

REVISTING MEDICATION ADHERENCE FROM A DIFFERENT PRESPECTION

Is it time to consider Medication adherence a disorder?

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Abstract:

It is not new in medical history to propose a global concern to be classified as a disease. Defining a concern into disease allows to assign ethical responsibilities to develop powerful and effective interventions. It also allow to appropriate distribute the resources uniformly economically and morally. In 2003, World Health Organization report stated that 30-50 % of patients do not take their medications as prescribed associated with morbidity, mortality and health cost. It was considered a global concern, however, irrespective of decades of researches conducted on medication adherence, we are still unable to state that medication adherence issues are being resolved. In this review, we have described few apprehensions in current understandings of medication adherence that have limited its research. We have also proposed medication adherence as disorder and provided its' definition and classification.

Keywords: Medication adherence, definition, disorder, perspective, healthcare professional

In 2003, World Health Organization report stated that 30-50 % of patients do not take their medications as prescribed associated with morbidity, mortality and health cost.¹ Patient initiated changes in dose, interval or duration of medication without support of health professionals may cause reduced efficacy, enhance risk of adverse event or harm the patient due to progression of disease. Estimated that 125,000 deaths/year and 33-60% of hospital admissions results due to medication non-adherence in United States, hence, identified as a global phenomenon.² Different words have been used to describe patient's medication taking behavior, such as adherence, compliance, persistence, concordance etc.³ Medication adherence or compliance is defined as the extent to which a patient acts in accordance with the prescribed interval, dose, and dosing regimen and expressed as a percentage of total number of doses taken or therapy-days.⁴ Being a major factor, medication plays a vital role in the treatment, diagnosis and prevention of disease and directly related to health outcomes, healthcare quality and safety.⁵ Irrespective of decades of researches conducted on medication adherence, we are still unable to resolve this issue. Based on identified elements of apprehensions, this review aims to offer recommendations to consider medication non adherence as a disorder.

Background Relating Medication Adherence

Efforts to understand and identify causes of medication adherence to improve it started since 1950. The three aspects of medication adherence i.e. dose, interval and duration, were studied throughout the world using different techniques and strategies. A common strategy was to relate research with a theory that would allow to understand associated factors and to develop correctional action to improve it. Theories relating to behavioral sciences were mostly used. Most common theories used were motivational interviewing, social cognitive theory, health belief model, trans-theoretical model and self-regulation model. Based on these theories, interventions were designed to elicit medication adherence behavior change in the recipients.⁶

Interventions are planned and systematically applied set of actions, delivered at a specified time and place. Most of these interventions used for medication adherence emphasized on either motivating patients or reminders alerts. These techniques ranged from simple direct counselling to use of mobile applications. These interventions can be simply classified as:

- 1- *Health Professionals based Interventions*⁷- Interventions that are depended on healthcare professionals for counselling patients and monitoring. These interventions can be further categorized based on type of health professional involved in the intervention
 - a. Physician based intervention
 - b. Nurse based interventions
 - c. Pharmacist based interventions
 - d. Others
- 2- *Electronic based Interventions*: These interventions are electronic devices which are used to improve medication adherence with little or no assistance of healthcare professionals or patients. These intervention can further classified into type of devices used:
 - a. Device based Intervention: clock, pill box, watches
 - b. Web based interventions: online based reminder
 - c. Mobile based : mobile app
- 3- *Mix interventions*: In this intervention, they utilized a healthcare professional and device to promote medication adherence. These can be classified into two sub categories based on the role played by healthcare professionals and electronic devices.
 - a. *Primary Mix Intervention*: Intervention where a healthcare professional play a major role i.e. assessments, interventions, and electronic devices assist them in collecting data.
 - b. *Secondary Mix Interventions*: Interventions where electronic device plays a major role in assessment and intervening whereas healthcare professionals provide the data.

Two major landmarks were achieved during this period. Firstly, standardization of terminology and its expressions. Before 2009, different terms were used to index it, and there were no standards to express it. In 2008, ISPOR helped to identify this concern and presented a solution for it. In 2009, Medline approved the term ‘medication adherence’ describing this phenomenon replacing all old terminologies. ⁸

Secondly, meta-analysis study related to different aspects of medication adherence were published. These included minor to major scope, from theories to interventions, in specific morbid to chronic diseases.

Apprehensions in Current Understanding of medication adherence

The following section provides apprehensions or concerns relating current understanding of medication adherence. Assuming that there is fundamental failure of understanding towards medication adherence, few understandings are identified with their apprehensions. Suggestions were also provided for each understanding.

Apprehension 1: Theories Relating Intervention are hard to implement in real clinical setting

Understanding: A theory is a “coherent and non-contradictory set of statements, concepts or ideas that organizes, predicts and explains phenomena, events, behavior, etc.”⁹ Theory plays a vital role in development of intervention to solve a problem and increases the chances of success and reducing the risk of failures. Theories are utilized in clinical and non-clinical cases.¹⁰ Behavioral issues like smoking, physical activities and dietary behavior had successfully utilized theories for their resolution.¹¹

Medication adherence has always been considered as patient’s behavioral issue, therefore, health psychology related theories have been utilized to understand, develop and test interventions for its improvement. Meta-analysis have proven the effectiveness of theories linked interventions on medication adherence.⁵

Apprehension: Even if the theory based interventions succeed to improve medication adherence, it would not be applicable in real clinical setting. These interventions are labor extensive and costly to be implemented in healthcare setting.¹² Thus its acceptance in healthcare setting would be very low.

Suggestion: After decades of utilizing psychological theories alone, it is about time to utilize a different approach that would open a new horizon for the research and its practical applicability in clinical settings.¹³ No doubt exist in the effectiveness of these interventions, however, to make them more acceptable in real healthcare setting, it is suggested that that these theories should gel with practice based models.

Apprehension 2: All good interventions will show improved health outcomes

Understanding: It is established that low medication adherence increase the risk of adverse health outcomes such as increase hospitalization, progression of disease and higher mortality.¹⁴ Hence,

it's been identified as a universal concern. Many researches involve measurement of health outcomes to validate the effectiveness of intervention utilized for improvement of medication adherence. Many intervention have shown positive results as well.

Apprehension: Health outcome is a multifactorial phenomenon which not only depend on the treatment but also the severity of illness. With respect to treatment, many other factors are involved such as medication dose and its frequency, duration of treatment. Any discrepancy in any may result in failure in treatment.

As evident from the study of Marcum et al that medication adherence cannot always be linked with health outcome .¹⁵ Thus, not all good interventions will show improved health outcomes.

Suggestion: Many interventions that showed promise in improving medication adherence and failed to provide improved health outcomes were reproached. It is suggested that research directed towards improve medication adherence should not be solely evaluated based on health outcomes, rather can be considered as secondary outcomes of the study. Health outcomes studies comparing two therapies should be conducted which ensured medication adherence in clinical trials.

Apprehension 3: Medication adherence interventions directed to patients only

Understanding: Factors influencing patient's medication adherence exceeds 200, which can be classified into five major categories , i.e. socio-economic factors, healthcare system related factors, disease related , therapy related and patient related factors.¹⁶ In the last seven decades, researches conducted on medication adherence had been patient centric. All interventions were developed to bring changes in patient behavior.

Limitation: Few researches carried out to be healthcare professional specific i.e. to bring change in healthcare professional attitude.¹⁷ Although small in number, data shows positive impact of healthcare professional centric on patient medication adherence. However, these were majorly related to communication and physicians characteristics¹⁸ Meta-analysis found a direct relationship of medication adherence with physician communication skills. It also suggested that interventions should be personalized by identifying the most relevant factor for a particular patient and adjusting intervention accordingly.¹⁹

Suggestion: Comparing the five categories of factors, four factors (therapy, patient, disease, and therapy) are the most variable ones which change with respect to ethnicity, geography and resource availability. Healthcare professional seem to be the more constant and reliable factor amongst them. Focus from only patient changing behavior should switch to healthcare professionals.

Revisiting Medication Adherence:

Medication adherence is a highly complex phenomenon which involves more than two hundred factors influencing it.²⁰ Furthermore, medication adherence cannot be confined to diseases, drugs or time period. It is a continuous process for acute to chronic diseases for a life time process of medication administration.²¹ As a result of perplexity, interventions employed to improve medication adherence have not proved to be cost effective, or feasible in clinical practice. Meta-analysis of effectiveness of these intervention has shown modest improvement (4-11%).²² Furthermore, Cochrane review suggested that these experimental interventions would not be able to be implemented in real clinical world.²³ Collectively, results of many meta-analyses and systematic reviews does not provide any positivity towards the direction of researches for medication adherence. As described above in the apprehensions relation medication adherence, no factors have been consistently linked to medication adherence, no theory or inventions alone have reliably shown improvement in medication adherence and lastly, improvement of medication adherence has not assured health outcomes also. Thus, it is about time to revisit medication adherence from different perspective.

Recommendations for a different perspective:

One of the major concern in current understanding is the acceptance of these interventions in clinical settings. Based on apprehensions mentioned above, it is proposed that medication adherence be considered as a disorder allowing its acceptance amongst healthcare professional thus more efforts would be utilized to resolve this concern. Defining medication adherence as a disorder will allow health professionals to take responsibility of it. Furthermore, patient may take medication adherence more seriously as a health issue. Hence a process of mutual understating can be initiated to resolve this concern by mutual decision making.

Medication non adherence as a Disorder: For medication adherence to be considered as a disorder it has to be

- define medication adherence from a prescriber perspective,
- define the disorder,
- Define a mechanism for its assessment and diagnosis.

Medication Adherence Disorder:

Medication Adherence Disorder is multidimensional disorder which causes patient to be non-compliant to the regimen prescribed for the treatment of their disease, acute or chronic.

Description:

Different self-assessment tools are available for analyzing medication adherence of the patient. Many of these tools allows to classify medication adherence into three level. Usually these are full compliant, partial compliant and non-compliant. Hence Medication Adherence Disorder can also be classified into these level. Patient assessed as partial compliant or non-compliant can be diagnosed as Medication Adherence Disorder.

Medication non adherence is also classified as intentional and non-intentional, persistence or non-persistence. We however, propose to classify disorder into acute or chronic.

a - Acute Medication Adherence Disorder:

Medication adherence Disorder caused for a short period of time relevant to one or few medication in a chronic adherent patient. It can be caused due to drug related issues such as adverse effect, cost of the drug etc.

b- Chronic Medication Adherence Disorder:

Patient is classified into chronic medication disorder, if the patient remain non-compliant to more than one drug irrespective to the drug relating concern. This may be caused due to cultural belief.

Conclusion:

It is not new in medical history of proposing a global concern to be classifying a concern into a disease. For example, osteoporosis was recognized as a disease in 2004. Defining a concern into disease allows to assign ethical responsibilities to develop powerful and effective interventions. It also allow to appropriate distribute the resources uniformly economically and morally.²⁴ Based on this apprehension, a healthcare professional based model of medication adherence was proposed and researched.²⁵

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