Optimizing Patient Adherence: Investigating Barriers and Developing a Strategic Framework to Improve Healthcare Outcomes

*Firas AlOmari, Abu Bakar Abdul Hamid, Noor Inayah Ya'akub

Infrastructure University Kuala Lumpur (IUKL), 43000, Kajang, Selangor Darul Ehsan, Malaysia
*Corresponding Author Email: fomari6@gmail.com

Abstract
This study proposes a framework to identify key factors influencing medication compliance and explores solutions to overcome barriers to adherence. To achieve this, an extensive review of previous research and underpinning theories on medication adherence was conducted to analyse and interpret the primary obstacles to adherence. Furthermore, a qualitative study was undertaken, incorporating semi-structured interviews with six consultant physicians from various specialties at four hospitals in Damascus, Syria. Our findings highlight several strategies to enhance patient adherence, including preventive healthcare, improved health insurance, increased health literacy, strengthened social and family support, simplified medication regimens, memory-enhancing techniques, and the establishment of trust through effective doctor-patient communication. While patient behaviour in Syria exhibits similarities to that in developing and developed countries, factors such as healthcare costs, cultural beliefs, and social support play a particularly significant role in medication adherence. This study underscores that while both patients and doctors have distinct responsibilities in promoting adherence, their roles are complementary, with neither being inherently more significant than the other.
Keywords: Patient Adherence, Doctor-Patient Communication, Patient Education, Patient Socioeconomic Factors, Syrian Healthcare

Introduction
Compliance with therapeutic procedures is a significant health concern related to patient safety, care costs, and treatment effectiveness. Improving patient safety requires assessment of current practices, developing targeted interventions, sharing information, and continuously refining efforts to drive sustained improvements in the quality of care (Hughes 2005). Noncompliance with medication can take different forms, such as failing to fill a prescription, taking more or less medication than prescribed, using other medications, or not adhering to the prescribed schedule. This issue has long been a dilemma, often linked to poor

patient-provider communication, leading to disease progression and a decline in quality of life. Noncompliance can take different forms, such as failing to fill out a prescription, taking less or more medicine than prescribed by a medical professional, taking other medication, failing to comply on time. Non-compliance with medication therapy is a longstanding dilemma that has been associated with poor patient-provider communication that causes disease progression and reduces quality of life (Nieuwlaat et al. 2014) ensuring the effectiveness of treatment plans (Kennedy-Martin, Boye, and Peng 2017). Besides, poor adherence to medication regimens contributes to substantial worsening of disease (Osterberg and Blaschke 2005). It is proven that patients who comply with a medical treatment plan have better health outcome in comparison to ones who do not comply, even though when taking a placebo (Murphy and Coster 1997). A customer's non-compliance behaviour has a negative impact on the quality of the services delivered by the service provider (Kostopoulos, Gounaris, and Rizomyliotis 2014). A clear and widely recognised definition of compliance remains ambiguous, leading researchers to use alternative terms such as therapeutic alliance, concordance, cooperation, self-management, and adherence. Furthermore, inconsistencies in defining compliance contribute to a lack of reliability and standardisation in its measurement within the healthcare setting (Settineri et al. 2019). Furthermore, there is a deficiency of a robust theoretical framework that provides a comprehensive picture of the variables contributing to noncompliant behaviour (Marandu et al. 2015). This challenge has been further intensified by the global pandemic, which has had a profound negative impact on all sectors, including healthcare. In response, healthcare providers are striving to navigate these difficult times by implementing effective strategies to adapt to the evolving circumstances (AlOmari 2020).

This article is organized into five sections. The first section critically examines patients' role in ameliorating compliance. The second section presents underpinning theories that elucidate the relationship between patient compliance and physician behaviour. The third section presents findings from a qualitative study based on semi-structured interviews with six consultant physicians from various specialties at four hospitals in Damascus, Syria. Two questions were asked: The first question is, "In your opinion, why do some patients not adhere to medication?". The second question is " based on previous discussion, what are the strategies can be employed to overcome the barriers to medication adherence?". The fourth section synthesizes conclusions drawn from the literature review, theoretical frameworks, and qualitative research. Consequently, a conceptual framework is proposed to highlight key factors influencing patient nonadherence to medication treatment. The fifth section discusses study limitations and suggests directions for future research.

Motivated by the complexity of medication noncompliance and its impact on patient health, this study aims to provide a comprehensive framework for understanding the factors contributing to poor adherence. By offering practical solutions, an integrated approach, and valuable insights, the study contributes to improving patient outcomes and enhancing the efficiency of healthcare practices.

Role of Patient in Medication Compliance
Patient-centered care fosters a partnership between patients and clinicians. Non-adherence to treatment can result in medication errors, potentially leading to serious injury or hospitalization (Hughes 2005). The patient's role in treatment has evolved from a passive

recipient to an active participant, engaging in shared decision-making with healthcare providers (Trostle 1988; Vivian 1996). Patient adherence to treatment regimens varies across different circumstances and stages of the treatment process. However, noncompliance with specific aspects of treatment recommendations is common. The issue of involuntary treatment remains a crucial ethical concern in healthcare (Sjöstrand et al. 2015). Unsolicited patient observations by medical professionals have been associated with a higher risk of clinical complications. Healthcare providers should prioritize patient safety by fostering effective and respectful communication among surgeons, patients, and medical professionals (Cooper et al. 2017). The role of patients in improving medication compliance will be thoroughly discussed in the next section.

Patient Personality and Communication Style
Customer personality traits and characteristics may occasionally result in noncompliance with service provider instructions, representing an uncontrollable factor that contributes to adherence challenges (Dellande, Gilly, and Graham 2004). The doctor's communication style, including explanation, listening, and information sharing, is positively influenced by the patient's communication behaviours, such as asking questions and providing feedback (Street 1991). Healthcare professionals, particularly nurses, often find their time consumed by non-clinical tasks such as documentation and equipment retrieval, thereby limiting the chance for patient communication and care (AlOmari 2020). When customers fail to follow the service provider's instructions, role ambiguity and lack of clarity increase, resulting in a diminished experience. Consequently, customers' perceptions of service quality decline (Walsh and Mitchell 2010). Cerimagic et al. (2015) observed that when customers do not comply with a service provider's instructions, role ambiguity increases, leading to greater uncertainty and a diminished overall experience. As a result, their perception of service quality declines. Similarly, the extent of communication between doctor and patient is not solely determined by the physician but is also influenced by the patient's behaviour and socioeconomic background (Levinson, Lesser, and Epstein 2010).

Socioeconomic Characteristics
Meesala and Paul (2018) indicated that women's satisfaction with service quality has a greater impact on loyalty than men's. Therefore, gender influences patient's evaluation, while age and marital status have no impact. Furthermore, it was revealed that elderly patients with high incomes who suffered from chronic obstructive pulmonary disease had significantly lower rates of non-adherence. additionally, polypharmacy, defined as the concurrent use of multiple medications, and a diagnosis of ischemic heart disease were associated with higher rates of non-adherence. These findings underscore that both specific drug classes and patient characteristics are closely linked to medication non-adherence (Pottegård et al. 2014). A variety of patient beliefs, , sociocultural factors, and psychological influences significantly affect medication adherence (Rau 2005). Moreover, the number of medications and the patient's age have been identified as independent predictors of improved compliance with antihypertensive medications (Siegel, Lopez, and Meier 2007). These factors highlight the complexity of medication adherence, where both individual characteristics and external influences play pivotal roles. Hinkin et al. (2004) highlighted that elderly patients who were infected with HIV were more adherent to medication than younger patients. However, another study found that elderly patients were vulnerable to non-adherence because they had cognitive and social complications that impeded their correct use of medication and led

to higher morbidity rates (Cárdenas-Valladolid et al. 2010). Russell et al. (2015) developed a model to assess healthcare quality from the patient's perspective. Their findings indicated that neither gender nor the type of healthcare provider significantly influenced overall patient satisfaction. However, notable differences emerged based on age group, physician specialty, and clinic type, with older patients generally providing higher satisfaction ratings than younger individuals. Furthermore, discontinuation of medication has been linked to older age, unmarried women, and lower educational attainment among patients undergoing cardiovascular drug regimens (Kulkarni et al. 2006).

Patient Knowledge and Health Literacy
Medication errors are often attributed to individual clinician errors (including physicians, nurses, and pharmacists) or patients' inadequate understanding of prescribed medications (Hughes 2005). Limited health literacy has been linked to poorer health outcomes, increased medication non-adherence, a higher incidence of medication errors, elevated healthcare costs, and greater rates of hospitalization. Identifying patients with low health literacy and providing tailored medication counselling is essential to improving adherence and reducing adverse health outcomes (Ngoh 2009). Some clinicians argue that most patients lack the knowledge and educational background necessary to assess the technical and clinical aspects of service quality, suggesting that interpersonal quality is of lesser importance. However, research indicates that patients evaluate the functional performance of healthcare providers largely based on the behaviour of medical professionals and the quality of interpersonal interactions, particularly communication (Eleuch 2011). Furthermore, clinicians tend to offer more comprehensive explanations, provide additional information, and devote more time to well-educated patients (Belasen and Belasen 2018; Hall et al. 2004). Better-educated patients have greater access to information and are more knowledgeable about their health when seeking care, particularly in private healthcare settings (Rose et al. 2004). Ho et al. (1998) found that educated individuals are more aware of their rights and are less reluctant to seek medical advice or request clarification on their health status. Additionally, women generally exhibit more accurate knowledge about cancer compared to men, with knowledge accuracy increasing in line with higher levels of education and household income. Fostering health beliefs and expanding cancer-related knowledge are pivotal for encouraging protective health behaviours. Boosting health education programs is fundamental for improving cancer awareness, particularly among patients from low socioeconomic backgrounds, and promoting the adoption of preventive health beliefs (Wilkinson et al. 2009). Patient education is widely recognized as a critical factor in improving adherence to treatment regimens (Roumie et al. 2006). Moreover, patients with lower levels of education and less expressive communication styles often face challenges in effectively engaging with healthcare providers (Willems et al. 2005).

Memory Loss and Regimen Complexity
A study conducted by Spiers et al. (Spiers, Kutzik, and Lamar 2004) identified elderly patients as being at greater risk of adverse health outcomes due to noncompliance compared to younger individuals. The study highlighted memory loss as a significant contributor, with nearly one-third of patients citing it as a primary reason for nonadherence. Additionally, 9% of patients reported discontinuation due to adverse reactions, while another 9% believed the medication was no longer necessary. These findings underscore the need for tailored interventions to address cognitive challenges and regimen complexity in medication

adherence among older adults. Rau (2005) illustrated that several factors contributing to non-compliance, including the complexity of the inhalation regimen (such as dosing frequency and the number of prescribed medications), the route of administration (oral vs. inhaled), and the type of inhaled agent, with corticosteroid adherence being lower than that of short-acting β2 agonists. Additionally, patient awareness of monitoring was found to influence adherence levels.

Patient Cooperation
Patient cooperation is essential for the success of treatment. Increased cooperation and kindness enhance patient satisfaction and promote better adherence to medication (Lipkin 1996). Resident doctors often employ indirect instructions, followed by scheduling, persuasion, motivation, and direct commands, to encourage patient compliance with medical advice. In the service delivery process, patients who adhere to frontline healthcare providers' recommendations and instructions are better able to fulfil their role in effective care delivery (Dong et al., 2008). Healthcare organizations must continuously enhance service strategies to align with established quality standards and optimize outcomes. Effective collaboration between customers and service providers improves service efficiency, meets expectations, and enhances satisfaction. Likewise, mutual cooperation between caregivers and patients strengthens patient satisfaction, mitigates non-compliance risks, and contributes to improved healthcare outcomes. (Walters-Salas 2012). Brunton (2017) identified doctors' behaviour as a significant factor contributing to patient non-adherence to management plans. Therefore, a comprehensive understanding of patients' needs and expectations is essential for enhancing the treatment process and addressing challenges faced by medical professionals.

Self-Efficacy and Psychological Disorders
Rudy et al. (2009) highlighted that no significant differences in the prevalence of mental health disorders between adherent and non-adherent HIV-infected individuals, nor was adherence associated with any specific category of mental health disorder. However, adherent patients exhibited higher levels of self-efficacy and outcome expectancy than their non-adherent counterparts. Depression, in particular, has been shown to negatively impact adherence in both adolescents and adults (Singh et al. 1996). Similarly, low self-efficacy, depression, anxiety, feelings of helplessness, inadequate social support, and heightened pain levels during exercise have been identified as significant barriers to adherence in musculoskeletal treatment (Jack et al. 2010). Self-efficacy, a core construct of the Health Belief Model (HBM), is a significant predictor of healthcare behaviour (Rosenstock 1974). Strengthening patients' confidence in their ability to manage treatment can enhance their satisfaction with physician interactions and foster greater loyalty to healthcare providers (Gaur et al. 2011). Furthermore, patients regard physicians' interpersonal skills and competencies as essential determinants of overall performance and quality of care (Van Den Assem and Dulewicz 2015).

Medication Side-Effects
Adherence to therapy is a critical determinant of achieving favourable treatment outcomes. However, throughout the course of clinical treatment, some patients may encounter adverse side effects or develop perceptions that the prescribed medication is either ineffective or superfluous, potentially undermining their commitment to the therapeutic regimen. Brown and Bussell (2011) indicated that patients' perceptions of adverse drug reactions influence

their decisions and strategies regarding medication adherence. Alam et al. (2018) developed a model comprising four constructs to assess overall patient satisfaction with medication. Their findings revealed that patient satisfaction significantly influences patient behaviour, particularly the likelihood of adhering to medication regimens and continuing to take medication as prescribed. Seventy-five percent of patients adhered strictly to the medication regimen as recommended by their doctors. Overall satisfaction, medication convenience, side effects, and effectiveness are key factors influencing patient satisfaction with medication.

Social Support and Attendants
Increasing both subjective and instrumental social support, along with non-family interactions, is linked to greater adherence among patients with a high internal locus of control (LOC). The relationship between social support and antidepressant medication adherence is influenced by individuals' beliefs about their control over the illness (Voils et al. 2005). The perception of healthcare satisfaction differs between the patient and their attendant (relative or friend). However, both groups identified the quality of interpersonal care as the most crucial factor for satisfaction, as they are unable to fully assess the technical quality of healthcare services (Padma, Rajendran, and Sai Lokachari 2010). According to social information processing theory, the attitudes and behaviours of others can influence the formation of human judgment (Salancik and Pfeffer 1978). Family members and friends surrounding the patient can serve as significant sources of social stimuli, influencing the patient's judgments of their healthcare experience. If these individuals share their perceptions of the quality of care, the patient's perception may be adjusted according to these cues. Supporting the family and friends involved in the patient's care is also crucial to enhancing the overall patient experience. Strasser and Schweikhart (1992) emphasized that friends and family members are generally more difficult to satisfy than patients, making it even more crucial for healthcare practitioners to focus on meeting the needs of these individuals as part of the patient's treatment process.

Trust
Mayer et al. (1995) defined trust "willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party". Therefore, people should depend on others in various ways to accomplish their personal and organizational goals. Effective communication skills with a patient-centered approach and trust lead to better care management. This concept underscores the importance of relying on others to achieve both personal and organizational goals. Effective communication, coupled with a patient-centered approach and trust (AlOmari 2022a), improves care management, enhances perceived quality of healthcare services, higher levels of patient satisfaction, and better adherence to the treatment plan (Chandra, Mohammadnezhad, and Ward 2018). Assem et al. (2015) developed a model to assess overall patient satisfaction, building on Mayer's (1995) model. This model includes overall satisfaction as the dependent variable, with trust, doctor's practice orientation, and doctor's performance as independent variables. The study found that demographic variables accounted for 12.7%, care continuity for 19.7%, trust for 38.6% (the largest contribution), doctor's practice orientation for 0.3%, and doctor performance for 3.2% of the variance in patient satisfaction.

Underpinning Theories

There is a lack of conceptual frameworks and a persistence of inconsistencies in measuring compliance in the healthcare setting (Marandu et al. 2015). However, there are still different relevant theories and models that have received attention in medication compliance research. In this research, Theory of Reasoned Action (TRA), Health Belief Model (HBM) and Social Cognitive Theory (SCT) were employed as underpinning theories to explain the existing theoretical perspective of medication compliance and its relationship with patient-doctor interaction and healthcare outcomes. The following section provides more details about some of these theories:

Theory of Reasoned Action (TRA): The theory of reasoned action is a fundamental and influential theory developed by Fishbein and Ajzen (1977) that has been widely used to predict a wide range of behaviours. The TRA stipulates that behavioural intention is the determinant of behaviour. Based on the theory of reasoned action, intention is influenced by two factors: subjective norms (which reflect others' thought on a given behavior) and attitudes (which represent a patient's attitude toward a given behavior). An individual will perform a certain health behaviour to reduce health risks if persuaded that such a behaviour will prevent the risks. It is essential for patients to believe that holding the right beliefs about their medications and exhibiting self-care behaviour lead to compliance with therapy that subsequently results in better healthcare quality and improved healthcare outcomes. (Adefolalu 2018).

Health Belief Model (HBM): The health belief model was designed by Rosenstock (1974) and suggests that in order to either cure or prevent a given disease, the patient must perceive no major obstacles and difficulties that hinder taking action (financial problems, communication with medical staff, inconvenience through the diagnosis and treatment process). Hence, the service quality provided by the medical staff, in addition to their behaviour towards patients, plays a role in patients' behavioural compliance. In addition, the patient should perceive himself/herself vulnerable or affected by the disease, and the patient should believe that by taking the given action (compliance with medication treatment), the disease will be efficiently cured or prevented. The health belief model has been implemented to improve the efficiency of interventions to alter patients' behavior by targeting numerous characteristics of the model's vital constructs (Rosenstock, Strecher, and Becker 1988). The aim of interventions is to increase perceived susceptibility and perceived seriousness of a healthcare condition by providing knowledge regarding the spread of disease as well as individualized evaluation of risk and consequences of sickness (such as social, medical, and financial consequences). Interventions may change the cost-benefit analysis by expanding perceived benefits and shrinking perceived obstacles. Besides, providing information about the effectiveness of various behaviours will decrease the hazard of sickness. Also, the HBM will help healthcare professionals to identify the main perceived obstacles and provide incentives to let patients get involved in health-promoting behaviours. Medical interventions will assist patients in lifting their self-efficacy by providing training in particular health-promoting behaviours, mostly for multifaceted lifestyle alterations (for example, altering diet or doing physical activities, complying with a complex medication regimen, physical environment). The Health Belief Model (HBM) suggests that six constructs can predict healthcare behavior: self-efficacy, risk severity, risk susceptibility, barriers to action, benefits, and cues to action. The HBM postulates that people will take action to avoid disease if they consider themselves vulnerable to a condition (perceived susceptibility), if they believe it would have potentially

grave consequences (perceived severity), if they believe that an available specific course of action would decrease the susceptibility or severity or lead to other positive results (perceived benefits), and if people perceive few negative attributes associated with health actions (perceived barriers) (Jones et al. 2015). Among these barriers, financial burdens play a significant role in determining access to medical services and adherence to prescribed medication regimens, as cost-related concerns may hinder individuals from seeking preventive care or following recommended treatments (AlOmari 2023).

Social Cognitive Theory (SCT): The social cognitive theory proposed by Bandura (1988) gives an explanation related to individual behaviour in terms of an uninterrupted, dynamic, and reciprocal relationship between the individual and his surroundings. The common theoretical basis of cognitive theory is the learning process; it illustrates that behavior is learned. Thus, social cognitive theory indicates that human behavior is the result of cognitive processes that individuals develop through the social acquisition of knowledge. Social cognitive theory concentrates on the perception of behavioral ability, asserting the individual would like to understand and comprehend what and how to do an action before a person acts in a certain condition. Medical staff can implement social cognitive theory during counselling of their patients. Prediction of behavioral compliance is sophisticated. However, beliefs and knowledge are not sufficient to accomplish changing patient behavior, particularly in chronic disorders. A doctor has to look for a chance to intervention, making a valuable opportunity to help patients realize the type of disease they have and encourage them, in a friendly way based on trust, to take quick action to comply with medication procedures in order to recover quickly. Social cognitive theory is applicable during medical staff counselling of patients with chronic disorders. It could be used to provide patients with medical information regarding their sickness and the possible procedures to make decisions about their medical treatment (anxiety management and relaxation skills) and associated health challenges such as medication adherence.

Qualitative Study
In order to gain a deeper insight into the main determinants of patient compliance, a qualitative study was conducted using semi-structured interviews. The interviews lasted between 20 and 30 minutes each, with six consultant physicians from various specialties at four hospitals in Damascus, Syria. The interviews were digitally recorded and subsequently analysed to uncover significant themes, providing a rich understanding of the main determinants of patient non-compliance. This qualitative research offers valuable insight into doctors' perceptions of patient non-adherence within the Syrian healthcare setting. During the interview, two questions were directly asked: the first question was, "In your opinion, why do some patients not adhere to medication?" and the second question was "based on previous discussion, what are the strategies can be employed to overcome the barriers to medication adherence?". The results have been categorized into factors and solutions as follows:

Answers to the first questions "In your opinion, why do some patients not adhere to medication?"
1- Patient's socio demographic characteristics: Less-educated and elderly patients sometimes do not fully understand what the doctor says. One patient, after leaving the hospital, called me and asked "Doctor, should I take the medicine before or after breakfast?".

Another patient asked "how many times should I take the medicine?" Patients with low literacy levels are at high risk of misunderstanding the given instructions regarding prescribed medication, even if they are clearly written.

2-Psychological disorder and sensory impairments (hearing and vision loss): A few patients pretend to understand all the instructions given by the doctor, but after returning home, they call to ask how/when to take medication. Some patients are embarrassed or shy about asking, while others are afraid of talking about their sickness. Additionally, some patients suffer from hearing loss/impairment (especially elderly patients). Therefore, warm and friendly talk with patients is key to easing patients' worries.

3- Health literacy: Some patients intentionally stop taking medication (without informing the doctor) if they do not experience symptoms. One patient said, "It is my body. I know it very well. I do not suffer from any disease". Some patients alter (increase/decrease) the dose of the medicine based on the symptoms. For instance, one patient suffering from pulmonary heart disease, and after nine months of hospital discharge, she stopped undertaking echocardiography because she did not feel any pain anymore. Other patients stop visiting the hospital and discontinue prescribed medications because they still have the same symptoms. One patient said, "Why should I keep taking the same medicine?". As a result, he switched to another clinic. The new doctor prescribed a different medicine (different brand), so he became happy (satisfied) with the new medicine.

4- Memory loss (Forgetfulness): Some elderly patients suffer from memory problems. They forget to take medicine as prescribed. One patient said that he once forgot whether he had taken the medicine, so he became afraid of taking the medicine twice This issue is especially common in patients with neurological disorders and cardiovascular disease. In this cases, family and friends (social support) play a crucial role in helping patients adhere to prescribed medications.

5- Patient's lifestyle: Some patients are busy during the day, have meetings, social commitments, or travel frequently, so they forget to take the prescribed medications.

6- Trust and elderly patient: Some elderly patients do not follow advice and instructions from young doctors; therefore, they do not trust them. They perceive that older doctors have more experience and provide higher quality care.

7- Social influence: One patient stopped taking her prescribed medication and changed it because her neighbor convinced her that the medicine she was taking was produced by a local pharmaceutical company. As a result, her neighbor advised her to take a different medication imported from a foreign pharmaceutical manufacturer. In her opinion, local medications are cheap and less effective, whereas imported ones are expensive and of better quality. She took the new medication without consulting a doctor and ended up in the emergency room due to a heart attack caused by the new medication. Some patients trust friends and relatives more than medical professionals.

8- Medication side effects: Some patients stop taking their prescribed medication due to undesirable side effects (dizziness, itching, frequent urge to urinate, cramps, drowsiness,

vomiting) that lead to non-compliance with prescribed treatment. This is especially common among patients who have frequent business meetings or travel daily.

9- Doctor shopping: Unfortunately, some patients engage in "doctor shopping" visiting different hospitals and receiving various prescriptions. Then they chose the medications that suited their lifestyle.

10- Health literacy and trust: One patient was asked to undertake blood and urine tests as well as ultrasound imaging, to evaluate kidney function. Initially, the patient went to a medical laboratory in the neighborhood, but the results showed glomerulonephritis. The patient became angry and suspected a problem with the medical laboratory instrument. Subsequently, the patient visited another medical laboratory but received the same result.

11- Cultural and social beliefs: Cultural background and social beliefs have an essential impact on patients' medication compliance, particularly the elderly. Therefore, doctors need to be aware of this issue. Some patients believe traditional remedies or folk healing methods are better than taking pills. For example, one patient with type two-diabetes believes that eating honey has no impact on blood sugar and sometimes it regulates insulin. Other patients believe that taking a spoonful of olive oil is better than cough syrup. Also, some old treatment methods, such as Al-Hijamah therapy (cupping therapy), are still being used to treat drug intoxication, indigestion, hypertension, and headaches. Some private hospitals have established departments dedicated to Arabic medicine and herbal remedies because a large segment of patients believes that Arabic medicine is more effective and more affordable compared to pharmaceutical medications.

12- Financial burdens: Patients who take multiple medications (polypharmacy) may cause a financial burden for some patients, especially during periods of economic recession and financial instability. Some medications are expensive and patients cannot afford them. As a result, some patients ask doctors to prescribe less expensive medications, even if they are less effective; others reduce their dosage, taking medication twice instead of three times a day. One patient asked me to prescribe only the most essential medications. Another challenge associated with multiple medications is that patients unintentionally forget to take the correct dose, resulting in overdosing or underdosing.

13- Complexity of Treatment Regimen: High cholesterol is linked to high blood pressure, diabetes, and cardiovascular diseases. One patient said, "My stomach has become a drug store. Can you imagine how many pills I have to take every day?" Another patient stated, "Every morning, I spend almost half an hour swallowing the tablets because I am afraid, they will get stuck in my esophagus". Complex of medication regimens is one of the primary reasons for non-adherence.

Answers to second questions "based on previous discussion, what are the strategies can be employed to overcome the barriers to medication adherence?".
Every consultant physician was asked about the strategies to improve patient adherence:

1- Preventive healthcare and better health insurance: There are various approaches in order to improve patient adherence to medical recommendations. Actually, regular physical and

mental health checks-ups (preventive healthcare) play a crucial role in reducing the risk of illness. Through regular check-up, doctors can detect health problems early, allowing patients to discuss any healthcare concerns and take preventive measures. For instance, preventive screenings and tests such as body mass index (BMI) measurement, cholesterol checks, electrocardiograms (ECG), blood pressure monitoring, blood tests, prostate exams (for men), mammograms (for women), and bone density tests (especially for women and elderly patients with lower bone density) can help in early diagnosis and treatment. However, financial constraints often make it challenging for people to adjust their budgets and lifestyles due to rising medical expenses and potential income reductions. Health insurance provides a practical solution for managing medical expenses for individuals and families. However, the extent of its benefits depends on the type of insurance plan and the coverage it offers.

2- Encourage patient health literacy: Patients should understand the implications and consequences of non-adherence to medical treatments. For instance, patients need to be aware that non-adherence can negatively impact their health, leading to severe complications. It not only affects them personally but also places a burden on their families and society, resulting in millions of pounds spent on hospitalizations each year. On the other hand, patients have to recognize the importance of taking their medication as prescribed. Besides. doctors should help patients feel their progress in managing their condition, experience the benefits of disease control, and observe the effects of their medications.

3- Social and family Support: Support from family and friends is essential, particularly for elderly patients. Some patients may have visual impairments that prevent them from accurately measuring medication doses in a syringe. Others may suffer from arthritis, making it difficult to open medicine bottles or pull the plunger to the correct dosage line. Assistance from family and friends can help ensure proper medication adherence and overall well-being.

4- Convenient and simple regimen: Medication regimens can often be complex, requiring patients to take different combinations of tablets multiple times a day. A potential solution is to simplify these regimens to make them more convenient. Since many patients lead busy lives, their medication schedules should be designed to fit seamlessly into their daily routines.

5- Techniques to improve patient's memory: Patient education is fundamental in reducing medication non-adherence. Doctors and healthcare educators should teach patients strategies to improve adherence. Several techniques can help, such as linking medication intake to daily activities like brushing their teeth or having meals. Additionally, implementing reminder systems such as mobile phone alerts or pill organizers (pillbox) with clearly labelled compartments (seven rows for the days of the week and three columns for each day and meal) can significantly improve medication adherence. Furthermore, personalized phone calls to remind patients of upcoming hospital appointments can serve as an effective strategy to improve compliance and continuity of care.

6- Building trust and effective communication: A trustworthy and honest patient-doctor relationship will encourage patients feel more comfortable discussing their concerns openly, without fear or hesitation.

Discussion and Conclusion

In this study, three approaches were implemented to clarify the patient's role and the doctor's responsibility in medication non-adherence. Motivated by the ongoing challenge of medication non-adherence and its impact on patient outcomes, this study integrates extensive literature review, underpinning theories, and qualitative research to propose a framework that outlines the fundamental elements influencing patient adherence. Moreover, our research synthesizes recent findings on medication compliance and presents a conceptual framework that can assist both doctors and patients in achieving successful treatment outcomes. It provides a comprehensive perspective on the interaction between doctors and patients in medication adherence. Figure 1 illustrates the conceptual framework for enhancing patient compliance, encompassing various interrelated factors. These include communication style, financial constraints, patient beliefs and attitudes, chronic disease management, health literacy, medication side effects, psychological disorders, and the complexity of treatment regimens. Additionally, patient cooperation, cognitive impairments such as memory loss, sensory deficits, social and family support, engagement in preventive healthcare, lifestyle factors, trust in healthcare providers, and sociodemographic characteristics are integral components influencing adherence to medical recommendations. Our investigation confirms the mixed and inconsistent findings regarding the relationship between adherence and socio-demographic factors, including age, marital status, gender, and social standing.

As part of the broader framework for improving patient adherence, the role of the doctor's communication skills emerges as essential. This research disclosed the essential role of a doctor's communication skills in increasing adherence, which is consistent with previous studies. For instance, Svensson et al. (2000) pointed out that strengthening the relationship between patients and medical professionals leads to better medication compliance. Similarly, Kovac et al. (2002) indicated that improving medical professionals' interaction skills and keeping patients informed regarding their medical treatment will lead to significantly increasing patients' adherence to medical recommendations. Besides, Baker and Watson (2015) highlighted that warm and empathetic interaction between doctor and patient improves the quality of patient care, leads to a positive relationship, better patient satisfaction, boosts patient compliance with medication and increases willingness to discuss with doctors. Furthermore, doctors' skills in providing clear explanations, active listening, and demonstrating competence have a significant, positive, and direct effect on patient satisfaction, loyalty, and compliance (AlOmari 2022b).

In addition to communication skills, the implementation of specific intervention strategies is crucial, particularly when addressing challenges faced by older patients with cognitive impairments. This study also revealed that employing successful intervention strategies is to improving medication adherence, particularly for older patients who suffer from cognitive impairments (such as difficulty remembering to take medications). Therefore, doctors must actively seek chances to improve patients' understanding of their diagnosis and, through a supportive and encouraging approach, motivate them to take immediate action in adhering to prescribed medical treatments for a faster recovery. Our finding align with those of Smith et al. (2007), who suggested calling patients or using video monitoring as effective methods to reduce non-adherence behaviour. Similarly, Kripalani et al. (2008) illustrated that there are several effective methods to improve adherence to medication after hospital discharge.

These include reducing medication costs, contacting patients, facilitating transportation to the pharmacy, providing patient counselling at the pharmacy counter prior to discharge, and offering pillboxes. Together, these strategies underscore the importance of continuous support and practical interventions in improving medication adherence.

Building on the importance of intervention, the role of trust in doctor-patient relationships further enhances adherence. Besides, trusting relationships are fundamental in healthcare. Our study demonstrated that mutual trust between patients and doctors is essential to fostering a relationship built on openness, thereby minimizing mistrust or suspicion. Assem and Dulewicz (2015) highlighted that older patients were less likely to actively participate in treatment decisions, frequently visit their doctors, or trust them. However, when they did trust their healthcare providers, they exhibited greater acceptance of the doctor's approach and were more satisfied compared to younger patients. Pawar (2005) indicated that patients who trust their doctors are more likely to comply with medical treatment plans and adhere to their doctor's advice. Furthermore, effective listening enables healthcare providers to better understand patients' true intentions and goals, ultimately leading to improved treatment outcomes.

This qualitative study revealed various factors impacting patient adherence, including regular physical and mental health checks (preventive healthcare), promoting patient health literacy, optimal utilization of social and family support, a convenient and simplified regimen, techniques to improve patients' memory, and the importance of building trust and effective communication. This study provides a holistic insight into patient behavior, assisting hospital administrators in enhancing operational efficiency. Our findings offer various recommendations for both medical professionals and patients to overcome barriers to medication nonadherence. Furthermore, the results will support healthcare policymakers in reviewing, refining, and developing a code of conduct that defines optimal doctor-patient interactions. This presents a valuable chance to educate both doctors and patients on improving their communication and interaction skills.

These factors, though widely recognized across global healthcare systems, are specifically examined in the context of the Syrian healthcare setting in this study. Our findings highlighted that the behavior of both patients and doctors in Syria is similar to that of patients and doctors in other developing and developed countries. However, the cost of care, cultural beliefs, and social support from friends and relatives are key factors in achieving a high level of medication compliance within the Syrian healthcare setting. While patients and doctors have distinct roles in medication adherence, both play complementary roles, and neither's contribution is inherently greater than the other's. Nevertheless, some scholars argue that doctors have a greater influence on medication adherence, as they oversee the entire treatment process, particularly in cases where doctors adopt an authoritative approach. Healthcare professionals can utilize our framework to assess and improve their operational performance, as well as benchmark their practices against competitors in the healthcare sector. Overall, the insights gained from this study, when applied within the Syrian context, offer a robust framework for improving medication adherence, underscoring the necessity for ongoing evaluation and refinement of healthcare practices. By bridging theoretical models with practical insights, this study provides practical guidance, strategic approaches, and a clear roadmap for better adherence, with valuable implications for patients, healthcare providers, and policymakers.

Limitation and Future Work

Although doctors play a major role in the medical treatment process, this qualitative study focused solely on medication compliance from the doctor's perspective. However, patients, nurses, and hospital senior managers are also valuable sources of insight and could provide additional perspectives.

Disclosure Statement

The authors declare that there are no potential conflicts of interest related to this study.
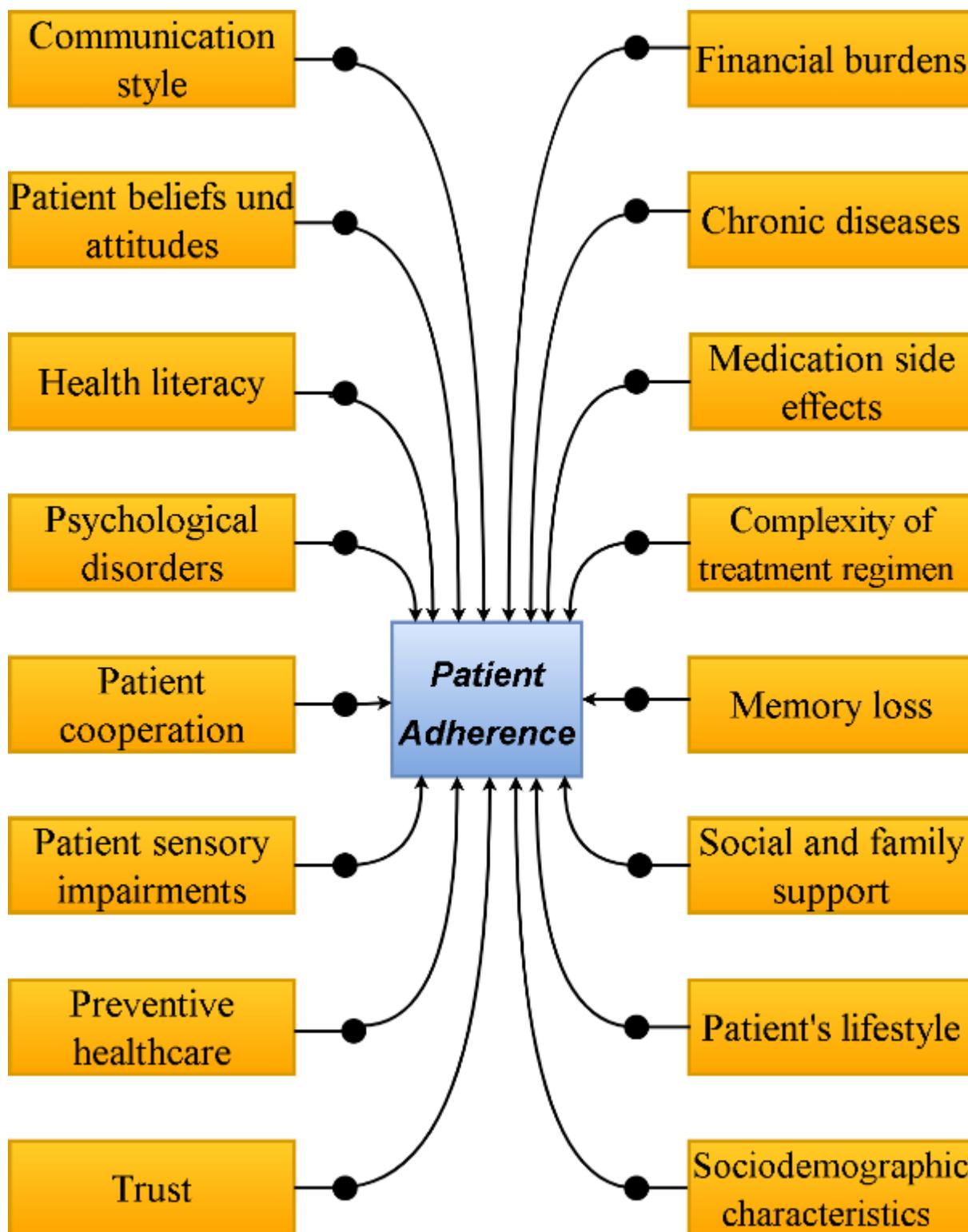
Figure 1. The primary determinants influencing patient adherence, including communication style, financial burdens, patient beliefs and attitudes, chronic diseases, health literacy, medication side effects, psychological disorders, complexity of treatment regimens, patient cooperation, memory loss, sensory impairments, social and family support, preventive healthcare, lifestyle factors, trust, and sociodemographic characteristics.

References

Adefolalu, A. O. (2018). Cognitive-behavioural theories and adherence: Application and relevance in antiretroviral therapy. *Southern African Journal of HIV Medicine*, 19(1). https://doi.org/10.4102/sajhivmed.v19i1.762

Ajzen, I., & Fishbein, M. (1977). Attitude-behaviour relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84(5), 888–918. https://doi.org/10.1037/0033-2909.84.5.888

Alam, M. M., Sikdar, P., Kumar, A., & Mittal, A. (2018). Assessing adherence and patient satisfaction with medication: Validation of TSQM in emerging markets. *International Journal of Pharmaceutical and Healthcare Marketing*. https://doi.org/10.1108/IJPHM-10-2016-0053

AlOmari, F. (2020). Measuring gaps in healthcare quality using SERVQUAL model: Challenges and opportunities in developing countries. *Measuring Business Excellence*. https://doi.org/10.1108/MBE-11-2019-0104

AlOmari, F., & Abu Bakar, H. (2022a). Impact of trust in doctor caring, nurse caring, and hospital administrative process on positive word of mouth: Patients' and attendants' perceptions. *International Journal of Business Process Integration and Management*, 10(3-4), 330-340.

AlOmari, F., & Abu Bakar, H. (2022b). Strategies to improve patient loyalty and medication adherence in the Syrian healthcare setting: The mediating role of patient satisfaction. *PLOS ONE*, 17(11). https://doi.org/10.1371/journal.pone.0272057

AlOmari, F., & Abu Bakar, H. (2023). Financial aspect and healthcare outcomes: Lessons learned from COVID-19. *Journal of Innovation in Business and Economics*, 7(1), 39-50. https://doi.org/10.22219/jibe.v7i01.25886

Van Den Assem, B., & Dulewicz, V. (2015). Doctors' trustworthiness, practice orientation, performance, and patient satisfaction. *International Journal of Health Care Quality Assurance*. https://doi.org/10.1108/IJHCQA-04-2013-0037

Baker, S. C., & Watson, B. M. (2015). How patients perceive their doctors' communication: Implications for patient willingness to communicate. *Journal of Language and Social Psychology*. https://doi.org/10.1177/0261927X15587015

Bandura, A. (1988). Organisational applications of social cognitive theory. *Australian Journal of Management*, 13(2), 275–302. https://doi.org/10.1177/031289628801300210

Belasen, A., & Belasen, A. T. (2018). Doctor-patient communication: A review and a rationale for using an assessment framework. *Journal of Health Organization and Management*, 32(7), 891–907. https://doi.org/10.1108/JHOM-10-2017-0262

Brown, M. T., & Bussell, J. K. (2011). Medication adherence: WHO cares? *Mayo Clinic Proceedings*, 86(4), 304–314.

Brunton, S. (2017). I have never liked the term 'compliance.' *Clinical Diabetes*, 35(2), 76–77. https://doi.org/10.2337/cd17-0010

Cárdenas-Valladolid, J., Martín-Madrazo, C., Salinero-Fort, M. A., Carrillo De-Santa Pau, E., Abnades-Herranz, J. C., & De Burgos-Lunar, C. (2010). Prevalence of adherence to treatment in homebound elderly people in primary health care: A descriptive, cross-sectional, multicenter study. *Drugs and Aging*, 27(8), 641–651. https://doi.org/10.2165/11537320-000000000-00000

Cerimagic, S., Ahmadi, N., Gurney, H., & Patel, M. I. (2015). Doctor-patient communication: A study of Australian ethnic urological cancer patients. *International Journal of Human Rights in Healthcare.* https://doi.org/10.1108/IJHRH-09-2014-0022

Chandra, S., Mohammadnezhad, M., & Ward, P. (2018). Trust and communication in a doctor-patient relationship: A literature review. *Journal of Healthcare Communications,* 3(36). https://doi.org/10.4172/2472-1654.100146

Cooper, W. O., Guillamondegui, O., Hines, O. J., Hultman, C. S., Kelz, R. R., Shen, P., Spain, D. A., Sweeney, J. F., Moore, I. N., Hopkins, J., Horowitz, I. R., Howerton, R. M., Meredith, J. W., Spell, N. O., Sullivan, P., Domenico, H. J., Pichert, J. W., Catron, T. F., Webb, L. E., Dmochowski, R. R., Karrass, J., & Hickson, G. B. (2017). Use of unsolicited patient observations to identify surgeons with increased risk for postoperative complications. *JAMA Surgery*, 152(6), 522–529. https://doi.org/10.1001/jamasurg.2016.5703

Dellande, S., Gilly, M. C., & Graham, J. L. (2004). Gaining compliance and losing weight: The role of the service provider in healthcare services. *Journal of Marketing*, 68(3), 78–91. https://doi.org/10.1509/jmkg.68.3.78.34764

Eleuch, A. E. K. (2011). Healthcare service quality perception in Japan. *International Journal of Health Care Quality Assurance*, 24(6), 417–429. https://doi.org/10.1108/09526861111150680

Gaur, S. S., Xu, Y., Quazi, A., & Nandi, S. (2011). Relational impact of service providers' interaction behavior in healthcare. *Managing Service Quality*.

Hall, P., Keely, E., Dojeiji, S., Byszewski, A., & Marks, M. (2004). Communication skills, cultural challenges, and individual support: Challenges of international medical graduates in a Canadian healthcare environment. *Medical Teacher*, 26(2). https://doi.org/10.1080/01421590310001653982

Hinkin, C. H., Hardy, D. J., Mason, K. I., Castellon, S. A., Durvasula, R. S., Lam, M. N., & Stefaniak, M. (2004). Medication adherence in HIV-infected adults: Effect of patient age, cognitive status, and substance abuse. *AIDS*, 18, S19. NIH Public Access.

Ho, F. N., O'Donnell, K. A., Yi-Ju-Marketing Health Services, & Undefined. (1998). Switching HMO providers. *Marketing Health Services*, 18(1), 7–23.

Hughes, R. G. (2005). Medication errors: Why they happen, and how they can be prevented. *AJN The American Journal of Nursing*, 105(3), 14–24.

Jack, K., McLean, S. M., Klaber Moffett, J., & Gardiner, E. (2010). Barriers to treatment adherence in physiotherapy outpatient clinics: A systematic review. *Manual Therapy*, 15(3), 220–228.

Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The Health Belief Model as an explanatory framework in communication research: Exploring parallel, serial, and moderated mediation. *Health Communication*, 30(6), 566–576. https://doi.org/10.1080/10410236.2013.873363

Kennedy-Martin, T., Boye, K. S., & Peng, X. (2017). Cost of medication adherence and persistence in type 2 diabetes mellitus: A literature review. *Patient Preference and Adherence*, 11, 1103–1117.

Kostopoulos, G., Gounaris, S., & Rizomyliotis, I. (2014). How to reduce the negative impact of customer non-compliance: An empirical study. *Journal of Strategic Marketing*, 22(6), 513–529. https://doi.org/10.1080/0965254X.2014.914056

Kovac, J. A., Patel, S. S., Peterson, R. A., & Kimmel, P. L. (2002). Patient satisfaction with care and behavioral compliance in end-stage renal disease patients treated with hemodialysis. *American Journal of Kidney Diseases*, 39(6), 1236–1244. https://doi.org/10.1053/ajkd.2002.33397

Kripalani, S., Henderson, L. E., Jacobson, T. A., & Vaccarino, V. (2008). Medication use among inner-city patients after hospital discharge: Patient-reported barriers and solutions.

Mayo Clinic Proceedings, 83(5), 529–535. https://doi.org/10.4065/83.5.529

Kulkarni, S. P., Alexander, K. P., Lytle, B., Heiss, G., & Peterson, E. D. (2006). Long-term adherence with cardiovascular drug regimens. *American Heart Journal*, 151(1), 185–191. https://doi.org/10.1016/j.ahj.2005.02.038

Levinson, W., Lesser, C. S., & Epstein, R. M. (2010). Developing physician communication skills for patient-centered care. *Health Affairs*, 29(7), 1310–1318.

Lipkin, M. (1996). Patient education and counseling in the context of modern patient-physician-family communication. *Patient Education and Counseling*, 27(1), 5–11. https://doi.org/10.1016/0738-3991(95)00784-9

Marandu, E. E., Mbekomize, C. J., & Ifezue, A. N. (2015). Determinants of tax compliance: A review of factors and conceptualizations. *International Journal of Economics and Finance*, 7(9), 207–218. https://doi.org/10.5539/ijef.v7n9p207

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709–734. https://doi.org/10.5465/amr.1995.9508080335

Meesala, A., & Paul, J. (2018). Service quality, consumer satisfaction and loyalty in hospitals: Thinking for the future. *Journal of Retailing and Consumer Services*, 40, 261–269. https://doi.org/10.1016/j.jretconser.2016.10.011

Murphy, J., & Coster, G. (1997). Issues in patient compliance. Drugs, 54(6), 797–800.Ngoh, Lucy Nkukuma. 2009. "Health Literacy: A Barrier to Pharmacist-Patient Communication and Medication Adherence." *Journal of the American Pharmacists Association* 49(5):e132–49.

Nieuwlaat, R., Wilczynski, N., Navarro, T., Hobson, N., Jeffery, R., Keepanasseril, A., Agoritsas, T., Mistry, N., Iorio, A., Jack, S., Sivaramalingam, B., Iserman, E., Mustafa, R. A., Jedraszewski, D., Cotoi, C., & Haynes, R. B. (2014). Interventions for enhancing medication adherence. Cochrane Database of Systematic Reviews, 11.

Osterberg, L., & Blaschke, T. (2005). Adherence to medication. New England Journal of Medicine, 353(5), 487–497. https://doi.org/10.1056/NEJMra050100

Padma, P., Rajendran, C., & Lokachari, P. S. (2010). Service quality and its impact on customer satisfaction in Indian hospitals. *Benchmarking: An International Journal*, 17(6), 807–841. https://doi.org/10.1108/14635771011089746

Pawar, M. (2005). Five tips for generating patient satisfaction and compliance. Family Practice Management, 12(6), 44–46.

Pottegård, A., Christensen, R. D., Houji, A., Christiansen, C. B., Paulsen, M. S., Thomsen, J. L., & Hallas, J. (2014). Primary non-adherence in general practice: A Danish register study. *European Journal of Clinical Pharmacology*, 70(6), 757–763. https://doi.org/10.1007/s00228-014-1677-y

Rau, J. L. (2005). Determinants of patient adherence to an aerosol regimen. Respiratory Care, 50(10), 1346–1359.

Rose, R. C., Uli, J., Abdul, M., & Ng, K. L. (2004). Hospital service quality: A managerial challenge. *International Journal of Health Care Quality Assurance*, 17(3), 146–159. https://doi.org/10.1108/09526860410532784

Rosenstock, I. M. (1974). The Health Belief Model and preventive health behavior. *Health Education Monographs*, 2(4), 354–386. https://doi.org/10.1177/109019817400200405

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the Health Belief Model. Health Education & Behavior, 15(2), 175–183. https://doi.org/10.1177/109019818801500203

Roumie, C. L., Elasy, T. A., Greevy, R., Griffin, M. R., Liu, X., Stone, W. J., Wallston, K. A., Dittus, R. S., Alvarez, V., Cobb, J., & Speroff, T. (2006). Improving blood pressure control through provider education, provider alerts, and patient education: A cluster randomized trial. *Annals of Internal Medicine*, 145(3), 165–175. https://doi.org/10.7326/0003-4819-145-3-200608010-00004

Rudy, B. J., Murphy, D. A., Harris, D. R., Muenz, L., & Ellen, J. (2009). Patient-related risks for nonadherence to antiretroviral therapy among HIV-infected youth in the United States: A study of prevalence and interactions. AIDS Patient Care and STDs, 23(3), 185–194. https://doi.org/10.1089/apc.2008.0162

Russell, R. S., Johnson, D. M., & White, S. W. (2015). Patient perceptions of quality: Analyzing patient satisfaction surveys. *International Journal of Operations and Production Management*, 35(3), 430–445. https://doi.org/10.1108/IJOPM-02-2014-0074

Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative Science Quarterly*, 23(2), 224–253. https://doi.org/10.2307/2392563

Settineri, S., Frisone, F., Merlo, E. M., Geraci, D., & Martino, G. (2019). Compliance, adherence, concordance, empowerment, and self-management: Five words to manifest a relational maladjustment in diabetes. *Journal of Multidisciplinary Healthcare*, 12, 299–314. https://doi.org/10.2147/JMDH.S193752

Siegel, D., Lopez, J., & Meier, J. (2007). Antihypertensive medication adherence in the Department of Veterans Affairs. *American Journal of Medicine*, 120(1), 26–32. https://doi.org/10.1016/j.amjmed.2006.06.028

Singh, N., Squier, C., Sivek, C., Wagener, M., Nguyen, M. H., & Yu, V. L. (1996). Determinants of compliance with antiretroviral therapy in patients with human immunodeficiency virus: Prospective assessment with implications for enhancing compliance. AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV, 8(3), 261–270. https://doi.org/10.1080/09540129650125696

Sjöstrand, M., Sandman, L., Karlsson, P., Helgesson, G., Eriksson, S., & Juth, N. (2015). Ethical deliberations about involuntary treatment: Interviews with Swedish psychiatrists. *BMC Medical Ethics*, 16(1). https://doi.org/10.1186/s12910-015-0029-5

Smith, G. E., Lunde, A. M., Hathaway, J. C., & Vickers, K. S. (2007). Telehealth home monitoring of solitary persons with mild dementia. *American Journal of Alzheimer's Disease & Other Dementias*, 22(1), 20–26. https://doi.org/10.1177/1533317506295888

Spiers, M. V., Kutzik, D. M., & Lamar, M. (2004). Variation in medication understanding among the elderly. *American Journal of Health-System Pharmacy*, 61(4), 373–380. https://doi.org/10.1093/ajhp/61.4.373

Strasser, S., & Schweikhart, S. (1992). Who is more satisfied with medical care? Patients or family members and friends. *Working Paper Series*, 92024.

Street, R. L. (1991). Information-giving in medical consultations: The influence of patients' communicative styles and personal characteristics. Social Science and Medicine, 32(5), 541–548. https://doi.org/10.1016/0277-9536(91)90288-N

Svensson, S., Kjellgren, K. I., Ahlner, J., & Säljö, R. (2000). Reasons for adherence with antihypertensive medication. *International Journal of Cardiology,* 76(2–3), 157–163. https://doi.org/10.1016/S0167-5273(00)00374-0

Trostle, J. A. (1988). Medical compliance as an ideology. *Social Science and Medicine*, 27(12), 1299–1308. https://doi.org/10.1016/0277-9536(88)90194-3

Vivian, B. G. (1996). Reconceptualizing compliance in home health care. Nursing Forum, 31(2),

5–14. https://doi.org/10.1111/j.1744-6198.1996.tb00488.x

Voils, C. I., Steffens, D. C., Flint, E. P., & Bosworth, H. B. (2005). Social support and locus of control as predictors of adherence to antidepressant medication in an elderly population. *American Journal of Geriatric Psychiatry*, 13(2), 157–165. https://doi.org/10.1097/00019442-200502000-00010

Walsh, G., & Mitchell, V. W. (2010). The effect of consumer confusion proneness on word of mouth, trust, and customer satisfaction. *European Journal of Marketing*, 44(6), 838–859. https://doi.org/10.1108/03090561011032739

Walters-Salas, T. (2012). The challenge of patient adherence. *Bariatric Nursing and Surgical Patient Care*, 7(4), 186.

Wilkinson, A. V., Vasudevan, V., Honn, S. E., Spitz, M. R., & Chamberlain, R. M. (2009). Sociodemographic characteristics, health beliefs, and the accuracy of cancer knowledge. *Journal of Cancer Education*, 24(1), 58–64. https://doi.org/10.1080/08858190802664834

Willems, S., De Maesschalck, S., Deveugele, M., Derese, A., & De Maeseneer, J. (2005). Socio-economic status of the patient and doctor-patient communication: Does it make a difference? *Patient Education and Counseling*.