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Review article

# CHECKING AND CORRECTING COMPLIANCE: FOCUSING RENAL PATIENTS

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## ABSTRACT

Compliance is a behaviour resulting from a specific set of cues and consequences. It is a self-care behaviour which entails obedience to a directive whereas noncompliance is self-care deficit, which calls for rejection of particular behaviour which may result in dissonance and may lead to the development of metabolic abnormalities in renal patients. To understand compliance, it is necessary to look for modifying and enabling factors affecting readiness to undertake recommended behaviour. It has been recognised that poverty, denial of illness, lack of control over life, non-supportive environment, old age, female gender and lower socioeconomic status, affect compliance, which is assumed to be a major obstruction to the effective management of disease and therapeutic disciplines. Diverse direct as well as indirect methods have been identified to measure compliance. Out of numerous methods, none of the methods appear to be completely reliable and valid, although biological assay is considered most accurate among all, as it is not affected by human judgements. To prevent complications due to noncompliance, measures should be adopted for improvement which not only entails role of physician and dietician but also of family. In health care system, compliance check is of prime importance, while aiming for better quality of care and management of patients.

**Keywords:** Compliance, Compliant Behaviour, Management of patients, Renal

## INTRODUCTION

Compliance means when the patient accomplishes is doctor's/ dietician orders with regard to the medical and dietary regimen. According to Webster's dictionary compliance is an "Acquiescence to a wish, request, or demand" or "a disposition or tendency to yield to the will of others".[1]It can also be defined as class of behaviours resulting from a specific set of cues and consequences. It takes into account patient's active, intentional and responsible process of self-care, in which the patient works to maintain his or her health in close collaboration with the healthcare staff.[2] Dracup and Meleis (1982), defined compliance as the extent to which an individual chooses behaviours that coincide with a clinical prescription[3], whereas Hussey and Gilliland (1989), defined compliance as the positive behaviour that patients exhibit when moving towards mutually defined therapeutic goals.[4] Presently, there is no approved definition of compliance. Therefore alternative terms like adherence, co-operation, mutuality and therapeutic alliance has been used.[5]

Compliance seems to be simple yet is a difficult and complex issue. It is not a unitary construct, but rather, a matrix of component parts in which a variety of factors separately influence those constituents.[6] However, it has been regarded as the most important

matter in successful treatment of patients with End stage renal disease (ESRD).[7]The emphasis on compliance is given by Dracup and Meleis (1982) who confirms that 'the most well established health care regimens are worthless if a patient chooses not to comply with there commendations of the health care system'.[3]Therefore, there is a need to study compliance deeply, to understand various factors and methods of finding compliance, to find out how closely noncompliance and health complications in renal patients exists and number of ways which can be adopted for improving compliance.

Some theoretical models of compliance are explained below to understand the nature of compliance:

- Personality trait model: Compliance behaviour is related to enduring and presumably unchanging, personality characteristics (e.g., immature, impulsive, uncooperative)
- Psychodynamic model: It highlights the psychological meaning of the illness and treatment situation to the patient and the conscious or unconscious fears, anxieties and psychological conflicts that may be result of compliance.[8]
- Sociocultural model: It stresses upon the importance of group roles, beliefs, practices and taboos as they affect health beliefs and compliance to medical regimens
- Cognitive theory model: It considers that humans are sensible decision makers and that attitudes, beliefs, values, intentions, and especially information are vital elements of compliance[9]
- Health belief model: Formulated by Rosenstock (1966). It considers[10]

1) The individual's subjective state of "readiness to take action" associated with particular health conditions, depending on the perception of perceived "susceptibility" and the "severity" of the disease and its consequences.
2) The individual's estimation of the health behaviour in terms of its feasibility and efficaciousness, considering physical, psychological, financial, and other costs or "barriers" involved in the expected action.
3) "Internal factors" (e.g., perception of bodily states) or "External factors"(e.g., interpersonal interactions, mass media communications) to trigger the appropriate health behaviour.[11]

**Factors for compliance :** Compliance is complex and influenced by various variables such as age and sex; socioeconomic, intellectual, and educational levels; medical knowledge; recreational and vocational energy demands; acceptance or denial of illness; time from onset of illness; patient memory; smoking habits; self-motivation; and exercise goal-setting.[12]

- Poverty: Poor patients are less demanding and non-complaining, hence more compliant[13]
- Health locus of control and family support : As defined by Rotter, 1966, locus of control refers to the degree to which individuals perceive events in their lives as being a consequence of their own actions.[14]It may be internal in which actions have causal relationships with originated consequences and external locus of control points events to external forces such as fate and chance. On review, it is believed that an individual's sense of control over life influences compliance rather than beliefs about health specifically. [15]
- Acceptance: Acceptance of permanence of disease and its influence on everyday life.[16]
- Knowledge: In renal study, patients on hemodialysis with appropriate, consistent, and sufficient educationand reinforcement with the complicated renal diet, supportiveenvironment, andadequate knowledge on diet have better compliance. [17]

**Importance of compliance in renal disease :**

In renal disease, kidneys cannot excrete components like phosphorus and potassium resulting in their build up in the blood, causing imbalances which leads to serious metabolic disturbances.[18,19] Hence renal patients are on restricted diet to prevent acidosis, hyperkalemia, hyperphosphatemia, oedema and high serum urea nitrogen.[20,21]Also, renal patients have to compensate for the kidney's inability to excrete fluids by restricting fluid intake, since fluid overload can result in pulmonary oedema and concomitant cardiovascular damage[19]whereas noncompliance with potassium content in diet can lead to cardiac arrest and death.[22]In addition these patients take a variety of medications, to take care of kidney failure and underlying co-morbidities. Therefore, renal diseases necessitate dietary and fluid restrictions, in addition to medication in daily regimen, to limit protein, sodium, and potassium intake. If compliance to the dietary prescription is missing in patients' regimen then it may lead to the development of renal osteodystrophy, metastaticcalcifications and

premature death (phosphate and binder non adherence);cardiac arrhythmia (potassium non-adherence); fluid overload with pulmonary oedema, left ventricular hypertrophy and heart failure (fluid and sodium non-adherence); and protein-energymalnutrition.[23]In studies, compliance with dietary and fluid restrictions has been described to turn down the risk of symptoms and medical complications, improve patients' quality of life, and increase life expectancy by 20 years or more.[24,25]Thus manipulation of diet is vital along with the compliance to slow down the loss of kidney function[26,27]

**Methods to measure compliance in general and renal patients :** The ideal method of measurement should maximize cooperation and minimize sensitization of patients, should be objective, able to reproduce data and should minimize cost.[28]According to Gordis (1976), there are two general approaches to the assessment of compliance: (a) direct measures such as biochemical determinations of blood or urinary levels of a medication or nutrient; and (b) indirect measures based on health outcome (e.g., weight loss), or patient interview.[29]

**I) Direct Methods:**

**1) Biochemical assessment:** Biochemical assessment is a direct method for measuring dietary and fluid compliance among patients. It is a true test to measure compliance and is unaffected by the human judgements. It is objective, reliable and easily quantifiable method, however, is costly and patients may alter their behaviour if they get to know that they are tested. In addition, other factors which may influence are physical characteristics of the individual and time when the measure is taken**.**[30]Biochemical assessment includes measurement of blood potassium and phosphorus levels to assess potassium and phosphorus intake. Phosphorus levels in the blood are measured to reflect both diet and medication compliance, which also reflect deterioration of the kidney as the disease progresses. However, both serum potassium and serum phosphorus levels can be altered by the presence of catabolic process or by the extent of the adequacy of the dialysis treatment.

Urea nitrogen appearance rate, is an another biochemical measure which is a simple and accurate method to assess dietary compliance. If there is any change in dietary protein intake then the primary metabolic response is through change in urinary nitrogen excretion.[31]This method assesses compliance by finding differences between prescribed intake and calculated total waste nitrogen excretion.

**2) Direct Questioning** includes perceptions of patient's compliant behaviour, doctors' perceptions of the patients' compliant behaviour, and an independent review of patients' medical records.[32]It is considered as an easy and universally applicable method, quantitative and useful measure of medication compliance which can also be assessed by pill count. It overcomes the disadvantage of recall and self-reporting method, however, it has a few limitations of not defining exactly the beginning of pill consumption, dosage, frequency and cancellation of side effects due to over compliance and under compliance.[28]In addition, this technique is not usually appropriate, applicable or affordable in the routine clinical care of patients[33]and is difficult to make patients bring all the medication with them to clinic visits.

**II) Indirect Methods:**

**1)Weight gain during dialysis session:**

Intersession weight gain is an indirect measure of compliance. It gives a measure of dietary compliance with sodium and fluid restrictions.[25]It is calculated by subtracting from each patient's predialysis weight with postdialysis weight. However, assessment of Interdialytic weight is influenced by various factors, such as failure to adjust for varying lengths of time between dialysis treatments (they varied from 2 to 3 days); failure to take account of the fact that some patients had urine output; lack of standardized measurement procedures for obtaining pre-postdialysis weight gains and errors in recording pre-postdialysis weights.[30]For further investigations other direct methods are regarded as more useful than indirect methods.[34]

**2) Dietary methods:** Dietary methods assess compliance by three dietary measures according to Brown (1968)

- Subjective rating by nutritionist,
- Semi objective rating based on recall of consumption of restricted foods, and
- 7-day food records[35]

Though dietary data is difficult to interpret, gather and quantify,[36] it sensitizes patients that their behaviour is being monitored,[28] thus grossly exaggerate compliance.[37]In addition there is a problem of objectivity which is innate in dietary

measures of compliance.[38]Altogether it depends on what questions are asked and how they are asked.[39]However it has been used to measure how closely patients' eating behaviour is close to the dietary recommendations. For this purpose method should be (a) reproducible, (b) valid, (c) representative of habitual food intake, and (d) feasible.[40]It has been seen that if multiple and repeated measures of compliance are taken, they will better apply in both clinical and research settings.

**3) Checking Dietary Knowledge:** According to Parmenter et al. (2000), knowledge is considered as a very important factor which influences eating behaviour[41]and adherence with dietary regimen.[42]Dietary knowledge questionnaire was used in a study on hemodialysis patients to judge dietary knowledge questions on potassium, phosphorus, sodium, and fluid intake based on the content of the dietary leaflet given to patients[43]

**4) Patient Diary:** Patient diary is the most prevalent and alternative measurement strategy to subside shortcomings of retrospective recall.[44]It captures experience close to the time of its occurrence, thus giving more accurate and less biased data. But there are limitations using diary method such as patient readiness to keep a diary or not, [45]fake or backfill written entries so as to give the appearance of good compliance; therefore electronic medical devices have also been used to track patient behaviour**.** [46, 47, 48]

**5) Attendance at appointments: A**n important measure of compliance, which applies to all patient population. [49]

Compliance comprises of complex actions, intentions, emotions and phenomena that may not be directly observable.[50]Out of numerous methods, no method appears to be adequately reliable and valid. There is a chance of overestimation due to biased measurement errors.[51]However, biological assays are considered as the most accurate method and interviews the least accurate, with pill counts falling somewhere in between[52]

**Non compliance**

Noncompliance is an obstruction to the efficient practice of medicine since it is a burdensome and complicated task, and requires comprehension of both behavioural issues and nutritional management.[36] Patients who miss their regular outpatient visits and regular blood urine tests and failure to comply with medication regimen are considered as non-compliant.[53,54]Noncomplianceaffects the general delivery of health care, interferes with achievement of therapeutic goals and is a barrier to delivery of effective medical care.[55]Evenwell-established healthcare regimens are worthless if patient chooses not to comply,[3] making it a significant factor to bear in mind while treating patients.

**Barriers to compliance:** It becomes vital to understand the barriers to adherence, to help health professionals plan and implement more intensive interventions and to assist patients in achieving beneficial lifestyle changes[56]

1) Disease condition : Non compliancein Chronic kidneydisease is due to the presence of anorexia due to uraemia, gastroparesis, especially in diabetics, intraperitoneal instillation of dialysate in peritoneal dialysis, increased serum levels of leptin, concurrent illness and hospitalisation, as well as increased pro-inflammatory cytokines[23]
2) Regimen Restrictions: Regimen is a combination of prescriptions (behaviour to be initiated) and proscriptions (behaviour to be prohibited).[57]Restrictions made on regimen and personal habits, become cause of noncompliance,[58]specifically for those patients who are on pre dialysis and dialysis with dietary restrictions i.e. restriction of fluid, potassium and sodium intake[34]becausedietary restrictions are restrictive and is a method of control and characterized by absence of cures. It has been observed that patients are frequently non-compliant with the phosphorus than potassium because of difficulty in reducing amounts of chocolate, cola drinks, meat, fish, eggs, and milk and other dairy products as compared to potassium rich fruits and vegetables. Sodium restriction also makes diet unpalatable, hence difficult to accept.[59]

3) Provider and Patient relation

a) Nature and quality of provider-patient interaction[60]:It is believed that when doctors fail to clearly convey the importance of a regimen to the patient, there is an equivalent failure on the part of the patient to comply.[61]Sometimes it is result of limited knowledge of nutrition among physician.[62]
b) Mode of communication**:** It has been noted that verbally communicated advice without written instructions make patients tend to forget information on the disease and its consequences[43]

c) Low compliance has been observed when patients have a lack of choice of plan or physician[63]

d) Plan of visit: Patients are scheduled for many shorter visits without respect to individual visit complexity making them adhere less to their follow up visits.

e) Lack of time and counselling skills[64]

4) Patient related factors:

a) Patient perception: Many time perception of patient to the usefulness of the therapeutic diet is outweighed by their traditional beliefs[65]and perception of not viewing themselves as ill which creates optimistic bias.

b) Influence: Influence of family members, friends, and associates may conflict with the medical advice and sometimes cancel out the doctor's potential authority. In addition, family dissonance is also closely associated with noncompliance.[66]

c) Situational barriers: Such as being away from home, prescriptions expiry, or thirst[7]affect compliance.

d) Additional burden: Compliance is also affected by the state where patient has to accept that he is ill although he is not evidently disabled and therefore not allowed to escape from his work duties and responsibilities.[36]

**e)** Dependency: Patients who require family support, considered to be dependent on their families, in turn negatively self-perceive by ignoring and not complying with the regimen.[67]It also takes into account dependency of meal preparation which may be altered if knowledge of the diet and disease is not communicated well.[22]

**f)** Low Frustration Tolerance: Patients with low frustration tolerance usually insist that they know and understand the restrictions but that they cannot comply with it.[68]

g) Acting Out: It is an unconscious psychiccondition observed in dialysis patients e.g. unconscious hostility and aggression.[68]

h) Excessive Gain From Sick Role: Sympathy, social benefit which patients gain from their surroundings increase abuse of the medical regimen. Therefore, some patients continue this state to solve their primary gain of reducing conflict and anxiety by abusing their diets.[68]

i) Suicidal Behaviour: Narrowing of interests, avoidance of interpersonal relations, lack of future vision, depression, make patient fed up of his/her own condition.[68]

j) Inadequate understanding and knowledge about the regimen and poor recall which is influenced by shorter words and use of technical terminology, results in patient remembering only the first half of the doctor's advice.[69]

**Improving compliance:** Various modes and sources as given below should be considered for improving compliance.

1) Patient Management and Treatment:

- When managing patients, it is vital to shorten the length of therapy
- Follow up visits should be planned as soon as initial visit is over.
- Make changes one by one and adding next objective later.
- Improving Interview method: Better Interviewing skills improve efficiency and cut costs, increase enrolment, and help retain satisfied physicians in the practice group.[70]Some points need to be considered while interviewing: listening actively to the patient's story[71],paying attention to the emotional agenda, use empathic statements, solicit patient attribution., take advantage of the patient's personal knowledge, establish agreement on goals of individual visits and medical care by involving patients in their care[72]and building trust with the patient[70]

2) Role of Care Providers:

a) Physician influence is dominant in treatment since he is the primary contact to the patient, hence his influence on patient to come for follow up visit is vital.[73]Follow up visits should be planned well keeping patients' convenience in mind and making them aware of the reason of their next visit. Follow up visit provides patient with a feeling of accomplishment and a sense of the treatment's importance. Factors to be kept in mind are convenience of scheduled appointment, availability of transportation, impact of visit on employment and delays experienced in the total process of receiving services.[74]It has been demonstrated in one study that spending extra 5 minutes with patients, improves quality of care, compliance with instruction to return for a follow-up visit and knowledge among patients.[73,75] Good communication skills[76]and positive interaction[32] is vital to enhance

satisfaction and hence compliance. Satisfaction, respect towards patients' concerns, providing information about condition and progress, sincere concern and sympathy[77]are also beneficial components in provider patient interaction.

b) Skilful dieticians play a vital role in dietary compliance because they consider patients' food preferences, plan diet with adequate calories, and make proper distribution of foods with encouragement to comply[27, 78]They are critical to ensure that the regimen is nutritionally sufficient and that the food preferences of a patient are included when recipes are planned. According to Glanz (1979), dieticians influence their patients to apply more influence strategies by involving patients in the counselling sessions for appropriate health attitudes and compliance behaviours.[39]To improve compliance, the initial dietary regimen should be simple, with complexities added gradually. Compliant behaviour can also be improved in dialysis patients by reducing environment barriers such as suggesting alternative ways to make the renal diet more palatable, such as the use of curry powder, garlic powder or onion powder.[79]It is hence important to identify environmental factors to help care providers to inculcate changes in efficient manner e.g. for patients on fluid restriction can be counselled to keep fluids away at meal times, sucking iceor eating hard candies when watching television or reading, to reduce dryness of the mouth.

Other alternatives in the diet can be made for renal patients such as using fresh or frozen ingredients containing less salt, using different cooking skills such as frying or poaching, using lemon juice, fresh or dried herbs, spices or spice mixes without added salt to flavor food., avoiding food prepared with monosodium glutamate and when going to a restaurant or visiting friends and family, ask to have meals prepared with a little or no salt[59]

Counselling and Education by Dietician: Dietary counselling motivates patients to make changes. It involves identifying patients and their stages in relation to adoption of a renal diet.[80]It has been seen that positive health motivations increase the likelihood of individual compliance[81]which is based on patients' readiness to change.[43] Awareness of patient's culture, food habits, beliefs, and practices help care providers streamline counselling. It also brings self-management, which involves alteration and changes in the old habits. [33]The patient centredcounselling steps for dietary change should increase the patient's awareness of his/her diet related risks, provide the patient with nutrition knowledge, increasethe patient's confidence in his/her ability to make dietary changes and enhance skills needed for long term adherence to dietary change plans. [82]

c) Role of Family : Several studies reviewed the importance of family and cooperation of family members in dealing with the health problem,[83] influencing food behaviour[84] and nutritional status.[85]Family members assist and encourage patient compliance. In addition, stable home situations are also necessary to make patient complaint.

d) Reinforcers in Practice: Through various studies, it has been validated that if patients are provided with some reinforcers, then compliance increases. It includes the social reinforcers (praise and conversations) or the tangible reinforcers (i.e. access to early sessions and preferred meals),[34]introducing token economy program if there is decreased fluid weight gain among dialysis patients,[86]additional time spent with the care provider or giving lottery tickets, which create incentives for achieving compliance goals.

3) Mode Of Communication

a) Weekly telephone contact in a study proved to be beneficial in modifying patients' health beliefs and, through this mechanism, improved compliance.[87] Mail and telephone reminders, remind patients of upcoming appointments.[88] Telephone call is cost-effective, feasible way of motivating people to manage a chronic condition[89]but have a few limitations such as , difficulty in assessing health problem if the caller cannot be seen, and difficulty in assessing the effect of a telephone call on a patient's behaviour[90]

b) Individualized instructions should be given in writing format for later reference since patient tends to forget and essential elements of the message should be repeated by the patient's after care provider, to recall and enhance the specific actions required to adhere on the treatment plan[88]

## CONCLUSION

Compliance is not integrated, but rather, a description of various component parts. Individual's sense of control over lifeinfluence compliance rather than beliefs about health specifically. It is the patient' noncompliance which affects the performance of medical care, resulting in progression of the primary disease and its complications. Evenwell-established healthcare regimens are worthless if patient chooses not to comply. Major findings of this study are that the compliance with one aspect of the regimen represents compliance with other components of the regimen as well. It has been seen that the dietary compliance cannot be improved by only nutrition education or by increasing patients knowledge. In addition, among all methods, no method of compliance measurement appears to be adequately reliable and valid. There is a chance of over estimation due to biased measurement errors. However, biological assay is considered the precise method to measure compliance among all. In improving compliance, no single, specific strategy will work to enhance compliance for all patients. It has been found that a partnership with the patient will establish greater influence on the patient's compliance.

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