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## **Health Literacy, Social Support, and Self-Management Outcomes in Cardiovascular Disease: A Cross-Sectional Analysis**

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### **ABSTRACT**

*Social support and health literacy represent the key factors that can trigger positive self-care practices among new and existing cardiac patients. There is however a dearth of evidence that has been carried out with tertiary care facilities in Pakistan to study the combined impact of such factors on patient outcomes. To establish the association between health literacy and self-care practices as well as test the mediating effect of social support between health literacy and medication adherence in cardiac patients.*

### **Methods**

*An analysis of 110 adult cardiac patients in Mayo hospital Lahore was done in a hospital based cross-sectional study. Consecutive sampling defined the participants applied in cardiology outpatient and inpatient units. The structured face-to-face interview that used validated measures assessing health literacy, perceived social support, self-care behaviours, and medication adherence was used to collect these data. Demographic and clinical characteristics were summarized with the help of descriptive statistics. The level of associations between*

variables was tested using Pearson correlation analysis and direct and indirect effects using regression-based mediation analysis. The *p* value was adjusted to statistical significance of *p* < 0.05.

### **Results**

The average scores of health literacy relayed a moderate literacy level ( $72.45 \pm 15.38$ ) and social support level was also moderate ( $58.72 \pm 10.41$ ) as well as self-care behaviours ( $66.81 \pm 12.26$ ). It was found that health literacy and social support ( $r = 0.41$ ,  $p < 0.01$ ) and health literacy and self-care ( $r = 0.45$ ,  $p < 0.01$ ) as well as social support and medication adherence ( $r = 0.47$ ,  $p < 0.01$ ) showed significant positive correlation. A mediation analysis showed that social support mediated the correlation between health literacy and self-care outcomes (indirect effect 0.25) which showed both a direct and indirect effect on the behaviours of disease management.

### **Conclusion**

Health literacy and social support are important predictors of self-care and adherence to medication among patients with cardiac conditions. Social support moderates the relationship between health literacy and health outcomes, which supports the need to incorporate educational and psychosocial interventions in cardiac care interventions.

### **Keywords**

Health literacy; Social support, Self-care; Medication adherence; Cardiac patients; Cross-sectional study; Pakistan.

### **Introduction**

The cardiovascular diseases (CVDs) are considered the primary cause of morbidity and mortality in the world [1], as they represent a significant fraction of premature mortality, especially in low- and middle-income nations [2]. Cardiovascular disorders are an increasing burden in Pakistan because of rapid urbanization, change of lifestyles, prevalence of high blood pressure and diabetes, poverty, and the lack of sufficient preventive health care facilities [3]. Cardiac disorders like coronary artery disease and heart failure can only be managed with adherence to medication and lifestyle changes [4], followed up care and active self-management behaviours in the patient. Self-care is a crucial factor in the management of chronic cardiac diseases and comprises medication adherence, symptom management, dietary management, physical activity, and seeking care in time [5]. Nonetheless, self-management is highly influenced by the capacity of a patient to comprehend the information about the health and make prudent choices. Health literacy in this sense has been considered one of the determinants of health outcomes [6]. The term health literacy is used to refer to cognitive and social skills that establish motivation and available capacity of an individual to access, interpret, derive, and utilize health information in order to achieve or sustain health [7].

Patients with low health literacy are not always able to follow medical prescriptions, decode prescription labels, be aware of potential symptoms and manage healthcare systems. Various works associated with poor medication compliance, high hospital readmissions, high spending on healthcare services, and high deaths in cardiovascular patients with poor health literacy. Health literacy is an issue that has not been investigated in Pakistani cardiac populations despite its significance [8]. Also, among the cognitive determinants, there are the psychosocial determinants like the social support, which is important in chronic disease management. Social support involves emotional, informational, and practical support given by the family members, friends and significant others. Family involvement in healthcare decisions making is most influential in collectivist societies such as in Pakistan [9]. Social support networks would boost the confidence of patients; encourage good behaviors and better compliance of treatments.

There is currently emerging evidence linking social support possibly mediating or further strengthening the relationship between self-care behaviours and health literacy [10]. Patients and those with greater health literacy can capitalize more on the support systems they have and social support can help replace the lack of literacy by helping patients to comprehend treatment guidelines and comply with positive health behaviour support. Nonetheless, the corresponding literature review shows a lack of empirical data on the role of the interaction between health literacy and social support in tertiary care in Pakistan [11] regarding the domains of self-care and medication adherence in heart patients.

With the growing number of cardiovascular diseases cases and the necessity to apply patient-focused management strategies [12-13], the interaction between cognitive and psychosocial elements and their effect on promoting health outcomes is quite crucial. Thus, the research was carried out in patients with cardiac conditions at Mayo Hospital Lahore to investigate the connections between the level of health literacy, social support, and self-care behaviours and medication adherence through a cross-sectional research method.

### **Research Objectives**

To establish the correlation between health literacy and self-care behaviours among the cardiac patients Mayo Hospital Lahore.

### **Methodology**

#### **Study Design**

This study used cross-sectional analytical study design based on a hospital setting to investigate the correlation between health literacy, social support, self-care, and medication adherence in cardiac patients. The cross-sectional method was chosen to measure the relationship between factors of cognition and psychosocial factors at one time in an actual clinical environment.

#### **Study Setting**

This case was done in Mayo Hospital Lahore, which is a public sector hospital and one of the largest tertiary cares in Punjab, Pakistan. The hospital has a balanced population featuring both rural or urban clients and offering specialized cardiac care, such as cardiology outpatient units, inpatient cardiac wards, and cardiac diagnostic units. Impetus was to conduct data collection in cardiology outpatient department (OPD) and cardiac inpatient unit in a 4-6 months period.

#### **Study Population**

The sample group was adult patients who were being treated with cardiovascular diseases in the cardiology wing.

#### **Sampling and Sample Size**

The number of cardiac patients that were included in the research was 110. The size of the sample was calculated by the feasibility and statistical measures of correlation and mediation. The sampling was done in a non-probability consecutive manner. The patients were approached in a sequential manner to the cardiology OPD and also to the cardiac wards where eligible patients were in the course of duration of study to reach the required sample size.

#### **Inclusion Criteria**

- Patients aged 18 years
- Someone diagnosed with coronary artery disease, heart failure, valvular heart disease or any other heart related illness.
- Taking cardiac medication at least three months on prescription.
- Understands Urdu or English.
- Ready to make an informed consent.

#### **Exclusion Criteria**

- Cognitively impaired patients or seriously psychopathic patients.

- Patients who will not be able to answer questionnaires because of critical illnesses.
- Patients who are deaf or mute and who cannot be assisted.
- Sample Size and Sampling Technique

#### Data collection instrument

The data used in the study was collected using open-ended questions. Data Collection Instruments Data used in the study, collected using close-ended questionnaire.

#### Data Collection Procedure

- Prior to being granted administrative approval of the hospital authorities:
- Patients identified were those who were eligible in both inpatient and OPD units.
- Study purpose was explained.
- Informed consent was taken in form of writing.
- Personally visit to the OPDs and Wards for data collection.
- The duration of interviews was about 20-25 min.
- There was also the strictness of confidentiality and anonymity.

#### Results

Table 1 describes demographic and clinical profile of 110 cardiac patients that were used in this study. Most of the respondents fell within the age range of 40-59 years (41.8) and 60 and above (41.8), which indicated that cardiovascular diseases were more common in the middle-aged and old populations. The only significant difference was that the sample was almost two-thirds male (65.5%), which is consistent with the existing data that cardiovascular disease is more prevalent in the developing countries among males. In terms of education level, the educational level among the patients was relatively low with 25.5 percent of the patients lacking any formal education, and 29.1 percent with a primary education. This conclusion is especially applicable as the level of health literacy is closely connected with the level of education. Over half of the respondents (56.4 percentage) were living in the city whereas 43.6 percent lived in rural environment which indicated relatively equal distribution. The most frequent diagnosis made clinically included coronary artery disease (49.1%), heart failure (25.5%) and valvular heart disease (16.4%). The most common comorbidity had been hypertension (61.8%) and diabetes mellitus (47.3%), with more than a third (36.4%) having both simultaneously. Smoking was found in 35.5 percent of the patients, which is a significant modifiable risk factor of cardiovascular.

**Table 1: Demographic and Clinical Characteristics of Cardiac Patients (n = 110) Mayo Hospital Lahore**

| Variable          | Category                | Frequency (n) | Percentage (%) |
|-------------------|-------------------------|---------------|----------------|
| Age (years)       | <40                     | 18            | 16.4           |
| 40–59             | 46                      | 41.8          |                |
| ≥60               | 46                      | 41.8          |                |
| Gender            | Male                    | 72            | 65.5           |
| Female            | 38                      | 34.5          |                |
| Education Level   | No formal education     | 28            | 25.5           |
| Primary           | 32                      | 29.1          |                |
| Secondary         | 30                      | 27.3          |                |
| Higher education  | 20                      | 18.2          |                |
| Residence         | Urban                   | 62            | 56.4           |
| Rural             | 48                      | 43.6          |                |
| Cardiac Diagnosis | Coronary artery disease | 54            | 49.1           |
| Heart failure     | 28                      | 25.5          |                |
| Valvular disease  | 18                      | 16.4          |                |

|                          |              |      |      |
|--------------------------|--------------|------|------|
| <b>Others</b>            | 10           | 9.1  |      |
| <b>Comorbidities</b>     | Hypertension | 68   | 61.8 |
| <b>Diabetes mellitus</b> | 52           | 47.3 |      |
| <b>Both HTN + DM</b>     | 40           | 36.4 |      |
| <b>Smoking Status</b>    | Smoker       | 39   | 35.5 |
| <b>Non-smoker</b>        | 71           | 64.5 |      |

Table 2 also indicates statistically significant beneficial relationships between health literacy, social support, self-care practices as well as medication adherence ( $p < 0.01$ ). There was a medium positive relationship of health literacy and social support ( $r = 0.41$ ), self-care ( $r = 0.45$ ), and medication adherence ( $r = 0.39$ ) which suggests health literacy among patients positively correlated with successful disease management behaviours. Social support showed significant correlation with self-care ( $r = 0.52$ ) and medication adherence ( $r = 0.47$ ), and thus the value of family and community support systems when managing chronic diseases. It was found that self-care and medication adherence showed the strongest association ( $r = 0.58$ ) which supports the idea that adherence is a fundamentally important part of effective self-management.

Table 2: Pearson Correlation Between Health Literacy, Social Support, and Self-Care Variables

| Variables                   | Health Literacy | Social Support | Self-Care | Medication Adherence |
|-----------------------------|-----------------|----------------|-----------|----------------------|
| <b>Health Literacy</b>      | 1               |                |           |                      |
| <b>Social Support</b>       | 0.41**          | 1              |           |                      |
| <b>Self-Care</b>            | 0.45**          | 0.52**         | 1         |                      |
| <b>Medication Adherence</b> | 0.39**          | 0.47**         | 0.58**    | 1                    |

Table 3, shows the mediation analysis with the examination of the mechanisms on how health literacy and social support impact on the outcomes of self-care and medication adherence. Health literacy exhibited a high total impact on self-care ( $= 0.58$ ,  $p < 0.001$ ) and the two-way impact ( $= 0.33$ ) and the two-way mediated impact ( $= 0.25$ ) by social support. This is an indicator of partial mediation implying that the health literacy enhances self-care not only on its own, but it also facilitates the social support mechanisms.

Likewise, the social support was found to have a strong relationship with self-care ( $0.49 = -0.001$ ), which was mediated in part by psychological processes like self-efficacy. Similar mediation patterns were found on the outcome of medication adherence in which both health literacy and social support had both significant direct and indirect effects.

These results present the complicated interaction of cognitive, social, and behavioural factors in the management of cardiac diseases. Enhancing health literacy might not be adequate and it is also important to reinforce the social support systems to attain the best results on patients.

Table 3: Mediation Analysis of Social Support and Health Literacy on Self-Care Outcomes

| Pathway                            | Total Effect ( $\beta$ ) | Direct Effect ( $\beta$ ) | Indirect Effect ( $\beta$ ) |
|------------------------------------|--------------------------|---------------------------|-----------------------------|
| <b>Health Literacy → Self-Care</b> | 0.58***                  | 0.33***                   | 0.25                        |
| <b>Social Support → Self-Care</b>  | 0.49***                  | 0.28***                   | 0.21                        |
| <b>Health Literacy → Adherence</b> | 0.46***                  | 0.27***                   | 0.19                        |
| <b>Social Support → Adherence</b>  | 0.42***                  | 0.24***                   | 0.18                        |

## Discussion

This paper reviewed connection among health literacy, social support, self-care behaviour, and adherence to medication among cardiac patients [14] who are undergoing treatment in a tertiary care hospital in Lahore, Pakistan. The results showed that patients had moderate health literacy, perceived social support, and self-management behaviours [15] with statistically significant relationships between them. The findings point to the paramount importance of the cognitive

and psychosocial factors in the management of cardiovascular diseases in the setting of developing countries.

The demographic analysis showed that most of the respondents were middle-aged and older persons with the majority of males [16]. This trend is in line with the international epidemiological patterns which suggest that elderly people and males are more susceptible to cardiovascular diseases because of exposure to more behavioural risk factors and metabolic factors. Additionally, a large percentage of the respondents were poorly educated and using this fact might culminate to a poor level of health literacy. It is also established that education is among the determinants of health literacy, and it determines a person to access health information, comprehend it, and utilize it [17].

The average rates of health literacy denoted moderate literacy in the participants, which implies that a high number of patients can experience [2, 18] some difficulty in understanding medical information, treatment dosages, and lifestyle. The same has been noted in the past regarding the populations of cardiac patients where poor literacy was linked to poor knowledge of the disease and poor adherence and increased hospitalization. The average compliance with the use of the medication that was found during the current research also helps to promote the idea that the low level of literacy may have a negative impact on medication compliance.

In the current research, the levels of social support were moderate, which showed that family and community networks are supportive in the management of diseases [19]. Family participation in making healthcare decisions is also a common and usually a positive practice in collectivist cultures like Pakistan. This findings with regard to high positive correlation between social support and self-care behaviours is in line with previous studies that show that emotional, informational and instrumental support enhance adherence, symptom monitoring and lifestyle changes.

The correlation analysis showed that there were significant positive associations between the health literacy and self-care behaviours and social support and medication adherence [20]. It is worth noting that the greatest relationship was recorded between self-care and medication adherence, which points to the fact that adherence is a part and parcel of effective disease management. Higher literacy levels in the patient were characterized by better ability to participate in appropriate self-management behaviours and presumably because they comprehended the processes and treatment [21] requirements of the diseases better.

Social support as a mediating factor on the relationship between health literacy and self-care outcomes is considered one of the most significant results [22] of the current research. The mediation study showed that health literacy has a direct and indirect effect on self-care via social support channels. It implies that better-meaning more literate patients might be more prone to using the existing support systems, and social support is positively associated with confidence, motivation, and engagement in behaviour. Such results are aligned with the social cognitive theory, which has placed an emphasis on individual, behavioural and environmental factors [23] and their interplay in influencing the change of health behaviour.

Furthermore, social support showed a partial intermediary role via the psychological mechanisms like self-efficacy that social support [24] and involvement of family could promote the level of confidence in dealing with the illness in patients. This multidimensional interdependence supports the relevance of the incorporation of psychosocial interventions in the cardiac care schemes as compared to emphasizing on the medical treatment approach.

In general, the results indicate that enhancing cardiac outcomes is not possible only through the improvement of health literacy [25]. Rather, extensive interventions based on educational and

social levels are necessary in order to improve the patient self-management and attitudes towards adherence.

### **Conclusion**

This paper reaches a conclusion that cardiac patients have health literacy and social support as important determinants of self-care practices and medication adherence. The results of disease management were better in patients who had higher literacy and high social support. It was found that social support is one of the mediating factors of the relationship between health literacy and self-care which emphasizes the interdependence of the cognitive and psychosocial determinants of cardiovascular disease management.

### **Recommendations**

On the findings of the study, it is proposed to recommend the following:

- Structured patient education is to be instituted in hospitals in accordance with literacy levels.
- It is suggested that simplified educational material, visual aids, and multilingual materials are used.
- The healthcare providers are supposed to engage the family members in treatment planning and education.
- The family counselling programs could enhance adherence and self-care behaviour.
- Cardiac Rehabilitation Programs Multidisciplinary.
- When nurses, pharmacists, psychologists, and social workers are interdisciplinary components of cardiac care groups, patient outcomes can be improved.
- Routine follow-up should involve behavioural counselling and adherence monitoring.

### **Implications**

- To customize the communication approach, healthcare providers ought to evaluate the level of health literacy when interacting with the patients.
- Enhancing social support systems can be an effective way of improving adherence to patients and minimize readmissions to hospitals.
- Education of patients must be regarded as one of the essential aspects of cardiac care instead of a secondary intervention.
- In self-care behaviour, reinforcing self-care, counselling and patient education, nurses are very instrumental.
- The intervention with nurses in charge can largely enhance the outcome of literacy and adherence.

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