

Determinants of Health Literacy in Cardiovascular Patients: Evidence from a Cross-Sectional Study

Ghulam Farid

Senior Librarian, Shalamar Medical & Dental College; PhD Scholar, Institute of Information Management, University Lahore, Punjab, Pakistan
Email: css_bcs@yahoo.com

Musfica Tanzin

Lecturer, Institute of Information Sciences, Noakhali Science and Technology University, Bangladesh Email: musfica.iis@nstu.edu.bd

Dr. Ferhana Saeed Hashmi

Assistant Professor, School of Information Management, Minhaj University Lahore, Punjab, Pakistan Email: ferhana.lis@mul.edu.pk

Muhammad Nadeem Akhtar

Head, Main Library & IT Department, Ayub Agricultural Research Institute, Faisalabad, Pakistan Email: ch.nadeem@aari.punjab.gov.pk

Misbah Jabeen (Corresponding Author)

Department of Information Management, University of Home Economics, Lahore, Pakistan Email: misbah.jawwad@yahoo.com

Prof. Dr. Khalid Mahmood

Pro Vice Chancellor, University of the Punjab, Pakistan Email: khalid.im@pu.edu.pk

Sidra Batool

Technical Librarian, Ayub Agricultural Research Institute, Faisalabad, Pakistan
Email: sidra.batool@aari.punjab.gov.pk

Sadaf Iftikhar

Librarian, Higher Education Department, Lahore, Punjab, Pakistan
Email: sadafiftikhar105@gmail.com

Abstract

Background: Health literacy is significant in treatment of cardiovascular diseases because the patients should get to know health-related information, understand how best to communicate with the health practitioners and to make informed decisions regarding treatment. This report set out to evaluate domain-specific health literacy and find demographic and clinical predictors in cardiac patients.

Methods: A cross-sectional study was performed with 105 cardiac patients in Mayo Hospital Lahore that is a hospital-based study. A functional, interactive, and critical health literacy structured close-ended questionnaire was used to collect the required data. The descriptive statistics were employed to describe patient characteristics and literacy scores. Comparative statistical tests were used to the differences in demographic groups and different predictors of health literacy were estimated using the multivariate regression analysis.

Results: Patients of lower age and with higher level of

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Corresponding E-mail & Author*:

Misbah Jabeen

Department of Information Management, University of Home Economics, Lahore, Pakistan
Email: misbah.jawwad@yahoo.com

education scored considerably better in all areas of health literacy ($p < 0.05$). Functional literacy presented larger mean scores than interactive and critical literacy. The multivariate regression analysis found that patient-centered communication ($B = 0.47$, $p = 0.001$) and education level ($\beta = 0.42$, $p = 0.001$) and social support ($\beta = 0.29$, $p = 0.002$) were significantly related to health literacy and the older age, diabetes mellitus, and low income were associated with poorer literacy levels.

Conclusion: Demographic, social and clinical factors affect health literacy of cardiac patients. Patient-centered communication and education provision can be enhanced and help increase health literacy and cardiovascular disease management.

Introduction

Cardiovascular diseases (CVDs) are among the leading causes of morbidity and mortality in the global arena and a primary problem in healthcare in most healthcare systems, especially in the developing countries. Cardiovascular conditions involve significant self-care practices and all the patients should be engaged in self-care practices that will lead to effective management of the condition, including drug compliance, lifestyle changes, symptom checking and follow-ups with healthcare providers. These activities will rely highly on the capacity of a patient to comprehend, assess and utilize information related to health, also known as health literacy (1-5).

Health literacy is a concept that has many dimensions that involve functional, interactive, and critical literacy required to access, comprehend, critique and use health information so as to make the right health-related choices. Functional health literacy means the skill to read simple medical instructions and understand them, whereas interactive health literacy means the skill to communicate with healthcare professionals and participate in healthcare decision-making. Critical health literacy is the highest tier of literacy and consists of the possibility to critically evaluate health facts and make a decision based on the analysis of the information (4-8).

Past studies have established the fact that low health literacy leads to poor management of the disease, low pharmaceutical compliance, high hospital readmission rates, and high healthcare expenses in patients with chronic diseases, such as cardiovascular disease. When the health literacy of patients is poor, they can find it difficult to follow more complex treatment regimens, understand the prescriptions that they are provided, or notice the onset of complications. Therefore, determining the factors that determine the level of health literacy is critical in enhancing patient outcomes and effectiveness of the healthcare interventions (6-10).

The health literacy might be affected by a number of demographic, socioeconomic, and clinical factors. Such determinants of literacy skills have been reported to include age, education level, socioeconomic condition, and comorbidities including diabetes. Moreover, patient centred communication and social support can also be very important towards enhancing the capacity of the patients to comprehend and apply health information. Nevertheless, there is a limited amount of evidence related to domain-specific health literacy and predictors of the same among cardiac patients in the tertiary care environment (11-12).

Knowledge of the healthcare literacy in various domains and groups of people may assist healthcare providers to create specific interventions and enhance patient self-education and disease management outcomes. Thus, the evaluation of the pros and cons of health literacy in cardiac patients is relevant with the aim of developing an effective communication plan and enhancing the outcomes of cardiovascular treatment. This research was meant to determine the rates of functional, interactive and critical health literacy in a cardiac patient and to determine demographic, socioeconomic and clinical risk factors linked to health literacy in a tertiary care facility.

Research Objectives

To determine the comparison between functional, interactive, and critical levels of health literacy of the various demographic groups of cardiac patients

To determine demographic, socioeconomic and clinical predictors of health literacy in cardiac patients

Methods

Study Design

The study involved a cross-sectional analytical study at a hospital to determine domain-specific health literacy and the predictors of cardiac patients in the form of demographic, social, and clinical factors. The cross-sectional design was advantageous to analyze the relationships between health literacy domains and possible factors motivating them at one point of time.

Study Setting

The research was conducted in Mayo Hospital Lahore which is among the largest tertiary-care state hospitals of Pakistan. The hospital specializes in the provision of cardiology services to a vast population of urban and rural, Punjab and other nearby areas. The data was gathered among patients that were visiting the cardiology outpatient department and the cardiac inpatient units.

Study Population

The study population was used as a target and comprised adult patients with cardiovascular diseases who were undergoing treatment at the cardiology department at the time of the study.

Inclusion Criteria

The criterion used to select the participants was that they:

Were 18 years of age or older

Got a confirmed diagnosis of a heart disease like coronary artery disease, heart failure or even valvular heart disease.

Was at least three months in the treatment process.

Could speak either English or Urdu.

Gave informed consent to get involved in the study.

Exclusion Criteria

Patients were not included who:

Has severe cognitive impairment/psychiatric illness.

And were critically ill and could not fill questionnaire.

Declined participation

Sample Size and the Sampling Method.

The sample size was 105 cardiac patients. This sampling technique was a non-probability consecutive method of recruitment, where the sample was enlisted in order of assessments, approaching the eligible patients in the cardiology department during the data collection period until the desired number of representatives was derived.

Data Collection Procedure

The cardiology units were visited and the eligible patients were approached after getting administrative support of the hospital authorities. Participants were informed of the purpose of the study and informed consent was signed in writing. The surveys were conducted in a confidential environment where the questionnaires were privately filled in to guarantee privacy and responding truthfully. The time of the interview took 1520 minutes each.

Statistical Analysis

The data were analyzed and put into SPSS software (version 26). The descriptive statistics involving frequencies, percentages, mean, and standard deviations were utilized to summarize the demographic features and scores in the health literacy domains. Inferential statistical tests were done to test the relationships between variables: The comparison of health literacy domains across demographic groups was done by the use of independent sample t-test and analysis of variance (ANOVA). It was analyzed in terms of Pearson correlation to determine the correlations between health literacy in relation with other variables. A multivariate linear regression analysis was done to determine the predictors of overall health literacy. A p-value of below 0.05 was taken to be statistically significant.

Results

The comparison of health literacy domains between demographic groups on the 105 cardiac patients is in Table 1. The findings indicate that the scores of patients under 60 years were higher in all the health literacy area than patients aged 60 years and above. In particular, younger patients rated functional literacy (3.82 ± 0.61), interactive literacy (3.34 ± 0.77) and critical literacy (2.95 ± 0.73) as higher compared to the scores of older patients in the same way. The statistical significance of the difference between age groups was $p = 0.021$, which implies that the age factor can have a negative impact on health literacy abilities.

On gender, males had a higher mean score on functional ($3.77, 0.66$), interactive ($3.25, 0.80$) and critical literacy ($2.88, 0.79$) than female patients. Nonetheless, no statistically significant differences between males and females were noted ($p = 0.134$), and it means that the gender does not seem to be such an influential factor in determining health literacy among this population.

Health literacy domains were most related to education level. In all dimensions of literacy such as functional literacy ($3.96, 0.55$), interactive literacy ($3.48, 0.72$) and critical literacy ($3.05, 0.70$), patients of higher educations had the highest scores. Conversely, no-formally educated patients registered the lowest scores in these spheres. The relationship between education level and health literacy was very significant ($p < 0.001$) which proves the significant role of educational attainment in determining the capacity of the patients to understand, communicate, and critically interpret health information.

Table 1. Health Literacy Domain Comparison by Demographic Groups (n = 105)

Demographic Variable	Group	Functional Literacy (Mean $\pm$ SD)	Interactive Literacy (Mean $\pm$ SD)	Critical Literacy (Mean $\pm$ SD)	p-value
Age	< 60 years (n=60)	3.82 ± 0.61	3.34 ± 0.77	2.95 ± 0.73	0.021
	≥ 60 years (n=45)	3.63 ± 0.69	3.05 ± 0.84	2.63 ± 0.81	
Gender	Male (n=68)	3.77 ± 0.66	3.25 ± 0.80	2.88 ± 0.79	0.134
	Female (n=37)	3.69 ± 0.71	3.17 ± 0.83	2.79 ± 0.82	
Education	Higher education (n=30)	3.96 ± 0.55	3.48 ± 0.72	3.05 ± 0.70	<0.001
	Primary/Secondary (n=49)	3.71 ± 0.67	3.19 ± 0.81	2.82 ± 0.77	
	No formal education (n=26)	3.48 ± 0.74	2.91 ± 0.86	2.54 ± 0.83	

Note: Functional Literacy: Understanding basic health information, Interactive Literacy: Communicating with healthcare providers, and Critical Literacy: Evaluating and making health decisions

Figure 1 shows the prevalence rates of the overall health literacy of the cardiac patients participating in the study. Most of the participants displayed moderate health literacy then the moderate literate patients came next with the poor health literacy being lower. This distribution implies that even though a significant portion of patients has an adequate knowledge of the health-related information, a significant proportion of them still have problems with the effective interpretation and use of the health information.

Clinically, it is also significant that patients with unsatisfactory health literacy can have a variety of negative effects, including the lack of medication adherence, inability to follow instructions on managing the disease, and the inability to identify the symptoms on time. These results have pointed to the necessity of specific educational interventions to increase health literacy in cardiac patients.

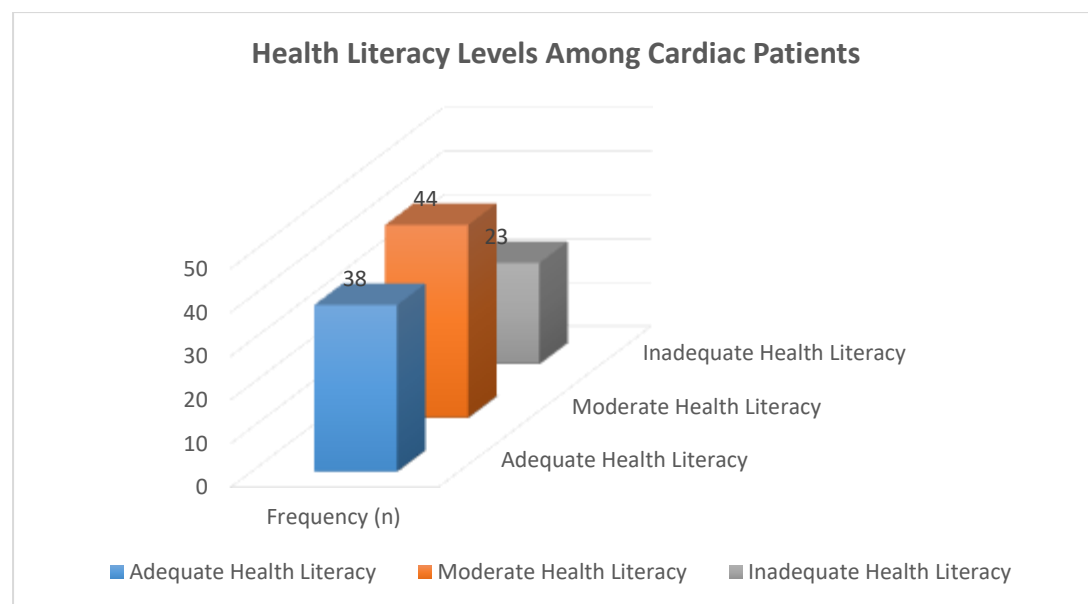


Figure 1: Health Literacy Levels among cardiac patients

The findings of the table 2 multivariate regression model that was used to study predictors of health literacy among cardiac patients are provided in table 2. It was shown that patient centred communication had the strongest positive correlation with health literacy ($\beta = 0.47$, $p < 0.001$). This means that the patients have a high chance of comprehending and utilizing the information about their health when the medical professionals interact with them in a clear manner as well as involve them in the decision-making process.

Table 2. Multivariate Regression Analysis Predicting Health Literacy Among Cardiac Patients (n = 105)

Predictor Variable	β Coefficient	Standard Error	p-value
Patient-centered communication	0.47	0.08	<0.001
Education level	0.42	0.07	<0.001
Social support	0.29	0.09	0.002
Age ≥ 60 years	-0.21	0.1	0.021
Diabetes mellitus	-0.18	0.09	0.039
Low-income status	-0.24	0.08	0.004

The level of education also demonstrated a strong positive correlation with health literacy (β 0.42, $p < 0.001$), which supports the fact that educational level plays a significant role in enhancing patients in terms of their capability to interpret and apply medical data. On the same note, social support showed a critical impact on health literacy (β 0.29, $p = 0.002$), and this implies that family members and social networks can support patients to comprehend healthcare guidelines and mantras to find their way in medical systems better.

On the other side, there are a number of factors that were linked to reduced health literacy. There was an inverse relationship between old age (unless the age is less than 60 years) and health literacy ($\beta = -0.21$, $p = 0.021$) implying that the elderly patients might have a higher difficulty in accepting health information. There was also a negative relationship with diabetes mellitus ($\beta = -0.18$, $p = 0.039$), presumably because it is difficult to cope with multiple medications and lifestyle changes. Also, low-income was an important negative predictor of health literacy ($\beta = -0.24$, $p = 0.004$), which shows that socioeconomic differences affect access to health information and healthcare resources. In general, the findings of the regression indicate that communication factors, education experience, social support and socioeconomic conditions are associated and affect health literacy of cardiac patients.

Discussion

This paper explored the domain-specific health literacy rates and demographic and clinical predictors of domain-specific health literacy rates in cardiac patients. The results indicated high levels of diversity in all aspects of health literacy and have found some of these factors related to better or poor literacy levels. Generally speaking, functional literacy demonstrated a comparatively better score than interactive and critical literacy which may indicate that patients could comprehend simple health-related information, yet might have difficulties with more complicated analytical and decision-making processes.

The study at hand discovered that young patients had high functional, interactive, and critical health literacy levels as opposed to 60 years and above. This observation can be correlating with numerous past researches that have already found that older adults have lower health literacy because of the age-related cognitive impairment, a paucity of health education, and low digital literacy. There are also chances of increased difficulties in understanding detailed medical information and getting through health care systems by old people (11-15). Nonetheless, various studies have also indicated contradictory results and that old-aged patients might have a higher health literacy level owing to their past life experiences and past experience of receiving healthcare services. These contradictory findings suggest that the effect of age on health literacy can be dependent on contextual information including level of education, access to health care, and culture (13-18).

The difference in gender, in terms of health literacy, was not found to be significant in this study, with the male participants being slightly higher on the mean scores with all the literacy domains. Such results are in line with the arguments of other studies indicating that gender may not be a good independent determinant of health literacy under other conditions of consideration like education and socioeconomic status. Nevertheless, a portion of the studies have found that female patients were more health literate, especially in subjects regarding involvement in healthcare and preventive health behaviours (19-23). These discrepancies might be the differences in the healthcare utilization among populations and their social people.

It was found in this study that education level is one of the strongest predictors of health literacy. Patients who had a higher education level had much more functional literacy, interactive literacy, and critical literacy than the primary or none educated ones. This observation is consistent with the vast body of literature that documents that educational attainment leads to better interpretation of medical information,

consideration of health resources, and their use of healthcare information to make prudent health choices. Higher education contributes to the availability of digital sources of information as well as enhancing communication with medical workers (19, 23-25). On the other hand, people with low education levels also have difficulties in deciphering detailed instructions on health and can have a significant dependency on medical staff or relatives.

The regression analysis also established that patient centred communication greatly contributes to health literacy. When medical personnel interact with the patient in an understandable manner, facilitate the involvement of the patient and give them easy to understand descriptions, patients have more chances of following instructions of treatment and practicing self-management. The result is consistent with the previous results that have shown that proper communication between patients and healthcare providers has the ability to defeat low-level literacy and enhance treatment compliance. Nevertheless, there are studies proposing that communication alone can be not sufficient in reducing gaps in health literacy and especially practitioners with lowest levels of education should properly be involved with educational interventions (26-28).

Another good health literacy determinant that was found in this research was social support. Clients who got the support of their families and social networks can take advantage of common information, emotional support, and help in healthcare systems navigation. The findings are valid in line with the previous research reports that social support enhances the patient's perception of the instructions to be followed during treatment and better health outcomes. However, a few studies have pointed out that overdependence on the family members could decrease the independence of the patients to deal with their health conditions, and therefore the significance of striking a balance between support and empowerment of patients (18,21,22, 29-32).

Other adverse factors of health literacy were also found to be negative predictors of health literacy in the study. Lower levels of literacy were closely related to old age, diabetes mellitus, and low income status. They can be characterized by patients with diabetes who have complicated treatment plans that require medication management, changing their diets, and periodic monitoring, which can increase informational burden and subsequently burden patients with poor literacy levels. On the same note, low-income citizens can lack access to healthcare resources, education opportunities, and quality health information, to put them in greater harm of poor health literacy (19,22,23, 30-36).

The health literacy of cardiac patients is multifaceted. Although most patients have sufficient functional literacy, critical and interactive literacy areas are still present. These gaps should be effectively addressed through a combination of ways, which include the provision of better communication in healthcare, educational interventions, and social support systems (35-40).

Conclusion

This study has shown that cardiac patients have health literacy which differs in functional, interactive and critical aspects and is greatly affected by demographic, socioeconomic and communication related issues. Improved health literacy is linked to younger age, higher education, patient centred communication, and social support whereas older age, diabetes, and low income are related to high chances of having limited literacy. Enhancing health literacy is thus critical in enhancing disease management as well as health outcomes among cardiovascular patients.

Recommendations

Nurses, and healthcare providers must establish organized patient education interventions based on the enhancement of patient knowledge of the cardiovascular disease, drug usage, and self-management measures. Simplified explanations, visual

aids, and teach-back method should be adopted as means of communication so that patients in receiving medical instructions obtain full understanding. Families should also be involved in patient education by health care institutions since social support is rather significant in enhancing health literacy. Older adults, chronically-diseased patients, and patients with low-level education should be regarded with particular attention due to their greater risks of having low health literacy.

Implications

Clinical Implications

Medical workers need to determine the level of health literacy of patients in clinical situations and adjust the communication plans based on the unique characteristics of the patients to enhance understanding and adherence to treatment.

Public Health Implications

The burden of cardiovascular disease can be reduced by improving health literacy among the population so that patients could have better control of their conditions and prevent complications.

Research Implications

Further research needs to look toward the long-term effects of the health literacy interventions and see other aspects like digital literacy and psychological well-being and access to healthcare and the effect of such factors on patients with cardiovascular disease management.

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