting and carrying out pharmacovigilance activities which could be coordinated perfectly with this PFU program by the voluntary notification to the National Pharmacovigilance System.

Discussion
Key points

What Is Known About the Subject

- The costs associated with the inappropriate use of medicines can be more than those invested in pharmacological treatments, and the major component in those costs is the hospitalisation derived from PRM.
- The implementation of pharmacotherapy follow-up (PFU) in different scenarios of the professional practice of the pharmacist has achieved an effective resolution of the PRM.

What This Study Contributes

- With the method used, a high percentage of resolved PRM (77.9%) is observed, which should demonstrate that the widening of PFU constitutes a valid means of preventing morbidity and mortality associated with medicines.
- In the pharmacist interventions which required the participation of the doctor to resolve them, a high percentage of acceptance was observed (74.6%), which demonstrates that teamwork between the community pharmacist and the doctor is possible in the PFU of the patients.

The analysis of resolved PRM, taking into account the drugs involved according to the ATC classification, shows a high proportion of those that act on the cardiovascular system—as the main anatomical group—, followed, in descending order, by those that act on the nervous system and digestive system and metabolism. It is important to point out that, as regards the main therapeutic group, it is seen that in more than 50% of the resolved PRM, 7 different types of drugs prevail, which are, in descending order: drugs active on the renin-angiotensin system, psycholeptics, anti-diabetics, calcium channel blockers, anti-inflammatories and anti-rheumatics, analgesics, and psychoanaesthetics. This data should indicate that the patients who use these types of drugs are most susceptible to the appearance of PRM, and as such that the promotion and development of more intensive PFU strategies would be required for them.

The problems of safety of medicines, qualitative ones as well as quantitative, are those which show up more often in patients of more advanced ages (60–69 and 70–79 years),

which indicates the need for carrying out PFU in this population, since it seems to be more susceptible to these problems.

On analysing the PI which required the participation of the doctor for resolving them, a high percentage of acceptance is observed (74.6%), which agrees with other published works.^{16,17} This demonstrates that teamwork is possible for the PFU of patients. The professionals of the health team have to be made aware of the need of this type of multidisciplinary approach which has a beneficial bearing on the results for the patient and helps to integrate the health care services.

Among the limitations of this study it should be pointed out that the drug and patient samples are not representative, which, as a consequence, limits the extrapolation of the results. Also, there is no control group, since it is not ethically acceptable to deny the PFU service to a particular group of patients.

This experience shows the need to add a larger number of pharmacists to carry out PFU activities, with the intention of being able to demonstrate, as such, its significant impact on the morbidity and mortality associated with medicines in society.²⁸ The commitment from Institutions, private and public, who promote health must also be obtained, to support and maintain, in the long term, these PFU activities, which are feasible from the community pharmacists

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COMMENTARY

Follow-up in Community Pharmacies: a Way of Minimising Problems Associated With Medicines

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Medication is, in all probability, the most used therapeutic tool, therefore its proper use and the effects derived from it are highly relevant from the perspective of obtaining results in health and the quality of the health services provided. However, the available data shows there are margins for improvement in pharmacological treatment. Thus, the average percentage of avoidable hospital admissions arising from morbidity associated with medication is 4.3%,¹ and among people older than 65 years the percentage of adverse reactions to medications, which could be considered preventable, exceeds 25%.² This situation, with its relevance to health as well as its susceptibility to improvement, seems to call for an appropriate response from the health authorities and from its professionals.

Pharmaceutical care, carried out by pharmacists in collaboration with other health professionals and the patient, is a group of interventions aimed at reducing the possible problems arising from medication. Pharmacotherapeutic follow-up is included within the framework of pharmaceutical care activities, which is defined as the professional practice in which the pharmacist is responsible for the needs of the patient as regards medications by continuously, detecting, preventing and resolving problems related to these medications (PRM), using systematic and documented methods, in collaboration with the patient him/herself and the rest of the health service professionals, with the aim of achieving concrete results which may improve the quality of life of the patient.³

Pharmacotherapeutic patient follow-up has been in the process of development since the 1990's, with the publication of different studies which report the interventions and methods employed, as well as the results obtained.

The article entitled "Pharmacotherapeutic Follow-up of Patients by Community Pharmacists" is a new addition which contributes to the spreading of the knowledge of these activities to other health professionals and reinforces their value as useful interventions to reduce the number of PRM. The authors obtained a satisfactory level of effectiveness for the interventions, resolving almost 78% of the problems detected. The fact that 28% of the resolved problems corresponded to adverse reactions to the drugs is

Key Points

- The problems related to medicines are a relatively common reality, clinically relevant and always avoidable.
- The pharmacotherapeutic follow-up of patients can contribute to minimise these problems related to medicines.
- Its development and the consolidation of this activity by identifying the most appropriate methodology and treatment of results in health care must continue.

notable, and another 28% related to problems derived from a lack of efficacy due to therapeutic non-compliance by the patient.

Different studies show that the morbidity associated with the adverse effects of drugs is a real health problem. Thus, a rate of adverse reactions of 50.1 per 1000 population per year² was found in non-hospitalised elderly patients, and as has been mentioned, the average percentage of avoidable hospital admissions generated by these adverse reactions stands at 4.3%. The health and economic repercussions arising from this problem are, therefore, relevant and evident. On the other hand, therapeutic non-compliance is relatively frequent; it is estimated that it occurs in 30 to 50% of elderly patients, a percentage which could increase to 70%^{4,5} in some illnesses. This non-compliance generates, on the one hand, a health risk to the patient, as we are faced with an incorrectly treated health problem, and on the other hand, it is often seen, falsely, as therapeutic failure which provokes unnecessary changes to treatments with other drugs, perhaps less adequate than the first ones. In this scenario, the results obtained by the authors of the study have been positively evaluated which, as they say, appear to minimise these 2 widely prevailing and highly relevant clinical problems.

Likewise, the fact that 75% of the PRM were resolved with the participation of the doctor, is interesting, inas-

much as it involves working as a team and shows multidisciplinary collaboration.

All the published works which evaluate pharmaceutical care activities agree in the results obtained in regard to the resolving of PRM. However, there are a smaller number of studies which evaluated the benefit of these interventions in terms of quality of life or improvement in health, and their conclusions are not unanimous.

It seems obvious that fewer adverse reactions to drugs, interactions between them, or an improvement in the rate of therapeutic compliance should help us to obtain real benefits in terms of health. The lack of agreement in the results in some studies demands new ones, which should be directed at clarifying the health benefits for the patients to whom these problems refer. On the other hand, the fact that the methods used in the interventions of the different published works have also been different, opens up the possibility that the differences found may be related to the method used in performing the pharmaceutical care activities, which should justify another line of investigation. Likewise, it worth thinking about the efficacy of implementing these activities in the closed and open institutions of the National Health System, which could be developed by the pharmacists of the pharmaceutical services in hospitals and primary care centres.

In conclusion, the results of this study are consistent with those obtained in other published studies and contribute to the development of a promising and encouraging field which can benefit, in the first place, the patients, but also the other professionals and lastly, the health services themselves. However, it is necessary to proceed to confirm the benefits in health of these activities, as well as identifying the most appropriate work methods.

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