Exploring the Role of Information Management in Connecting Economic Health Status and Health Outcomes

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Abstract:

Health information behavior (HIB) of chronic patients is influenced by several inter-related factors such as economic, psychological and social factor. Economic health status (EHS) is emerging as a critical determinant that affects the ability of patients to access and manage health information that in turn impacts general health outcomes (HO). The prolonged nature of chronic diseases imposes sustained physical and economic burden. It requires constant self-management and continuous engagement with health information to prevent complications. This study examined the relationships among health information management (IM) and health outcomes (HO) in patients with chronic cardiac disease, diabetes, and hypertension. Aligning the health belief model (HBM) framework, EHS is conceptualized as a perceived barrier that limits an individual's ability to manage health information. EHS operationalized as monthly income and household family size is hypothesized to have a direct influence on health outcomes as well as an indirect influence on health outcomes through the mediation role of information management. Data were collected by a structured questionnaire from the patients attending five major hospitals of the city of Lahore, Pakistan. Partial Least Squares Structural Equation Modeling (PLS-SEM) was performed by using Smart PLS software version 4.1.1 to determine the measurement and structural models. The results suggest that economic health status does exert a significant impact on the ability of patients to manage health information effectively. The research highlights the possible importance of reducing economic barriers and enhancing health information management skills as a pathway to better health outcomes.

Introduction

Chronic diseases are a major health concern that causes mortality and raises healthcare expenditures throughout the world(Wilder et al., 2021). Conditions such as hypertension, cardiovascular disease, and diabetes require constant monitoring and ongoing patient engagement outside of the formal healthcare setting(Hardman et al., 2020). Effective management depends not only on the availability of health services but also on the ability of patients to access, understand and make use of health information to make appropriate decisions regarding their own health (Howell et al., 2021). Health information behavior has become an essential part of chronic illness management. Chronic patients use a wide range of information sources such as digital platforms, social networks, and consult healthcare providers(Donald et al., 2019). The ability to distinguish reliable sources and to contextualize information appropriately is important in symptom control and treatment adherence. However, engagement with health information differs among patients as a result of more general structural and socioeconomic determinants (Reynolds et al., 2018). Economic health status (EHS) is an important predictor of health information behavior. Financial constraints can limit the availability of healthcare services and resources, which can in turn limit the ability of patients to access and utilize health information(Adams, 2010). Economic hardship therefore, creates not only material limitations but also informational barriers which hinder

people's participation in healthcare systems(Jeon et al., 2009). Although specific empirical evidence has provided the connection between socioeconomic conditions and health disparities, the mechanisms by which EHS impacts health situations with chronic patients is not implicit enough (Janeice Morgan & Eileen, 2013).

The health belief model (HBM) carries a functional theoretical model for understanding these mechanisms (Rosenstock & Ph, 1960). Within the HBM, EHS is conceptualized as a perceived barrier that inhibits the ability of patients to engage in health-promoting behaviors, which include effective health information management(Zhao et al., 2022). When economic resources are limited, patients can be at risk of encountering problems with access to health information, the evaluation of treatment recommendations, or the ability to self-adherently perform self-care practices. These challenges, in turn, affect health outcomes, even in the presence of appropriate medical facilities (Sulat et al., 2018). Prior literature has documented associations between economic status and health outcomes but limited studies were found to investigate the mediating role of health information management in this relationship, particularly among chronic disease populations in low- and middle-income countries (Schwarz et al., 2022). Moreover, limited attention has been given to operationalizing economic health status in ways that reflect household-level constraints relevant

to chronic disease management (Hardman et al., 2020). Addressing this gap, this paper offer a profound insight into prior literature by positioning EHS as a central determinant of health IM and HO by a theory-driven, mediation-based model to examine the direct effects of economic health status measured through monthly income and household family size on health outcomes. By integrating economic dimensions into the Health Belief Model, this study adds an empirical contribution in literature on health information behavior and chronic disease management.

However these variables are often studied in the light of applicability as a contextual feature and not as an integral part of explanation model. Also, household family size (HFS) despite its centrality in shaping information-sharing and caregiving practices in the familial setting, has received minor attention. The current investigation also contributes to the health information-behavior literature and offers useful implications to reduce economic disparities in chronic disease outcomes. The results are projected to impart practical knowledge for costs to policymakers, doctors, and health care providers in order to address the creation of a directed health literacy interventions and supportive structures in order to support information management competencies among chronic disease patients, especially those facing financial hardship and massive household responsibilities.
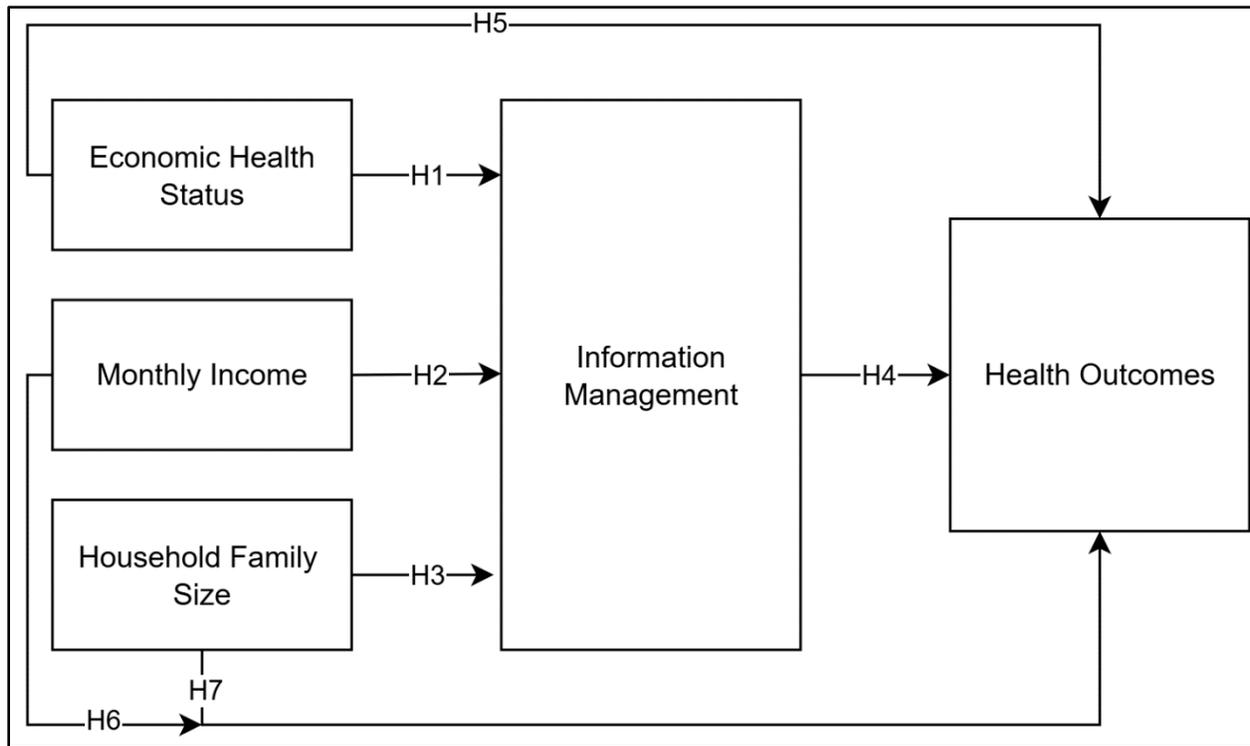
Theoretical framework

Figure 1. *The Proposed conceptual model of the study*

Figure 1 shows the hypothetical framework used in this study which is based on the health belief model (HBM). The study emphasizes the relationship between perceived barriers and the economic health status (EHS) of patient. Within this framework, EHS is postulated as a major manifestation of perceived economic barriers influencing the health behaviors of chronically ill patients and eventually affecting health outcomes (HO). EHS meant to provide financial security and stability of the patients. The purpose of the model is to show that EHS has both direct and indirect impacts on health information management (IM) and HO. Accordingly, the perception of barriers is expected to promote health promoting behaviors which subsequently result in enhancement of HO. IM is conceptualized as a core behavioral mechanism which links economic conditions to HO. Effective IM helps

patients understand their medical instructions, monitor symptoms, and interact with healthcare providers to cope symptom of disease.

The model also takes into account the impact of monthly income (MI) and household family size (HFS) as contextual economic indicators of perceived barriers, which are presumed to be diminished unless it significantly affects the EHS of patients. This framework underscores that perceived barriers along with demographic variables exert a dominant influence on HO. Collectively, the theoretical construct focus on perceived barriers as the major explanatory path for the interaction between information behaviors and EHS to influence HO, in line with HBM. The following hypotheses are therefore put forward to test empirically the hypothesized relationships between EHS, IM and HO.

Hypothesis development

H1: Economic health status has a significant relationship with Information management

Economic health status (EHS) contributes significantly in promoting health information for chronic patient. Constant EHS leads to a reduction in perceived barriers so patients can access, organized and use health information (Anuar et al., 2020). The finding suggests that perceived economic stability is more influential than financial indicators to promote health information behaviors. Building on this relationship, the next hypothesis is to examine the relationship between monthly income and information management.

H2: There is a significant relationship between monthly income and Information management

Monthly income (MI) is considered as one of the major economic resources which affect patient's access to reliable healthcare sources and services. Individuals with enhanced incomes can have access to the necessary resources such as online health platforms, electronic health records, and mobile applications (Schwarz et al., 2022). MI is appears to be economic barrier, that change patients response towards health-related behaviors. Accordingly, it is hypothesized that MI has an important relationship with health IM of chronic patients(Jeon et al., 2009). But it is not true in this study as outcome of the study does not support this hypothesis and it suggests that monthly income alone does not have any direct significant effect on the practices of IM.

H3: Household family size and its relation with the information management

Household family size is the structural context for the management of health information behavior among patients. Previous studies have

shown that family members contribute to the understanding of health information and decision-making amongst chronic patients (Slade et al., 2015). Larger families may be able to pay for emotional support, share decision-making, and help with the management of medical data (Seeman, 2000). Nonetheless, the results of this research do not support this hypothesis of H3, thus it seems that household family size alone does not substantially influence the management of information. Although the family structures are relevant, we seem to find that the sheer dynamic influence of the family is inadequate without structures of lasting economic stability and information support. The importance of these behaviors on health outcomes is yet to be studied.

H4: Information management and its correlation with health outcomes

A body of prior research consistently shows that good information management is linked with better treatment and better outcomes of patients with chronic conditions (Wang et al., 2004).Patients that manage health information are able to better understand medical advice and make informed health decisions which contribute to controlling symptoms and improving health (Longo et al., 2010).The results clearly prove this hypothesis and that health information management promotes better self.-care practices and treatment plans of patients (Merati-Fashi et al., 2022). This generates benefits of information management that lead to better health outcomes.

H5: Economic health status and its association with health outcome

This hypothesis puts in association the economic health status and the health outcomes. Findings

show that economic stability also plays a major role in the ability of patients to manage their health information and achieve better health outcomes (Sugisawa et al., 2019). The results demonstrate that economic stability boosts the capacity of coping with healthcare expenditures and play a decisive role in determining the results beyond isolated economic pressures (Janeice Morgan & Eileen, 2013). Improved economic health status lowers perceived financial barriers, thus facilitating access of healthcare services for chronic patients (Kristofferzon et al., 2018). Therefore, there is a direct link between the overall economic well-being of patients and improved health.

H6: Monthly income has a significant relationship with Health outcomes

Monthly income was hypothesized to have a significant relationship with health outcomes (Ettner, 1996). But the findings of this study specified that monthly income did not exert a statistically significant influence on health outcomes. This proposes that income, when considered as an isolated economic indicator, may not effectively capture the perceived economic barriers that impact HO. Although previous literature places of interest to income as a vital determinant of health, the results

Methodology

This study adopts a quantitative research design to determine the relationships among economic health status (EHS), health information management (IM), and health outcomes (HO). The target population comprised chronic diabetes, hypertension, and heart disease patients. Primary data were distributed through purposive sampling via a structured questionnaire to ensure the inclusion of respondents with diagnosed chronic conditions,

indicated that EHS, including financial stability and perceived economic security, may be more noticeable in shaping health outcomes (Matthew & Brodersen, 2018). These findings suggest that chronic patients with similar income levels may experience different health outcomes depending on their economic capacity and resilience to manage health. Therefore, monthly income alone appears insufficient to explain variants in health outcomes without seeing mediating behavioral mechanisms and economic aspects.

H7: Household family size has a significant relationship with Health outcomes

Household family size was assumed to have a significant relationship with health outcomes, the findings indicate that the effect was not statistically significant (Ahnquist et al., 2012). While HFS may affect affordability and caregiving dynamics. These issues alone do not appear to directly interpret improved or poorer outcomes without the presence of behavioral mechanisms(Slade et al., 2015). The results indicated that EHS and IM are more critical in shaping HO, this align with the HBM's focus on perceived barriers. Subsequently, HFS alone may not explain health outcome disparities among chronic patients.

who regularly interact with health information and living with the condition at least six months. The population was selected from five large public and private hospitals located in Lahore, Pakistan. The reason behind the choice of these hospitals is that they have a high number of patients and have special outpatient services that deal with chronic diseases management. The participants were made aware of the aim of the study, and voluntary consent was taken

before administering the questionnaire. The data collection was done with confidentiality and anonymity. The process of data gathering was supported by the administration and the staff of the hospitals. The data obtained were tested by using Partial Least Squares Structural Equation Modeling (PLS-SEM). Because it was appropriate

in predictive research models, mediation analysis, and non-normal data distribution. The analysis was made in two steps, measurement model evaluation and assessment of structural model. The significance of path coefficients and mediation effects was tested by using bootstrapping with 5,000 resamples.
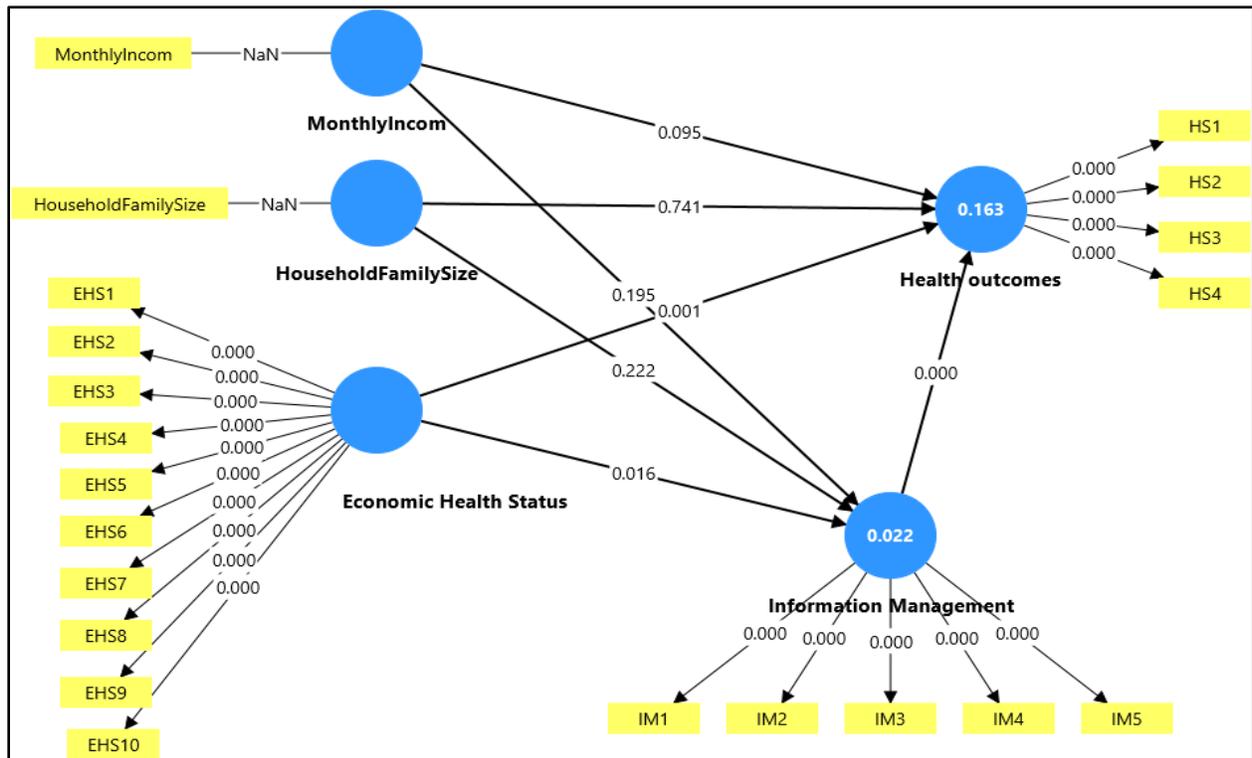
Results and Discussion

Figure 2. *Path analysis*

Measurement Model Assessment

To determine reliability and validity of the constructs, the measurement model was tested. Internal consistency reliability was measured by the Cronbach's alpha and composite reliability,

and the value of both was found to be over the recommended value of 0.70. Convergent validity was ensured because average variance extracted (AVE) values were greater than 0.50, meaning that the indicators were sufficient to explain the variance.

Table 1
Measurement model

Constructs	Loadings	Cronbach's α	CR	AVE
Economic Health Status		0.930	0.942	0.614

EHS1	0.750			
EHS2	0.827			
EHS3	0.791			
EHS4	0.826			
EHS5	0.756			
EHS6	0.808			
EHS7	0.814			
EHS8	0.759			
EHS9	0.839			
EHS10	0.646			
Information Management		0.892	0.911	0.697
IM1	0.743			
IM2	0.829			
IM3	0.856			
IM4	0.873			
IM5	0.866			
Health outcomes		0.796	0.838	0.620
HO1	0.778			
HO2	0.853			
HO3	0.676			
HO4	0.830			

Note. CR: composite reliability; AVE: average variance extracted; EHS: economic health status IM; information Management; HO: health outcomes values above 0.70 indicate acceptable reliability.

All the constructs had higher values of Cronbach's alpha and composite reliability than 0.70, which showed the presence of internal consistency. AVE values that are greater than 0.50 suggest that the indicators are sufficient to explain their underlying constructs and concur with the validity of construct-convergent. This makes the measurement model reliable to analysis structure. The high factor loadings and AVE values propose that the indicators sufficiently capture their particular latent constructs, supporting the robustness of the model in explaining the relationships among EHS, IM, and HO in chronic patients.

Table 2

HTMT0.85 ratio (Discriminant validity)

Construct	EHS	HO	HFS	IM	MI
EHS	0.166	0.034			
HO	0.030	0.75			

Construct	EHS	HO	HFS	IM	MI
HFS	0.137	−0.48	0.79		
IM	0.354	−0.44	0.66	0.77	
MI	0.166	−0.39	0.69	0.63	0.80

Note. EHS: economic health status IM; information Management; HO: health outcomes; HFS: household family size; MI: monthly income

The Fornell–Larcker criterion was used to check the discriminant validity by linking the square root of each construct's AVE with its relationship with other constructs. , which showed that all the constructs were different and measured different concepts. The obtained results prove that the measurement model was reliable and valid to be subjected to further structural analysis. The results indicates the diagonal values for every constructs were greater than inter-construct correlations. For example, the AVE for economic health status exceeds its correlations with health outcomes, HFS, IM, and MI, demonstrating that EHS shares more variance with its own indicators. Likewise, HO establishes strong discriminant validity, as its diagonal value is greater than correlations with EHS, HFS, IM, and MI. IM also fulfils the criterion, with a square root of AVE, exceeding its correlations with EHS, HO, HFS, and MI. These results confirm that all constructs are empirically distinct, minimizing concerns of multicollinearity and construct overlap.

Structural Model Results

The structural model tested the postulated relationships between economic health status, information management, and health outcomes. The findings showed that health EHS positively influenced IM in a significant way. Information management showed a strong positive relationship with HO, which showed that successful management and utilization of health information may lead to improved health status and management of the disease.

Table 3

Path analysis direct effect

Hypothesized path	β	T statistic	P value
EHS>HO	-0.170	3.301	0.001
EHS>IM	0.137	2.414	0.016
HFS>HO	0.015	0.330	0.741
HFS>IM	-0.064	1.223	0.222
IM>HO	0.368	8.400	0.000
MI>HO	0.070	1.671	0.095
MI>IM	-0.062	1.297	0.195

Note. β = path coefficient; EHS = Economic health status; IM = Information management; HFS = House hold family size; HO = Health outcomes; MI= Monthly Income

The direct relationships between economic health status, household family size, monthly income, information management, and health outcomes among chronic patients. The results indicated that not all economic and demographic factors directly influence HO or IM. EHS has a significant direct effect on health outcomes suggesting that poorer EHS is associated with worse outcomes. It also positively influences IM indicating that economically stable patients better access, and utilize health information.IM is a strong predictor of HO highlighting its role in treatment adherence. In contrast, HFS does not significantly affect HO or IM, suggesting that family quantity alone does not capture social

support or caregiving quality. Likewise, MI demonstrates no significant relationship on health outcomes or IM indicating monthly income alone may not reflect long-term economic security. The quality of family support and guidance can have a more decisive impact than having more members at home. Therefore, household size might not be sufficient to reflect the social processes influencing patient involvement in health information. These results underscore that EHS is more significant construct than isolated economic indicators, and that refining chronic patients' health outcomes needs both economic and information management capability.

Table 4

Indirect Effect mediation analysis

Hypothesis	Path	Beta	T statistics	P values	Effect size
H2	EHS -> IM -> HO	0.051	2.299	0.022	Significant
H5	MI -> IM -> HO	0.023	1.261	0.207	Not Significant
H6	HFS->IM->HO	-0.023	1.167	0.243	Not Significant

Note. β = path coefficient; EHS = Economic health status; IM = Information management; HFS = House h

Using the bootstrap methods the mediating role of information management (IM) in the relationship between economic-health status (EHS) and health outcomes (HO) was investigated. Among the indirect effects evaluated, IM partially mediated the EHS and HO relationship (β = 0.051, t = 2.299, p = 0.022), which shows that people with stable economic health have the capacity to manage information, thereby improving their health outcomes. Conversely, the indirect effects of motivational

intensity monthly income (MI) and health management with household family size (HFS) via IM were not significant, indicating that these variables did not show a substantive influence on health outcomes through IM. These results highlight the key importance of EHS as a perceived barrier, taking into consideration its impact on HO mediated by the efficient management of information.

Key Findings

This study examined the relationship between economic health status (EHS) and health outcomes (HO) with information management (IM) as the mediator between the household family size (HFS) and monthly income (MI).

The results revealed a differentiated relationship by indicating that not all demographic and economic factors exert a direct impact on HO or IM behavior. The findings verified that information management considerably mediates the relationship between EHS and HO (β = 0.051, t = 2.299, p = 0.022) while no mediation was found for MI (β = 0.023, t = 1.261, p = 0.207) because it does not capture long-lasting economic stability or perceived financial stress. Moreover the results of HFS (β = −0.023, t = 1.167, p = 0.243) signifying that family structure affects HO through psychosocial support instead of IM. Furthermore, EHS enhances patients' ability to obtain and evaluate health information and improves outcomes. Generally, these findings highlight the key role of IM, which is most active inside the broader context of economic well-being. The evidence suggests that economic health status (EHS) is an important predictor of financial indicators only. Consequently, the present study has added to the literature of health information behavior by bringing out the combined influence of EHS and information management (IM) on health outcomes among chronic patients. The results imply that attempts to improve health outcomes of chronic disease management can go beyond income-based stratifications and instead focus on strengthening the overall economic stability of patients as well as their ability to manage health information. Strengthening the competencies of patients in accessing and using

health information can result in informed decision-making thereby improving quality of life of chronic patients.

Limitations and Practical Implications

This study has various limitations that need to be taken into account in interpreting the study findings. This research is part of a larger doctoral thesis, as such, necessary limitations of variables and depth of analytical techniques had to be kept in mind, which could potentially limit inclusion of other theoretical constructs or related factors. Secondly, the use of a quantitative survey design has a drawback of narrowing down on the ability of establishing pivotal relationship between EHS, IM, and HO, therefore, it is mandatory future longitudinal studies to examine these relationship over time.

Third, the use of self-reported measures may be prone to social desirability or recall bias especially in the measurement of EHS and HO. To help reduce these issues, the current research would suggest that future research must utilize longitudinal designs with repeated data collection over time and thus reduce the problem of recall bias and provide stronger findings regarding the temporal relationships of the information-seeking behavior of patients. Moreover, the study sample was obtained from a specific context of chronic patients, so their feasibility the obtained results to other populations or healthcare systems may limit to some extent. In addition, some key economic indicators were also examined; moreover, other relevant factors, such as health insurance coverage, educational programs and digital literacy were not considered in this study, which are all potential subjects for future research.

Despite these limitations, the results of this study have some important implications for policy makers, healthcare practitioners, or those who work with chronic patients in information professions. Practical implications are the need for strengthening information management skills of patients through workshops, the establishment of structured health literacy programs and counselling according to the economic context.

Policymakers should consider that economic health goes beyond income, including insurance coverage, economic stability, access to medication and access to digital tools. Libraries and information centers should establish digital platforms to support patients by curating accessible, reliable and culturally authentic sources of health information. Furthermore, to avoid discrimination digital interventions should be accessibility and usability oriented. Lastly, interventions for the perceived economic health and the IM capacity of patients rather than relying on demographic characteristics or income should be done to ensure better health outcomes and informed decision-making among the chronic patients.

Conclusion

The current study attempted to investigate the relationship between economic status of health (EHS), monthly income (MI), household family size (HFS) and health outcomes (HO) among people with chronic illnesses with particular focus on the mediating role of information management (IM). Using Partial Least Squares Structural Equation Modeling (PLS-SEM), analyses showed statistically significant proof that economic conditions influence health outcomes.

The results determined that EHS is a key determinant of both IM and HO. EHS had a strong direct impact on HO and a positive impact on IM, indicating that a more general dimension of financial stability (and not just separate measures of income) plays a key role in determining the pattern of patient's health. On the other hand, MI and HFS did not show any statistically significant direct or indirect impact, which suggests that these indicators alone are not sufficient to explain differences in health outcomes among any chronic patients. Economic and household factors may shape patients' access to support systems that facilitate health information engagement, even if their direct statistical effects are not significant in the model. Notably, IM was found to be a strong predictor of HO and to mediate significantly the relation between EHS and HO. This finding indicates that IM is a behavioral mechanism by which economic conditions affect the capacity of patients to manage chronic illness and follow treatments effectively. The lack of mediation effects for MI and HFS is further evidence of the salience of perceived and practical economic well-being over demographic or even purely economic indicators.

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