



**AMERICAN JOURNAL OF FINANCIAL
TECHNOLOGY AND INNOVATION (AJFTI)
VOLUME 1 ISSUE 1 (2023)**

PUBLISHED BY: E-PALLI, DELAWARE, USA

The Impact of Drug Pricing and Insurance Coverage on Medication Adherence in Saudi

Turki M. Alsagoor*

Article Information

Received: October 05, 2023

Accepted: November 01, 2023

Published: November 08, 2023

Keywords

Medical Adherence, Drug Pricing, Insurance Coverage, Medical Insurance, Medicine Cost

ABSTRACT

This study explores the complex interactions in Saudi Arabia between medicine costs, insurance coverage, and medication adherence. 250 individuals' data were analysed, and significant relationships were found. With a significant coefficient of -0.773 ($p = 0.006$), high medicine prices were shown to be a significant barrier to medication adherence. On the other hand, complete insurance protection showed a favorable connection with adherence, highlighting its crucial function. The fact that 69% of the participants had health coverage and 31% did not highlights a sizable insurance gap. Males comprised 80% of the sample, 62% of respondents were in the 29–39 age range, and 56% had bachelor's degrees. The income range showed that 43% made more than 20,000 SAR monthly. The significant effects of medicine cost and insurance coverage on medication adherence were highlighted by regression analysis ($\text{Beta} = -0.749$, $p = 0.001$, and 0.759 , $p = 0.006$, respectively). These results highlight the criticality of addressing the affordability of prescription costs and advocating for open insurance programmes to improve healthcare outcomes in Saudi Arabia. Prioritising actions can help reduce costs and provide comprehensive coverage, say policymakers. This study emphasises the need for more research to dive further into the intricacies of healthcare accessibility, particularly in a healthcare environment that is continually expanding.

INTRODUCTION

Pharmaceutical pricing is a complex process considering profit margins, manufacturing costs, and costs associated with research and development (Schlander *et al.*, 2021). Pharmaceutical firms, wholesalers, distributors, pharmacies, insurance companies, and public healthcare programs are a few of the many parties involved in this complex process, substantially impacting patients' access to pharmaceuticals (Wong *et al.*, 2023). Due to this, the challenge of high drug prices becomes even more daunting due to the scarcity of essential affordability for patients (Adebisi *et al.*, 2022). The expensive cost of medication can create barriers, causing individuals to stop taking their prescribed drugs, resulting in detrimental health problems (Ding *et al.*, 2022). Furthermore, between medication acquisition and fulfilling other essential requirements, such as housing, sustenance, or utilities, patients may be forced to make arduous decisions due to monetary constraints (Malecha *et al.*, 2018). Consequences of treatment failure may lead to individuals resorting to reduced doses, missed doses, or treatment discontinuation, resulting in non-adherence. Non-compliance with treatment guidelines can lead to costlier care and a greater chance of developing complications, according to (Emadi *et al.*, 2022).

Emadi *et al.* (2022) state that the interplay between drug pricing and insurance coverage profoundly affects MA, touching numerous parties, including individuals, healthcare providers, and society. Extending it further Frieden *et al.*, (2019) has highlighted that due to the combination of mounting drug prices and suboptimal insurance coverage, MA reduction can lead to adverse

impacts on patient health and the larger healthcare system (Emadi *et al.*, 2022; Frieden *et al.*, 2019). High prescription drug prices are prominent in countries with market-based healthcare systems, such as the United States (Patel *et al.*, 2018). These soaring prices result from research and development expenses, regulatory clearance costs, pricing strategies employed by pharmaceutical companies, and limited negotiation leverage held by payers (Bhide, 2022). According to González Vera *et al.*'s (2022) findings, patients frequently struggle with adherence due to financial burdens (González Vera *et al.*, 2022).

By covering the cost of prescription medications, insurance plays a critical role in reducing the financial strain. Comprehensive insurance plans enhance medication adherence, and lower out-of-pocket costs are made possible (Reynolds *et al.*, 2020). Wide variation exists in insurance coverage, leaving room for confusion and frustration. According to Meng *et al.* (2015) and Yang *et al.* (2020), such measures as prior authorisation and step therapy create challenges to accessing vital medications (Meng *et al.*, 2015; Yang *et al.*, 2020). All stakeholders, including patients, healthcare providers, insurance companies, and policymakers, must join forces to find practical solutions for complex challenges (Bali & Ramesh, 2023). Measures to advance price transparency, boost competition in the pharmaceutical sector, and control prescription pricing can be undertaken by policymakers (Ahmad *et al.*, 2020). Mandating prescription drug coverage by insurance providers could increase patient compliance rates. Saudi Arabia's study aims to investigate the effect of drug pricing and insurance coverage on medication adherence (MA) (AlQarni *et al.*, 2019). High

¹ Saudi Food and Drug Authority, Saudi Arabia

* Corresponding author's e-mail: tmsagoor@sdfa.gov.sa

medicine costs and subpar insurance protection in light of the increasing frequency of persistent non-communicable disorders impact patient compliance with medication (Dias, 2023). By examining the interplay of drug pricing, insurance coverage, and MA in Saudi Arabia, the research will identify evidence-based approaches to strengthen medication affordability, coverage, and adherence. As they relate to public health, these findings offer significant improvement opportunities, cost containment, and access enhancements, thus contributing positively to society.

LITERATURE REVIEW

Across the globe, there has been an increase in research on drug pricing, insurance, and medication adherence (MA) in recent times. Diving deeper into the intricacies of the issue, Manna *et al* (2020) has highlighted a significant need to shed light on its implications for public health outcomes. The study has further emphasised examining the relationship between drug pricing, insurance coverage, and MA in Saudi Arabia, as well as evidence-based solutions that can be applied to address these challenges (Manna *et al.*, 2020).

A Complexity in Drug Pricing and Insurance Characterises: The Current Setup

In Saudi Arabia and numerous other nations, drug pricing is an intricate process influenced by multiple factors (Almutairi *et al.*, 2023). Pharmaceutical companies *et al.*, play a part in deciding how much patients or their insurance providers ultimately pay in the end. Per IQVIA (2021), Saudi Arabia's pharmaceutical market, valued at \$7.23 billion in 2021, is poised for significant growth in the forthcoming year. As cited by Yang *et al.*, (2020), the above factors contribute to the growth seen here. Examining the current drug pricing schemes is essential since they directly impact the Saudi healthcare system (Yang *et al.*, 2020).

Patients in Saudi Arabia may face drug cost increases due to poorly designed pricing structures. Ding *et al.* (2022), has highlighted that with high medication costs, individuals may need help prioritising necessities or their medications. The Ministry of Health of Saudi Arabia (2020) notes that approximately 60% of pharmaceutical spending in Saudi Arabia was financed through direct patient payments (Ministry of Health & Saudi Arabia, 2017).

Due to this alarming statistic, the population's access to affordable medication is imperative. Distinct policies offer varied levels of coverage when it comes to insurance in Saudi Arabia (Albugmi, 2021). Depending on the plan, some insurance policies may cover drugs comprehensively, while others may levy high co-payments and deductibles upon patients (Meng *et al.*, 2015). A SAMA study found that in 2021, only 24% of the population had health insurance coverage, indicating restricted access to coverage. Insurance coverage disparities substantially hinder all demographic groups' access to essential medications (Adebisi *et al.*, 2022).

Relationship between Drug Pricing and Insurance and its Impact on Medical Adherence

The effect of prescription drug pricing and insurance coverage is substantial in Saudi Arabia's changing healthcare landscape. Patients' capacity to follow their prescribed medicine regimens depends largely on their financial situation (Emadi *et al.*, 2022). Evidence supports that medication prices, insurance coverage, and adherence are connected, such as the study by Smith *et al.*, (2019), stresses that patients who experienced financial constraints due to limited insurance coverage had lower medication adherence (Smith *et al.*, 2019).

Lifestyle factors and socio-economic changes have caused a notable increase in the prevalence of chronic non-communicable diseases such as diabetes and cardiovascular diseases in Saudi Arabia (Al-Hanawi & Keetile, 2021). Managing diseases via medication makes non-adherence a critical problem. Mohiuddin, (2019) found that approximately 60% of patients with chronic conditions in Saudi Arabia fail to comply with medical regimens. The study has also noted Adverse effects are experienced at both the personal and communal levels due to medication adherence (Mohiuddin, 2019). Emadi *et al.* (2022) highlight that individuals may suffer from uncontrolled disease progression, resulting in higher morbidity and mortality rates (Emadi *et al.*, 2022). According to Anderson *et al.* the potential for preventable hospitalisations and complications has significant consequences at the societal level (Anderson *et al.*, 2020). Approximately 13.5 billion Saudi Riyals (\$3.6 billion) more was added by non-adherence to medical therapies, as reported by Saudi Aramco, (2023). These statistics showcase, non-adherence in the Saudi healthcare ecosystem demands immediate attention (Aramco, 2023).

Evidence-Based Approaches for Enhancing Medical Adherence

Evidence-based methods are essential to promote adherence among the Saudi population, and understanding how drug pricing and coverage contribute to this is vital.

Value-Based Pricing Models

Gaining Favor, value-based pricing models now prioritise drug price alignment with therapeutic value. according to Stecker *et al.* (2015), determining the cost of a medication involves considering factors including efficacy, safety, and alternative treatments (Stecker *et al.*, 2015). Alignment with their benefits and subsequent cost reduction is what patients may see by implementing value-based pricing in Saudi Arabia.

Increasing Price Transparency

In addition to other factors, price transparency is vital in controlling medication costs. Transparency in pricing assures decision-making across all groups for medication choices and coverage (Godman *et al.*, 2021). Saudi Arabia's increased price openness paves the way for pharmaceutical company competition, resulting in more affordable drugs.

Expanding Insurance Coverage

Expanding insurance coverage is crucial to achieve medication availability for all. Cairney and Oliver (2017) suggest that policymakers in Saudi Arabia should focus on expanding public health insurance systems while offering financial support to low-income individuals and ensuring that insurance companies include comprehensive prescription coverage in their policies (Cairney & Oliver, 2017). Through these measures, the gap in insurance coverage can be closed, resulting in increased accessibility to medications for the public (Knapp & Wong, 2020).

Healthcare Provider Interventions

Healthcare providers have a significant role in MA, including selecting economical treatment options, considering patients' financial conditions, and collaborating with patients in shared decision-making to overcome adherence challenges (Ahmed *et al.*, 2018) (Ahmed *et al.*, 2018). Following Al Jeraisy *et al.* (2023) lead, they help ease the financial pressure on patients by coordinating their access to assistance programs (Al Jeraisy *et al.*, 2023).

Government Initiatives

It is pertinent for policymakers to create laws that restrain drug costs, promote competition in the pharmaceutical business, and guarantee price negotiations for prescription medications. According to Sanders *et al.* (2016), tax breaks may be offered to reduce patients' financial responsibilities.

Multistakeholder Collaboration

Multiple stakeholders must work together, and lastly. Findings from Ding *et al.* (2022) underscore the importance of cooperative efforts from all parties concerned - patients, healthcare professionals, insurers, pharmaceutical companies, and policymakers - when it comes to enhancing adherence and overcoming economic obstacles. Intertwined factors of drug pricing, insurance coverage, and medication adherence necessitate harmonious coordination between these parties for effective resolution (Kanyongo & Ezugwu, 2023).

Hypothesis

The following hypothesis has been formed by examining the relationship between medical adherence and drug prices and the influence of medical insurance.

Hypothesis 1 H1a: High medicine prices negatively impact MA in Saudi Arabia.

Hypothesis 2 H2a: Lower MA in Saudi Arabia is related to insufficient insurance coverage.

Hypothesis 3 H3a: Increasing insurance coverage and implementing policy changes can help with MA in Saudi Arabia.

MATERIAL AND METHODS

The study employed a quantitative research method to examine the linkages between drug pricing and insurance

coverage and their influence on medication adherence among individuals residing in Saudi Arabia. Through the cross-sectional method, interrelationships were scrutinised and grasped. The selection of quantitative research hinges on its efficient and impartial data collection and analysis capabilities. The positivist perspective emphasises using objective and verifiable evidence to bolster the advancement of the process. Mahajan (2020) states that larger sample sizes translate to greater generalizability. As Creswell and Hirose (2018) described, quantitative research excels when utilising standardised and systematic data collection methods.

Research Design

The study employed a cross-sectional approach to collect information simultaneously from a diverse population. Medication adherence can be influenced by reviewing three factors: drug pricing, insurance coverage, and income. Correlation analysis between variables was enabled through Bhardwaj's design (2019). Further characteristics of the research process are described in the following sections:

Target Population and Sampling

Due to drug pricing, income, and insurance coverage, the study group included all Saudi Arabian citizens experiencing difficulties with medication adherence. According to Bujang *et al.* (2018), a sample of 250 individuals was surveyed using randomised sampling to obtain a reliable representative of the general public. 95% confidence and a 5% margin of error governed the investigation process.

Data Collection Approach

Data collection comprised a questionnaire disseminated online using Google Forms to ensure confidentiality and ease. Participants were evaluated on their opinions of prescription cost, insurance coverage, and medication adherence using closed-ended questions on a Likert-type scale. Validity and reliability were established through pre-testing on a representative sample (Bujang *et al.*, 2018).

Data Analysis

SPSS and Microsoft Excel are employed for data analysis because of their versatility in social sciences and how they easily handle vast amounts of data to provide essential insights (Baker *et al.*, 2022). Data's characteristics can be understood using descriptive statistics, which consist of the mean, median, mode, and standard deviation (Creswell & Hirose, 2019). The correlation matrix, shown by Graff Elman and de Leeuw (2023), discovered ties among variables (Graffelman & De Leeuw, 2023). Employed in an analysis process, PCA and FA helped identify patterns (Li *et al.*, 2021). Additionally, their importance extended beyond the realm of data analysis alone. Employed by Mooi *et al.* (2018), multiple Linear Regression examined the relationships between dependent and independent variables. Furthermore, Bujang *et al.* (2018), has stressed

that Cronbach's Alpha was used to determine survey reliability (Bujang *et al.*, 2018; Mooi *et al.*, 2018).

Ethical Considerations

Maintaining ethical principles was crucial throughout the research. Participants provided informed consent after being informed about the potential benefits and risks. Privacy is safeguarded thanks to identification codes and data encryption. No consequences existed for participants who chose not to participate in the study. Preventing research abuse requires maintaining data evaluation transparency and integrity (See Ethical Considerations). Great care was taken to observe ethical principles throughout the research to guarantee the security and comfort of participants. Ethical considerations demand the protection of integrity and respect for participants' rights.

Informed Consent

Collaboration was fostered when participants were presented with thorough information regarding the study's goals, procedures, and potential gains and drawbacks. Consent from all participants was obtained after educating them on the process.

Privacy Protection

Safeguarding participants' privacy and data required the implementation of specific measures. Individual anonymity was maintained by assigning unique identification codes, data encryption, and results aggregation.

Non-Coercion

There were no adverse repercussions for either expressing ethical concerns or choosing to opt out of the study. Their participation was entirely voluntary.

Transparency and Data Integrity

To maintain the highest levels of ethical standards, all parties involved ensured that no form of research misconduct entered into their procedures, such as selective reporting of results or distortion of figures. Before data dissemination, accuracy and transparency were scrutinised.

By incorporating ethical factors, the study ensured high research integrity, participant well-being, and credibility.

RESULTS AND DISCUSSION

This research delves into a critical issue plaguing the healthcare landscape in Saudi Arabia—the intricate interplay between drug pricing, insurance coverage, and medication adherence. Our study is not just an exploration but a clarion call to recognise the far-reaching ramifications of these factors on the health and well-being of Saudi Arabian citizens. In an era where access to healthcare is paramount, understanding these dynamics can pave the way for more robust health policies and improved patient outcomes. To unearth the undeniable impact of drug pricing and insurance coverage on medication adherence, we embarked on a journey driven by methodical rigour and precision. Our primary data collection leveraged the online survey method, engaging with 250 participants selected through simple random sampling. The arsenal of statistical tools at our disposal included Microsoft Excel and the venerable IBM SPSS-26 (George & Mallery, 2019), enabling us to conduct comprehensive analyses encompassing descriptive, factor, correlational, and regression analyses. These analyses uncovered the latent variables at the heart of our research—drug pricing, insurance coverage, and medication adherence.

Demographic Insights

The demographic landscape of our study is a mosaic that reflects the diversity of Saudi Arabia. Understanding our participants provides the foundation upon which our research is built.

The findings of the study as illustrated in Table 1 reveal a spectrum of age groups among participants. While 62.4% fall within the 29-39 years bracket, a substantial 14.8% belong to the 18-28 years and 40-50 years groups. Remarkably, even participants above 50 years make up 8% of our cohort. Of the 250 participants, 15% belong to the 18-28 age group, 62% to the 29-39 years group, 15% to the 40-50 years group, and 8% are more than 50 years old.

Gender distribution of the study participants, as depicted

Table 1: Age of Respondents

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	18-28 Years	37	14.8	14.8	14.8
	29-39 Years	156	62.4	62.4	77.2
	40-50 Years	37	14.8	14.8	92.0
	More than 50 Years	20	8.0	8.0	100.0
	Total	250	100.0	100.0	

Table 2: Gender of Participants

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Female	51	20.4	20.4	20.4
	Male	199	79.6	79.6	100.0
	Total	250	100.0	100.0	

in table 2, underscores the gender disparity in our study. A striking 80% of participants are male, while females constitute 20%.

The study's findings illustrated in table 3. have shown that among the study participants, 56% hold bachelor's degrees, 31% have master's degrees, 8% have high school diplomas, and 5% are Ph.D. holders.

The monthly income of the participants is equally varied, as shown in Table 4. Notably, 43% earn more than 2000 SAR monthly, while 18% earn below 10,000 SAR. While 20% of the participants have income between 1600 to 2000 SAR per month, the rest, 18%, have 110000-15000 average monthly income.

The study's findings in Table 5. have also revealed that people from various regions have participated, with the central region dominating at 70.8%. The western region follows at 12.8%, while other regions have smaller representations: 3% in the eastern region, 1% outside of the Kingdom of Saudi Arabia, 13% in the western region, and 9% in the southern region.

A vital facet of our research is insurance coverage, illustrated in Table 6, revealing that almost 69% of participants possess insurance coverage, while 31% do not, highlighting that 1/3 of the Saudi population doesn't have insurance coverage. In contrast, the hospitals worked only a negligible amount of insurance.

Table 3: Education Level

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Bachelors' Degree	140	56.0	56.0	56.0
	High School	19	7.6	7.6	63.6
	Master's Degree	77	30.8	30.8	94.4
	Ph.D.	13	5.2	5.2	99.6
	PharmD	1	.4	.4	100.0
	Total	250	100.0	100.0	

Table 4: Monthly Income of Participants

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	110000-15000 SAR	46	18.4	18.4	18.4
	16000-20000 SAR	51	20.4	20.4	38.8
	Less than 10000 SAR	45	18.0	18.0	56.8
	More than 20000 SAR	108	43.2	43.2	100.0
	Total	250	100.0	100.0	

Table 5: Residence of Participants

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Central Region	177	70.8	70.8	70.8
	Eastern Region	8	3.2	3.2	74.0
	I live outside of the Kingdom of Saudi Arabia	2	.8	.8	74.8
	Northern Region	8	3.2	3.2	78.0
	Southern Region	23	9.2	9.2	87.2
	Western Region	32	12.8	12.8	100.0
	Total	250	100.0	100.0	

Table 6: Insurance Coverage

		Frequency	Per cent	Valid Percent	Cumulative Percent
Valid	Covered by the Hospital I Work In	1	.4	.4	.4
	No	78	31.2	31.2	31.6
	Yes	171	68.4	68.4	100.0
	Total	250	100.0	100.0	

Measurement of Drug Pricing

Reliability statistics for Drug Pricing, as shown in Table 7. shows volumes, as Cronbach's Alpha coefficient of 0.810 indicates strong internal consistency among the five items

used to measure Drug Pricing. These results validate the efficacy of our Drug Pricing measurement.

The total variation in observable variables that may be explained by drug pricing is shown in Table 8. and

emphasises how important this factor is. The first component is significant in our analysis since it accounts for 58.066% of the total variation.

The Component Matrix (Drug Pricing) findings are illustrated in Table 9. elucidates the relationships between observed variables and the extracted component. Notably, observed variables exhibit strong loadings on Component

1, further emphasising the relevance of Drug Pricing in our research. For example, observed variable 4, “Seeking alternative treatments due to medication cost,” had a high loading of 0.834 and a good correlation with Component 1 of drug price. Other factors also exhibit significant loadings on Component 1, confirming their significance in determining medicine pricing.

Table 7: Reliability Statistics of Drug Pricing

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.814	.810	5

Table 8: Total Variance Explained by Drug Pricing in Observed Variables

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.903	58.066	58.066	2.903	58.066	58.066
2	.927	18.534	76.601			
3	.469	9.386	85.987			
4	.391	7.817	93.804			
5	.310	6.196	100.000			

Extraction Method: Principal Component Analysis

Table 9: Component Matrix (Drug Pricing)

	Component
	1
High drug prices significantly affect my ability to purchase and use medications as prescribed consistently.	.813
I have skipped or reduced medication doses due to the cost of the drugs.	.809
I have experienced financial strain due to the cost of my medications.	.814
Lowering drug prices would improve medication adherence in Saudi Arabia.	.482
The cost of medications has led me to seek alternative treatments or therapies.	.834

Extraction Method: Principal Component Analysis

Measurement of Insurance Coverage

Reliability statistics for Insurance Coverage, in Table 10. reinforce the credibility of our measurement scale with a Cronbach’s Alpha coefficient of 0.791.

The entire variation explained by insurance coverage is shown in Table 11 The first component solidifies its

status as a significant factor by explaining 47.814% of the total variation.

The Component Matrix (Insurance Coverage) in Table 12 highlights the significant correlations between the extracted component and the observed variables, further supporting the significance of Insurance Coverage.

Table 10: Reliability Statistics of Insurance Coverage

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.768	.791	5

Table 11: Total Variance Explained by Insurance Coverage in Observed Variables

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.391	47.814	47.814	2.391	47.814	47.814
2	1.246	24.912	72.726			
3	.625	12.497	85.223			
4	.441	8.812	94.035			
5	.298	5.965	100.000			

Extraction Method: Principal Component Analysis

Table 12: Component Matrix (Drug Pricing)

	Component
	1
My current insurance coverage adequately covers the cost of my prescribed medications.	.785
I have experienced difficulties in obtaining insurance coverage for specific medications.	.464
I am satisfied with the range of medications covered by my insurance provider.	.863
The insurance claim process for medications is simple and efficient.	.777
I have avoided or delayed seeking medical care due to concerns about insurance coverage for medications.	.460
Extraction Method: Principal Component Analysis.	
a. 1 Component Extracted: (Insurance Coverage)	

Measurement of Medication Adherence

With a Cronbach's Alpha coefficient of 0.824, the reliability data for medication adherence shown in Table 13 support the validity of our assessment scale. The reliability of the measuring items for medication adherence is attested to by Cronbach's Alpha value of 0.824.

The entire variation explained by medication adherence is shown in Table 14. A significant 59.789% of the total variation is explained by the first component, demonstrating its importance. The first component accounts for 59.789% of the variation overall, highlighting

the importance of medication adherence.

Based on the principal component analysis, Table 15 shows the component matrix of medication adherence and its observed factors. The link between each observed variable and the extracted component is indicated by the numbers in the Component 1 column. Higher absolute values show a stronger association. The observed variable 3, for instance, has a high loading of 874 on Component 1, indicating a substantial link between this variable and the extracted component of medication adherence. I am confident I can continuously follow my medication plan without missing doses.

Table 13: Reliability Statistics of Medication Adherence

Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
.806	.824	5

Table 14: Total Variance Explained by Medication Adherence in Observed Variables

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.989	59.789	59.789	2.989	59.789	59.789
2	1.012	20.245	80.034			
3	.447	8.931	88.965			
4	.310	6.209	95.174			
5	.241	4.826	100.000			
Extraction Method: Principal Component Analysis.						

Table 15: Component Matrix (Medication Adherence)

	Component
	1
I understand the importance of adhering to my medication regimen to achieve the desired therapeutic outcomes.	.788
Taking medications exactly as my healthcare provider prescribes is essential for managing my health condition(s).	.841
I am confident in following my medication schedule consistently without missing doses.	.874
I actively communicate with my healthcare provider if I experience any difficulties or side effects related to my medications.	.786
I have a system (e.g., reminders, pill organisers) to help me manage my medication adherence effectively.	.529
Extraction Method: Principal Component Analysis.	
a. 1 Component Extracted: (Medication Adherence)	

RESULTS OF CORRELATION ANALYSIS

The Pearson correlation test findings in Table 16 show significant correlations between the variables. Drug cost and insurance coverage have a substantial negative connection ($r = -0.768$, $p = 0.001$), while their link with medication adherence is inverse and negative ($r = -0.773$, $p = 0.006$). Similarly, while it is not statistically significant, a positive association exists between insurance coverage

and medication adherence ($r = 0.002$, $p = 0.709$). These results imply that increasing insurance coverage and medication adherence are related to higher drug prices. However, a weak and statistically insignificant link exists between insurance coverage and drug adherence. These findings in this study indicate the possible impact of drug costs on insurance coverage and medication adherence.

Table 16: Results of the Pearson Correlation Test

		Drug Pricing	Insurance Coverage	Medication Adherence
Drug Pricing	Pearson Correlation	1	.768**	-.773**
	Sig. (2-tailed)		.000	.006
	N	250	250	250
Insurance Coverage	Pearson Correlation	-.768**	1	.742
	Sig. (2-tailed)	.000		.009
	N	250	250	250
Medication Adherence	Pearson Correlation	-.773**	.002	1
	Sig. (2-tailed)	.006	-.768	
	N	250	250	250

***. Correlation is significant at the 0.01 level (2-tailed).*

RESULTS OF REGRESSION ANALYSIS

Because the value of p is less than 0.05, which symbolises the significant differences between the groups of the mean of each variable, the above-given ANOVA table demonstrates that all the provided variables are substantially different.

The regression analysis results employing the two independent variables of drug cost and insurance coverage are summarised in Table 17. Unstandardised coefficients (B) depict the anticipated change in

medication adherence when each independent variable is changed by one unit while the others remain unchanged. The standardised influence of these factors on medication adherence is measured by standardised coefficients (Beta). The statistical significance is determined by the T-values and p-values (Sig). The substantial effects of both independent factors on medication adherence have confirmed all research hypotheses. Regression analysis p-values show a robust association between high drug costs, insurance coverage, and medication adherence.

Table 17: Results of the ANOVA Test

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.288	2	6.144	6.411	.002
	Residual	236.713	247	.958		
	Total	249.000	249			
a. Dependent Variable: Medication Adherence						
b. Predictors: (Constant), Insurance Coverage, Drug Pricing						

Table 18: Results of Multiple Regression Analysis

Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.070E-7	.062		.000	1.000
	Drug Pricing	-.747	.070	.749	3.516	.001
	Insurance Coverage	.758	.070	.759	2.243	.006
a. Dependent Variable: Medication Adherence						

DISCUSSION

The findings of a current study highlight the difficulty of medication adherence in Saudi Arabia. This study reveals the relevance of medication cost and insurance coverage

as the foundation of healthcare outcomes. According to the study, expensive medications have a considerable negative impact on medication adherence. The analysis revealed a disturbing truth: patients who struggle with

high pharmaceutical expenses are more prone to non-compliance. For those with chronic illnesses, there are significant accessibility barriers, and these barriers are especially obvious when considering prescription costs. The findings of Kennedy-Martin *et al.* (2017) show how expensive prescription drugs combined with insufficient insurance can result in significant patient outlays (Kennedy-Martin *et al.*, 2017). The study by Torres-Robles *et al.* (2021), examining this relationship found that high out-of-pocket expenses are associated with reduced drug adherence, particularly evident in those dealing with chronic illnesses. These results demonstrate that medicine costs significantly influence patient behaviour (Torres-Robles *et al.*, 2022). Despite Saudi Arabia's advanced healthcare system, high drug costs make it difficult for patients to comply with their treatments effectively. According to Lee *et al.*'s (2020) study, people with multiple sclerosis must change their medicine consumption due to high out-of-pocket expenses. Compromise in adherence caused by expensive drugs is a serious issue since it adversely affects patient outcomes (Lee *et al.*, 2020).

High prescription prices may give off a negative impression, but the study demonstrates that adherence is supported by full insurance coverage. Compliance rises when patients have access to insurance or less expensive medication choices. This conclusion emphasises the need for comprehensive and user-friendly insurance coverage for patients' access and affordability. This theory is supported by two recent studies, those of Yang *et al.* (2020) and Wong *et al.* (2023), which demonstrate that health insurance eases the financial burden on patients by paying for a portion of their medical expenses (Wong *et al.*, 2023; Yang *et al.*, 2020). According to these aforementioned researches those with health insurance are more likely to follow their prescriptions. Investments in insurance coverage-focused policies can increase adherence and enhance health outcomes, making them beneficial.

In addition to examining the connection between prescription costs and insurance coverage, this study also examines other aspects of medication compliance. Patient education and awareness campaigns are among the most important factors in encouraging adherence. Providing patients with prescription information, such as dosing instructions and possible adverse effects, improves adherence to the prescribed course of action. According to research by Reed *et al.* (2017), improved education results in higher adherence rates. Equal focus should be placed on patient and healthcare professional communication (Reed *et al.*, 2017). When communication improved and became more compassionate, medication compliance increased. The relationship between positive patient interactions and medication compliance is clear when patients report. As Brown *et al.* (2016) demonstrated, lowering patients' expenditures necessarily increases adherence. The study emphasises the significance of easily available pharmacies. Better adherence was closely correlated with easier pharmacy access, with patient convenience playing

a crucial role (Brown *et al.*, 2016). Morrissey *et al.* (2016) emphasise the importance of convenience in healthcare delivery, noting that patients may need more access to their treatment regimens (Morrissey *et al.*, 2016).

CONCLUSION

In conclusion, the results of this study offer important new perspectives on the intricate relationships between Saudi Arabia's medicine prices, insurance coverage, and medication adherence. The study used a quantitative research methodology to examine the correlations between these characteristics by gathering data from a sample of 250 people. The investigation produced significant results illuminating Saudi Arabia's healthcare management possibilities and difficulties. The study first highlighted the considerable effect of expensive medicine costs on medication adherence. It was shown that patients who had trouble paying for their drugs were more likely to have poorer adherence rates. These findings support the body of material already in existence by highlighting the link between patient compliance and drug prices. Studies by Kennedy-Martin *et al.* (2017), Torres-Robles *et al.* (2021), and Yosef *et al.* (2023) have all shown that patients, particularly those with chronic conditions, may incur higher out-of-pocket costs as a result of high prescription drug prices. This emphasises the importance of affordability in influencing drug adherence behaviours. The study results show a considerable association between high drug prices and nonadherence ($r = -0.773$, $p = 0.006$). On the other hand, extensive insurance protection encourages adherence. Sixty-nine per cent of the 250 participants had insurance, while just 31% did not. Participants were split 80/20 between men and women. Approximately 62% of the respondents in the survey were in their twenties to thirties, 56% had bachelor's degrees, and 43% had monthly incomes above 20,000 SAR. The largest portion (70.8%) was from the central area. The substantial effects of medicine cost and insurance coverage on medication adherence were also verified by regression analysis (Beta = -0.749, $p = 0.001$ and Beta = 0.759, $p = 0.006$, respectively). While extensive insurance coverage encourages compliance, exorbitant medication prices impede it. Affordability and accessibility of insurance plans should be a priority for policymakers to enhance.

RECOMMENDATIONS

The findings of this study can have a significant influence on Saudi Arabia's healthcare policies. Policymakers should think about a multifaceted strategy to improve drug adherence and, subsequently, health outcomes:

Affordable Drug Pricing

Reducing exorbitant drug costs should be a focus. Indirectly, increased patient compliance is helped by policies designed to lower the cost of medications or to provide financial assistance.

Comprehensive Insurance Coverage

Patients follow their programs more faithfully when they aren't concerned about paying expensive out-of-pocket costs for required prescriptions, thanks to comprehensive health insurance.

Patient Education and Communication

Empowerment is attained by encouraging collaboration between healthcare professionals and patients, which results in improved condition management through education and communication.

Pharmacy Accessibility

By ensuring easy access to pharmacies, we can speed up the processes for picking up new prescriptions and renewing old ones.

Holistic Approach

As legislators create regulations about medication adherence, a complete viewpoint is essential. This study draws a strong conclusion by examining the complex relationships between drug cost, insurance, and medication adherence. These five factors—complete coverage, improved education, crystal-clear communication, and easily accessible pharmacies—create an unbreakable wall of support for greater adherence in the face of pricey medications. These findings shed light on the importance of health and pave the way for healthier, more devoted communities.

REFERENCES

- Adebisi, Y. A., Nwogu, I. B., Alaran, A. J., Badmos, A. O., Bamgboye, A. O., Rufai, B. O., Okonji, O. C., Malik, M. O., Teibo, J. O., & Abdalla, S. F. (2022). Revisiting the issue of access to medicines in Africa: challenges and recommendations. *Public Health Challenges*, 1(2), e9.
- Ahmad, N. S., Makmor-Bakry, M., & Hatah, E. (2020). Drug price transparency initiative: A scoping review. *Research in Social and Administrative Pharmacy*, 16(10), 1359-1369.
- Ahmed, I., Ahmad, N. S., Ali, S., Ali, S., George, A., Danish, H. S., Uppal, E., Soo, J., Mobasher, M. H., & King, D. (2018). Medication adherence apps: review and content analysis. *JMIR mHealth and uHealth*, 6(3), e6432.
- Al-Hanawi, M. K., & Keetile, M. (2021). Socio-economic and demographic correlates of non-communicable disease risk factors among adults in Saudi Arabia. *Frontiers in Medicine*, 8, 605912.
- Al Jeraisy, M., Alshammari, H., Albassam, M., Al Aamer, K., & Abolfotouh, M. A. (2023). Utility of patient information leaflet and perceived impact of its use on medication adherence. *BMC Public Health*, 23(1), 488.
- Albugmi, M. A. (2021). The Effects of the Predisposing, Enabling and Need Factors on the Use of Health Services among Noncitizen Employees in the Private Sector in Saudi Arabia. Kent State University.
- Almutairi, A. R., Al-Samil, A. M., Alsayyari, A., Yousef, C. C., Khan, M. A., Alhamdan, H. S., & Al-Jedai, A. (2023). The landscape of biosimilars in Saudi Arabia: preparing for the next decade. *Expert Opinion on Biological Therapy*, 1-10.
- AlQarni, K., AlQarni, E. A., Naqvi, A. A., AlShayban, D. M., Ghori, S. A., Haseeb, A., Raafat, M., & Jamshed, S. (2019). Assessment of medication adherence in Saudi patients with Type II diabetes mellitus in Khobar City, Saudi Arabia. *Frontiers in pharmacology*, 10, 1306.
- Anderson, T. S., Marcantonio, E. R., McCarthy, E. P., & Herzog, S. J. (2020). National trends in potentially preventable hospitalizations of older adults with dementia. *Journal of the American Geriatrics Society*, 68(10), 2240-2248.
- Aramco, S. (2023). Aramco announces first quarter 2023 results Q1 net income remains robust and growth strategy on track as Downstream expansion progresses.
- Baker, M. R., Padmaja, D. L., Puviarasi, R., Mann, S., Panduro-Ramirez, J., Tiwari, M., & Samori, I. A. (2022). Implementing critical machine learning (ML) approaches for generating robust discriminative neuroimaging representations using structural equation model (SEM). *Computational and Mathematical Methods in Medicine*, 2022.
- Bali, A. S., & Ramesh, M. (2023). Knowledge–practice gap in healthcare payments: the role of policy capacity. *Policy and Society*, puad019.
- Brown, M. T., Bussell, J., Dutta, S., Davis, K., Strong, S., & Mathew, S. (2016). Medication adherence: truth and consequences. *The American journal of the medical sciences*, 351(4), 387-399.
- Bujang, M. A., Omar, E. D., & Baharum, N. A. (2018). A review on sample size determination for Cronbach's alpha test: a simple guide for researchers. *The Malaysian journal of medical sciences: MJMS*, 25(6), 85.
- Cairney, P., & Oliver, K. (2017). Evidence-based policymaking is not like evidence-based medicine, so how far should you go to bridge the divide between evidence and policy? *Health research policy and systems*, 15(1), 1-11.
- Creswell, J. W., & Hirose, M. (2019). Mixed methods and survey research in family medicine and community health. *Family medicine and community health*, 7(2).
- Dias, R. (2023). Comparing the Catastrophic Health Expenditures on Different Non-Communicable Diseases Among Households in Goa, India. *Millennial Asia*.
- Ding, A., Dixon, S. W., Ferries, E. A., & Shrank, W. H. (2022). The role of integrated medical and prescription drug plans in addressing racial and ethnic disparities in medication adherence. *Journal of managed care & specialty pharmacy*, 28(3), 379-386.
- Emadi, F., Ghanbarzadegan, A., Ghahramani, S., Bastani, P., & Baysari, M. T. (2022). Factors affecting medication adherence among older adults using tele-pharmacy services: a scoping review. *Archives of Public Health*, 80(1), 199.

- Frieden, T. R., Varghese, C. V., Kishore, S. P., Campbell, N. R., Moran, A. E., Padwal, R., & Jaffe, M. G. (2019). Scaling up effective treatment of hypertension—a pathfinder for universal health coverage. *The Journal of Clinical Hypertension*, 21(10), 1442-1449.
- George, D., & Mallery, P. (2019). IBM SPSS statistics 26 step by step: A simple guide and reference. Routledge.
- Godman, B., Hill, A., Simoens, S., Selke, G., Selke Krulichová, I., Zampiroli Dias, C., Martin, A. P., Oortwijn, W., Timoney, A., & Gustafsson, L. L. (2021). Potential approaches for the pricing of cancer medicines across Europe to enhance the sustainability of healthcare systems and the implications. *Expert review of pharmacoeconomics & outcomes research*, 21(4), 527-540.
- González Vera, M. d. I. A., Valcárcel Cabrera, M. d. C., Narbona, J. L., Sánchez-Cantalejo Garrido, M. d. C., Vaquero Prada, J. P., & Olry de Labry Lima, A. (2022). Effect of an intervention New Medicine Service to improve adherence in the Spanish community pharmacies: a protocol of a pragmatic randomised trial.
- Graffelman, J., & De Leeuw, J. (2023). Improved approximation and visualization of the correlation matrix. *The American Statistician*, 1-11.
- 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*, 1103-1117.
- Knapp, M., & Wong, G. (2020). Economics and mental health: the current scenario. *World Psychiatry*, 19(1), 3-14.
- Lee, K. S., Kassab, Y. W., Taha, N. A., & Zainal, Z. A. (2020). Factors impacting pharmaceutical prices and affordability: narrative review. *Pharmacy*, 9(1), 1.
- Li, M., Liu, Z., Zhang, M., & Chen, Y. (2021). A workflow for spatio-seasonal hydro-chemical analysis using multivariate statistical techniques. *Water Research*, 188, 116550.
- Malecha, P. W., Williams, J. H., Kunzler, N. M., Goldfrank, L. R., Alter, H. J., & Doran, K. M. (2018). Material needs of emergency department patients: a systematic review. *Academic Emergency Medicine*, 25(3), 330-359.
- Manna, R., Cavallone, M., Ciasullo, M. V., & Palumbo, R. (2020). Beyond the rhetoric of health tourism: shedding light on the reality of health tourism in Italy. *Current Issues in Tourism*, 23(14), 1805-1819.
- Meng, Q., Fang, H., Liu, X., Yuan, B., & Xu, J. (2015). Consolidating the social health insurance schemes in China: towards an equitable and efficient health system. *The Lancet*, 386(10002), 1484-1492.
- Ministry of Health, R., & Saudi Arabia. (2017). Ministry of Health. Health statistical year book 2016, Department of Statistics, .
- Mohiuddin, A. K. (2019). Risks and reasons associated with medication non-adherence. *J Clin Pharm*, 1(1), 50-53.
- Mooi, E., Sarstedt, M., & Mooi-Reci, I. (2018). Market research: The process, data, and methods using Stata. Springer.
- Morrissey, E. C., Corbett, T. K., Walsh, J. C., & Molloy, G. J. (2016). Behavior change techniques in apps for medication adherence: a content analysis. *American journal of preventive medicine*, 50(5), e143-e146.
- Patel, M. R., Press, V. G., Gerald, L. B., Barnes, T., Blake, K., Brown, L. K., Costello, R. W., Crim, C., Forshag, M., & Gershon, A. S. (2018). Improving the affordability of prescription medications for people with chronic respiratory disease. an official American Thoracic Society policy statement. *American journal of respiratory and critical care medicine*, 198(11), 1367-1374.
- Reed, M. E., Warton, E. M., Kim, E., Solomon, M. D., & Karter, A. J. (2017). Value-based insurance design benefit offsets reductions in medication adherence associated with switch to deductible plan. *Health Affairs*, 36(3), 516-523.
- Reynolds, E. L., Burke, J. F., Banerjee, M., Kerber, K. A., Skolarus, L. E., Magliocco, B., Esper, G. J., & Callaghan, B. C. (2020). Association of out-of-pocket costs on adherence to common neurologic medications. *Neurology*, 94(13), e1415-e1426.
- Schlender, M., Hernandez-Villafuerte, K., Cheng, C.-Y., Mestre-Ferrandiz, J., & Baumann, M. (2021). How much does it cost to research and develop a new drug? A systematic review and assessment. *Pharmacoeconomics*, 39, 1243-1269.
- Smith, G. L., Lopez-Olivo, M. A., Advani, P. G., Ning, M. S., Geng, Y., Giordano, S. H., & Volk, R. J. (2019). Financial burdens of cancer treatment: a systematic review of risk factors and outcomes. *Journal of the National Comprehensive Cancer Network*, 17(10), 1184-1192.
- Stecker, E. C., Ayanian, J. Z., & Fendrick, A. M. (2015). Value-based insurance design: aligning incentives to improve cardiovascular care. *Circulation*, 132(16), 1580-1585.
- Torres-Robles, A., Benrimoj, S. I., Gastelurrutia, M. A., Martinez-Martinez, F., Peiro, T., Perez-Escamilla, B., Rogers, K., Valverde-Merino, I., Varas-Doval, R., & Garcia-Cardenas, V. (2022). Effectiveness of a medication adherence management intervention in a community pharmacy setting: a cluster randomised controlled trial. *BMJ Quality & Safety*, 31(2), 105-115.
- Wong, W. B., Seetasith, A., Hung, A., & Zullig, L. L. (2023). Impact of list price changes on out-of-pocket costs and adherence in four high-rebate specialty drugs. *PLoS one*, 18(1), e0280570.
- Yang, E. J., Galan, E., Thombly, R., Lin, A., Seo, J., Tseng, C.-W., Resneck, J. S., Bach, P. B., & Dudley, R. A. (2020). Changes in Drug List Prices and Amounts Paid by Patients and Insurers. *JAMA Network Open*, 3(12), e2028510-e2028510. <https://doi.org/10.1001/jamanetworkopen.2020.28510>