Pharmacist Cognitive Service and Pharmaceutical Care: Today and Tomorrow Outlook

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Abstract

The aim of this work was to ask more use of clinical pharmacists in medical team. The application of pharmaceutical care principle in practice settings can improve clinical outcomes, reducing therapy errors and containment cost. An opportunity to use pharmacist’s expertise in assisting physician’s drug and medical devices specialists. Isn’t time for the medical community to get aid of the clinical pharmacists to work side by side and assist the physicians, in order to give a better care, protect and safeguard patients. The rationale of this focus article was to invite pharmacists to take a much more active role and to help physicians using their expertise in order to complete the therapeutic work in a more rational way. Pharmacists need to get out of their private stores, sharing their expertise and knowledge, by making active presence in the very infrastructure of clinical centers, such as hospitals and ambulatory. Physicians alone cannot cover every aspect of the pharmacological treatment, for example in the field of drug therapy monitoring, interactions, adverse drug reaction (ADR), toxicology, novel delivery systems, immunoglobuline-based therapeutics and other innovative drugs and medical devices systems, which have their pharmaceutical specific worlds.

For over 80 years the only role’s pharmacists played were compounding and consulting for over the counter drugs. By the year 2025, the innovative polymer and nano drug delivery systems, genomes, immunoglobuline-based therapeutics and stem cells and other innovation will add or substitute to the ordinary local, enteral, or parenteral dosage forms. That era is now rapidly changing, and the all nations pharmacists need to come out of their convenient type of stores to the aid of the physicians in their actual duties, taking role in that missing rescuing the patients which in many occasions, their health and even lives can be at risk (Drug allergy undetected).

Observing some actual university courses of clinical pharmacy in different countries and some old and new studies involving clinical pharmacists taking part of wards’ medical teams, we have noticed that the pharmaceutical care service given by a pharmacist has an undeniable positive impact on, and improves the clinical outcome in the pharmacological therapies (Pharmaceutical treatments, on therapeutic levels).

1 Introduction

The pharmacist role needs to be actually changed, and this change can be used also to improve patient’s clinical outcomes. Helper and strand in “Opportunities and responsibilities in Pharmaceutical Care” in 1990 wrote, “changing the focus of practice from products and biological systems to ensuring the best drug therapy and patient safety will raise the pharmacy’s level of responsibility and require philosophical, organizational, and functional changes.”

In this focus article, the right key words for clinical pharmacists are best drug therapy and patient’s safety and new pharmacist’s responsibility. The evolution of clinical pharmacy imposes an interesting and different approach to ward’s services. The pharmacist
can’t simply dispense drugs even more, but the pharmacist can positively influence pharmacological therapies. We can call this kind of activity cognitive service. The cognitive service is a new tool that can improve clinical outcomes, not just to prevent patient’s therapeutic errors.

This field today is gaining more and more importance so that it becoming an actual new working field for pharmacists, not only because we have a great number of new drugs, new medical procedures, new diagnostic methods and more complexity of cure like multi-therapies. However, we need to take into consideration the economical aspects; a limitation imposed by the cost of drugs and medical device⁵.

Both government healthcare bodies and patients are always seeking reduction in therapy errors, which demand the cognitive pharmacists taking a role and/or at least some sort of engagement. In fact Papadopoulos and others in 2002 in the article “The critical care pharmacist: an essential intensive care practitioner” wrote “clinical pharmacy service in critical care setting: reduced drug errors and adverse drug reactions, decreased morbidity and mortality rates and had a positive pharmaconomic impact by decreasing overall health care costs⁶.

In fact, a multidisciplinary healthcare team is a golden point, as an end-point objective: in the year 1994, in WHO/Pharm/94.569 was written: “the health care team which is concerned with the use of drugs, must include a pharmacist”. Although today’s clinical pharmacist’s contributions in some discipline are clearly drawn (oncology, toxicology, critical care, nuclear medicine, antimicrobial stewardship and nephrology), it doesn’t mean that they not have room for improvement in other disciplines such as imaging, biochemistry, molecular biology, genetic, immunochemistry in order to have a more rational therapy.

These medical disciplines are strongly related to pharmacological therapy and their clinical outcomes. Clinical pharmacists are also expert in field as innovative drug delivery systems, novel combinatory or conjugational advanced therapeutic systems to provide high specialist-Scientific contribute to medical team.

In 1994 Shaw M wrote: “pharmacists, not only specialists must be knowledgeable about the role diagnostic imaging plays in pharmaceutical care; diagnostic imaging is utilized to follow the course of therapy; i.e. determining therapeutic outcomes⁷. The involvement of the clinical pharmacist in the management of new therapies is not only the right way but also essential in betterment of the safety of patients. A pharmacist can and will make a big difference in a medical team, and his/her contribution can be really vast, from monitoring of drug levels to the double check on the accuracy of the prescriptions, especially when it comes to drug metabolism and interactions with other drugs, food, pathophysiological medical status of the patient (such as diseases, allergies), social habits, as well as patient compliance, along with restraint of high costs, not to mention that these are just few between many others.

Other factors to take into the count are that patients normally comply more easily and are more comfortable with the pharmacist, for a number of reasons, for instance, the patient can visit the community pharmacist without restraint, appointment and above all free of charge, where, the visit to a physician normally has financial costs and consumes a lot of time.

This accessibility to the patient gives a great chance to the pharmaceutical clinician in assisting the both physician and patient and sometimes in communicating between them. For instance, often the patient doesn’t know that the antihistaminic prescribed by the physician was not a etiological cure but symptomatic drugs.

Also the clinical pharmacist with a deep knowledge in clinical cases and in the diagnostic matter is a great resource in both private and hospital medical team and it’s obvious it will prevent many unfortunate and preventable failures; therefore, therefore it will definitely end up in a better patients’ clinical outcome and a better quality of their lives.

Otherwise, this approach gives some economic benefits because we can observe errors and hospitalization days’ decrease, a better drugs’ use and as a consequence also a reduction of stocks of drugs and medical device.

For example, in Italy there was a health ministerial project: “Ward pharmacists in oncologic field⁸”. This project is due to a collaboration of different organizations: SIFO (Italian Society Hospital Pharmacy), FOFI (Italian Federation of professional Pharmacists’ Orders), AIOM (Italian association of Medical Oncology), EAHF (European Association of Hospital Pharmacist). It was a multi-center experience involving 5 public hospitals with the presence of clinical pharmacists in their oncology wards. The result is a reduction of ward stokes from 32% to 88% and 30% less of drugs therapy errors.

2 Materials and Methods

To examine deeper this argument, we analyzed some scientific articles published around the word in different pharmacist’s working field:

Kane SL et al. 2003 documented that pharmacist’s involvement in improving clinical outcomes of critically ill patient was associated with optimal fluid management and substantial reductions in rates of adverse drug events, medication administrations errors, and ventilator-associated pneumonia⁹.

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Kaboli PJ et al. 2006 reported that the addition of clinical pharmacist service in care of inpatients generally resulted in improved care with no evidence of harm7.

Bond CA et al. 2007 documented that in seven hospitals, clinical pharmacy service reduces mortality rates8.

Koshman et al. 2008, Pharmacists care of treatment with heart failure (HF) greatly reduce the risk of all causes and HF hospitalizations, and the incorporation of pharmacists into HF care team should be considered9.

Wang HY et al. 2008, investigated the effects of pharmaceutical care in renal transplant clinics could observe that physician acceptance rates of recommendation types and drugs classes were 96% and 97.1% respectively, among the cases in which the recommendations were accepted, 94.2% of patients showed improved conditions10.

Milfred-La Forest et al. 2013 evaluated that transplant pharmacology expert in Medicare and Medicaid centers is a necessary condition for accreditation. Because this figure knows how to increase evidence based therapies. This decreases HF hospitalizations and emergency department visits and also decreases in all causes readmissions11.

Chisholm et al. 2010 documented that pharmacists provided direct patient care has favorable effects across various patient outcomes, health care settings, and disease states12.

Tommelein R. et al. 2013 reported that pragmatic pharmacist’s care program improves the therapeutic regimen in patients with COPD and could reduce hospitalization rates13.

Joost R. et al. 2014 documented that the additional intensified pharmaceutical care improved patient’s medication adherence remarkably. It suggesting that the applied additional care programs have the potential to improve outcomes after organ transplantation. Medication adherence was critical for transplant patients because the consequences of no adherence can result in allograft loss and may be life threatening14.

Rocha BS et al. 2015 suggested that pharmaceutical interventions might contribute to improve adherence to ART and the achievement of virological charge lowering, although the differences between the intervention and control groups were not statistically significant. Pharmaceutical intervention might be more efficacious in populations with low adherence to treatment and greater vulnerability15.

In Katayama T 2015 reported that medical treatment integrated team is now advancing, although pharmacist’s role in clinical decision is increasing; and pharmacists have a greater burden of responsibility than before16.

3 Result

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In these studies, we observe a general positive influence of pharmacist’s presence in the medical team also in different clinical outcomes.

4 Discussions

The following factors are the major driving forces behind healthcare systems changes:

- The population of each nation (age)
- Distribution and accessibility by the public of healthcare systems throughout the nation
- Costs of hospitalization and medical care
- The ratio of social programs, i.e. government financial assistance/ coverage by government and/or insurance to the private sector
- Sense of responsibility and active involvement and moral and ethical presence of each of the healthcare professionals
- The frequency of the so-called casual death, due to the mistakes or often negligence in writing prescriptions.
- Socio-political systems, with special interest groups and the, lobbies with financial interests.
- Broken distribution of responsibilities within healthcare communities
- Financial resources for patients
- Effect of the priorities due to social structure

Regardless in which country or systems and which of the factors played a major role, the need of the medical/healthcare systems rapidly changed and in continuous evolution and improvement with more diversified specialized sectors, especially for pharmacy school graduates seems to be very well justified and beneficial, all over the world. The fact that different countries have different health care systems, doesn’t rule out the fact that the type, proportion and distribution of the roles played by each of the medical professionals, such as physicians, pharmacists, nurses, medical assistants, imaging professionals has to be evolved in more rational way.

All of these indicate that the current medical/healthcare systems are not only subject to change but also not necessarily the best and in some countries actually dysfunctional.

Therefore, although each country has to tailor its own system, but the role of the clinical professionals, as campaign activists in making changes in these systems, in a way to benefit the patient’s both health and safety, in all countries is certainly a crucial necessity.

In certain countries the shortcoming of pharmacists to take side of the patients is unforgivable, therefore we have many reasons to believe that such publications are not only essential, but also there is

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a lack of presence of the pharmacists at the right level in the healthcare system, and therefore, there it’s crucial need in making a change in the patients' safety management.

In Italy, for instance, there is a need to increase the level of responsibility in therapy field, as widespread as in other countries for example USA, UK.

In Italy, we don’t have a regulatory requirement but only a ministerial recommendation about ward pharmacist’s presence in hospital settings as for example in the oncology field.

Italian national experience has given as result the reduction of 35% of drugs’ and medical devices’ costs and therapy errors.

We think that the difficulty to have ward pharmacist in Italian hospital settings depended on economic reasons due to actual economic time. The analysis of the number of clinical pharmacist in public hospitals versus MD confirms this idea.

Many European resolutions made by Council of Europe from 2001 suggested to apply clinical pharmacy and pharmaceutical care principles in countries' healthcare system.

Furthermore The joint commission international in “The Joint Standards for Hospitals, 5th Edition” dose not say how organizing and staffing of pharmaceutical services,( ward clinical pharmacists presence).

The number of hospitals and organizations using ward pharmacists is increasing to raise a better safety in the medication system even if standards' levels are not yet pointed out.

To deep apply pharmaceutical care principles represents a great opportunity in all countries in order to improve clinical and economic outcomes but we think also for ethical reason.

There are two strategies in applying ward pharmacist presence:

- A real division between clinical and logistic activities
- A cross approach between clinical and logistic activities when economic and human resource are poor

For example in our hospital (PIACENZA – ITALY) since 2004 we chose the second way: this choice was due to the medium hospital dimension and related to the budget assigned.

So every clinical department cooperates the assigned pharmacist to monitor costs and other pharmaceutical needs.

Every pharmacist attends to a specific department or area (surgery/Internal medicine, emergency, medicine, diagnostic imaging, medicine laboratory) to rationalize prescription according to Ebm criteria, patientns clinical needs, local and national policy, budget assigned.

In our hospital our specialist’s pharmacists have their own fields (medical devices, Toxicology, oncology, nutritional, infectious disease, medicinal gas quality control) and are involved in Pharmacological therapy and also in ward economic management.

As clinical activity our pharmacists manage oncologic pharmacy therapies to prepare standard and particular doses checking the right dosage and mix of drugs ensuring the right therapy and Monitoring costs. We have a specialized pharmacist full time involved in medical devices management that evaluates the ward request helping to balance costs and sureness and controlled legal claims or ministerial recalls of products.

From 2007 we also have adose unit system that supports pharmaceutical care activities.

Our galenical laboratory prepares magistral formulas for tree pediatric wards, including cardioligic surgery pediatrics.

The hospital is also a rare metabolic disease regional centre and we take care about children needs particular drugs and nutrition.

For adult patients we have a nutritional team dedicated with clinical pharmacist.

For all other wards in discharge from hospital activity the clinical pharmacists not only provide drugs and medical devices and nutrition but also monitor prescriptions and provide pharmaceutical care to patients.

Also advisory activity is provided in field of nuclear medicine (radiopharmaceuticals), diagnostic imaging (contrast agents) and laboratory medicine (reagent, diagnostic in vitro).

Clinical pharmacists are applied in ethical committee.

In 2014, in order to give more emphasis to medical team collaboration, we organized an updating course “Introduction to pharmaceutical care in medical equip”. Online and open to all medical eqips.

It was about practical activity concerning a bibliography research in biomedical databases about this subject. It was also required a write comment on the effect of clinical pharmacists presence in the medical team.

5 Conclusions

This article wants to improve the pharmaceutical care application in countries with an advanced healthcare system in order to provide more rational drug therapy to patients.
When this is not possible, it would be a good idea using pharmaceutical care, in particular populations such as: severe disease, critically ill, patients with multiple illnesses, transplants, immunosuppression, oncology or other serious conditions, at least when the treatments cost a lot.

This could address international bodies, involved in the hospital settings, accreditation procedure: introducing ward clinical pharmacists’ presence, as strong requirements.

This is hard to realize without ward clinical pharmacist. We believe this is not limited to Italy; many other nations suffer from the same syndrome, rigidity in their bureaucratic systems, and in this case “health care bureaucratic system”.

We don’t claim USA has the best health care system, but we believe that USA is one of the most flexible, active, rapidly self-adjusting, open minded and evolved systems, especially when it comes to differentiation of different medical specialties, distribution of roles and tasks, team-working and the involvement of the pharmacists, in many specialties, in insuring the safety of the patient, double-checking the prescriptions and assisting physicians and other relevant activity.

Isn’t time for pharmacy professionals to take role side by side of the physicians in treatment of the ill people in all nations? Isn’t time for pharmacy specialists to speak out, reach out people of influence, if the medical community is not reacting with a proper speed or enough attention?

We believe there is a damage done on the public safety, because of such a bureaucratic rigidity and that pharmacist’s activism in this field will safeguard the best interest of the patient’s health.

We believe that our pharmacist’s satisfaction to the current circumstances or silence is not noble, and there is a need to break this passive atmosphere where it is.

We believe this article is just to beginning for a global movement and if we don’t do something about it, no UN or WHO officials would know or care at the right level.

A discussion must be opened, under the light of the results of clinical studies, and the bibliography published in this filed.

6 Competing interests
No competing interest

7 Author’s contributions
ML, FC, GB and BNA carried out literature review and analysis of outcomes. All authors read and approved the final manuscript.

8 References

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