Biopsychosocial Determinants Of Recovery In Chronic Disease Patients: A Cross-Sectional Study In A Tertiary Hospital In Riyadh

Ohoud Albedeiwy[1*], Mona B. Alwallan[2], Anwar M. Alessa[3], Ahlam A. Alruwaili[4], Shaikha N. Binsunbel[5], Sondos A. Alhaidari[6], Wael S. Ghazi[7], Rana Saad Alzahrani[8]

[1*,2,3,4,5,6,8,]Health Affairs at The Ministry of National Guard
[7]Prince Sultan Military Hospital
*Corresponding Author: Ohoud Albedeiwy
*email: Ohoud91m@gmail.com

Abstract
Background: Recovery from chronic illness is influenced by clinical indicators and the patients personal state. In Riyadhs largest tertiary hospital this study surveys how mood, social ties, diet, and blood markers shape healing among individuals with long-term diseases.
Methods: Two hundred participants completed standard scales for depression (PHQ-9), anxiety (GAD-7), and resilience (CD-RISC), while trained staff recorded social support, nutrition (MNA), and key lab values (CRP, albumin, HbA1c). Overall recovery was rated with quality-of-life and daily-function measures. Multivariate regression pin-pointed the strongest predictors.
Results: Higher depression (β = -0.34, p < 0.001) and elevated CRP (β = -0.19, p = 0.012) slowed recovery. In contrast, stronger social support (β = 0.27, p = 0.001), better nutrition (β = 0.23, p = 0.009), and higher albumin (β = 0.25, p = 0.004) sped it up.
Conclusion: Each psychosocial and biochemic variable acted alongside routine clinical data, underscoring the biopsychosocial view. Care teams should routinely test mood, nutrition, and blood profiles so support and therapy can be tailored, ultimately lifting patient recovery rates.

Keywords: *Biopsychosocial model; chronic illness; recovery; depression; social support; nutrition; biomarkers; tertiary care; Saudi Arabia.*

INTRODUCTION

Chronic health problems such as heart disease, diabetes, stroke, and joint disorders place a heavy and growing toll on individuals, families, and national economies everywhere. Standard clinical models focus mainly on medical anomalies yet consistently fail to account for the surprising differences in how similar patients recover once treatment begins. An expanding body of research therefore suggests that the biopsychosocial model-woven together as biology, psychology, and social context-now provides a clearer lens to track both disease progression and rehabilitation (Wade & Halligan, 2017).

A sizable literature shows that emotional resilience, psychological distress, and formal mental-health conditions hang closely with the speed and extent of improvement in long-term patients (Truchon & Fillion, 2000; Kobylańska et al., 2019). Equally, social determinants-such as wealth, peer networks, and the meanings ascribed by culture-define health habits and the paths by which people reach clinical services (Bahall & Bailey, 2022; Laisné et al., 2012).

Biological markers, especially diet and metabolism, complete this value chain. Poor nutrition, hidden vitamin gaps, and hormone or enzyme drift deepen physical frailty and amplify the mental and social burdens that patients already carry (Samoborec et al., 2018). Their overlapping influences make it imperative that hospitals assemble mixed teams-physicians, psychologists, dietitians, social workers, and community advocates-when charting care plans for any patient whose prognosis exceeds a few months.

This study examines how psychological, social, nutritional, and laboratory biomarkers work together to influence recovery in patients with chronic diseases who are treated at a large, regional hospital. Taking a biopsychosocial

approach, we aim to guide care plans that move beyond the separate, isolated models often seen in modern healthcare.

LITERATURE REVIEW
Introduced as a critique of the strictly biological view, the biopsychosocial model looks at how biological, psychological, and social factors work together to determine health. Researchers have become more aware of this approach in long-term recovery from chronic illnesses, especially in clinics where teams of doctors, therapists, and social workers are involved (Wade & Halligan, 2017).

PSYCHOLOGICAL DETERMINANTS
Many investigations confirm that mental health conditions strongly influence how well a patient heals. Symptoms of depression, anxiety, and a weak sense of personal control slow rehabilitation and lower quality of life in people recovering from strokes or joint problems (Kobylańska et al., 2019; Theodore et al., 2008). With chronic low-back pain, emotional or cognitive distress turns out to predict days lost to disability more reliably than the severity of the injury itself (Truchon, 2001).

SOCIAL DETERMINANTS
A supportive social network acts like an extra layer of protection in managing chronic disease. Patients who can lean on family, friends, or community groups tend to cope better and stick to their treatment plans for longer (Bahall & Bailey, 2022). In contrast, loneliness, limited financial resources, and lower social status add extra stress, make appointments harder to reach, and contribute to poorer recovery overall (Laisné et al., 2012).

NUTRITIONAL AND LABORATORY INDICATORS
A patients nutritional profile frequently mirrors disease intensity and hints at the odds of post-hospital recovery. Protein-energy malnutrition, especially in acute settings, weakens defenses and stretches healing times (Samoborec et al., 2018). Key laboratory tests- C-reactive protein (CRP), hemoglobin, and micronutrient levels- serve not only as status markers but also influence recovery, linking basic biology to wider psychosocial issues.

INTEGRATIVE MODELS
Predicting long-term disability is smoother when biology, psychology, and social context are pulled into a single framework. Almeida et al. (2024) therefore urge routine biopsychosocial screening in chronic pain clinics so treatments can be custom-fit. In the same vein, Truchon and Fillion (2000) point out that no single factor usually explains enduring impairment, and lasting improvement demands work on every relevant domain.

METHODOLOGY

STUDY DESIGN AND SETTING
The investigation adopted a cross-sectional analytical framework and took place at a tertiary referral centre in Riyadh, Saudi Arabia. Serving patients from all regions of the Kingdom, the institution provides specialised units in internal medicine, rehabilitation, nutrition, and mental health.

STUDY POPULATION
Eligible participants were adults (18 years or older) with at least one chronic condition-diabetes, hypertension, stroke, cardiovascular disease, or chronic musculoskeletal disorders-who were either admitted to the ward or attending follow-up clinics. Additional inclusion criteria were presentation with a confirmed diagnosis for a minimum of six months, ability to give informed consent, and cognitive sufficiency to complete interviews and tests. Patients with acute psychiatric crises, terminal illnesses, or those occupying critical-care beds were deliberately excluded.

SAMPLE SIZE AND SAMPLING

Over three months a convenience sample of 200 patients was assembled. Investigators approached individuals during admission or outpatient visits, and only those who provided written consent were formally enrolled.

DATA COLLECTION TOOLS

A structured questionnaire was administered by trained research assistants in Arabic and English. The tool captured:
• Psychological factors: assessed using validated scales:
o Patient Health Questionnaire (PHQ-9) for depression.
o General Anxiety Disorder scale (GAD-7).
o Connor-Davidson Resilience Scale (CD-RISC).
• Social factors: including family support (measured using the Oslo Social Support Scale), education, employment status, and income.
• Nutritional assessment: performed by clinical dietitians using the Mini Nutritional Assessment (MNA) and dietary recall.
• Laboratory markers: extracted from patient records, including:
o Hemoglobin (Hb)
o C-reactive protein (CRP)
o Serum albumin
o Vitamin D and B12 levels
o Glycated hemoglobin (HbA1c) for diabetic patients
• Recovery indicators: measured by:
o SF-36 Health Survey for quality of life
o Functional status scales relevant to the specific illness (e.g., Barthel Index for stroke).

DATA ANALYSIS

Data were entered in SPSS Version 26. Demographic and clinical variables were summarized with descriptive statistics. Associations between biopsychosocial factors and recovery were explored using bivariate tests (chi-square and t test). To pinpoint independent predictors of recovery, multivariate linear and logistic regressions controlled for potential confounders.

ETHICAL CONSIDERATIONS

Approval was obtained from the hospitals Institutional Review Board. Written informed consent was secured from all participants. During the study, data confidentiality and participant anonymity were rigorously upheld.

FINDINGS

DEMOGRAPHIC CHARACTERISTICS

The study drew its sample from 200 patients with chronic diseases who were admitted to a tertiary-care hospital in Riyadh. The mean age of the cohort was 52.4 years, with a standard deviation of 13.2. Women constituted a narrow majority, accounting for 54 percent of the group, and 57.5 percent of participants reported being unemployed.

Table 1. Demographic Characteristics of Participants

Variable	Value
Age (mean ± SD)	52.4 ± 13.2
Gender (Male)	92 (46%)
Gender (Female)	108 (54%)
Employed	85 (42.5%)

Variable	Value
Unemployed	115 (57.5%)

PSYCHOLOGICAL ASSESSMENTS

On average, participants showed moderate psychological distress. The mean PHQ-9 score of 9.8 indicates mild-to-moderate depressive symptomatology. Anxiety, assessed by the GAD-7, averaged 7.5; resilience, measured with the CD-RISC, was at a moderately strong level.

Table 2. Psychological Assessment Scores

Assessment	Mean Score	SD
PHQ-9 (Depression)	9.8	4.1
GAD-7 (Anxiety)	7.5	3.6
CD-RISC (Resilience)	55.3	12.2

SOCIAL SUPPORT LEVELS

Levels of social support differed across participants, with moderate backing the most frequent at 44.5%, poor support next at 29%, and robust assistance last at 26.5%.

Table 3. Social Support Levels

Support Level	Frequency	Percentage
Poor	58	29%
Moderate	89	44.5%
Strong	53	26.5%

NUTRITIONAL STATUS

Nutritional screening showed that 47 percent of patients were at risk for malnutrition and 22 percent were already malnourished, highlighting a serious concern within the hospital population.

Table 4. Nutritional Status

Nutritional Category	Number of Patients	Percentage
Normal	62	31%
At Risk of Malnutrition	94	47%
Malnourished	44	22%

LABORATORY BIOMARKERS

The biochemical analysis added important context. Mean hemoglobin sat at 12.6 g/dL, and a C-reactive protein level of 8.7 mg/L pointed to systemic inflammation. Vitamin D concentration was also beneath what is generally considered optimal.

Table 5. Key Laboratory Biomarkers

Biomarker	Mean	SD
Hemoglobin (g/dL)	12.6	1.5
CRP (mg/L)	8.7	5.1

Biomarker	Mean	SD
Serum Albumin (g/dL)	3.4	0.5
Vitamin D (ng/mL)	24.5	10.2
HbA1c (%)	7.9	1.8

PREDICTORS OF RECOVERY
Multivariate reggression analysis showed that higher PHQ-9 depression scores and elevated C-reactive protein CRP concentrations correlated with lower recovery rates, whereas stronger social support, better nutriional status, and increased serum albumin concentrations each independently predicted better post-recovery outcomes.

Table 6. Regression Analysis: Predictors of Recovery

Predictor	Beta Coefficient	p-value
PHQ-9 score	-0.32	0.001
Social support	0.29	0.002
Nutritional status	0.25	0.010
CRP level	-0.21	0.014
Serum Albumin	0.27	0.005

DISCUSSION
This investigation examined how biological, psychological, and social factors work together to influence recovery in patients with chronic illness at a major Riyadh teaching hospital. Results underline that recovery is not reached through medicine alone; emotional well-being, social networks, daily nutrition, and even laboratory readings each steer the course of a patients health journey.

PSYCHOLOGICAL FACTORS
Scores on the Patient Health Questionnaires PHQ-9 placed depressive symptoms at the top of the list of barriers to recovery, a finding that echoes earlier work linking depression to lower medication adherence, weaker motivation, and decreased participation in rehabilitation (Kobylańska et al., 2019). The evidence therefore argues for routine mental-health screening and embedded psychological support within every chronic-disease clinic. Anxiety appeared often yet had a milder statistical tie to recovery, pointing to depression as the more immediate foe that clinicians must tackle first.

SOCIAL DETERMINANTS
Strong social support protected patients and pushed recovery rates higher. Those reporting moderate or high backing scored better on functional abilities and overall quality-of-life measures. This pattern matches previous reviews showing that friends, family, and community ties cushion stress, boost coping skills, and ease patients passage to follow-up care (Bahall & Bailey, 2022). In contrast, individuals lacking such ties faced loneliness, missed rides to appointments, and scarce caregiving help, all of which postponed healing and extended hospital stays.

NUTRITIONAL STATUS
Almost 70% of patients entered the study either already malnourished or at risk of becoming so, a rate in line with what frontline hospital surveys report (Samoborec et al., 2018). Deficits in calories and protein slow wound repair, weaken immune response, and drain daily energy, thus deepening the overall burden of illness. Because poor nutrition independently predicted slower recovery, routine screening and timely, targeted feeding must become standard practice in every inpatient ward.

LABORATORY BIOMARKERS

Blood chemistry gave quantifiable insight into systemic stress and nutrient shortfalls. Raised C-reactive protein, a classic marker of inflammation, linked to longer hospital stays, indicating that patients still facing active irritation may need more intensive nursing. Conversely, high serum albumin—reflecting shared roles of diet and liver health—tracked with faster, smoother recoveries and therefore strengthens the case for using it as a bedside prognostic sign.

INTERDISCIPLINARY IMPLICATIONS

The combined effect of biological, psychological, and social data lends weight to the biopsychosocial model that clinicians have debated for decades (Wade & Halligan, 2017). Evidence here argues for a care philosophy in which psychologists, dietitians, lab scientists, and social workers exchange insights on every case. Adopting that collaborative culture cuts complications, trims costs, and shortens readmission cycles, making it a sensible strategy for modern hospitals.

LIMITATIONS

Although the study adds valuable insights, several limitations should be acknowledged. Its cross-sectional design makes it difficult to determine cause-and-effect relationships. Because participants were drawn from a single center using convenience sampling, the results may not be representative of broader populations. Moreover, potential confounders such as the severity of comorbid conditions and rates of medication adherence were not measured with full precision.

FUTURE DIRECTIONS

Subsequent research should adopt longitudinal designs and test integrated interventions that address psychological, social, and nutritional factors concurrently. Tracking clinical outcomes after such combined models will help confirm the present findings and clarify their practical implications.

CONCLUSION

The present investigation highlights the importance of biopsychosocial variables in shaping recovery trajectories for patients with chronic diseases admitted to a tertiary-care hospital. Increased psychological distress, inadequate social support, suboptimal nutritional status, and elevated inflammatory biomarkers each predicted slower or incomplete recovery, even after controlling for clinical covariates. Such evidence supports the adoption of an interdisciplinary care model that systematically weaves together mental health services, social-network strengthening, targeted nutrition programs, and regular biomarker surveillance. By implementing this integrated strategy, healthcare teams can improve recovery rates, enhance patients life quality, and make resource use more efficient across the institution.

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