

What determines the duration of patient medication compliance in patients with chronic disease: are we looking in the wrong place?

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Abstract

Objectives: The objective of this study was to do a pilot inquiry, to determine whether physicians with similar practices in the same neighborhood demonstrated any difference in the duration of compliance among their patients.

Methods: Through a cooperating urban community pharmacy, patients with prescriptions for hypertension and type II diabetes were identified for this pilot study. Patients refill medication records were searched to determine the average number of months of drug regimen compliance. The patient data of the four local physicians were separated and compared.

Results: One physician was able to generate refill durations nearly double that of the average duration of medication refills seen in the patients consulting the several other nearby physicians.

Conclusion: In this pilot study, it was determined that there are differences in the compliance behavior of patients attending different physicians. We can conclude that some communication or personality characteristics of some physicians appear to be more successful in achieving higher compliance. Subsequent studies should identify those which may be at least partially responsible for this finding.

Keywords: Medicines compliance, medicines concordance, patients, physicians

Introduction

The importance of patient compliance was mentioned 2000 years ago by Hippocrates and after all of this time, the issue of non-compliance has still not been definitively solved¹. Numerous studies have been conducted on the topic of patient medication compliance^{2,3}. Patients' income, co-payment levels, tablet or capsule shape or color and patient age, gender and numerous other socio-demographic variables have been considered some of the factors which could help or aid towards patient compliance. For many years, pharmacists have attempted to understand how they can improve patient adherence. Time spent by pharmacists undertaking consultation, and the communication skills learned by pharmacists have been found to be important issues⁴. However, studies are incomplete and inconsistent regarding the benefits of printed leaflets, follow-up telephone calls, colorful labels, special boxes for pills, reminder

alarm boxes, printed personalized instructions and in-person encouragement at the prescription counter in the pharmacy.

Each new research project has endeavored to understand and explain at least one aspect of the overall compliance problem. But nearly all of these studies^{4,5} have focused on the patient or in a few cases, on the pharmacist and nevertheless they do not seem to help in aid in solving and understanding the dilemma of lack of compliance with prescribed therapeutic medication regimens. One may speculate that the pharmacist and the patient are not the only directions to look for answers regarding patient medication compliance behavior. It is rather obvious that the first person who comes in contact with the written prescription for a patient is the physician. And usually, physicians inform patients about their illness and about the importance of the drug being prescribed. Physicians are the ones who would be expected to motivate, encourage and persuade patients

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about the medication schedule necessity as prescribed. It is well-known that physicians have a powerful effect on patient knowledge regarding their therapy as well as patient behavior. Following on from Tamblyn⁶ et al., the authors suspect that there is a possibility that physicians who usually possess great proficiency in communication and/or medical management will achieve better medication adherence among their patients, but that this has not been examined definitively².

It is estimated that only one half of patients with chronic diseases are compliant over time⁷. Lack of compliance with prescribed medication is likely to influence numerous medication related outcomes such as: unnecessary suffering, hospitalization, decreased quality of life and increased costs for both the individual and society⁸. Findings from qualitative-oriented compliance research have been used to build behavioral models to overcome and improve compliance with medication deficits. The Health Belief Model and Health Decision Model are examples of such efforts⁹. Based on reports about these models, questionnaires were developed. The Beliefs about Medicines questionnaire (BMQ) is one of the surveys that have been studied based upon several qualitative and quantitative inquiries. These studies show that both general and specific beliefs have an effect on compliance. Also, health professionals' beliefs affect patients and their own beliefs, opinions and attitudes. Health professionals, primarily doctors, nurses and pharmacists reflect their own beliefs to patients while they are communicating. Patients' and health care providers' cultural backgrounds have also been found to have an influence on patient adherence behavior¹⁰. Moreover, it has been shown that demographic variables such as gender, age, education, income and clinical variables such as disease severity or culture variations have a relationship with compliance. There are also multiple other reasons for patients' failure to comply with medication regimens. Patient unwillingness to accept the therapy, lack of motivation, early recovery and forgetting about physician advice are also some other factors^{11,12}.

Britten¹³ suggested that noncompliance can be avoided through five prerequisites undertaken by physicians during patient consultations. Britten believed that willingness to share power and a commitment to giving appropriate weight to patient values and goals, open discussion of the options with explicit inquiry to patient views without making assumptions, adequate sharing of information, including uncertainties to arrive at a decision, listening as much as talking, and time allocated to patients are vital prerequisites the physician should include in any consultation.

Cushing and Metcalfe¹⁴ found that patients could remember only about 60% of what they had been told. Patients remembered the first things that the physician had said. And also, it was found that patient' prior knowledge and consistency aid in recall when the health professionals' explanations are not very clear. In essence, this means that if the message from the physician is not entirely clear, that patients will continue believing their own ideas and much of this prevents them from being totally compliant.

In accordance with data on this topic in the literature, Huntenburg¹⁵ also found that most of the patients for whom long term drug therapy was prescribed, ceased using their medications after a brief period of time. About 50% of patients who have been prescribed maintenance medication for chronic conditions for the first time, stop using their medications within a matter of months. Perceived side effects, ineffectiveness of medications and personal considerations were related to the use, as well as lack of need of treatment. These were the main reasons for discontinuing maintenance drug therapy¹⁶. Also, in another study, it was declared that one third of chronic patients' beliefs were that long-term effects of medications could be dangerous. The same study strongly emphasized that medication beliefs were more powerful predictors than were clinical and socio-demographic factors¹⁷.

In Horne and Weinman's research, patients who had stronger concerns about side effects reported having lower adherence rates. This should remind us that patient education via the media and direct marketing may have unwanted effects, especially on patients with chronic conditions, and elderly patients. Patients who believe in themselves more than health professionals are seen to be more noncompliant according to qualitative semi structured interviews. Many chronic condition patients declared: "I hate taking medicines." This is an important statement that we learn from many societies. At this point, the role of the health professional, especially the physician, is the most important role for patients¹⁸. These declarations and statements by patients lead us to think that physicians' affect and role should be measured. The study and the analysis of the generated data describe and prove the statements to be true.

Physicians' effect on compliance has been investigated in many different illnesses, both chronic and acute, and it is obvious that if communication is to be effective between patient and physician, the patient is more likely to adhere¹⁹⁻²². These background studies and their results lead us to speculate that patient compliance with prescribed medication may differ according to physician characteristics and variables.

One of the important variables of noncompliance is the patient's cultural difference with the physician. The world is globalizing and in both developed and in lesser developed areas, people are moving and migrating. Communicating on health issues with the physician is becoming more complicated for patients. In a study, interviews with diabetic patients related to compliance show that food has different meanings for various ethnic groups. Patients were not compliant with the nutrient regimen that physicians had asked them to adhere to and some patients did not even comply with described future consultation visits because of this²³. The study has also been replicated in various ethnic neighborhoods.

In order to measure patient compliance with prescribed medication, numerous different methods have been used: pill counts, physical tests, medical and pharmacy records, self-reporting, electronic monitoring, health behavior testing and

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appointment keeping²⁴. In this context, the objective of this study was to determine whether different physicians are associated with different patient compliance results. In this study patient compliance was measured using a different approach, involving pharmacy refill records. The objective was then to determine whether physicians in similar practices had differences in the medication compliance rates of their respective patients. The variable responsible for differing levels of patient compliance with prescribed medication to physician characteristics was postulated.

Methodology

Recent research has shown that structured self-reported measures can yield adherence estimates that have moderate to strong concordance with objective measures such as computerized pharmacy records, insurance claims records and electronic monitoring. Such reports support a high correlation between self-reported measures and pharmacy records²⁵. As Rickles and Svarstad²⁶ showed in their study, patients' written and oral information strongly paralleled pharmacy records. Given these conclusions it was decided to use only pharmacy records and not to engage individual patients in this study.

New and refill prescription records were obtained from an urban, independent community pharmacy located in Philadelphia, Pennsylvania on a crowded, busy, shopping street. The neighborhood is comprised of lower social/economic strata patients, many of whom are from ethnic minorities. Very close to this community pharmacy are the solo offices of four different general practitioner physicians. All of them treat the full range of patient medical problems and most of the prescriptions written by these four physicians are brought to the study pharmacy since it is the closest community pharmacy to their offices. Many of these lower income patients do not own automobiles, so convenience and proximity are important considerations in community pharmacy choice.

The study data regarding patient and physician identifications was blinded to the researchers, an assumption was made that the 154 patients included in the study were in many ways homogeneous, from the same neighborhood, similar educational attainment and probably the same general range when typical chronic diseases such as diabetes and hypertension are first recognized. This assumption was accepted as basically accurate by the pharmacists at the study pharmacy. Patient medication records in the pharmacy's computerized management and information system were searched for patients with an index prescription for a chronic medication. The date that the patient should collect follow-up medication was calculated by using the prescribed dosage and the number of medication units. This was matched with the number of days of actual supply. Chronic medications were assumed to be taken regularly all year. The number of months that the patient had medication prescribed and collected from the pharmacy was calculated and recorded. Some patients had concomitant chronic illnesses and medicines,

but only drugs for cardiac conditions and diabetes were included in the study. The medications for these conditions when found in the pharmacy records were noted and analyzed. The outcome for each patient was only a number and the total number of months that the chronic condition medication was refilled was also recorded. Prescriptions were recorded from January to December 2010. The computer service monitored these patients and follow-up medication refills were provided anonymously with patient code numbers during the one-year study period. The medication practices of patients of four physicians were recorded. The difference between the compliance periods for patients of the four physicians was evaluated.

Regarding ethical concerns, the researchers were blinded and did not know the identity of the four physicians or of any of the patients. The researchers had no link to patients or physicians. The pharmacist provided the documents with physicians being numbered and with patients having a separate number system. All ethical considerations were adhered to and neither patients nor physicians were put into any risk at any time.

The data analysis was conducted with the use of SPSS version 15. First, the Kolmogorov Simirnov Test was applied and it was found that the distribution was asymptotic. Then with the addition of the Kruskal Wallis Test, the differences between the groups (physicians and patients) were analyzed. Following this it was found that there was a significant difference between groups (<0.05), and the Mann – Whitney U Test was used for paired groups to determine where differences existed.

Results

The study included 154 patients. The number of total patients was 210, but the number of patients that fulfilled with the study criteria of chronic coronary or diabetic diseases with prescribed maintenance medication was 154. The summary of findings may be seen in Table 1.

The concern about *seterus paribus* was taken into consideration; patient age, gender, financial, educational and clinical situations were expected and assumed to be similar and homogeneous. The Kruskal-Wallis Test showed that there is a significant difference between the physicians ($p < 0.05$). The Mann-Whitney Test was used between each pair of groups so as to define where the differences exist. There is a significant difference between physician one and both physicians three and four. There is no difference between physicians three and four in terms of patient

Table 1. Physician Compliance Results

TOTAL	Physician 1	Physician 2	Physician 3	Physician 4	Results
Number of patients	37	43	89	41	210
Number of chronic patients involved	16	33	67	38	154

Table 2. Description of data analysis

Phys. No.	No. of patients	Mean	Std. Deviation	Std. Error	Mini.	Max.
1	16	5.7500	3.19374	.79844	2.00	12.00
2	33	4.3333	2.68871	.46804	1.00	12.00
3	67	3.0000	1.63299	.19950	1.00	7.00
4	38	3.3158	1.33771	.21701	1.00	6.00
Total	154	3.6494	2.20674	.17782	1.00	12.00

compliance. The difference is mainly coming from physician one's patients ($p < 0.05$), as seen in Table 2.

Physician 1's patients have nearly 6 months of compliance, on average. This is the highest duration compared to the other physicians' patients. The least compliant group is that of physician four's patients. Their average compliance is three months with the most compliant patient demonstrating only seven months adherence with prescribed medication. There is no difference between physician three and physician four's patient compliance. Their minimum and maximum compliance are similar, even though the numbers of patients the individual doctors are substantially different. ($n=67$ vs. $n=38$). Physician 2's patients have average compliance duration of 4.3. There is a difference between the numbers of compliance months between the four physicians' patients.

Physician 1's patients are the most compliant group. It is obvious that some characteristics of physician one lead to his/her patients having followed their drug regimen longer than those of the other physicians.

Discussion

We believe that a major part of persuading a patient is to "touch" his or her needs. No matter what one thinks about the illness or drug, if you believe in the doctor, you obey what he has instructed. The important thing in compliance, more than technical and medical knowledge, is communication. All the communication barriers should be eliminated to persuade and lead the patient to compliance.

It is advised that barriers between health professionals and patients should be eradicated. These barriers could be summarized as: time, communication skills and medical training. Physicians are motivated to tell the medicine name, what it does to the patient, to ask the patient's opinion, to talk more about the side effects and benefits of the medicine, and to listen more²⁷.

As Homedes and Ugalde declared a decade ago, modifying the behaviour of all the actors in the medication cycle (manufacturers, health professionals, retailers, consumers and government) is needed. A meaningful change is necessary to improve the pharmaceutical management as it has a very precious economic value²⁸. Managing pharmaceuticals is in a way like managing economics. All health professionals in all arenas of the health system have to take care of clinical, humanistic and also economic outcomes. The cost of non-compliance affects all society. Especially, chronic diseases need long term medication treatment. Both in diabetes and hypertension, patients misusing medicines cause more severe health problems, complications, suffering and expenditures. So, to allocate and share resources properly, compliance is an important issue for health economists. Non compliance also is a criterion for negative effects of health investments.

In the last five decades many studies have looked at compliance. It is obvious that the term compliance is used for adherence, concordance, cooperation and partnership in different parts of this paper. The foundation for compliance is a health profession-patient relationship, good communication and shared decision-making. Patients' health beliefs and the patient perspective should be incorporated also in doctor-patient encounters. However, health care providers can change themselves faster than the patients and it is necessary to continue to revise professional relationships as this paper has shown that physicians are a major factor.

This pilot study was not designed to determine what physician variables might be related to patient compliance differences, but only to ascertain whether such differences might exist. Having found that, future research is now needed to help determine what features or physician attributes are critical and related to the differences found in this pilot study.

One may consider the situation of the office: professional or shabby, or physician dress, the number of minutes spent with each patient, the nature of the communication, the opportunity for the patient to ask questions, eye contact, a handshake or pat on the back as possible key features. As a subnote, the reader has probably already recognized that the duration of compliance for even the patients of "the best" doctor in this study are not ones to brag about. Clearly there is still a void or vacuum which translates into an opportunity for the dispensing pharmacist to reinforce the message about the importance of serious efforts toward long-term compliance with the prescribed therapeutic regimen.

Conclusion

What may be concluded from this pilot study is that there were major differences in the average compliance rates of several physicians. Physician characteristics and features should be studied in a greater sample sized investigation and accompanied

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by the collection of physician practice information. Perhaps we have been looking in the wrong place far too long in the search for the key to high levels of patient medication compliance.

Limitations

This study has several imitations. First of all, as only a small sample of patients was involved and only one pharmacy data were used, findings may not be generalizable to other patient populations. Also physician characteristics and specifications cannot be generalized. They can all be similar or totally different both in character and professionalism. Other potential predictors of medication use such as side effects, disability, costs, polypharmacy were not evaluated and thought to affect all participants similarly. Third, we did not collect oral or written data from patients. We do not know the reasons for not obtaining the refill. Finally, pharmacy records may have limitations as a data source but it is assumed that patients usually patronize the same pharmacy for refills and that records are maintained accurately.

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