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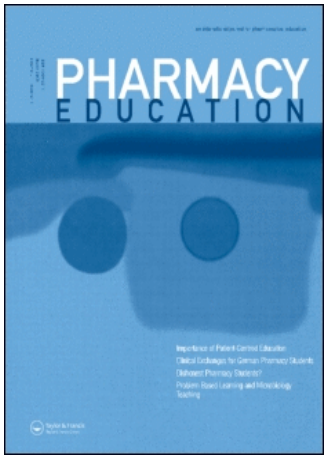

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Physicians' Acceptance of Pharmacy Residents' Recommendations on Drug Therapy

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The objective of this study was to evaluate the impact of a training program delivered to pharmacy residents. During their clinical pharmacy training program, the residents have to learn more about how to deal with drug related problems, develop clinically relevant recommendations, and develop communication skills to make therapeutic recommendations acceptable for the prescriber. Six pharmacy residents, working in different clinical wards, collected data during six consecutive weeks every time they gave a recommendation to a prescribing physician. The main issue was the prescribers' level of acceptance of pharmacy residents' recommendations. The items taken into account were the type of recommendation, the physician's status and the mode of interaction between pharmacy residents and prescribers. Two hundred and twenty one interventions were collected. The major recommendations were changing drug regimen (39%) and enhancing monitoring (31%). The rate of prescribers' acceptance of recommendations made by pharmacy residents was 47% (higher for senior prescribers (59%) than junior prescribers (41%)). Oral recommendations of around 80% were accepted.

Keywords: Clinical pharmacy; Resident; Training program; Impact; Evaluation

INTRODUCTION

In recent decades, economic and quality constraints have forced the evolution of pharmacy practice in hospitals and in other health care organizations. In a more complex, highly technical, consumer-centered environment, there is a need to better organize and enhance the efficiency of pharmaceutical services, from general support activities (for example, administration, financial resources management, purchasing programs, drug control and distribution) to more patient oriented activities (for example, nutritional support or oncology preparation, drug information practice, pharmacokinetics, pharmaceutical care). Pharmaceutical care is one of the major issues concerning the evolution of pharmacy practice in French hospitals. The main objective is to get pharmacists to participate in patient care, by developing collaboration with physicians in clinical environments.

The residency training program is one of the options used to enhance the quality of service delivered in clinical wards (ASHP Practice Standards, 1997; ASHP and ACCP, 1999). French pharmacy residents complete eight semesters of training. They choose at least one semester in a clinical ward, where they are included in the medical staff. Their main task is to assist physicians dealing with drug regimens. After reviewing the patient's medication history (for example, previous drug therapy, drug-induced symptoms or disease, misuse or abuse), the pharmacy resident checks critical endpoints concerning the patient's drug therapy, therapeutic appropriateness of the drug regimen, including route and method of administration, any therapeutic redundancy, current or potential drug–drug, drug–food or drug–disease interaction, and clinical and pharmacokinetic laboratory data pertinent to the patient's follow-up. The resident also ensures an optimal monitoring process, counsels patients regarding their treatment, potential adverse effects, administration plan and surveys current and potential drug toxicity, adverse effects and level of compliance.

In order to assume these responsibilities, pharmacy residents go through a specific training

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program before they start their rotation. The training is threefold. First, residents complete a formal clinical pharmacy program of 10 one-day sessions. The general framework of each session is a focused formal intervention by an expert and an interactive workshop using drug therapy problem solving approach (Sorensen and Biebighauser, 2003). The main topics are drug therapy choice, implementation and monitoring of drug therapy and patient counseling. The program ends with a formative evaluation session where each student presents a case report.

Second, a technical session is dedicated to the software managing the hospital drug delivery system, CristalNet©, which includes several modules: prescriptions, dispensing, administration, drug ordering, invoicing. The dispensing module allows the pharmacist to write and record structured comments on drug therapy, including recommendations on drug therapy treatment plans and therapeutic endpoints.

Third, residents attend a monthly staff meeting with a senior referent pharmacist, to discuss technical or clinical pharmacy problems.

In order to evaluate the impact of this training program on the residents' performance, the objective of the present survey was to assess the prescriber's level of acceptance of pharmacy residents' recommendations on identified drug related problems.

METHOD

A descriptive study was designed based on three weeks of prospective data collection in a 2000 bed teaching hospital during March 2002 (Grenoble University Hospital, France). Six pharmacy residents were enrolled. They were assigned for the whole period to one of the five following clinical wards: geriatric (60 beds), respiratory (66 beds), rheumatology (27 beds), nephrology (34 beds) and internal medicine (20 beds).

The data was collected by each pharmacy resident, each time she/he provided a recommendation to a prescriber. A standardized data collection form included information on the type of drug related problem, the type of recommendation, the physician's status, the mode of interaction between the pharmacy resident and the prescriber, and the acceptability of the recommendation.

The principal outcome was the rate of acceptance by prescribers of pharmacy residents' recommendations. A recommendation was rated "accepted" following any modification of the drug therapy. Where the recommendation was "not accepted", the justification for no modification could be recorded orally or documented through the computer system. When no tangible modification could be expected from the recommendation (i.e. drug clinical monitoring) or when the modification observed could not clearly be imputed to the resident's intervention (i.e. addition of a laboratory test which could have been implemented by the prescriber anyway), the intervention was rated "not assessable".

The rate of acceptance by prescribers of pharmacists' recommendations was estimated as a percentage. The associations between the potential explanatory variables and the rate of prescriber acceptation were tested with the chi square test. A p value inferior to 0.05 was considered significant. Statistical analyses were made with the Stata 6.0 software (Stata Corporation, College Station, TX, USA).

RESULTS

Two hundred and twenty one interventions made by the pharmacy residents were collected. These interventions were: geriatrics, 38% (82); pneumology, 30% (67); rheumatology, 17% (38); internal medicine, 8% (18); nephrology 7% (16). The types of drug related problems leading to the pharmacist's recommendation (Table I) mostly dealt with drug–drug interactions, monitoring of the therapy and drug–disease interaction. Problems in drug supply were mainly associated to the prescription of non-formulary drugs.

The major recommendations proposed by pharmacy residents consisted of (Table II):

1. changing drug regimen 39% (86);
2. enhancing monitoring 31% (68);
3. optimizing the administration 14% (31)
4. finding a formulary alternative 10% (22).

The time between recommendation and prescriber's decision was less than one hour in 47% of cases (104 interventions), less than the day 13% (29 recommendations), within one week for the rest 40% (88).

The rate of prescribers' acceptance of the recommendations made by pharmacy residents was 47% (104 interventions) (Table III). The acceptance measure in 42% of cases was not assessable (93 interventions).

TABLE I Types of drug related problems ($N = 221$)

Drug related problem	*N*	%
Wrong or inappropriate dose	18	8.1
Inappropriate drug, wrong choice	12	5.4
Inappropriate drug administration	13	5.9
Inadequate or lack of patient monitoring	37	16.7
Wrong frequency or wrong time	16	7.2
Drug-drug interaction	60	27.1
Drug-disease interaction	28	12.7
Drug supply problem	33	14.9
Side-effects	4	1.8

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TABLE II Types of recommendation made by pharmacy residents ($N = 221$)

Recommendation	*N*	%
Discontinue drug	34	15.4
Change drug	27	12.2
Change dose	25	11.3
Add clinical or therapeutic monitoring	50	22.6
Add Lab test	18	8.1
Change schedule	22	10.0
Change mode of administration	9	4.1
Drug supply alternative	22	10.0
Other	14	6.3

TABLE III The prescriber's acceptance rate of the pharmacy resident's recommendations ($N = 221$)

Accepted by prescriber	*N*	%
Yes	104	47.1
No	24	10.9
Not assessable	93	42.1

When analyzing the main characteristics of interaction setting (Table IV), we noted that the acceptance rate of senior prescribers was higher at 59% (43/72) than that of junior prescribers at 41% (61/149). The recommendations' transmission mode was correlated to the physician's level of acceptance, with oral recommendation giving the best result at 81% (17/21) being accepted by the prescriber. Finally, the rate of acceptance was high for recommendations like "change of schedule" at 82% (16/22), "change of drug" at 78% (21/27), "change of mode of administration" at 67% (6/9), and low for monitoring with less than 15% (7/50).

DISCUSSION

The rate of acceptance of recommendations proposed by the pharmacy resident was low (47%), compared to literature where rates greater than 90% are quoted (Hawkey *et al.*, 1990; Mutnitz *et al.*, 1997; White and Chow, 1998; Leape *et al.*, 1999; Lee *et al.*, 2002), and to local situation (92%) (Guignon *et al.*, 2001).

We made a conservative methodological choice: a recommendation was rated "accepted" after modification of the drug therapy. When the impact on the drug therapy of the recommendation made by the resident was impossible to ascertain, the intervention was rated as "not assessable". Ninety three out of 221 recommendations were rated this way (for example, potassium monitoring for patients using diuretics or INR follow-up for patients treated with anticoagulants). If we pooled the 93 recommendations rated this way with the 104 rated "accepted", the overall rate of acceptation would increase to 89%.

It should be noted that this rate of acceptance depends on three types of factors concerning physician–pharmacist interaction (McDonough and Doucette, 2001): participant characteristics, context characteristics and exchange characteristics. Each factor can potentially explain why it is difficult for the pharmacy resident to convince the referent prescriber.

TABLE IV Acceptance rate according to main characteristics of the intervention ($N = 221$)

	Accepted		Not accepted		Total	
Characteristics of the interaction	*N*	% Line	*N*	% Line	*N*	% Column
Type of prescriber*						
Junior prescriber	61	40.9	88	59.1	149	67.4
Senior prescriber	43	59.7	29	40.3	72	32.6
Total	103	46.6	118	53.4	221	100
Mode of interaction*						
Computer	56	37.8	92	62.2	148	67.0
Oral + computer	33	63.5	19	36.5	52	23.5
Oral	17	81.0	4	19.0	21	9.5
Total	106	48	115	52	221	100
Type of recommendation*						
Discontinue drug	16	47.0	18	53.0	34	15.4
Change drug	21	77.8	6	22.2	27	12.2
Change dose	14	56.0	11	44.0	25	11.3
Change schedule	18	81.8	4	18.2	22	10.0
Change mode of administration	6	66.7	3	33.3	9	4.1
Add monitoring	7	14.0	43	86.0	50	22.6
Add Lab test	2	11.1	16	88.9	18	8.1
Drug supply alternative	11	50.0	11	50.0	22	10.0
Other	5	35.7	9	64.3	14	6.3
Total	100	45	121	54	221	100

*$p < 0.01$.

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Participant Characteristics

The literature data shows that the willingness to accept the risk involved when developing collaboration is mainly determined by the age and the education of the participants. Younger prescribers seem more involved in teamwork, therefore more receptive to interaction with pharmacists than older physicians (Haxby *et al.*, 1988). In our results, there were more junior prescribers involved (first-line prescribers in French hospitals). However, the rate of acceptance of pharmacy residents' recommendations was higher among senior prescribers. This might be due to the fact that recommendations directed to junior or senior physicians were different. There were more drug oriented interventions for junior prescribers, changing drug regimen in 40% of cases compared to 33%, optimization of administration in 17% of cases compared to 12%.

Context Characteristics (Geographical, Organizational and Social)

Pharmacists are generally not perceived as readily available drug information specialists because of such factors as location or telephone delay (Ranelli and Biss, 2000). In our setting, the proximity of the pharmacy resident to the junior physician helped enhance the frequency and duration of interaction. They usually shared the same office and therefore could discuss prescriptions while they were being written, which can also explain why oral recommendations (30% of all recommendations) were more easily accepted than written ones and, most of the time, taken into account quasi-instantaneously by physicians.

The Exchange Characteristics

The literature shows that in order to be efficient, communication has to be face-to-face (McMahan *et al.*, 1994) and bi-directional (Mohr and Nevin, 1990). Computerized medication systems can generate or potentialise communication between prescriber and pharmacist (Schmitt *et al.*, 2001), but we observed that oral communication gave better acceptation rates. Oral recommendations mainly concerned changing drug regimen (51.6% compared to 31% for computer ones).

Finally, the acceptance by the physician is higher for clear, patient focused recommendations. Inefficient or needless communication initiated by the pharmacist makes the physician less willing to listen during future interactions. When analyzing recommendations, we noted that those targeting drug regimens (changing drug regimen in 39% of cases) or optimizing the administration (14% of cases) had the highest rates of acceptance by prescribers ($>50\%$), compared to more generic recommendations on monitoring ($<15\%$).

There are limits to the analysis of our results concerning

1. The sample size, which was too small to draw strong statistical evidence.
2. The period of data collection was short and did not take into account the learning effect over time (technical and communication skills, self-confidence). However, residents had already completed four months on the ward, and could be considered as operational for their task.
3. We chose a pragmatic outcome to evaluate the impact of training: "Does the prescriber take into account the pharmacy resident's proposition?". We did not consider intermediate criteria around cognitive and behavioral learning at the end of the formal training session. We assumed that the residents' technical background could be considered as acceptable before they began their rotation. However, we did not have any control on behavioral aptitudes.

Taking into consideration these limitations, our results show two directions in which to optimize the training of pharmacy residents.

Scientific and Technical Relevance of Recommendations

Following these results, a formal project has been initiated with residents, the objective of which is to screen the type of intervention (selecting more patient-oriented ones), and to edit the corresponding recommendation (with a minimum of scientific evidence). This will help enhance the relevance of interventions and, therefore, the credibility of pharmacy residents.

Communication Skills

The informal feedback of residents on the subject showed us that there is still a communication gap between physician and pharmacist. Pharmacists express a lack of confidence in their ability to persuade prescribers to accept their recommendations. Therefore, communication strategies have to be integrated in the training of pharmacy residents. Another option could be to develop a joint training program with junior physicians (for example, Leemans and Laekeman, 2000), on prescription and dispensing practice. This would help those involved to develop a common culture on drug therapy handling. Experiments are already under way in some French schools of medicine and pharmacy.

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CONCLUSION

In the French hospital context, pharmaceutical care is one of the major issues concerning the evolution of pharmacy practice. Currently, human resources are scarce in this activity. Few senior pharmacists are involved in such a daily routine. Therefore, the presence of pharmacy residents in clinical wards, supervised by a senior pharmacist, is an opportunity to develop collaborative working with physicians. This activity should be further structured, focusing on the relevance and acceptability of the resident pharmacist's interventions.

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