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Original Article

The Impact of Illness Perception on Self-Care Management and Adherence to Medication among Patients: The Moderating Role of Self-Efficacy

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ABSTRACT

Background: The relationship between self-care management, illness perception, and medication adherence is complex and influenced by various factors, including self-efficacy. This study aims to examine the impact of illness perception on self-care management and medication adherence, and to explore the moderating role of self-efficacy in this relationship.

Objective: To investigate the influence of illness perception on self-care management and adherence to medication, and to evaluate the moderating effect of self-efficacy on these relationships.

Methods: A random sampling approach was utilized to collect data from 385 patients at hospitals in Islamabad through validated pen-and-paper questionnaires. Data analysis was performed using SPSS software, incorporating statistical tests such as correlation, regression, mediation, and moderation analyses. The reliability of the scales used was confirmed to be acceptable.

Results: Descriptive analysis of demographic variables and rigorous statistical testing supported all hypotheses. A positive illness perception significantly increased self-care management (β=.695, p<.001) and medication adherence (β=.214, p<.001). Self-care management positively influenced medication adherence (β=.174, p<.001) and mediated the relationship between illness perception and adherence (direct effect β=.625; indirect effect β=.215). Self-efficacy moderated the relationship between illness perception and medication adherence, enhancing the impact of positive illness perceptions (β=.214, p=.001).

Conclusion: The study highlights the interconnections between illness perception, self-care management, and medication adherence, and the crucial moderating role of self-efficacy. These findings underscore the importance for healthcare professionals to assess and bolster patients' self-efficacy to improve adherence and health outcomes. Future research should address the study's limitations regarding sample generalizability.

Keywords: Adherence to medication, illness perception, self-care management, self-efficacy, statistical analysis.

INTRODUCTION

The study aimed to investigate the multifaceted elements contributing to medication adherence among patients, emphasizing the role of illness perception, self-care management, and self-efficacy. Understanding these relationships was critical in addressing the widespread issue of medication adherence. Background information highlighted the significance of addressing medication adherence to fill existing research gaps, providing a foundation for the research objectives and significance(1, 2).

The theoretical framework suggested that self-efficacy, an individual's belief in their capabilities, was a key driver of behavior, surpassing mere skills and abilities. Individuals with a strong sense of self-efficacy were more motivated and proactive in achieving their goals. Illness perception, self-care management, adherence to medication, and self-efficacy were interconnected concepts within health psychology and patient behavior. Illness perception encompassed a patient's cognitive, emotional, and psychological representations of their health condition, influencing their beliefs about the causes, consequences, control, and progression of their illness. Self-care management involved actions taken by patients to maintain their health and manage their illness, such as medication adherence, dietary practices, and physical activity. Adherence to medication referred to the extent to which patients

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followed their prescribed treatments. Self-efficacy represented the belief in one's ability to manage illness and engage in necessary behaviors. Studies indicated that positive illness perceptions and high self-efficacy were associated with better self-care behaviors and medication adherence, ultimately leading to improved health outcomes(3-5).

The relationship between self-efficacy and patient behavior was crucial. High self-efficacy resulted in increased motivation and effort, while low self-efficacy led to lower goals and reduced persistence when faced with obstacles. Research highlighted that support from family and friends enhanced well-being and self-efficacy, and collaboration was vital for effective disease management. Medication adherence, essential for disease control, was often hindered by patients' thoughts, feelings, and behaviors. Understanding self-efficacy's role in maintaining health practices over time was essential for improving patient well-being(6, 7).

Previous research indicated that patients frequently did not adhere to prescribed medications due to fears of side effects, dependence, or treatment complexity. New approaches, such as incentivizing patients or incorporating gamification, aimed to improve medication adherence. Illness perception, a predictive belief system about managing disease and correcting risk factors, significantly impacted cardiovascular health behavior, survival rates, quality of life, tolerance, and access to care. Effective self-care management was essential for maintaining wellness, preventing illness, and enhancing health outcomes. This proactive approach included accurately diagnosing symptoms and seeking necessary therapeutic interventions. For heart failure patients, self-care activities included low-sodium diets, medication adherence, flu shots, regular physical care, and leisure activities. Community care played a crucial role in managing chronic conditions, especially in primary care settings, emphasizing the need for dedicated care paradigms and workforce(8, 9).

The study also highlighted the global concern of medication non-compliance, with significant consequences for patients with hypertension, asthma, and COPD. Successful medication adherence programs led by community pharmacists demonstrated improvements in adherence and clinical outcomes. In psychiatry, medication adherence remained a challenge, with non-adherence prevalent among individuals with complex mental illnesses, leading to negative outcomes. Effective patient-provider relationships were essential for improving medication adherence. Research gaps included the need for better understanding of self-efficacy's role in enhancing adherence and overall well-being(10, 11).

Based on existing literature and theoretical foundations, the study hypothesizes that illness perception positively influences adherence to medication (H1) and self-care management (H2). Furthermore, it proposes that effective self-care management is associated with better adherence to medication (H3). The study also suggests that self-care management mediates the relationship between illness perception and adherence to medication (H4). Lastly, it posits that self-efficacy moderates the relationship between illness perception and adherence to medication, with the relationship being stronger when self-efficacy is high (H5). These hypotheses will be tested through statistical analysis of the collected data to understand the complex interplay of these factors(12, 13).

This research aimed to analyze the relationship between illness perception, self-care management, adherence to medication, and the moderating role of self-efficacy. The objective was to determine how these factors interacted to influence patient behavior and health outcomes, providing valuable insights for improving adherence and self-management strategies in healthcare settings.

METHODOLOGY

The methodology of the current study covered all aspects of the research design and data collection process, incorporating comprehensive guidelines, advanced approaches, and methods. The research design was meticulously structured to reduce bias and enhance the validity and reliability of the findings, ensuring the results accurately reflected the phenomena under study(14, 15).

The study measured the impact of illness perception on self-care management and medication adherence among hospital patients, along with the moderating role of self-efficacy. Employing a quantitative approach, data were collected from patients through questionnaires to assess their views on these variables. The setting for this study involved inviting hospital patients to participate by completing a survey questionnaire. Conducted in the field, the study ensured the confidentiality of participants' personal information, which was communicated through consent forms before their participation(16, 17).

Cross-sectional data were gathered for this research, utilizing self-administered questionnaires. This method, commonly used in previous studies, allowed participants to provide thoughtful and well-considered responses without any disruptions. The unit of analysis was individual patients in the Islamabad region. Due to time constraints, convenience sampling was employed, with the sample size determined based on the population size and a suitable number of questionnaires distributed among the patients in Islamabad. This approach was simple and convenient, given the accessibility of the population(18, 19).

The study population consisted of patients residing in Islamabad, the capital city of Pakistan, who were more likely to face issues with adhering to their medication regimen. Convenience sampling was chosen for its cost-effectiveness and straightforward

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approach, allowing participants to voluntarily agree to participate in the study. An appropriate number of questionnaires was distributed among university students in hospitals in Islamabad, resulting in 398 responses. After discarding 13 incomplete responses, 385 complete responses were analyzed(20, 21).

All study variables were measured on a five-point Likert scale. Illness perception was assessed with a scale ranging from "Never" to "All the time"; adherence to medication from "Not at all" to "Extremely well"; self-care management from "Never" to "Always"; and self-efficacy from "Not at all true" to "Extremely true." The self-management support scale, consisting of ten items with five options each, measured knowledge, emotional adjustment, future goals, daily routines, and social support. This scale demonstrated a construct validity of 89 and internal reliability of 0.92. The Brief Illness Perception Questionnaire, with eight items rated on a five-point scale, had an internal consistency of 0.80 and validity of 0.98. The Adherence to Medication Rating Scale, comprising ten items, showed reliability with a coefficient of 0.80 and validity with a coefficient of 0.77. The General Self-Efficacy Scale, consisting of ten items rated on a four-point scale, demonstrated internal reliability of 0.76 and validity of 0.90(22).

Smart PLS software was utilized to investigate the relationships and associations between the variables. Confirmatory Factor Analysis (CFA) was employed to evaluate the scales of reliability, assessing factor item loading, Cronbach's alpha, average variance extracted, composite reliability, and discriminant validity. The results displayed the factor loadings of each variable item and the values for construct reliability and validity. All items had factor loadings above 0.6, indicating accurate results with no need for a second-level confirmatory factor analysis test. The discriminant validity test results indicated the statistical difference between variables and their level of relationship(23).

To ensure the accuracy of the collected data, a standardized procedure for data analysis was followed. Data from both online forms and hard copies were compiled and organized on an Excel sheet, coded for easier evaluation. Statistical analysis was conducted using SPSS version 25, and confirmatory factor analysis was performed using Smart PLS software. Demographic information was analyzed quantitatively, while the relationships between variables were examined using statistical tests, including outlier and missing value analysis, frequency distribution tests, descriptive statistics, reliability analysis, one-way ANOVA, correlation analysis, and regression analysis. The proposed hypotheses were accepted or rejected based on the results obtained from the Hayes analysis method, providing a comprehensive and rigorous examination of the study's objectives.

RESULTS

The study aimed to examine the relationship between illness perception, adherence to medication, self-care management, and self-efficacy. To achieve this goal, a quantitative method was employed, utilizing statistical analysis through SPSS software. The study design incorporated one-way ANOVA, correlation, and regression analyses to evaluate mediation and moderation effects. The initial phase of the results section detailed the descriptive analysis of the demographic variables of the study participants, followed by the statistical evaluation of the research hypotheses to understand the relationships between the variables of interest.

The study analyzed demographic data to accurately identify the characteristics of the targeted population and draw unbiased conclusions about the relationship between variables. Descriptive analysis was performed on demographic variables such as gender, age, education, marital status, and socio-economic status, determining their frequencies and distribution. Additionally, mean and standard deviation values were calculated for key study variables, including illness perception, adherence to medication, self-care management, and self-efficacy. The findings indicated that women were more likely to comply with their medication regimen compared to men, with various gender-related factors impacting medication adherence. The adherence to medication varied with age, where older patients typically showed higher adherence due to their more serious illnesses.

The demographic variable of age was categorized into five groups, ranging from 20 to 70 years old. The distribution showed that older age groups had higher adherence rates, supporting previous research indicating increased medication adherence with age. The role of education in enhancing medication adherence was recognized as significant, although no substantial difference was found between single and multi-component interventions. The study also examined the impact of marital status on medication adherence, revealing that unmarried patients were more prone to non-compliance and cardiac events compared to their married counterparts. Socio-economic status was identified as a crucial factor, with higher socio-economic status correlating with better adherence to medication.

A one-way ANOVA was conducted to assess the effect of demographic characteristics on medication adherence. The results showed significant differences based on age, marital status, and socio-economic status, indicating that these variables should be considered as control variables in further statistical analyses to minimize their interference and preserve the validity of the results.

The study analyzed four main variables: illness perception, adherence to medication, self-care management, and self-efficacy, using a 5-point Likert scale. Mean values and standard deviations for these variables were calculated. Correlation analysis assessed the

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strength of relationships between the study variables, revealing significant, strongly positive correlations between illness perception, adherence to medication, self-care management, and self-efficacy.

Regression analysis, a key statistical method, was employed to investigate the relationship between the variables. Linear regression analysis was used to assess the direct impact of illness perception on adherence to medication, with the findings supporting the hypothesis that illness perception positively influenced medication adherence. Moderated regression analysis evaluated the effect of self-efficacy on the relationship between illness perception and medication adherence, showing that self-efficacy significantly moderated this association. The results indicated that higher self-efficacy led to increased adherence to medication.

Mediated regression analysis examined the role of self-care management as a mediating variable between illness perception and medication adherence. The results demonstrated partial mediation, with self-care management positively influencing both illness perception and adherence to medication. The findings supported the hypotheses that illness perception is positively linked to self-care management, self-care management is associated with better adherence to medication, and self-care management mediates the relationship between illness perception and adherence to medication.

The study investigated the influence of illness perception, self-care management, and self-efficacy on medication adherence, revealing significant interconnections between these variables. The findings provided valuable insights into improving adherence and self-management strategies in healthcare settings.

Table 1: Demographic Distribution of Respondents

Demographic Variable	Category	Frequency	Percentage
Gender	Male	146	37.9%
	Female	239	62.1%
	Total	385	100%
Age	20-30	57	14.8%
	31-40	82	21.3%
	41-50	65	16.9%
	51-60	87	22.6%
	61-70	94	24.4%
	Total	385	100%
Education Status	Primary	103	26.8%
	Middle	59	15.3%
	Secondary	69	17.9%
	Higher Secondary	59	15.3%
	Higher Education	95	24.7%
	Total	385	100%
Marital Status	Unmarried	111	28.8%
	Married	230	59.7%
	Widow/Widower	32	8.3%
	Divorced	12	3.1%
	Total	385	100%
Socio-economic Status	Upper Class	61	15.8%
	Upper Middle	97	25.2%
	Middle	139	36.1%
	Lower	88	22.9%
	Total	385	100%

Table 2: One-way ANOVA: Control Variable Analysis

Demographic Factors	Adherence to Medication	
	f statistical value	p value
Gender	2.097	.001
Age	1.598	.025

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Demographic Factors	Adherence to Medication	
Education	1.191	.227
Marital Status	2.278	.000
Socio-Economic Status	1.264	.162

Table 3: Descriptive Statistical Analysis

	N	(M) Mean	SD (Standard deviation)
Illness Perception	385	3.3795	.76673
Adherence to Medication	385	3.1509	.63378
Self-care management	385	2.7366	.52598
Self-care Efficacy	385	3.1618	.54186

Table 4: Mean, Standard Deviation and Correlation Analysis

		M	SD	1	2	3	4
1	Illness Perception	3.37	.76	1			
2	Adherence to Medication	3.15	.63	.395***	1		
3	Self-care Management	2.73	.52	.062*	.118**	1	
4	Self-efficacy	3.16	.54	.167**	.214***	.068*	1

Table 5: Linear Regression Analysis

Predictors	Adherence to Medication		
	B	R2	ΔR2
Step 1			
Gender	.036		
Age	.020	.804	.801
Marital Status	-.028		
Education	-.014		
Socio-economic Status	.035		
Step 2			
Illness Perception	.748***	.807	.804

Table 6: Moderated Regression Analysis

Predictors	Adherence to Medication			
	B	P	LLCI	ULCI
Illness Perception	.214	.000	.254	.621
Self-efficacy	.079	.001	.137	.474
Self-efficacy x Illness Perception	.141	.000	.317	.541

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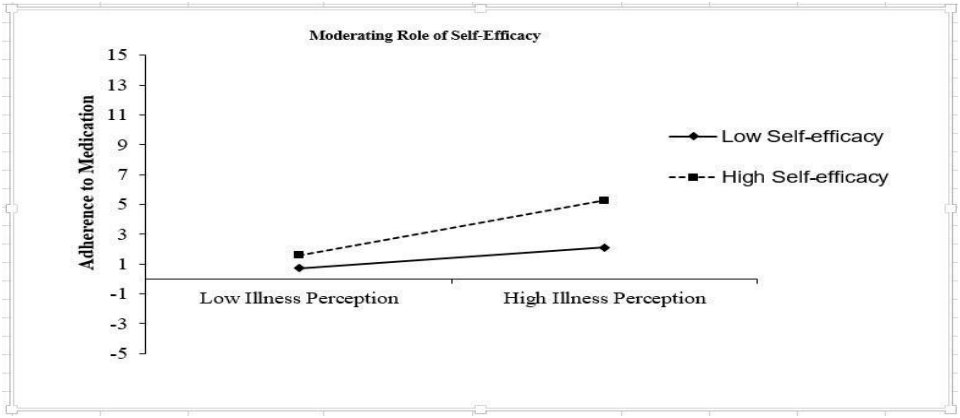

Figure# 4.1: Moderation Effect of SE (Self-Efficacy) between IP (Illness Perception) and Adherence to Medication

Table 7: Regression Analysis for Mediation of Self-care Management

IV's	IV → DV	IV → M	M → DV	IV→M→DV	Bootstrapping results for indirect effects		
					Indirect Effect	LL 95 CI	UL 95 CI
Illness Perception	.84**	.695***	.174***	.625***	.215	.107	.474

The study tested five hypotheses on the relationships between illness perception, self-care management, medication adherence, and self-efficacy. Illness perception was found to be positively linked to medication adherence, indicating a significant positive relationship. Additionally, illness perception was positively associated with self-care management, a finding that was also supported by the data. Self-care management was shown to be connected to better adherence to medication, validating this hypothesis. Moreover, self-care management was found to mediate the relationship between illness perception and medication adherence, confirming the mediation effect. Finally, self-efficacy was shown to strengthen the relationship between illness perception and medication adherence when self-efficacy levels were high, supporting its moderating role. In conclusion, all hypotheses were accepted, underscoring the interconnectedness of these factors in patient health behavior.

DISCUSSION

The results from the regression modeling detailed in the previous chapter provide comprehensive support for the hypotheses, shedding light on the socio-environmental factors influencing medication adherence among patients in Islamabad, Pakistan. This study primarily explored the relationship between illness perception and adherence to medication, with a focus on the mediating role of self-care management and the moderating role of self-efficacy(24).

The positive association between illness perception and medication adherence was strongly supported by the data. This finding aligns with previous research, indicating that individuals with a positive and accurate perception of their illness are more likely to adhere to their medication regimen. This is because a clear understanding of the illness, including its causes, consequences, and control, fosters a sense of responsibility and urgency in managing the condition. Conversely, negative or incorrect illness perceptions can diminish adherence, as patients may feel overwhelmed or pessimistic about their treatment efficacy(25).

The study also confirmed the significant impact of illness perception on self-care management. Individuals with a positive view of their illness and its management tend to engage more in self-care activities, such as adhering to prescribed medications, maintaining a healthy lifestyle, and seeking medical assistance when necessary. This is crucial as effective self-care management can lead to better health outcomes and enhance overall well-being. The sense of control over the illness plays a significant role in this regard, as those who believe they can manage their condition through proactive behaviors are more likely to do so(1).

Furthermore, the analysis demonstrated a strong connection between self-care management and medication adherence. Patients who actively engage in self-care practices are more likely to adhere to their medication regimens, reinforcing the importance of promoting self-care activities. Self-care not only improves health outcomes but also positively influences patients' beliefs about their

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illness and its treatment, thereby enhancing medication adherence. Various factors, such as age, gender, cultural background, and socio-economic status, can influence an individual's engagement in self-care activities and their adherence to medication. Healthcare providers must consider these factors and provide the necessary support and resources to encourage self-care practices(2).

The study also highlighted the mediating role of self-care management in the relationship between illness perception and medication adherence. Engaging in self-care behaviors can directly improve health outcomes and positively influence an individual's perception of their illness, leading to better adherence to medication. This mediation effect underscores the importance of fostering positive illness perceptions and promoting self-care activities to enhance medication adherence(3).

Additionally, the moderating role of self-efficacy was supported by the findings. Self-efficacy, or an individual's confidence in their ability to perform specific tasks, significantly influences the relationship between illness perception and medication adherence. Higher self-efficacy strengthens this relationship, as individuals with strong self-belief are more likely to have a positive outlook on their illness and its treatment, resulting in better adherence to medication. Conversely, low self-efficacy can lead to negative perceptions and poor adherence. Factors such as age, gender, cultural background, and economic status can influence self-efficacy, and healthcare providers should assess and support patients' self-efficacy to improve their confidence in managing their illness and adhering to their medication regimen(4).

The findings of this study highlight the complex interplay between illness perception, self-care management, medication adherence, and self-efficacy. Promoting positive illness perceptions, encouraging self-care activities, and enhancing self-efficacy are crucial strategies for improving medication adherence and overall health outcomes.

CONCLUSION

The study effectively demonstrated that illness perception, self-care management, and self-efficacy significantly influence medication adherence. Positive illness perception and high self-efficacy enhance self-care management and medication adherence. These findings underscore the importance of healthcare professionals in assessing and addressing patients' perceptions of their illness, promoting self-care practices, and bolstering self-efficacy to improve health outcomes.

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