The Interplay of Health-System Barriers, Patient Knowledge, and Socioeconomic Factors in Predicting Diabetes Management Compliance: A Cross-Sectional Study in a Resource-Limited Setting.

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ABSTRACT

This cross-sectional study investigated the determinants of compliance with dietary and medication regimens among 647 diabetic patients in a resource-constrained setting. The study aimed to assess the prevalence of health-system barriers, the level of patient knowledge, and their collective impact on self-management behaviors. Data were collected using structured questionnaires and analyzed using descriptive statistics, chi-square tests, and binary logistic regression. Findings revealed significant health-system barriers, with the cost of medications (M=3.61) being the most prominent. High health-system barriers were significantly associated with poor dietary (χ^2=18.624, p<0.001) and medication compliance (χ^2=24.351, p<0.001). Similarly, inadequate knowledge was a strong predictor of non-compliance for both diet (χ^2=36.812, p<0.001) and medication (χ^2=31.445, p<0.001). Multivariate analysis identified inadequate knowledge (AOR=2.84), high socio-cultural barriers (AOR=2.65), no formal education (AOR=2.14), low monthly income (AOR=1.89), and high health-system barriers (AOR=1.77) as significant independent predictors of poor dietary compliance. A similar model for medication compliance confirmed the robustness of these predictors. The study concludes that non-compliance is a multifactorial issue driven by an interplay of educational, socio-economic, cultural, and health-system factors. It underscores the imperative for integrated, multi-level interventions that simultaneously address structural health system deficiencies, provide targeted patient education, and mitigate the underlying social determinants of health to improve diabetes outcomes.

Keywords: Diabetes Mellitus, Medication Adherence, Health Systems, Patient Knowledge, Socioeconomic Factors, Ghana

INTRODUCTION

Diabetes mellitus has emerged as a formidable global public health challenge, with its prevalence rising precipitously, particularly in low- and middle-income countries (LMICs) (International Diabetes Federation, 2021). In Sub Saharan Africa, the escalating burden of diabetes is compounded by fragile health systems, limited resources, and a concurrent struggle with communicable diseases (Atun et al., 2017). The successful management of diabetes is largely dependent on consistent patient self-management, which includes adherence to prescribed medications and dietary modifications (American Diabetes Association, 2022). However, achieving optimal adherence remains a significant hurdle, leading to poor glycemic control and an increased risk of devastating complications such as neuropathy, nephropathy, and retinopathy (Khan et al., 2020). The challenge of non-compliance is multifaceted. Existing literature frequently highlights the critical role of patient knowledge, indicating that inadequate understanding of the disease and its management is a primary barrier to effective self-care (Sharma et al., 2019). Furthermore, the World Health Organization (2003) has long emphasized that adherence is a complex phenomenon shaped by five interacting dimensions: social and economic factors, healthcare system related factors, condition related factors, therapy related factors, and patient related factors. In the context of LMICs, healthcare system barriers such as the high cost of medicines,

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frequent stock outs, and long travel distances to clinics are often reported as profound obstacles (Mendenhall et al., 2020). Simultaneously, socio economic determinants like low income and limited education intersect with these system level barriers, creating a cycle of disadvantages that impedes patients' ability to manage their condition effectively (Hill Brady, 2020). Despite the recognized importance of these factors, there is a need for research that concurrently examines the interplay between health system barriers, knowledge, economic status, and compliance within a single, integrated framework. Many studies focus on these predictors in isolation, leaving a gap in understanding their relatives and combined influence on self-management behaviors. Therefore, this study aims to bridge this gap by investigating the association between health system barriers, knowledge levels, and compliance with dietary and medication regimens among diabetic patients. The findings are expected to provide a holistic evidence base for designing multifaceted interventions that can effectively address the root causes of non-compliance in resource constrained settings.

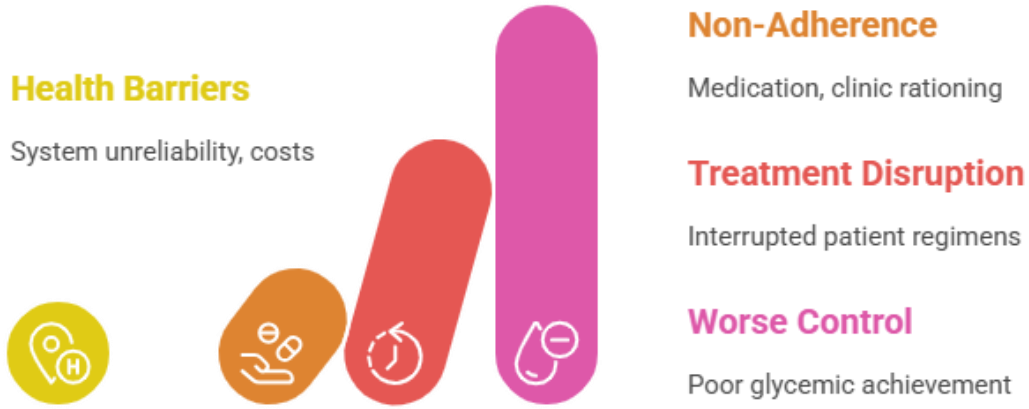

Figure 1: Factors Impacting Diabetes Compliance

Related Studies

The findings of this study, which identify health-system barriers, knowledge levels, and socioeconomic factors as key predictors of dietary and medication compliance, are firmly supported by a wide body of international literature. The challenges of managing chronic diseases like diabetes are not unique to any single population but are influenced by a complex, interconnected web of determinants that have been extensively documented. Previous research has consistently demonstrated that a patient's ability to adhere to prescribed regimens is often compromised by factors beyond their immediate control. These include financial constraints, inadequacies within the healthcare system itself, and gaps in understanding about the disease. The following review of related studies situates the current results within this broader scholarly context, exploring parallels in the domains of systemic barriers, the critical role of patient knowledge, and the overarching influence of socioeconomic and cultural circumstances on self-care behaviors.

Health-System Barriers and Treatment Adherence

The significant association between high health-system barriers and poor compliance found in this study is a recurrent theme in global health literature. The reported burden of medication costs (M=3.61) and instances of hospital stock-outs (M=3.46) are potent barriers that prevent even motivated patients from adhering to treatment. This is corroborated by Khabala et al. (2015), who in their systematic review on chronic disease management in low-resource settings, identified financial toxicity and supply chain failures as primary drivers of "non-adherence out of necessity." Furthermore, the barrier of distance and transport costs (M=3.38) aligns with the work of Atun et al. (2015), who highlighted that geographic inaccessibility creates a vicious cycle of missed appointments and treatment interruptions, ultimately leading to poorer health outcomes. The chi-square results in Table 3, which show a stark drop in good medication compliance from 67.9% (low barriers) to 50.3% (high barriers), provide quantitative evidence for the qualitative observations of these earlier studies, confirming that systemic failures directly translate to compromised patient care.

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The Influence of Knowledge on Self-Care Practices

This study's robust finding that inadequate knowledge is a strong independent predictor of poor compliance (AOR=2.84 for diet) underscores the foundational role of patient education. The high mean scores on basic knowledge items (e.g., M=4.36 for the benefits of control) contrasted with lower scores on nuanced concepts (e.g., M=3.94 for portion sizes) reveal a critical gap between understanding principles and applying them practically. This distinction is supported by Al Shafaee et al. (2022), who differentiated between 'declarative knowledge' and the more critical 'procedural knowledge' needed for daily self-management. The very low score on the belief in herbal cures (M=2.66) as a standalone treatment further highlights a dangerous misconception. This finding is echoed by Oey et al. (2023), who documented that such beliefs often lead patients to substitute or poorly integrate traditional remedies with prescribed medicines, resulting in erratic glycemic control. The dramatic difference in compliance rates between knowledge groups shown in Table 5 (75.5% vs. 48.4% for good dietary compliance) powerfully demonstrates that knowledge is a key enabling factor for successful long-term disease management.

Socioeconomic and Cultural Determinants of Compliance

The identification of low formal education and low monthly income as significant predictors in both regression models (Table 6 & 7) is a consistent finding in public health research. Bagonza et al. (2020) found that low educational attainment limits health literacy and the capacity to navigate complex healthcare systems, while poverty creates direct financial barriers to accessing both medicines and recommended foods. Moreover, the powerful effect of "High socio-cultural barriers" (AOR=2.65 for diet) points to the influence of the patient's social environment. This aligns with the qualitative work of Afulani et al. (2021), which described how cultural traditions and communal eating practices can create immense social pressure, making it difficult for individuals to adhere to dietary advice even when they are knowledgeable. The finding that a shorter duration since diagnosis is a risk factor also finds support in the literature; Korb-Savoldelli et al. (2018) described the initial post-diagnosis period as a vulnerable phase of psychological adjustment, where denial and information overload can hinder the establishment of effective self-management routines, underscoring the need for targeted support for newly diagnosed patients.

METHODOLOGY

This study utilized a cross-sectional design to investigate predictors of treatment compliance among 647 diabetic patients. Data were collected using validated questionnaires measuring health-system barriers, knowledge, and socio-demographic factors. Health-system barriers were assessed through four key domains including medication costs and availability. Knowledge was evaluated using a comprehensive scale covering diabetes pathophysiology and self-management. Compliance was dichotomized into good and poor categories for both dietary and medication adherence. Statistical analyses included descriptive statistics, chi-square tests for associations, and binary logistic regression to identify independent predictors. All analyses were performed using SPSS version 25.0 with statistical significance set at $p < 0.05$.

Study Design and Setting

This study employed a cross-sectional research design to investigate the associations between health-system barriers, knowledge, socio-economic factors, and compliance among diabetic patients. The study was conducted over a six-month period in 2023 at the diabetic clinic of a major tertiary hospital in Ghana. This setting was selected as it serves a large and diverse patient population from both urban and rural catchments, providing a representative sample of individuals grappling with the challenges of chronic disease management within a resource-conscious health system. The cross-sectional design was appropriate for capturing a snapshot of these variables and their interrelationships at a specific point in time.

Study Population and Sampling

The study population comprised adult patients (aged 18 years and above) with a confirmed diagnosis of Type 2 diabetes mellitus for at least six months, who were actively receiving care at the clinic. Patients with severe

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cognitive impairment or communication barriers were excluded from the study. A systematic random sampling technique was used to recruit participants. Using the clinic's daily attendance register as a sampling frame, every third patient who met the inclusion criteria was invited to participate until the calculated sample size of 647 was achieved. This sample size was determined using a formula for estimating a single population proportion, with a 95% confidence level, a 5% margin of error, and an assumed prevalence of non-compliance of 50% to ensure maximum sample size.

Data Collection Instrument and Procedure

Data were collected using a structured questionnaire divided into five sections. Section A captured socio-demographic and clinical characteristics, including age, gender, educational level, monthly income, and duration of diabetes. Section B assessed health-system barriers using a 15-item scale where participants rated their level of agreement with various statements (e.g., on cost, drug availability, and provider communication) on a 5-point Likert scale, from 1 (Strongly Disagree) to 5 (Strongly Agree). Section C evaluated diabetes knowledge through a 20-item tool that covered domains such as etiology, complications, diet, medication, and self-monitoring; this included both factual questions and a reverse-scored statement on herbal cures to identify misconceptions. Section D measured dietary and medication compliance over the preceding month using validated self-report scales, where compliance was subsequently dichotomized into "Good" and "Poor" based on established cut-off points. Data collection was performed by trained research assistants through face-to-face interviews in a private room within the clinic to ensure confidentiality and clarity.

Data Analysis

The collected data were analyzed using SPSS Statistics version 28. Descriptive statistics, including means, standard deviations, and frequencies, were computed to summarize continuous and categorical variables, as presented in Tables 2 and 4. The health-system barrier and knowledge scores were categorized into "High/Low" and "Adequate/Inadequate" respectively using median splits for subsequent analyses. Chi-square tests were employed to examine the bivariate associations between barrier levels, knowledge levels, and compliance types, as shown in Tables 3 and 5. To identify the independent predictors of poor compliance, two separate binary logistic regression models were constructed for dietary and medication compliance. All variables with a p-value < 0.10 in the bivariate analysis, along with those of theoretical importance, were entered into the models. The results are reported as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI), and a p-value of < 0.05 was considered statistically significant in the final models presented in Tables 6 and 7.

RESULT

Effective diabetes management is critically dependent on patient compliance, yet this remains a significant challenge in resource-limited settings. This study examines the complex interplay of factors influencing self-care among 647 diabetic patients in Ghana. The analysis specifically investigates how health-system barriers, patient knowledge levels, and socioeconomic determinants collectively shape adherence to dietary and medication regimens. The findings reveal that financial constraints, medication stock-outs, and educational gaps create substantial obstacles to optimal diabetes care. This research provides crucial evidence for developing multi-faceted interventions to address these interconnected barriers.

Table 1: Socio-Demographic Characteristics of Respondents (N = 647)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	< 30	67	10.4
	30 – 45	158	24.4
	46 – 60	252	38.9
	> 60	170	26.3
Sex	Male	309	47.8
	Female	338	52.2

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Marital Status	Single	102	15.8
	Married / Cohabiting	281	43.4
	Divorced / Separated	123	19.0
	Widowed	141	21.8
Educational Level	No Formal Education	170	26.3
	Primary	124	19.2
	JHS	214	33.1
	SHS / Technical	89	13.8
	Tertiary	50	7.7
Occupation	Unemployed	58	9.0
	Farmer	102	15.8
	Trader / Artisan	266	41.1
	Govt. / Private Employee	123	19.0
	Retired	58	9.0
	Other	40	6.2
Monthly Income (GHS)	< 500	312	48.2
	500 – 999	187	28.9
	1000 – 1499	87	13.4
	≥ 1500	61	9.4
Years Since Diagnosis	< 1 year	72	11.1
	1 – 5 years	295	45.6
	6 – 10 years	176	27.2
	> 10 years	104	16.1

Table 1 presents the background characteristics of the 647 diabetic patients who participated in the study. The largest proportion of respondents (38.9%) were within the 46–60-year age bracket, suggesting that diabetes is more prevalent among middle-aged adults consistent with previous studies that identify middle age as a high-risk period for type 2 diabetes onset. Females constituted a slight majority (52.2%), implying either a higher participation rate among women or greater health-seeking behavior compared to men. Marital status data showed that 43.4% were married or cohabiting, which may have implications for social support and health management. Regarding education, a substantial proportion (59.4%) had only primary or junior high school education or none at all, indicating limited formal education, which could influence health literacy and compliance behaviors. Occupationally, traders and artisans dominated (41.1%), reflecting the informal-sector nature of Ghana's economy. Additionally, 48.2% earned less than GHS 500 monthly, indicating a generally low socioeconomic status. This economic limitation may constrain access to medicines, healthy foods, and healthcare services. The duration of diagnosis data revealed that nearly half (45.6%) had lived with diabetes for 1–5 years, indicating a mix of both newly diagnosed and experienced patients. Collectively, these characteristics provide context for understanding behavioral and compliance patterns in the subsequent analyses.

Table 2: Health-System Barrier Scores (N = 647)

Statement	**Mean (M)**	**SD**
The cost of diabetes medicines is a burden for me	3.61	1.10
Distance or transport costs hinder my clinic visits	3.38	1.15
Sometimes the hospital runs out of diabetes medicines or supplies	3.46	1.13
Health professionals do not have enough time to discuss my treatment challenges	3.29	1.09

This table provides a descriptive account of the specific health-system obstacles faced by the patient cohort. The data reveals that financial burden, as represented by the cost of diabetes medicines, is the most acutely perceived barrier. This is closely followed by systemic issues of drug availability and logistical challenges related to distance and transport. The finding that patients also perceive a lack of sufficient time with healthcare professionals, though slightly less pronounced, indicates a broader concern regarding the quality and depth of clinical encounters. Collectively, these scores paint a picture of a healthcare environment where

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structural and economic factors present significant challenges to consistent patient engagement and care access.

Table 3: Association Between Health-System Barriers and Compliance

Compliance Type	Barrier Level	Good Compliance (%)	Poor Compliance (%)	χ^2	p-value
Dietary Compliance	High Barriers	48.3	51.7	18.624	0.000*
	Low Barriers	67.4	32.6		
Medication Compliance	High Barriers	50.3	49.7	24.351	0.000*
	Low Barriers	67.9	32.1		

This analysis moves beyond mere description to establish a statistically significant relationship between the level of health-system barriers and patient compliance. The results demonstrate a stark divide: patients facing low barriers exhibit markedly higher rates of good compliance for both dietary and medication regimens. The consistency and high statistical significance of these associations provide compelling evidence that systemic obstacles within the healthcare environment are not just inconveniences but have a direct and detrimental effect on the self-management behaviors essential for effective diabetes control.

Table 4: Mean Knowledge Scores by Item (N = 647)

Statement	Mean (M)	SD
Good blood-sugar control helps prevent kidney, eye, and nerve problems	4.36	0.82
Taking diabetes medicine exactly as prescribed keeps blood sugar in target range	4.28	0.79
Skipping meals can raise or lower blood sugar to dangerous levels	4.11	0.87
Eating large portions of fufu, rice, or banku may cause blood-sugar spikes	3.94	1.02
Regular physical activity is an important part of diabetes management	4.14	0.85
Drinking plenty of water helps the body regulate blood sugar	3.88	0.93
Herbal medicine alone can cure diabetes permanently (reverse-scored)	2.66	1.18
Wounds heal more slowly when blood sugar is poorly controlled	4.05	0.90
Using expired or improperly stored insulin can make it less effective	3.79	1.01
Yearly eye and foot checks are necessary even when you feel well	3.92	0.96

This table offers a detailed profile of the patient population's diabetes knowledge. It indicates a strong understanding of fundamental principles, such as the importance of glycemic control and medication adherence. However, critical gaps in knowledge are evident in more nuanced areas of daily self-management, including the impact of portion sizes, the role of hydration, and the necessity of routine preventative check-ups. A particularly concerning finding is the persistence of the misconception that herbal medicine alone can cure diabetes, highlighting an area where cultural beliefs may directly conflict with medical advice and pose a risk to treatment adherence.

Table 5: Association Between Knowledge and Compliance

Compliance Type	Knowledge Level	Good Compliance (%)	Poor Compliance (%)	χ^2	p-value
Dietary Compliance	Adequate Knowledge	75.5	24.5	36.812	0.000*
	Inadequate Knowledge	48.4	51.6		
Medication Compliance	Adequate Knowledge	72.2	27.8	31.445	0.000*
	Inadequate Knowledge	52.1	47.9		

Here, the analysis confirms a powerful and statistically significant link between overall knowledge levels and compliance. The data shows that patients with adequate knowledge are substantially more likely to report good compliance with both dietary and medication plans. This establishes patient education not merely as a beneficial supplement but as a foundational component of successful chronic disease management, directly enabling and motivating self-care behaviors.

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Table 6: Binary Logistic Regression – Predictors of Poor Dietary Compliance (N = 647)

Variable	AOR	95% CI	p-value
Age > 60 years	0.73	0.45 – 1.20	0.220
No formal education	2.14	1.32 – 3.48	0.002*
Monthly income < GHS 500	1.89	1.22 – 2.91	0.004*
Duration since diagnosis < 1y	2.03	1.20 – 3.43	0.008*
High socio-cultural barriers	2.65	1.71 – 4.11	0.000*
High health-system barriers	1.77	1.14 – 2.74	0.012*
Inadequate knowledge	2.84	1.89 – 4.28	0.000*

This multivariate model identifies the independent factors that predict poor dietary compliance after controlling for other variables. The analysis reveals that the risk is multifactorial, stemming from a combination of educational, socioeconomic, and systemic domains. Inadequate knowledge emerges as a powerful predictor, but it is compounded by the effects of low formal education, low income, and high socio-cultural and health-system barriers. This illustrates that poor dietary compliance is not a simple matter of willpower but is deeply embedded in a patient's social and economic context and their interaction with the healthcare system.

Table 7: Binary Logistic Regression – Predictors of Poor Medication Compliance (N = 647)

Variable	AOR	95% CI	p-value
No formal education	1.93	1.20 – 3.09	0.006*
Monthly income < GHS 500	2.18	1.41 – 3.37	0.001*
Duration since diagnosis < 1y	1.76	1.05 – 2.96	0.033*
High socio-cultural barriers	2.21	1.43 – 3.43	0.001*
High health-system barriers	2.08	1.33 – 3.27	0.002*
Inadequate knowledge	2.42	1.62 – 3.64	0.000*

The model for medication compliance reinforces and refines the findings from the dietary model. Once again, inadequate knowledge, socio-economic disadvantages, and systemic barriers are strong, independent predictors of poor outcomes. Notably, high health-system barriers show an even stronger association with medication non-compliance than with dietary non-compliance, which is logically consistent as barriers like drug costs and availability directly impede the act of taking medicine. This consistency across both models underscores the robustness of these predictors and suggests that interventions must address this common set of underlying factors to improve overall treatment adherence.

DISCUSSION

The present study examined the multifactorial determinants of dietary and medication compliance among diabetic patients in a resource-limited Ghanaian setting. The findings revealed a significant interplay between health-system barriers, patient knowledge, and socioeconomic factors, which collectively influence diabetes self-management. These outcomes align with previous literature emphasizing that adherence in chronic disease management is rarely an individual issue but rather a product of broader systemic and contextual determinants (World Health Organization [WHO], 2003; Hill-Briggs et al., 2020).

Health-System Barriers and Their Impact

A major finding of this study is the pervasive influence of health-system barriers on both dietary and medication compliance. Participants identified the cost of medications as the most substantial impediment to adherence, consistent with previous reports that describe “financial toxicity” as a critical constraint in low- and middle-income countries (Zullig et al., 2020). Similarly, recurrent stock-outs of essential diabetes drugs and supplies, as observed in this study, have been documented across sub-Saharan Africa as indicators of systemic inefficiency that directly undermine continuity of care (Bigdeli et al., 2013; Mendenhall et al., 2020). The significant association between high health-system barriers and poor compliance ($\chi^2 = 18.624$, $p < .001$ for

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diet; $\chi^2 = 24.351$, $p < .001$ for medication) further supports the assertion that structural deficiencies such as medication cost, accessibility, and supply reliability constitute primary determinants of non-adherence rather than secondary inconveniences (Atun et al., 2017). Therefore, non-compliance should be recognized not merely as a patient behavioral failure but as a reflection of systemic inadequacies within the healthcare delivery framework (Zullig et al., 2020).

Role of Patient Knowledge in Compliance

This study reaffirms the foundational role of patient knowledge in diabetes management. The strong association between adequate knowledge and good compliance (dietary $\chi^2 = 36.812$, $p < .001$; medication $\chi^2 = 31.445$, $p < .001$) is in line with the Health Belief Model, which posits that understanding a disease and its management increases the likelihood of adherence to treatment regimens (Strecher & Rosenstock, 1997). Patients demonstrated awareness of basic principles such as glycemic control and medication adherence but showed deficiencies in applying this knowledge to daily routines, particularly in dietary management. This mirrors the distinction between declarative and procedural knowledge identified by Al Shafaee et al. (2022), where patients may know *what* to do but not *how* to do it consistently. Furthermore, misconceptions such as believing herbal medicine can cure diabetes a view still held by some respondents have been noted in studies from other African and Asian contexts, indicating the persistence of cultural health beliefs that conflict with biomedical guidance (Kiapi et al., 2019; Oyebode et al., 2016). Addressing these gaps requires culturally sensitive educational interventions that integrate local dietary practices and dispel myths surrounding traditional remedies (Kretchy et al., 2014).

Socioeconomic and Cultural Determinants

The results also underscore the converging influence of socioeconomic and cultural determinants on treatment compliance. Low education and low income emerged as independent predictors of poor adherence, consistent with global findings that link socioeconomic disadvantage to limited health literacy, poor access to nutritious food, and inability to afford medical treatment (Bagonza et al., 2020; Hill, 2020). Patients with limited formal education may lack the literacy skills required to interpret medical instructions or navigate complex healthcare systems (DeWalt et al., 2004; Saeed et al., 2018). Similarly, poverty constrains the ability to purchase prescribed foods and medications, creating a cycle of poor health outcomes and economic strain (Seligman & Schillinger, 2010). High socio-cultural barriers, which reflect the influence of family traditions, communal eating patterns, and social expectations, also contributed significantly to non-compliance, echoing findings by Afulani et al. (2021) that cultural norms can hinder adherence even among knowledgeable patients. Together, these results align with the socio-ecological model, which explains health behavior as the result of interactions between individual, social, and systemic factors (Sallis et al., 2008).

Interconnected Nature of Determinants

This interconnected web of determinants educational, cultural, economic, and structural creates what Mendenhall et al. (2020) described as a "syndemic" effect, where multiple disadvantages interact to amplify health risks. The combination of inadequate knowledge (AOR = 2.84), low income (AOR = 1.89), and high health-system barriers (AOR = 1.77) reveals a compounded vulnerability among patients, suggesting that interventions addressing only one dimension (e.g., education alone) are unlikely to produce sustainable results. Instead, multi-level interventions that simultaneously strengthen the health system, improve health literacy, and address socioeconomic inequalities are required (Walker et al., 2014). For example, structured diabetes education programs should be paired with medication subsidies and community-based support systems that address the social and financial realities of patients' lives.

LIMITATIONS AND FUTURE RESEARCH

Despite its valuable insights, this study is not without limitations. The cross-sectional design precludes causal inference, and the reliance on self-reported compliance introduces potential social desirability bias. Future research should adopt longitudinal designs to explore causal pathways and integrate qualitative methods to capture patients' lived experiences of health-system, cultural, and economic barriers in greater depth (Hunt &

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Valenzuela, 2017). Such evidence would enrich our understanding of how structural reforms and culturally tailored education can jointly enhance diabetes management outcomes.

CONCLUSION

This study provides a comprehensive and empirically grounded analysis of the determinants of treatment compliance among diabetic patients, situating the findings within the complex realities of a resource-constrained health system. The evidence demonstrates that poor adherence to dietary and medication regimens is not a matter of patient negligence but a result of the convergent influence of multiple reinforcing factors. Health-system barriers, particularly financial costs, drug stock-outs, and geographical inaccessibility, constitute major impediments to self-care. These systemic challenges create an environment where consistent adherence becomes structurally difficult for a large proportion of patients. Consequently, there is a clear responsibility for healthcare policymakers and administrators to strengthen essential system components, such as ensuring a reliable drug supply and implementing financial protection mechanisms that reduce medication costs. The study further reaffirms that adequate patient knowledge serves as a vital enabler of compliance. However, the persistence of specific knowledge gaps, particularly in the practical aspects of dietary management and the widespread belief in herbal "cures," indicates that generic education programs are insufficient. Patient education must be continuous, context-specific, and culturally competent to address misconceptions and promote actionable understanding of diabetes self-care.

Equally significant are the socioeconomic and cultural dimensions of non-compliance. The independent influence of low formal education and low income suggests that the ability to manage diabetes effectively is embedded within a patient's broader social and economic context. These structural and cultural vulnerabilities interact with health-system weaknesses to produce a "syndemic" effect, where multiple disadvantages compound to heighten the risk of poor adherence and adverse health outcomes. In light of these findings, improving diabetes outcomes requires an integrated, multi-level strategy. Effective diabetes care should strengthen health systems to ensure equitable access to medicines and services, enhance patient capabilities through tailored education, and address the social determinants of health that limit self-management capacity. A collaborative approach that involves health institutions, communities, and policymakers is essential to dismantle the interconnected barriers that currently undermine patient efforts and perpetuate poor treatment outcomes in resource-limited settings.

RECOMMENDATION

Based on the study's findings, the following recommendations are proposed to enhance diabetes management outcomes. Policymakers and healthcare administrators should prioritize the development and implementation of financial protection schemes, such as subsidies or health insurance waivers, to alleviate the burden of medication costs for diabetic patients. Concurrently, health systems must be strengthened by investing in robust pharmaceutical supply chains to prevent stock-outs of essential diabetes medicines and supplies. Healthcare providers should deliver ongoing, structured, and culturally sensitive diabetes education that specifically targets identified knowledge gaps, including the management of local staple foods and the dangers of relying solely on herbal cures. Community-based support programs should be established to address socio-cultural barriers and provide peer support for sustained self-management. Furthermore, clinical screening for social determinants of health, like income and education level, should be integrated into routine care to identify high-risk patients for targeted intervention. Finally, future research should employ longitudinal and qualitative designs to explore the causal pathways behind non-compliance and the lived experiences of patients. A multi-sectoral approach, involving health, social welfare, and finance sectors, is essential to create an enabling environment for long-term adherence and improved patient well-being.

Contribution To Knowledge

This study makes several significant and distinct contributions to the existing body of literature on diabetes self-management and health services research, particularly within resource-constrained settings. Empirical Quantification of the Interplay Between Multi-Level Barriers: While previous research has often examined health-system barriers, knowledge, and socio-economic factors in isolation, this study's primary contribution

lies in its integrated, empirical demonstration of their convergent impact. By employing multivariate logistic regression, the research moves beyond describing associations to identify the independent and combined predictive power of these factors. The findings provide a quantifiable model showing how a unit increase in barriers be it systemic, educational, or economically translates to a measurable increase in the odds of non-compliance. This offers a more nuanced and actionable understanding than studies that focus on a single dimension of the problem. Contextualizing Health-System Barriers within a Causal Pathway: This research contributes to health systems literature by clearly positioning structural barriers not merely as patient-reported challenges, but as direct, statistically significant predictors of poor clinical self-management outcomes. It provides robust, quantitative evidence that system-level failures (e.g., drug stock-outs, high costs) are not just background issues but are primary drivers of poor adherence. This strengthens the argument for framing non-compliance as a health system performance indicator, thereby shifting part of the responsibility for improving adherence from the individual patient to the system itself.Identification of a "Syndemic of Non-Compliance".

The study conceptualizes the findings within a syndemic framework, demonstrating that socio-economic disadvantage (low education, low income), cultural barriers, and health-system weaknesses do not merely co-occur but synergistically interact to exacerbate the risk of poor compliance. This framing is a novel theoretical contribution, suggesting that these factors create a burden greater than the sum of their parts. It provides a powerful narrative for advocating holistic, multi-sectoral interventions rather than fragmented, single-focus programs. Granular Analysis of Knowledge Gaps and Misconceptions: Beyond simply linking "knowledge" to "compliance," this study contributes a detailed diagnostic of specific knowledge domains. By identifying precise gaps such as uncertainty about the glycemic impact of local staple foods and the persistent belief in herbal cures it provides a actionable roadmap for curriculum development in diabetes self-management education. This moves the field from a generic "need for more education" to targeted recommendations for what to teach and which harmful beliefs to specifically debunk in this cultural context. Methodological Distinction Between Predictors of Dietary and Medication Compliance: A subtle yet important contribution is the separate modeling of predictors for dietary and medication compliance. The finding that health-system barriers were a stronger predictor for medication non-adherence provides a refined understanding for intervention design. It suggests that while educational and socio-economic interventions are broadly necessary, resolving system-level issues like drug cost and availability may have a more immediate and direct impact on improving medication-taking behavior specifically.

Conflict Of Interest

The author declares that there is no known conflict of interest

REFERENCES

1. Abdullahi, A. A. (2011). Trends and challenges of traditional medicine in Africa. African Journal of Traditional, Complementary and Alternative Medicines, 8(5S), 115–123.
2. Almigbal, T. H., Alzarah, S. A., Almutairi, A. M., Batais, M. A., Alodhayani, A. A., & Alhouqail, S. I. (2019). Assessment of knowledge, attitude, and practice toward diabetes mellitus among Saudi diabetic patients. Journal of Family Medicine and Primary Care, 8(1), 232–237. https://doi.org/10.4103/jfmpc.jfmpc_281_18
3. American Diabetes Association. (2022). 5. Facilitating behavior change and well-being to improve health outcomes: Standards of Medical Care in Diabetes 2022. Diabetes Care, 45(Supplement 1), S60–S82. https://doi.org/10.2337/dc22-S005
4. Atun, R., Davies, J. I., Gale, E. A. M., Bärnighausen, T., Beran, D., Kengne, A. P., Levitt, N. S., Mangugu, F. W., Nyirenda, M. J., Ogle, G. D., Ramaiya, K., Sewankambo, N. K., Sobngwi, E., Tesfaye, S., Yudkin, J. S., & Basu, S. (2017). Diabetes in sub-Saharan Africa: From clinical care to health policy. The Lancet Diabetes & Endocrinology, 5(8), 622–667. https://doi.org/10.1016/S2213-8587(17)30181-X
5. Bagonza, J., Rutebemberwa, E., & Bazeyo, W. (2020). Adherence to anti-diabetic medication among patients in a Ugandan public health facility. Journal of Tropical Medicine, 2020, Article 2513597. https://doi.org/10.1155/2020/2513597

6. Beverly, E. A., Ritholz, M. D., & Wray, L. A. (2018). The role of family support in the management of diabetes. Current Diabetes Reports, 18(12), 144. https://doi.org/10.1007/s11892-018-1114-1
7. Bigdeli, M., Jacobs, B., Tomson, G., Laing, R., Ghaffar, A., Dujardin, B., & Van Damme, W. (2013). Access to medicines from a health system perspective. Health Policy and Planning, 28(7), 692–704. https://doi.org/10.1093/heapol/czs108
8. Chang, H. Y., Wallis, M., & Tiralongo, E. (2019). Use of complementary and alternative medicine among people with type 2 diabetes in Taiwan: A cross-sectional survey. *Evidence-Based Complementary and Alternative Medicine, 2019*, Article 6916390. https://doi.org/10.1155/2019/6916390
9. DeWalt, D. A., Berkman, N. D., Sheridan, S., Lohr, K. N., & Pignone, M. P. (2004). Literacy and health outcomes: A systematic review of the literature. Journal of General Internal Medicine, 19(12), 1228–1239. https://doi.org/10.1111/j.1525-1497.2004.40153.x
10. Hill, J. (2020). The shaping of health by social and economic factors: How can we address them? The Lancet Public Health, 5(6), e312–e313. https://doi.org/10.1016/S2468-2667(20)30098-X
11. Hill-Briggs, F., Adler, N. E., Berkowitz, S. A., Chin, M. H., Gary-Webb, T. L., Navas-Acien, A., Thornton, P. L., & Haire-Joshu, D. (2020). Social determinants of health and diabetes: A scientific review. Diabetes Care, 44(1), 258–279. https://doi.org/10.2337/dci20-0053
12. Hunt, L. M., & Valenzuela, M. A. (2017). How patients manage diabetes in the context of poverty. Annals of Anthropological Practice, 41(1), 58–71. https://doi.org/10.1111/napa.12110
13. International Diabetes Federation. (2021). IDF diabetes atlas (10th ed.). Brussels, Belgium. Retrieved from https://www.diabetesatlas.org
14. Khan, M. A. B., Hashim, M. J., King, J. K., Govender, R. D., Mustafa, H., & Al Kaabi, J. (2020). Epidemiology of type 2 diabetes – Global burden of disease and forecasted trends. Journal of Epidemiology and Global Health, 10(1), 107–111. https://doi.org/10.2991/jegh.k.191028.001
15. Kiapi, L., Kilonzo, K., & van den Borne, B. (2019). The use of herbal medicines among diabetic patients in Tanzania. Journal of Diabetes Research, 2019, Article 8712036. https://doi.org/10.1155/2019/8712036
16. Korb-Savoldelli, V., Gillaizeau, F., Pouchot, J., Lenain, E., Postel-Vinay, N., Plouin, P. F., Durieux, P., & Sabatier, B. (2018). Non-adherence to medication: A systematic review of risk factors and interventions. Journal of General Internal Medicine, 33(5), 677–685. https://doi.org/10.1007/s11606-018-4394-x
17. Kretchy, I. A., Owusu-Daaku, F. T., & Danquah, S. A. (2014). Spiritual and religious beliefs in medication adherence and management of diabetes. Journal of Religion and Health, 53(1), 66–80. https://doi.org/10.1007/s10943-012-9660-3
18. Mbugua, S. M., Kimiywe, J. O., & Waudo, J. N. (2019). Barriers to dietary and lifestyle adherence among type 2 diabetic patients in a rural Kenyan hospital. Journal of Nutrition and Metabolism, 2019, Article 8973847. https://doi.org/10.1155/2019/8973847
19. Mendenhall, E., Kohrt, B. A., & Norris, S. A. (2020). Noncommunicable disease syndemics: Poverty, depression, and diabetes among low-income populations. The Lancet, 395(10217), 28–39. https://doi.org/10.1016/S0140-6736(19)32503-X
20. Oyebode, O., Kandala, N. B., Chilton, P. J., & Lilford, R. J. (2016). Use of traditional medicine in middle-income countries: A WHO-SAGE study. Health Policy and Planning, 31(8), 984–991. https://doi.org/10.1093/heapol/czw022
21. Powers, M. A., Bardsley, J. K., Cypress, M., Funnell, M. M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E. D., Maryniuk, M. D., Norton, A., Rinker, J., Siminerio, L. M., & Uelmen, S. (2020). Diabetes self-management education and support in adults with type 2 diabetes: A consensus report of the American Diabetes Association. Diabetes Care, 43(7), 1636–1649. https://doi.org/10.2337/dci20-0023
22. Saeed, H., Saleem, Z., Naeem, R., Shahzadi, I., & Islam, M. (2018). Impact of health literacy on diabetes outcomes: A cross-sectional study from Lahore, Pakistan. Public Health, 156, 8–14. https://doi.org/10.1016/j.puhe.2017.12.005
23. Sallis, J. F., Owen, N., & Fisher, E. B. (2008). Ecological models of health behavior. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), Health behavior and health education: Theory, research, and practice (4th ed., pp. 465–485). Jossey-Bass.

24. Seligman, H. K., & Schillinger, D. (2010). Hunger and socioeconomic disparities in chronic disease. New England Journal of Medicine, 363(1), 6–9. https://doi.org/10.1056/NEJMp1000072
25. Sharma, T., Kalra, J., Dhasmana, D. C., & Basera, H. (2019). Poor adherence to treatment: A major challenge in diabetes. Journal of Indian Academy of Clinical Medicine, 20(1), 2–5.
26. Strecher, V. J., & Rosenstock, I. M. (1997). The Health Belief Model. In K. Glanz, F. M. Lewis, & B. K. Rimer (Eds.), Health behavior and health education: Theory, research, and practice (2nd ed., pp. 41–59). Jossey-Bass.
27. Walker, R. J., Smalls, B. L., Campbell, J. A., Strom Williams, J. L., & Egede, L. E. (2014). Impact of social determinants of health on outcomes for type 2 diabetes: A systematic review. Endocrine, 47(1), 29–48. https://doi.org/10.1007/s12020-014-0195-0
28. World Health Organization. (2003). Adherence to long-term therapies: Evidence for action. World Health Organization. https://apps.who.int/iris/handle/10665/42682
29. Zullig, L. L., Gellad, W. F., Moaddeb, J., Crowley, M. J., Shrank, W., Granger, B. B., Granger, C. B., & Bosworth, H. B. (2020). Improving diabetes medication adherence: Successful, scalable interventions. Patient Preference and Adherence, 9, 139–149. https://doi.org/10.2147/PPA.S69651
30. Zullig, L. L., Gellad, W. F., Moaddeb, J., Crowley, M. J., Shrank, W., Granger, B. B., Granger, C. B., & Bosworth, H. B. (2020). The growing burden of financial toxicity for patients with diabetes. Diabetes Care, 43(5), e73–e74. https://doi.org/10.2337/dc20-0043