COMPLIANCE IN MEDICAL CARE: RECONSIDERATION OF SELF-PREDICTIONS

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ABSTRACT

Noncompliance with therapeutic regimens is a major problem hampering the quality of medical care. Published data suggest that rates of noncompliance vary between 15% and 93%, depending on the patient population and the definition of noncompliance. Because of these problems, extensive efforts have been made to predict noncompliance. However, traditional approaches based on personality measures and clinical predictions have not predicted compliant behavior reliably. In this review, we considered the problem of noncompliance in relation to current developments in social psychology. The review confirms that personality measures are poor predictors of compliance behavior. In some circumstances, however, patients are remarkably accurate in forecasting their own compliant and noncompliant behaviors. This is particularly true once patients have gained experience with the regimen. Implications for practice and research are discussed.

INTRODUCTION

Attempts to predict noncompliant behavior have been largely unsuccessful (1). Although many have become pessimistic about the probability of successfully predicting compliance, simple self-reports of expectation to comply may be of considerable value. In this paper, we review the issues relevant to the prediction of noncompliance and offer suggestions for new directions in research and practice. We argue that the traditional research strategies are unlikely to lead to new insights. However, there may be some simple methods that can help guide new research efforts.

PROBLEMS AND ISSUES

Despite major advances in diagnosis and medical therapeutics, patients often do not receive optimal benefit from medical care. While many diseases are preventable or treatable, benefits will accrue only if specific treatment recommendations are followed (1). Nearly all patient encounters end in advice to the patient. This advice might include scheduling another appointment, filling a prescription and following directions, or adopting a recommended change in behavior such as weight loss or smoking cessation. Noncompliance is the failure to follow such advice. Various authors have described the same process as non-adherence, non-cooperation, or patient resistance. In this paper, we use the terms compliance, adherence, and cooperation interchangeably.

A rapidly growing literature suggests that failure to adhere to therapeutic regimens is a major problem hampering the quality of medical care (2–4). Published figures suggest that rates of non-compliance vary between 15% and 93%, depending on the patient population and the definition of non-adherence. Reviewers agree that most studies indicate that at least 33% of patients fail to adhere to the recommended therapeutic regimen (3,5–7). Non-compliance rates appear to be much higher among patients with chronic conditions who must undergo long-term therapy (8–10). Noncompliance rates are also very high among patients who must comply with regimens involving lifestyle changes, such as changes in physical activity (4,11,12).

Physician Awareness of the Problem

Although evidence consistently demonstrates that patient noncompliance is common, many physicians do not appear to appreciate the problem. DiMatteo and DiNicola (2) reviewed a variety of studies on practitioner awareness. They found that physicians most often overestimated the extent to which their patients cooperated with recommendations. Caron and Roth (13) found that 22 out of 27 medical residents overestimated the degree to which their patients complied with a prescribed liquid antacid prescription. The same investigators found that correlations between estimates made by senior faculty physicians and actual patient compliance were near zero. Several studies [i.e. Norell (14)] have suggested that physicians typically are inaccurate in their estimates of patient compliance and that they generally overestimate correspondence between their orders and patient behavior. These problems raise serious doubts about the validity of physicians’ predictions of future patient compliance.

Our view of compliance is simple. We suggest that patients are rational and that they comply with treatment when they perceive a net health benefit. They fail to comply when the consequences of compliance outweigh the expected benefits. In this decision process, patients may discount future benefits because of current side effects. A corollary of the theory is that treatments that have a short-term effect should evoke better compliance than those for which benefits occur later. Thus, we would expect better compliance with pain killers that provide immediate symptomatic benefit than with anti-hypertensive therapies that exchange current inconvenience for future benefit. The full theory and its several corollaries will not be presented here. Instead, we will focus on one aspect of the theory, which suggests that patients can accurately self-predict compliance when they have a clear understanding of the short-term consequences of medicine use.
Several previous papers have described the related phenomenon of rational noncompliance [see (4)]. Often, patients adhere to their regimen but fail to obtain the desired health benefit. If no eventual treatment benefit is expected, and if undesirable side-effects are associated with the regimen, noncompliance is rational. Similarly, noncompliance is rational when the patient achieves the desired result despite noncompliance. Patient perceptions must also be considered independent of the empirical health outcomes. The health care provider is only one source of information relevant to a decision to comply. Other input comes from media exposures of medical controversies, contradictions between providers, and word-of-mouth descriptions of adverse reactions (4).

With this input, patients may decide that the provider's recommendations are not in their best interest. "Noncompliance" involves weighting other opinions more than those of the physician in the decision process.

It is generally held that compliance with effective therapeutic regimens will result in better health outcomes. For many situations, such as the use of antihypertensive agents, there may be a direct relationship between compliance and health outcome (9). However, many studies on compliance fail to consider health outcomes. When health outcomes are evaluated, their correspondence with compliance is not always systematic. Noncompliant patients may improve clinically while some compliant patients may not benefit from treatment. Furthermore, in addition to yielding benefits, compliance can also increase the probability of side-effects (15). In one study, 36% of the inpatients in a large tertiary care hospital had some iatrogenic disease (16). The elderly experienced a seven-fold increase in adverse reactions when compared to those aged 20-29 (17). In England, it has been suggested that 10% of admissions to a geriatric unit resulted from undesirable drug-drug interactions (18). Since side-effects are often measured differently from benefits, analyses often overlook the consequences of compliance (19). For example, the tight control of insulin-dependent diabetes mellitus (IDDM) often results in symptomatic hypoglycemia. Patients who are unconvinced by the evidence encouraging tight control may rationally decide to forego repeated episodes of symptomatic hypoglycemia. This considered choice is usually labeled as noncompliance. Our point is that "noncompliance" often provides feedback about the patient's experience with the regimen. This feedback may be used in a rational decision to comply or not comply with treatment. Studies that focus on compliance and do not consider what happens to the patient (outcomes) may miss some of the reasons why patients decide not to continue treatment.

Direct Effects of Compliance

A corollary of this view of compliance is that patients should continue to comply when their health is improving. Thus, independent of therapeutic efficacy, those who feel better will comply more and those in failing health will comply less. At least some support for this notion comes from studies on the direct effects of compliance. Compliance is often used as a control or covariate in clinical trials. Patients assigned to experimental treatment programs may not always comply with them. When investigators analyze the data in accord with the actual amounts of medication delivered to the patient, these studies typically demonstrate that there is a relationship between compliance and outcome. More compliant patients usually achieve better outcomes than do noncompliant patients.

Epstein (20) identified six randomized trials in which active pharmaceutical agents were tested against placebos. In each of these studies a compliance/noncompliance determination was made. Only half of the studies demonstrated a statistically reliable effect of the drug versus the placebo. However, five of the six studies demonstrated a main effect of compliance. To achieve this effect, it was necessary for patients in both the treatment and the placebo groups to achieve better health outcomes when compliant. For example, in the Coronary Drug Project (21) 3,789 post-MI patients were randomly assigned to use clofibrate or a placebo. Patients were followed between 5 and 8.5 years to detect differences in mortality. Compliance was evaluated on the basis of patient interviews and pill counts. Initial analysis showed no difference in mortality between the clofibrate- and placebo-treated groups. However, early analysis within the clofibrate-treated group showed that those who consumed the medication experienced lower mortality rates than did those who failed to comply. When the same analysis was done within the placebo-treated group, the placebo-treated compliers also experienced lower mortality rates than did the noncompliers.

There are several alternative explanations for these outcomes. First, patients may fail to comply because they are in poorer health to begin with. Thus, the direct effects of compliance may reflect prior differences in health status. A second explanation is that compliance may create the expectation of better health outcomes. Compliance may stimulate other health behaviors which, in turn, result in better health outcomes. Compliance with medication may stimulate patients to comply with diet, exercise, and other aspects of their regimen. We suggest that patients expect benefits from medications. When they fail to obtain these benefits, they quit taking the medication and they are often aware of their reasons for doing so. This will happen whether or not the patients are receiving the presumed effective principle.

LOCUS OF THE PROBLEM

Explanations for patient noncompliance abound. These can be divided into three categories: patient-related, environment-related, and patient–provider interaction related. The most common patient-centered theories hold that patients intentionally resist medical advice in order to reject authority (22), because they misunderstand information (10), or to exert control over the provider (23). These theories suggest that remedies for patient noncompliance require the patient to change. Yet, we have found essentially no empirical evidence to support the belief that patients fail to comply because of rebelliousness. A second theory holds that the social ecology must be considered, because a variety of environmental factors may influence compliance behaviors. These include cultural variables, family or situational variables, and environmental cues. For example, arthritis patients are most likely to miss taking their medications when they have changes in their daily routines (24). According to these formulations, the most efficient way to improve compliance is to alter the patient's environment. Evidence suggests that environmental manipulations, such as reminders, can improve compliance (25). Yet these approaches fail to consider patient experiences with the medications.

The third theory holds that patient noncompliance reflects defects in the patient–provider relationship. Substantial evidence documents deficiencies in information exchange between patients and providers (26). According to this view, the remedy for non-
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IMPROVING SELF-REPORTING OF COMPLIANCE

It is widely asserted that self-reported measures of compliance are untrustworthy (36). The fact that patients over-report compliance to physicians has long been recognized. For example, Hippocrates stated that the physician "... should keep aware of the fact that patients often lie when they state that they have taken certain medicines." Several studies reviewed by Gordis (36) indicate that physician estimates of compliance tend to be artificially high (37) and that patients also over-report compliance in situations where actual compliance is verified by pill counts (38).

As Epstein and Cluss (39) suggest, studies with objective verification of self-reports show that, when patients actually have taken their medications, they usually report that they have done so. However, patients who have failed to take their medications also tend to report that they have consumed them.

Despite the prevalent skepticism about the validity of self-reporting, our review identified circumstances in which patients are surprisingly accurate in forecasting their own future compliance. In fact, when asked simply and directly, patients are remarkably accurate in describing the likelihood that they will comply. In particular, the situations in which patients accurately self-report are those that they understand clearly and have personally experienced.

An example of accurate self-assessment of compliant behavior is provided in a study by Litt (40). In this investigation, 110 adolescents beginning an oral contraceptive regimen were asked to indicate whether or not they resembled either of two women described in vignettes. One woman was forgetful while the other woman was careful and systematic. Among those adolescents who eventually complied with the regimen, 64% described themselves as resembling the careful and systematic woman while only 14% of the noncompliant women described themselves in such terms.

Findings from the Litt (40) study are consistent with current behavioral science theory. At least two lines of theoretically derived evidence support these views. First, there is the concept of self-efficacy, which was derived from Social Learning Theory (41). Self-efficacy is the expectation that an individual can succeed in a defined endeavor. For a complicated regimen of contraceptive use, for example, a high efficacy expectation is a patient's personal belief that the regimen can be successfully completed. This expectation may be independent of beliefs about the efficacy of the medication. The latter introduce an independent dimension known as outcome expectancy. In other words, an adolescent female may believe that continuous use of oral contraceptives will decrease the probability of pregnancy. However, she might simultaneously have low expectations that she will successfully adhere to the regimen. Similarly virtually all smokers know that their habit is harmful and that quitting will enhance their outlook for better health (outcome expectancy). Yet many smokers lack the expectation that they can successfully quit (efficacy expectancy).

Research relevant to self-efficacy theory suggests that specific efficacy expectations are reasonably good predictors of compliance behavior and health outcomes. Thus, Kaplan, Atkins, and Reinsch (42) demonstrated that the stated expectation to complete a painful exercise regimen by patients with chronic obstructive pulmonary disease (COPD) accurately forecast persistence with the regimen and performance on laboratory exercise tests. Patients randomly assigned to a treatment designed to increase compliance also significantly increased efficacy expectations in comparison with patients randomly assigned to control groups.

A related study evaluated the self-efficacy theory in relation to compliance with a complex regimen for adults on hemodialysis. Actual fluid intake compliance can be reliably measured by means of monitoring body weight between dialysis episodes for the three months prior to the study and throughout follow-up periods. Expectations for success were predictive of compliance with the fluid diet (43). Rees (44) found that compliance with alcohol treatment programs could be predicted from patient expectations of the relationship between improvement and remaining in treatment. In the Litt (40) study cited above, 75% of adolescents were able to assess themselves accurately in terms of future compliance behavior. A related study demonstrated that joining or not joining a smoking cessation program was predictable from perceived self-efficacy judgments. Joiners were shown to have higher self-efficacy expectations for treatment effectiveness than non-joiners (45). These studies also show that those who expect to fail in treatment do indeed experience a greater failure rate. Success in quitting smoking, for example, can be roughly predicted from the expectation that an attempt to quit will succeed (46). Patients in cardiac rehabilitation programs accurately describe their future inability to walk on a treadmill, despite their physical capability to perform the required tasks (47).

Past compliance is perhaps the best predictor of future compliance. Several studies show that noncompliance early in a study is a reliable predictor of later noncompliance. On the other hand, those who comply in defined situations develop expectations for future compliance and continue to comply (48). Conversely, patients will be less likely to comply when they discover that treatments cause side-effects. Once they have experienced these adverse effects, they might quite accurately forecast that they will avoid treatments that cause them to feel badly. In summary, studies consistently suggest that patients have considerable self-knowledge and that their performance expectations are reasonably good predictors of compliance behavior.

Much of this self-knowledge is acquired through experience. After experiencing side-effects or facing difficult physical demands, patients may accurately estimate their chances of staying with a treatment. Self-predictions should be poorest when the demands of the regimen or the side-effects of the treatment are unfamiliar.

Template Matching

In previous sections, we have considered several competing issues relevant to compliance with medical regimens. It appears that patients may quite accurately predict their future compliance when they have experience with the regimen and understand its benefits and consequences.

Research in personality theory suggests methods that might increase the reliability of predictions of compliance behavior for specific treatments. Although these approaches have not been applied in health care, there is reason to believe they may be of value. Initial work on interactions between personalities and situations was discouraging. The difficulty was that there are innumerable unique combinations of personality characteristics and situations, and behavior in one situation is not necessarily correlated with, nor predictive of, behavior in other situations. However, several studies suggest that some individuals behave
SUMMARY AND CONCLUSIONS

In summary, patient comprehension is crucial. The value of advising patients to seek further information is emphasized. However, it is important to note that this information may not always be available or understandable. Therefore, we must consider these factors in our approach to patient education. 

REFERENCES


Connection of behavioral changes with different complex...


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To improve comprehension, we suggest that these predictions will be better understood if the patient is able to read the instructions with the aid of a health literacy tool. The predictions are more effective when written in a clear and concise manner. The use of graphs and diagrams can also aid in understanding the predictions. Patient education is an important aspect of healthcare delivery and should be addressed.

Our review suggests that, overall, the quality of the predictions is acceptable. However, there is a need for further research to determine the effectiveness of these predictions in clinical settings.
Self-Prediction of Compliance


