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The relationship between beliefs about medicines, health locus of control and medication compliance in patients with mental disorders

Olga Velentza[1], Nasim Aouant[2], Sophia Zyga[3], Foteini Tzavella[4], Aspasia Panagiotou[4]
[1] Department of Nursing, Aiginiteio Hospital, Athens, Greece
[2] Department of Nursing, NHS Epsom and St Helier University, London, England
[3] Professor, Department of Nursing, University of Peloponnese, Tripoli, Greece
[4] Assistant Professor, Department of Nursing, University of Peloponnese, Tripoli, Greece

Abstract
Introduction: Medication non-compliance is a serious barrier among chronically mentally ill patients. Horne defined it as the degree to which the patient's medication intake does not match with the prescriber's suggestions. Many factors may be affecting medication non-compliance these factors divided to patient-related factors, disease-related factors, and healthcare system-related factors. Many studies fined that patients' characteristics, may impact on attitudes, beliefs, medicines, and disease as well as health locus of control are directly related to treatment adherence.
Objective: The present study attempts through a systematic literature review to determine the relationship between beliefs about medicines and health locus of control to the degree of medication compliance of patients with mental disorders.
Methods: A systematic literature review was conducted at PubMed / Medline and Google Scholar databases, using the key terms: Mentally Ill, Mental Disorders, Medication Non-Compliance, Medicines Opinions, and Health Locus of Control in both languages Greek and English, without a time limit. Articles that met the inclusion criteria and addressed the degree of medication compliance in relation to beliefs about medicines and health locus of control in patients with mental disorders were studied.
Results: Many studies in the literature appeared to agree that the beliefs about mentally ill and the medicines they take, as well as the health locus of control can positively interact towards medication compliance.
Conclusions: The present review highlighted the importance of assessing the patients' attitudes and beliefs about their role in decision-making. Understanding patients' health beliefs and attitudes towards medication, as well as the variable of health locus of control, are necessary for the successful outcome of patients' treatment with mental disorders.

Keywords: Mentally Ill, mental disorders, medication non-compliance, medicines opinions, health locus of control

Introduction

Medication non-compliance remains one of the greatest challenges in psychiatry. According to studies of the literature, a percentage of 40% to 55% of schizophrenia spectrum patients, and 35% to 75% with mood disorders do not take their medicines at all or they do not take the medicine as prescribed [1, 2, 3, 4].

Compliance is a multidimensional term that has been much discussed in the literature [5, 6]. We find it with the following terms: "compliance", "adherence", "persistence" and "concordance", which are usually used to describe the patient's response to health professional advice or instructions [7].

According to WHO (2003), medication compliance is "the extent to which the individual's behaviour that related to medication, dietary habits and lifestyle changes, corresponds to agreed recommendations by a health professional'.

Non-Compliance Types

Jimmy & Jose, divided non-compliance to treatment into several types. The first type is the primary non-adherence, where doctors prescribe treatment, but patients never start it. The second type of non-compliance called non-persistence, where patients, stop the treatment, without consulting the therapist. Non-persistence is rarely intentional and occurs when patients and healthcare providers have poor communication about treatment plans. Intentional non-compliance results from beliefs, attitudes and expectations that influence the patients' motivation to start and continue taking their prescribed treatment regimen [8].

The third type of non-compliance, known as non-conforming, patients do not follow the medical instructions but regulate the treatment, adding, skipping, and removing doses from the treatment [9].

Colom, *et al*., (2005) [10], enumerated several diverse ways of categorizing non-adherence behaviours in patients with mental disorders:

1. Complete non-compliance in following all the provider's instructions.
2. Selective non-compliance or non-adherence with following certain instructions, such as taking only the morning dose or taking more or less than the prescribed medicines.
3. Intermittent compliance or nonadherence, but only during certain periods, such as not taking medication while using alcohol or drugs.
4. Delayed adherence or non-adherence, that is, initial non-medication compliance is followed by later compliance, for example, increased compliance over time due to improved clinical picture or after specific interventions.
5. Abuse or taking more medicines than prescribed refers to attempts by patients to increase the effectiveness of a medicine by taking a larger dose. 6. Behavioral non-compliance or adherence to non-medicinal aspects of treatments [10].

Factors affecting medication compliance in patients with mental disorders

The main factors that may influence treatment compliance are related to (a) individual patient behaviour, (b) clinical factors, and (c) healthcare system factors [11].

The most common reasons given by patients for their low compliance are that they forget to take their treatment (30%), have other priorities during their daily life (16%), decide to skip doses (11%), characterized by a lack of information (9%) as well as for various emotional reasons [12].

It is noticeable that a significant percentage of patients (27%) present no justification at all even though it is solely responsible for notable deviations from the proposed medication treatment [13, 14].

According to the literature, several factors may influence medication adherence. Some of the most common predictors of poor adherence to psychiatric treatment including the medication side effects, complexity of treatment regimens, stigma associated with psychiatric illness, lack of social support, financial barriers, and substance abuse [15]. On the other hand, some of the most consistent predictors of compliance include therapeutic alliance, perceived benefits of treatment, social support, and access to health care [16, 17].

Regarding patient characteristics, research has shown that patients' beliefs and attitudes about their illness and treatment as well as perceived health control are closely related to treatment adherence in patients with mental disorders [18, 19].

Correlation of Medication Compliance and Beliefs in Patients with Mental Disorders

Perception of illness is a term that refers to the mental representations and personal ideas that people have about an illness. Individuals form their perceptions of their illness based on five elements:

1. Beliefs about the identity of the illness,
2. Causes of the illness,
3. Consequences of the illness,
4. Duration and cyclical nature of the illness, and
5. Ability control of the disease (Petrie & Weinman 2012). Studies have shown the importance of perceptions about illness in important health outcomes, including medication adherence [20].

According to Elwy *et al*., (2011), the patient's decision to seek treatment depends on their understanding of the disease, their belief in the effectiveness of the treatment, and their evaluation of the outcomes [21].

If individuals do not comply with their treatment, they must first recognize and understand their illness. Thus, illness perception is the next step after health literacy in the hierarchical model [22].

The data of the health belief model, such as perceived susceptibility to illness and perceived severity of illness, play a significant role in influencing perceptions of illness [23].

Once individuals believe that their illness needs treatment, then they evaluate the prescribed medication and that influences the patient's attitude and decisions about treatment [24].

Table 1: Articles on mentally ill people's beliefs about medication

Author, Year	Purpose of Research	Sample	Method	Main Research Results
Maia Asher *et al*., 2023	Exploring subjective perceptions of factors influencing both attitudes and patterns of medication use among people with severe mental illness	16 patients with a diagnosed mental illness and taking medication for more than a year	Patients completed the following questionnaires: 1. Sociodemographic and Medical data 2. Mini-International Neuropsychiatric Interview/MINI 3. Self-reported medication adherence scale. 4. Semi-structured interview	From the results of the research, three distinct successive phases emerged, each of which was characterized by different themes related to attitudes towards medication and patterns of use. (1) loss of self and high level of drug use (2) accumulation of drug use/reduction/discontinuation experiences and (3) formation of a more stable attitude towards medication and development of own pattern of use
Samalin L. *et al*., 2016	To investigate the attitudes of mentally ill patients towards the medication they receive and to investigate the level of compliance in their treatment	The sample consisted of 120 patients with a diagnosis of the schizophrenia spectrum	Patients completed the following questionnaires: 1. demographics and clinical characteristics of the sample 2. 2) BMQ medication beliefs questionnaire;	According to the results, the high level of compliance differed significantly between behavioral groups (Acceptance, 70%; Indifferent, 63%; Ambiguous, 50%; Skeptical, 14%; $p < 0.001$). Poor insight and side effects of antipsychotic medication were the most significant predictors of negative beliefs.
Cardoso AM. & Xavier M, 2015	To identify patient-related factors and assess the impact of attitudes and beliefs on medication adherence	The research included 121 patients diagnosed with: schizophrenia 40.5%, bipolar disorder 54.4%, schizoaffective disorder 5.8% and other psychosis 3.3%.	Patients completed the following questionnaires: 1. demographics 2. Beliefs about medicines questionnaire (Horne *et al*, 1997) 3. medication adherence questionnaire (Delgado & Lima, 2001)	Research has shown that patient adherence to treatment is likely to be influenced by a complex interaction of treatment, patient beliefs, and sociodemographic factors. Also, shared discussion of beliefs about medication between patient and mental health professional allows for a broader exploration of personal meanings that can help improve medication adherence and treatment adherence.
J. Adams	Investigating the	39 people who received	Patients completed the	

& J. Scott, 2001	health belief model (HBM) in medication adherence of patients with severe mental disorders	treatment in a hospital participated. 27 (n=27) had a diagnosis of affective disorder and 12 (n=12) had a diagnosis of schizophrenia.	following questionnaires: 1. demographics 2. health belief questionnaire (HMB)	Highly adherent and partially adherent individuals differed significantly in their perception of illness severity, their beliefs about themselves and control of the disorder, and their concerns about further hospitalization. Two components of the HBM (perceived severity of illness and perceived benefits of treatment) explained 43% of the variance in adherence behavior.
Abdullax M., *et al*., 2016	The assessment of mental disorder patients' awareness of illness and medication adherence	Contemporary study with 647 outpatients	Patients completed the following questionnaires: 1. Demographics 2. Completing a semi-structured questionnaire	Most of the 555 adult patients (86.6%) were sufficiently aware of their diagnosis (58.2%). However, it was insignificant compared to other groups. The adult group (n=301, 87.2%) had more medication knowledge than the younger group (55.8%). The association of gender with diagnosis ($p \geq 0.058$) and drugs ($p \geq 0.094$) was not significant. The patient's awareness of his illness is insufficient even under normal conditions and much needs to be learned about psychiatric patients for a positive outcome of his mental disorder.
AL-Tarawheh F. *et al*., 2022	To study the level of adherence and the relationship between adherence to treatment and superstitious thinking-beliefs of patients with chronic diseases	314 people with chronic conditions, where 49.4% had high levels of adherence, 27.7% had low levels of adherence and the rest of the sample had a medium level of adherence	Patients completed the following questionnaires: 1. Demographics 2. Compliance reference scale (MARS-5) 3. Health issues scale, for superstitious thinking and beliefs about medicines	Culture influences beliefs about medication, particularly irrational ideas that influence treatment adherence. The results of multiple regression analysis show that superstition and education were two variables that influenced treatment adherence in this study. While superstitious beliefs lead to lower adherence to treatment, education has the opposite effect.

Correlation of medication compliance and perceptions of health control in patients with mental disorders

Perceived health control and health locus of control are related constructs that both refer to an individual's beliefs about their ability to control their health outcomes. However, they differ in their focusing and scope of practice. Perceived health control is a broad construct that includes a person's beliefs about their ability to influence their health outcomes through actions such as engaging in healthy behaviors and seeking medical care. It is a more general construct that includes both internal and external factors that can affect one's health [25].

On the other hand, health locus of control, is a more specific construct that focuses on an individual's beliefs about the extent to which their health is affected by internal or external factors. Specifically, it refers to the extent to which individuals believe that their health is determined by their own actions (internal locus of control) or by external factors such as fate, luck, or the actions of others such as their doctors (external locus of control) [25].

Health locus of control has been widely used as a predictor of health behavior the higher internal locus of control over people health the more likely to behave in healthier ways than those who do not believe that they have control over their health [26].

According to scientific data, internal health locus of control is related to better health, and health-promoting attitudes, and individuals with a low internal health locus of control had higher mortality [27].

Table 2: Articles on health control and health locus of control

Author, Year	Purpose of Research	Sample	Method	Main Research Results
Mitra Dogonchi *et al*., 2022	Exploring the relationship between health locus of control and health behaviors	1099 articles were studied, from the beginning of April to the beginning of May in the year 2021	Systematic review of databases in: PubMed, Science Direct, Web of Science, Google Scholar, and Scopus	The results showed that people who have an internal locus of control were more likely to engage in health behaviors. These individuals also tend to believe that the results of their actions are a result of their own abilities and that their health is directly affected by their actions and behaviors. Health locus of control is recognized as an effective variable in the development of health behaviors and the ability to treat and explain health problems
Laslo Pogany & Judit Lazary, 2021	Exploring perceived health control beliefs and patients' attitudes toward treatment	The sample consisted of 189 patients in total. Of which 106 were psychiatric patients and 83 were suffering from general diseases	Patients completed the following questionnaires: 1. Demographics 2. Scale measuring patients' attitudes towards treatment, perceived health locus of control and psychological response (PHBQPT). 3. Drug Attitude Inventory	Our data analysis suggests that mistrust of medication does not differ in psychiatric and nonpsychiatric samples, whereas acceptance of physician competence may be stronger in the nonpsychiatric sample. The authors pointed out that patients' negative beliefs are often stronger than their clinicians assume. Finally, frustration with medication was a matter of lack of efficacy and tolerability

			(DAI-10), 4. Hong Psychological Reactance Scale (HPRS), 5. Multidimensional Health Locus of Control (MHLC, Form C)	
Levenson H. 1973	Application of the scale - multidimensional locus of control - in psychiatric patients	165 hospitalized psychiatric and neurotic patients participated	Patients completed three Likert-type scales to measure different aspects of locus of control: 1. Interiority 2. Control by powerful others and 3. Forces of chance	Baseline testing within 5 days of hospitalization showed that Ss perceived significantly more control from powerful others and forces of chance than normal samples, and psychotics scored higher than neurotics. Committed Ss believed that powerful others controlled their lives, and recurrent Ss had higher perceptions of control by powerful others and the forces of chance than young Ss. Factor analysis showed that the dimensions of control by powerful others and control by random forces were consistent factors, whereas only 1/2 of the items on the internalization scale responded as a single factor. During the 1st month of hospitalization, Ss acquired their belief in internal control.
Zaroti N. *et al*., 2023	Investigating the predictive ability of multiple aspects of perceived control of medication adherence in people with Parkinson's disease	Online, cross-sectional survey with 1210 participants	Patients completed the following questionnaires: 1. Demographics 2. Parkinson's Disease Questionnaire (PDQ-8) 3. Geriatric depression scale (GDC-15) 4. Scale (PMS) 5. Self-efficacy scale (SCS) 6. Multidimensional health locus of control scale form C (MHLC-C) 7. Symptom control scale (SCS) 8. Medication adherence reference scale (MARS-5)	Results showed that longer disease duration, higher disease impact, physical problems accessing medications, different doses with clinical team approval, and payment for medications predicted significantly lower levels of adherence, while greater knowledge of the condition predicted greater compliance. All aspects of perceived control investigated, except for feeling in control of symptoms or attributing control to chance, were significantly associated with medication adherence. Internal LOC emerged as a weakly negative predictor of compliance. In contrast, Doctors LOC was a stronger positive predictor of adherence and so were those who believed “Powerful Others” were in control but to a lesser extent.
Vandervoort D. *et al*., 1997	Exploring the relationship of health locus of control and depression, anxiety, hostility, and physical health	162 people participated in the survey	The participants completed the following questionnaires: 1. Demographics 2. Powerful Others Health Locus of Control 3. Chance Health Locus of Control	The results support the cognitive model of mental health and highlight the importance of adaptive beliefs. Specifically, they suggest that control issues are related to negative affect and indicate that the often-reported relationship of an external locus of control to depression and anxiety also applies to hostility. In addition, evidence is provided for the external validity of the Multidimensional Health Locus of Locus (MHLC) Scales in relation to mental health. Finally, the results show that one's health belief can play an important role in one's physical health and that one's health behavior model. Relationship between locus of control and physical health is insufficient to explain the relationship.
De las Cuevas, 2023	Exploring the Potential Relevance and Interaction of Perceived Health Control and Psychological Response to Medication Adherence	This is a literature review with PubMed publications on the role of health locus of control and psychological response to March 2023	The questionnaires completed in the reviews were: 1. Demographics 2. Health belief model (HBM) 3. Multidimensional health locus of control scale (MHLC-C). 4. Psychological response scale (HPRS) 5. The Patients Health Belief Questionnaire on Psychiatric Treatment	As a conclusion of this review, it becomes evident that in psychiatric clinical practice, understanding perceived health control and psychological response can be useful in empowering patients to effectively manage their health and overall well-being. Patients who feel a sense of control over their health may be more receptive to interventions and may be more likely to engage in behaviors that promote their overall health.

Objective

The present study attempted through a systematic literature review to investigate the possible relevance and interaction of beliefs about medicines and health locus of control in relation to medication compliance in patients with mental disorders.

Individual objectives were a) to emphasize the importance of medication compliance in the appropriate treatment, b) to report the effects of non-medication compliance, (c) to show the importance of the personal characteristics of each patient and how much these affect the degree of medication compliance with their treatment.

Material and methods

A systematic literature review in the databases PubMed, Google Scholar, and Medline, in Greek and English terms, without time limit was conducted. Articles that met the inclusion criteria and addressed the degree of medication compliance in relation to mentally ill patients' beliefs about medication and health locus of control were studied.

The inclusion criteria were:

a. The patients must be adults,
b. Have been diagnosed with a mental disorder,
c. Have received antipsychotic treatment for more than two years,
d. Articles written in English and /or Greek language.

Results

Meta-analysis of 94 studies showed a statistically significant relationship between beliefs of necessity and compliance. [28] As the typical deviation of a patient's need for treatment increases, the odds of compliance increase, whereas as the typical deviation of a patient's concern about potential adverse outcomes increases, the odds of compliance decrease. So, for a person to take his medicine as prescribed, he must believe in medicine. For this to occur, the satisfaction from treatment with current treatment or previous treatments may be a coordinator [29].

Patient belief in their illness and treatment, is a vital component of medication adherence which influenced by health belief model variables such as perceived susceptibility, perceived severity, demographics, and signs of action [22].

If patients have strong beliefs about their susceptibility to the disease and its severity, there is a high chance that they will adhere to their medication. That is, the faith of individual in their medicines [30].

Health and illness behaviors are formed and maintained through three interacting processes, which are: (1) perception of stimulus (2) behavioral reinforcement, and (c) cognitive development. There are several health psychology theories that have been used to predict medication adherence [31].

Important predictors of medication compliance related to the characteristics of the mentally ill are their beliefs about medicines and disease as well as the perceived health control and health locus of control [32].

Perceived health control has been found to be a crucial factor for patients with psychiatric disorders and can be considered an aspect of strengthening

In a 2001 study, in a large sample of young adults in 18 European countries, those with an internal locus of control were 40% more likely to exhibit positive health behaviors than those with an external locus of health control [33].

Therefore, health perception control distinguishes between people who take responsibility for their actions, people who believe that their health depends on experts, and people who believe that their health depends on fate. Those who exhibit internal locus of control believe that the events that occur in their lives are the result of personal control. While those who show external locus of control believe that their lives are influenced by the environment [34].

Health locus of control is known as an adjustable that effects in developing and promoting health behaviors, controlled by internal or external factors [35].

Ganjoo suggests that external health locus of control (particularly the strong others, fate, and luck) is associated with negative health behaviors and poor psychological status [36].

Schwartz (2000) showed that an internal locus of control is effective in disease prevention and life expectancy [37, 38].

Discussion

The present study showed that as far as patients' characteristics concerned which related to their beliefs about medicines and disease, as well as the locus of health control and perceived health control, are directly connected with medication compliance to prescribed treatment.

A patient's compliance to treatment reflects a series of complex behaviors and decisions. There must be some necessary elements so that an ideal compliance to occur [39].

Patient's beliefs about medicines pre-exist the disease, affecting the evaluation of the diagnosis, the initiation of treatment, the adherence to medical instructions and the compliance to medication [40].

The framework of beliefs in medicines posits that patients will weigh the necessity of taking medication against concerns they have about taking medication [22].

If necessity exceeds their concerns, then they will be loyal. This phase may be influenced by their satisfaction with treatment, whether it is real or perceived, for themselves or for someone else. If the satisfaction from treatment is high, the beliefs in medicines may also favor the side of necessity and patient will be cooperative with treatment [36].

Control beliefs refer to an individual's perception of their ability to influence or control their environment, which may include and determine their behaviors and outcomes about health [41].

Ghahremani *et al*., (2017), showed that individuals who have an internal health locus of control were more likely to participate in health behaviors. These individuals also tend to believe that the results of their actions are a result of their own abilities and that their health is directly affected by their actions and behaviors [42].

Conclusion

The assessment of health is problematic primarily because the boundaries between health and disease are poorly defined. The perceptions of health and responses to illness are often profoundly influenced by individual beliefs and attitudes, as well as social and economic incentives and pressures [43, 44, 45].

The comprehension of the perceived health control can be helpful in strengthening of patients to effectively manage their health and overall well-being. Patients who take

control over their health they are responsive to interventions and promotion to their health [25].

Overall, both perceived health control and beliefs about medicines are important constructs which should consider in health care environments as they can influence the health behaviors and treatment outcomes of patients.

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