

Article history:
Submit Date: 11 May 2026
Revise Date: 01 August 2026
Accept Date: 08 August 2026
Initial Publish: 11 August 2026
Final Publish: 01 May 2027

Developing a Predictive Model of Psychosocial Adjustment to Illness Based on Health Locus of Control with the Mediating Role of Optimism in Patients with Systemic Lupus Erythematosus

Nooshin. Gharibpanah¹, Sara. Hashemi^{2*}, Setareh. Tehrani³

1. Department of Psychology, UAE.C., Islamic Azad University, Dubai, United Arab Emirates
2. Department of Clinical Psychology, SR.C., Islamic Azad University, Tehran, Iran
3. Department of Medical Sciences, TEMS.C., Islamic Azad University, Tehran, Iran

* Corresponding author email address: Hashemi2026@iau.ac.ir

Article Info

Article type:

Original Research

How to cite this article:

Gharibpanah, N., Hashemi, S., & Tehrani, S. (2027). Developing a Predictive Model of Psychosocial Adjustment to Illness Based on Health Locus of Control with the Mediating Role of Optimism in Patients with Systemic Lupus Erythematosus. *International Journal of Education and Cognitive Sciences*, 8(3), 1-13.
<https://doi.org/10.61838/kman.ijecs.439>



© 2027 the authors. Published by Iranian Association for Intelligence and Talent Studies, Tehran, Iran. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

ABSTRACT

Purpose: This study aimed to develop and test a structural model of psychosocial adjustment to illness based on health locus of control, with optimism as a mediating variable, among patients with systemic lupus erythematosus.

Methods and Materials: This descriptive-correlational study employed structural equation modeling. The statistical population comprised all female patients with systemic lupus erythematosus who attended Bouali, Farhikhtegan, and Amir Al-Momenin hospitals affiliated with Islamic Azad University in Tehran, as well as the Lupus Association, during the first six months of 2025. Based on the eligibility criteria, 280 patients were selected through purposive sampling. Data were collected using the Psychosocial Adjustment to Illness Scale developed by Derogatis (1986), the Life Orientation Test developed by Scheier and Carver (1985), and the Multidimensional Health Locus of Control Scale developed by Wallston et al. (1978). The data were analyzed using regression analysis and partial least squares structural equation modeling in SPSS and PLS software at a significance level of .05.

Findings: The overall goodness-of-fit index of the structural model was .341, indicating an acceptable predictive fit. The mean communality value was .399, and the mean coefficient of determination was .283, demonstrating that the exogenous variables in the model explained approximately 28% of the variance in psychosocial adjustment to illness. The structural analysis further indicated that optimism and pessimism significantly mediated the relationships of internal health locus of control and powerful-others health locus of control with psychosocial adjustment to illness. Accordingly, health-related control beliefs influenced patients' psychosocial adjustment both directly and indirectly through motivational orientations toward positive and negative future outcomes.

Conclusion: Health locus of control and optimism are important psychological determinants of psychosocial adjustment to systemic lupus erythematosus. Patients who perceive greater personal control over their health and maintain more optimistic expectations may demonstrate better adjustment to the emotional, social, and functional demands of the disease. Therefore, psychological interventions designed

to strengthen internal control beliefs, promote realistic optimism, and reduce pessimistic expectations may facilitate more effective adaptation to chronic illness among patients with systemic lupus erythematosus.

Keywords: *Health locus of control; optimism; psychosocial adjustment to illness; systemic lupus erythematosus; structural equation modeling*

1. Introduction

Systemic lupus erythematosus (SLE) is a chronic, multisystem autoimmune disease characterized by heterogeneous clinical manifestations, unpredictable periods of exacerbation and remission, and substantial variation in disease severity and organ involvement. Its course may include musculoskeletal, dermatological, renal, neurological, hematological, pulmonary, and cardiovascular complications, requiring continuous medical monitoring and, in many cases, long-term immunomodulatory treatment. Although advances in diagnosis and treatment have improved survival and the clinical management of SLE, the disease continues to impose a considerable burden on patients' physical functioning, emotional well-being, social participation, occupational roles, family relationships, and perceived quality of life (Tselios et al., 2023; Uzun et al., 2024). Moreover, rare and severe manifestations of SLE may require complex therapeutic decisions and individualized management strategies, which can increase patients' uncertainty and psychological strain (Arnaud et al., 2025). Even when effective treatments are available for resistant manifestations, such as difficult-to-treat cutaneous lupus, the need for prolonged care and the possibility of recurrence may reinforce the experience of vulnerability associated with the disease (Abdelmalik et al., 2025).

The psychosocial burden of SLE extends beyond the direct effects of inflammation and organ damage. Patients may experience fatigue, pain, altered appearance, functional limitations, concerns about fertility or pregnancy, medication-related adverse effects, social misunderstanding, and disruptions in education, employment, and intimate relationships. These challenges can affect how patients perceive themselves, interpret their illness, and participate in daily life. The social and psychological consequences of SLE may include emotional distress, reduced social functioning, role impairment, stigmatization, and difficulties maintaining a stable sense of normality (Swaak et al., 2023). Consequently, successful disease management cannot be evaluated solely in terms of laboratory findings or symptom control. It must also include the extent to which patients can adapt psychologically and socially to the ongoing demands of the illness.

Psychosocial adjustment to illness refers to the dynamic process through which individuals adapt to the psychological, interpersonal, familial, occupational, and social consequences of a medical condition. It includes the ability to integrate the illness into one's life without allowing it to dominate personal identity, maintain meaningful relationships and social roles, regulate illness-related emotions, adhere to treatment, and respond flexibly to changes in physical functioning. Psychosocial adjustment is not equivalent to the absence of distress. Rather, it reflects an individual's capacity to manage illness-related challenges while preserving a satisfactory level of functioning and psychological equilibrium. This process is influenced by disease severity, symptom burden, treatment demands, social support, coping resources, illness perceptions, personality characteristics, and motivational beliefs.

The concept of psychosocial adjustment is particularly relevant to SLE because the disease is often experienced as unpredictable and only partially controllable. Patients may be required to revise personal goals, reorganize daily routines, and cope with repeated medical evaluations and fluctuations in symptoms. Longitudinal evidence concerning illness perceptions and coping in patients with lupus suggests that the ways in which individuals interpret the causes, consequences, controllability, and duration of their disease may shape their coping responses and subsequent psychological adaptation (Gómez et al., 2023). Coping strategies can either facilitate or hinder adaptation, depending on whether they promote active problem solving, emotional processing, treatment adherence, help seeking, and realistic acceptance or instead reinforce avoidance, helplessness, and persistent distress (Da Silva et al., 2024; Zhou et al., 2024). Accordingly, psychosocial adjustment in SLE should be understood as the outcome of interactions among disease-related experiences, cognitive appraisals, coping processes, and personal psychological resources.

Social support is another central factor in adaptation to SLE. Support from family members, partners, peers, healthcare professionals, and patient communities may reduce feelings of isolation, facilitate access to practical assistance, and strengthen adaptive coping. Research on patients with SLE has emphasized the importance of social

support and coping mechanisms in managing the emotional and functional consequences of the illness (Abu Samra et al., 2023). More recent work has similarly highlighted the combined role of optimism, perceived support, and coping strategies in the adjustment of individuals living with SLE (Jenkins et al., 2025). Nevertheless, social support alone may not fully explain why some patients adapt successfully while others experience persistent psychosocial difficulties. Internal cognitive and motivational variables may influence how patients interpret support, engage in treatment, and respond to the perceived controllability of their health condition.

Health locus of control is one such variable. It refers to an individual's generalized beliefs about the factors that determine health-related outcomes. The multidimensional health locus of control framework distinguishes among internal health locus of control, powerful-others health locus of control, and chance health locus of control (Wallston et al., 2023). Internal health locus of control reflects the belief that one's own behavior, decisions, and efforts influence health outcomes. Powerful-others health locus of control refers to the belief that health is primarily determined by physicians, healthcare professionals, family members, or other influential people. Chance health locus of control reflects the belief that health outcomes are governed by fate, luck, randomness, or uncontrollable external forces. These dimensions are not necessarily mutually exclusive, and their adaptive or maladaptive significance may depend on the nature of the illness and the context in which health decisions are made.

In chronic illness, internal health locus of control may support active participation in care, adherence to treatment, symptom monitoring, self-management, and health-promoting behavior. Individuals who believe that their actions can influence their health may be more willing to engage in behavioral changes and maintain treatment recommendations. Studies have linked health locus of control to health-promoting lifestyles and related behavioral orientations (Sepah Mansour & Bagheri, 2017). Internal health locus of control may also serve as a psychological mechanism through which broader personality traits contribute to health outcomes, suggesting that beliefs about personal control partly translate dispositional characteristics into health-related action (Shaffer, 2025). However, an exclusively internal orientation may become problematic when patients interpret unavoidable disease activity as evidence of personal failure. In diseases such as SLE, where biological processes cannot be controlled solely through

individual behavior, adaptive internal control should be accompanied by realistic recognition of medical limitations.

A powerful-others orientation may also have both adaptive and maladaptive implications. Trust in physicians and healthcare professionals can facilitate treatment adherence, particularly when a disease requires complex medication regimens and specialist monitoring. For patients with SLE, reliance on competent medical professionals is often necessary and should not automatically be interpreted as passivity. However, excessive dependence on others may weaken self-efficacy, reduce autonomous decision-making, and increase feelings of helplessness when access to care is limited or when medical interventions do not produce immediate improvement. Similarly, a chance orientation may diminish perceived agency and reduce engagement in self-management because patients may believe that their efforts have little influence on the disease course. Evidence from other chronic and serious medical conditions indicates that health locus of control is associated with symptom distress, illness acceptance, self-management behavior, and psychological outcomes (Cheng et al., 2025; Qi et al., 2024). These findings support the relevance of examining health control beliefs as potential predictors of psychosocial adjustment in SLE.

Health locus of control may also be associated with emotional vulnerability. When individuals perceive little personal influence over health-related outcomes, they may be more likely to experience hopelessness, depressive symptoms, or passive coping. Research involving people with dementia has shown that locus of control is associated with depressive symptoms, illustrating the broader relationship between control beliefs and emotional well-being in health-related contexts (Halse et al., 2021). In patients with type 2 diabetes, health locus of control has also been discussed in relation to self-efficacy and dispositional optimism, indicating that control beliefs operate within a broader network of cognitive and motivational resources (Krzemińska & Bąk, 2023). Therefore, the effect of health locus of control on psychosocial adjustment may not be exclusively direct. It may occur partly through variables that shape expectations about the future, including optimism and pessimism.

Optimism is generally defined as a relatively stable tendency to expect positive outcomes, whereas pessimism reflects the expectation that negative outcomes are likely to occur. These orientations influence how individuals appraise stressful events, allocate effort, select coping strategies, and persist when confronted with adversity. Optimistic

individuals are generally more likely to view difficulties as manageable, seek constructive solutions, use available support, and maintain engagement with valued goals. Pessimistic individuals may be more likely to interpret problems as overwhelming or enduring, disengage from effort, and focus on adverse outcomes. A biopsychosocial perspective suggests that optimism and pessimism emerge through interactions among personal dispositions, cognitive appraisals, social experiences, and environmental stressors (Paat et al., 2024). Thus, optimism should not be reduced to unrealistic positive thinking; it is better conceptualized as a motivational orientation that influences adaptation while remaining embedded in the person's social and medical context.

The relationship between optimism and health has received substantial empirical attention. Meta-analytic evidence indicates that optimism is associated with more favorable health-related outcomes across diverse populations and medical conditions (Carver et al., 2023). Optimism may contribute to better adjustment by promoting persistence, adaptive coping, treatment adherence, and emotional regulation. Longitudinal research on chronic illness has suggested that optimistic expectations are associated with more effective coping and improved adaptation over time (Barton et al., 2023). Optimism has also been identified as an important component of resilience during chronic illness, helping individuals maintain hope and psychological functioning in the presence of continuing stress (Seligman et al., 2024). These mechanisms are particularly relevant to SLE, where patients must manage uncertain symptoms and repeated disruptions without knowing precisely when exacerbations may occur.

Research across clinical populations further supports the role of optimism in shaping illness-related adaptation. Among hematology patients, optimism has been examined alongside health-related quality of life, illness perception, and stigmatization, suggesting that positive expectations may influence both cognitive appraisals of disease and broader well-being (Kiss et al., 2025). In healthcare workers exposed to substantial stress, optimism has been studied as a resource associated with resilience and lower emotional exhaustion (Akdağ et al., 2023). Although these populations differ from patients with SLE, such findings indicate that optimism can function as a protective psychological resource under persistent conditions of uncertainty and burden.

In contrast, pessimism may intensify the perceived threat of illness and increase emotional distress. When patients

expect unfavorable outcomes, they may interpret symptoms as evidence of inevitable deterioration, underestimate their coping capacity, and disengage from health-promoting behaviors. Pessimism can also magnify the emotional effects of external control beliefs. For example, a patient who believes that health is controlled primarily by chance or by powerful others may become particularly vulnerable when these beliefs are combined with negative expectations about the future. In this sense, optimism and pessimism may represent mechanisms through which health locus of control becomes translated into psychosocial outcomes.

The relationship between optimism and health locus of control is theoretically plausible because both constructs concern expectations about outcomes, although they focus on different aspects of those expectations. Health locus of control concerns the perceived source of influence over health outcomes, whereas optimism concerns whether future outcomes are expected to be favorable or unfavorable. An individual may believe that personal behavior affects health and simultaneously expect that effort will lead to improvement. Conversely, a person may perceive health as governed by chance and expect deterioration regardless of personal action. Research among women has shown that optimism and mindfulness can predict health locus of control, supporting a meaningful association between positive psychological orientation and beliefs about health-related agency (Balouchi Bidokhti et al., 2018). It is therefore reasonable to propose that optimism and pessimism may mediate the association between health control beliefs and psychosocial adjustment.

This mediational perspective can clarify why identical health locus of control orientations may produce different outcomes across patients. Internal control beliefs may facilitate adjustment when they generate hopeful expectations and adaptive action, but they may be less beneficial when patients remain pessimistic or blame themselves for uncontrollable symptoms. A powerful-others orientation may support adjustment when it is accompanied by confidence in medical care, but it may predict poorer adjustment when combined with pessimism and dependency. Chance control beliefs may undermine adaptation by weakening agency and reducing optimism. Thus, the psychological meaning of health locus of control may depend partly on the motivational orientation through which it is interpreted.

Evidence from intervention research also indicates that psychosocial adjustment is modifiable. Psychological treatments such as acceptance and commitment therapy and

transdiagnostic interventions have been associated with improvements in psychosocial adjustment and self-care among individuals with cardiovascular disease (Amiri et al., 2024). Although such findings derive from a different medical population, they demonstrate that adjustment to chronic illness can be strengthened by interventions targeting cognition, emotion, acceptance, and behavior. Identifying the pathways that predict psychosocial adjustment in SLE may therefore have practical value. A model incorporating health locus of control and optimism could help clinicians identify patients at greater risk of maladjustment and design interventions that strengthen realistic internal control, reduce maladaptive dependence or fatalism, and cultivate adaptive expectations.

Psychosocial adjustment is also shaped by developmental and relational contexts. Research on psychosocial adjustment in nonclinical populations has shown that adjustment develops through reciprocal interactions between environmental experiences and psychological functioning over time (Deng et al., 2024). Although this evidence concerns early adolescence, it reinforces the broader principle that psychosocial adjustment is dynamic rather than fixed. In chronic illness, patients' beliefs, emotions, and social experiences may continuously influence one another. Consequently, examining only direct relationships may provide an incomplete account of adaptation.

Despite growing recognition of the psychosocial consequences of SLE, several gaps remain. Many studies have focused on quality of life, distress, coping, or social support without testing integrated explanatory models of psychosocial adjustment. Other studies have examined health locus of control or optimism separately, limiting understanding of how control beliefs and future-oriented expectations operate together. In addition, findings from other chronic illnesses cannot automatically be generalized to women with SLE because the disease has distinctive features, including its autoimmune nature, fluctuating course, visible and invisible symptoms, and potential effects on identity, relationships, and reproductive concerns. There is therefore a need to examine a model that simultaneously considers internal, powerful-others, and chance health locus of control and evaluates optimism and pessimism as potential mediating mechanisms.

Accordingly, the aim of the present study was to develop and test a predictive model of psychosocial adjustment to illness based on health locus of control, with optimism and pessimism as mediating variables, among women with systemic lupus erythematosus.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a descriptive-correlational design using structural equation modeling and aimed to determine the mediating role of optimism in the relationship between health locus of control and psychosocial adjustment to illness among patients with systemic lupus erythematosus. The statistical population consisted of all female patients with systemic lupus erythematosus who attended Bouali, Farhikhtegan, and Amir Al-Momenin hospitals affiliated with Islamic Azad University in Tehran, as well as the Lupus Association, during the first six months of 2025. The research sample was selected through purposive sampling, and participants were enrolled according to the inclusion and exclusion criteria. The inclusion criteria were being a woman with systemic lupus erythematosus aged 35–55 years, willingness to participate in the study, having at least a high school diploma, having no psychiatric disorders based on self-report, not using psychiatric medications based on self-report, having no history of substance or alcohol abuse, and receiving concurrent psychotherapy. The exclusion criteria were submitting incomplete or invalid questionnaires, failing to complete the questionnaires, and withdrawing from further participation. Data were collected through library-based and field methods. The library-based method involved the use of Internet resources, books, and scholarly articles. In the field phase, after obtaining informed consent, the questionnaires were administered to all participants in the sample.

2.2. Data Collection Tools

Three validated instruments were used to assess the study variables. The Psychosocial Adjustment to Illness Scale developed by Derogatis (1986) consists of 46 items and assesses psychosocial adjustment to illness across the dimensions of attitudes toward the illness, vocational environment, domestic environment, sexual relationships, extended family relationships, social environment, and psychological distress. The Multidimensional Health Locus of Control Scale developed by Wallston et al. (1978) consists of 18 items designed to assess individuals' sources of health control and their related beliefs and cognitions. It predicts health-related behavior based on personal beliefs across three subscales: internal health locus of control, powerful-others health locus of control, and chance health locus of control. The optimism questionnaire developed by Scheier

and Carver (1985) consists of 10 items designed to assess dispositional optimism across three subscales: optimism, pessimism, and filler items. The validity of the instruments was confirmed through evaluations by university faculty members and specialists in psychology. Before the main administration, the reliability of the questionnaires was assessed in a preliminary sample of 15 participants. Cronbach's alpha coefficients for the Psychosocial Adjustment to Illness Scale, the Multidimensional Health Locus of Control Scale, and the optimism questionnaire were .868, .823, and .802, respectively, indicating acceptable reliability.

2.3. Data Analysis

Descriptive data were analyzed using means and standard deviations. To obtain the final model, structural equation modeling and bootstrapping procedures were performed and reported using SPSS version 27 and SmartPLS version 4.

3. Findings and Results

The sample in the present study consisted of 280 participants. Regarding age, 15% of the participants were

aged 35–41 years, 37.86% were aged 42–48 years, and 47.14% were aged 49–55 years. As shown, participants aged 49–55 years constituted the largest group, whereas those aged 35–41 years constituted the smallest group.

Regarding educational attainment, 37.86% of the participants held a high school diploma or associate degree, 43.21% held a bachelor's degree, and 18.93% held a master's degree or higher. As shown, participants with a bachelor's degree constituted the largest group, whereas those with a master's degree or higher constituted the smallest group.

This demographic distribution indicates that the sample had adequate diversity in terms of age and educational attainment while maintaining an acceptable degree of homogeneity in demographic characteristics, thereby strengthening the validity of the research findings.

Consistent with the title and objectives of the study, three main variables were assessed using standardized questionnaires. The descriptive findings are presented in Table 1.

Table 1

Means and Standard Deviations of the Main Study Variables

Variable	Mean	Standard Deviation
Psychosocial adjustment to illness	1.50	0.403
Health locus of control	3.51	0.226
Optimism	2.30	0.784

Based on the descriptive findings, psychosocial adjustment to illness had a mean of 1.50 and a standard deviation of 0.403. Health locus of control had a mean of 3.51 and a standard deviation of 0.226, while optimism had a mean of 2.30 and a standard deviation of 0.784. Because the study variables were assessed within a structural

equation modeling framework, the research hypotheses and the statistical significance of the path coefficients between the variables were examined using the software output. The path coefficients and their significance levels are presented in Table 2 and Figure 1.

Table 2

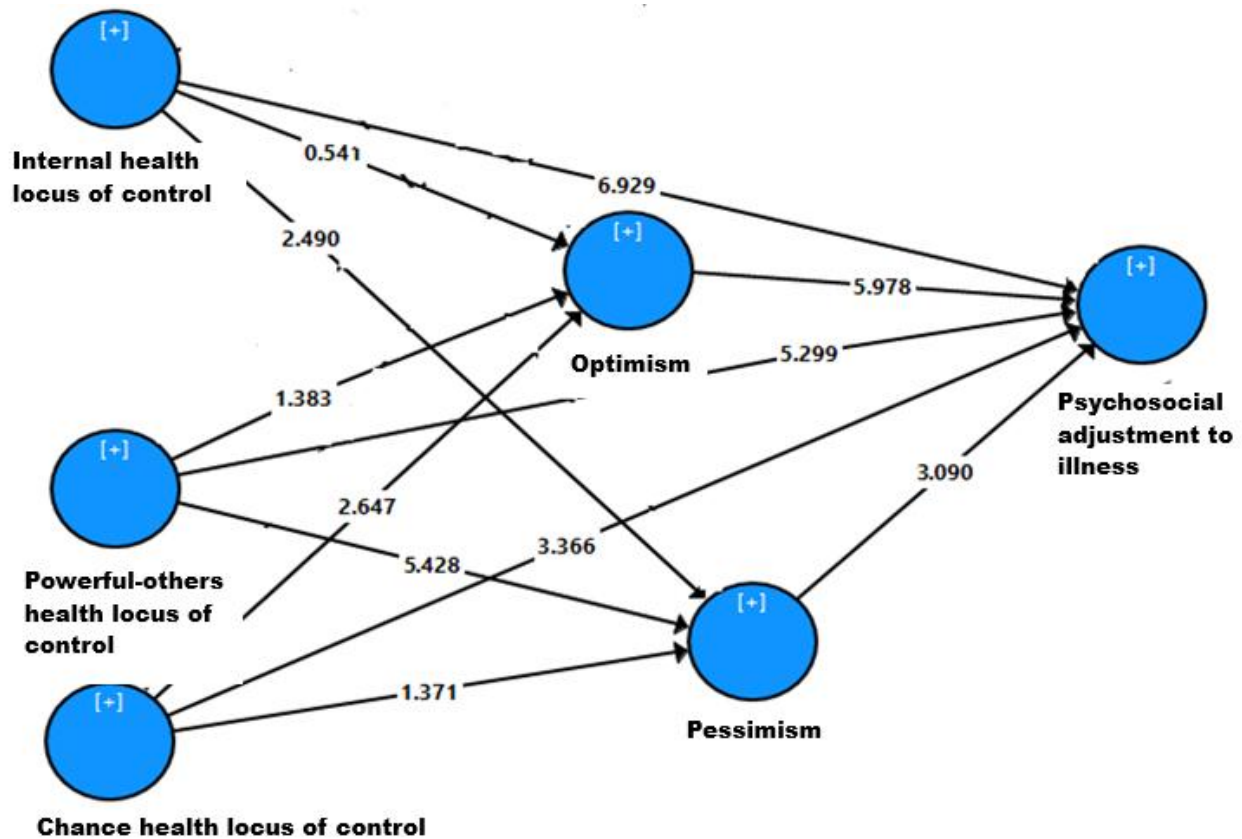
Path Coefficients and t Values for the Overall Model

Path	Effect	t Statistic	p Value	Result
Pessimism → Psychosocial adjustment to illness	-0.269	3.090	.002	Relationship supported
Optimism → Psychosocial adjustment to illness	0.363	5.978	< .001	Relationship supported
Chance health locus of control → Pessimism	0.081	1.371	.171	Relationship not supported
Chance health locus of control → Optimism	-0.149	2.647	.008	Relationship supported
Chance health locus of control → Psychosocial adjustment to illness	-0.156	3.366	.001	Relationship supported
Internal health locus of control → Pessimism	-0.211	2.490	.027	Relationship supported
Internal health locus of control → Optimism	0.038	0.541	.589	Relationship not supported

Internal health locus of control → Psychosocial adjustment to illness	0.346	6.929	< .001	Relationship supported
Powerful-others health locus of control → Pessimism	0.384	4.428	< .001	Relationship supported
Powerful-others health locus of control → Optimism	-0.091	1.383	.167	Relationship not supported
Powerful-others health locus of control → Psychosocial adjustment to illness	-0.259	5.299	< .001	Relationship supported

Figure 1

Testing the Overall Research Model



The coefficient of determination is the primary criterion for evaluating endogenous latent variables in a path model. The coefficients of determination for the endogenous variables—psychosocial adjustment to illness ($R^2 = .549$), pessimism ($R^2 = .190$), and optimism ($R^2 = .176$)—indicated relatively weak explanatory power for some components of the research model. The predictive relevance values for the endogenous variables—pessimism ($Q^2 = .104$), optimism

($Q^2 = .092$), and psychosocial adjustment to illness ($Q^2 = .222$)—were within the weak-to-moderate range. Therefore, the structural model demonstrated an approximately acceptable level of quality and relatively satisfactory predictive ability for the endogenous latent variables. To assess the significance and adequacy of the model, the goodness-of-fit indices generated by SmartPLS were examined. A summary of the results is presented in Table 3.

Table 3

Results of the SRMR, rms Theta, and NFI Model-Fit Indices

Fit Index	Saturated Model	Estimated Model	Criterion
SRMR	0.092	0.104	< 0.10, acceptable
rms Theta	—	0.150	< 0.12, desirable
NFI	0.817	0.811	> 0.80, acceptable

According to the results presented in Table 3, the SRMR value was considered acceptable for the saturated model,

although the estimated-model value was slightly above the conventional threshold. The rms Theta value exceeded the

desirable threshold, whereas the NFI value was within the acceptable range.

The mean communality value was .399, and the mean R^2 value was .283. Based on these values, the goodness-of-fit index was calculated as .341, indicating that the model had adequate power to predict its endogenous latent variables.

Table 4

Bootstrapping Results for the Statistical Significance of Indirect Effects

Independent Variable	Mediator	Dependent Variable	Indirect Effect	Upper Bound	Lower Bound	t Statistic	Standard Error	p Value
Internal health locus of control	Optimism	Psychosocial adjustment to illness	0.014	0.072	-0.044	1.084	0.053	.393
Powerful-others health locus of control	Optimism	Psychosocial adjustment to illness	-0.033	0.062	-0.125	1.271	0.060	.211
Chance health locus of control	Optimism	Psychosocial adjustment to illness	-0.054	-0.009	-0.102	2.001	0.068	.045
Internal health locus of control	Pessimism	Psychosocial adjustment to illness	0.057	0.094	0.005	1.994	0.074	.043
Powerful-others health locus of control	Pessimism	Psychosocial adjustment to illness	-0.103	-0.038	-0.160	2.837	0.057	.001
Chance health locus of control	Pessimism	Psychosocial adjustment to illness	-0.022	0.041	-0.077	1.351	0.049	.244

As shown in Table 4, the significance level for the mediating role of optimism in the relationship between chance health locus of control and psychosocial adjustment to illness was .045, and the confidence interval did not include zero. Therefore, the mediating role of optimism in the relationship between chance health locus of control and psychosocial adjustment to illness was supported. Moreover, the significance levels for the mediating role of pessimism in the relationships of internal health locus of control ($p = .043$) and powerful-others health locus of control ($p = .001$) with psychosocial adjustment to illness were below .05. Therefore, the mediating role of pessimism in the relationships of internal health locus of control and powerful-others health locus of control with psychosocial adjustment to illness was supported.

4. Discussion and Conclusion

The present study aimed to develop and test a predictive model of psychosocial adjustment to illness based on health locus of control, with optimism and pessimism serving as mediating variables, among women with systemic lupus erythematosus. The findings indicated that optimism had a significant positive direct effect on psychosocial adjustment to illness, whereas pessimism had a significant negative direct effect. Chance health locus of control negatively predicted both optimism and psychosocial adjustment to

illness. Internal health locus of control positively predicted psychosocial adjustment and negatively predicted pessimism, although its direct relationship with optimism was not significant. Powerful-others health locus of control positively predicted pessimism and negatively predicted psychosocial adjustment, but its relationship with optimism was not significant. The mediation analysis further showed that optimism significantly mediated the relationship between chance health locus of control and psychosocial adjustment, while pessimism significantly mediated the relationships of internal health locus of control and powerful-others health locus of control with psychosocial adjustment. In contrast, the mediating role of optimism in the relationships of internal and powerful-others health locus of control with adjustment, as well as the mediating role of pessimism in the relationship between chance health locus of control and adjustment, was not supported. Overall, the model explained 54.9% of the variance in psychosocial adjustment to illness, indicating that health-related control beliefs and future-oriented expectations together account for a meaningful proportion of differences in adjustment among women with systemic lupus erythematosus.

The positive direct effect of optimism on psychosocial adjustment is consistent with the broader literature demonstrating that optimistic expectations facilitate adaptation to chronic illness. Optimism encourages individuals to interpret illness-related difficulties as

manageable, maintain engagement with treatment, seek social and medical support, and persist in adaptive coping efforts despite uncertainty. Meta-analytic evidence has shown that optimism is associated with more favorable physical and psychological health outcomes, partly because optimistic individuals are more likely to employ active coping strategies and less likely to disengage when confronted with stress (Carver et al., 2023). Longitudinal findings similarly suggest that optimism supports more effective coping with chronic illness over time and reduces the disruptive influence of disease-related stress on everyday functioning (Barton et al., 2023). The present result is also compatible with evidence indicating that optimism promotes resilience during chronic illness by preserving hope, motivation, and psychological stability in the presence of continuing health threats (Seligman et al., 2024).

This finding is particularly meaningful in systemic lupus erythematosus because the disease is characterized by an unpredictable course, recurring exacerbations, periods of remission, and uncertainty regarding future organ involvement. Under such conditions, positive but realistic expectations may help patients maintain continuity in family, occupational, and social roles despite fluctuating symptoms. Studies conducted specifically among patients with lupus have emphasized the importance of optimism, social support, and adaptive coping in reducing emotional distress and improving adjustment (Jenkins et al., 2025). Evidence also shows that patients with systemic lupus erythematosus who use more constructive coping strategies report better emotional well-being and quality of life (Da Silva et al., 2024; Zhou et al., 2024). Optimism may facilitate these strategies by encouraging patients to view treatment adherence, symptom management, and social participation as worthwhile even when complete control over the disease is impossible.

The negative direct effect of pessimism on psychosocial adjustment also accords with theoretical and empirical expectations. Pessimistic patients may anticipate worsening symptoms, treatment failure, social rejection, or irreversible loss of functioning. Such expectations can intensify illness-related threat, reduce motivation to engage in self-care, and increase avoidance, helplessness, and emotional withdrawal. From a biopsychosocial perspective, optimism and pessimism influence responses to stress through their effects on cognitive appraisal, emotional regulation, health behavior, and social interaction (Paat et al., 2024). Thus, pessimism may impair psychosocial adjustment not only by increasing negative affect but also by undermining practical

coping and reducing willingness to maintain valued roles. This interpretation is consistent with findings showing that illness perceptions and coping strategies are longitudinally associated with adaptation among patients with lupus (Gómez et al., 2023). When patients perceive the illness as uncontrollable, highly threatening, and likely to produce persistent negative consequences, pessimistic expectations may become self-reinforcing and contribute to poorer adjustment.

The finding that internal health locus of control positively predicted psychosocial adjustment supports the assumption that belief in personal influence over health-related outcomes can promote adaptive engagement with chronic illness. Patients who perceive that their choices and behaviors matter may be more likely to adhere to medication, attend follow-up appointments, monitor symptoms, communicate effectively with healthcare providers, and preserve health-promoting routines. Previous research has linked internal health locus of control to healthier lifestyles and stronger engagement in health-related behaviors (Sepah Mansour & Bagheri, 2017). It has also been suggested that internal health locus of control can mediate the effects of broader personality characteristics on health outcomes by translating personal dispositions into active health behavior (Shaffer, 2025). In the context of systemic lupus erythematosus, internal control beliefs may therefore support psychosocial adjustment by strengthening agency without requiring patients to believe that they can completely control the biological course of the disease.

The direct negative relationship between internal health locus of control and pessimism further indicates that stronger personal control beliefs may reduce expectations of unfavorable outcomes. When patients believe that their actions can influence symptom management and daily functioning, they may feel less helpless and less likely to anticipate inevitable deterioration. This result is broadly aligned with literature connecting health locus of control, self-efficacy, and dispositional optimism in chronic disease populations (Krzemińska & Bąk, 2023). Research among women has also shown that optimism is associated with health locus of control orientations, suggesting that beliefs about personal agency and positive expectations are psychologically interconnected (Balouchi Bidokhti et al., 2018). However, the nonsignificant direct path from internal health locus of control to optimism in the present study suggests that perceived control does not necessarily generate optimistic expectations. A patient may believe that self-care and treatment adherence are important while remaining

uncertain about the future because SLE can progress unpredictably despite appropriate behavior. Therefore, internal control may reduce pessimism more readily than it increases optimism.

The significant mediating role of pessimism in the relationship between internal health locus of control and psychosocial adjustment provides a more specific explanation of this pathway. Internal control beliefs were associated with lower pessimism, which in turn was associated with better adjustment. This suggests that personal agency may contribute to psychosocial adaptation partly by preventing negative expectations rather than by directly producing strongly positive expectations. In other words, patients who believe that their behavior matters may be less likely to conclude that unfavorable outcomes are unavoidable. Reduced pessimism may then help them remain involved in treatment, preserve social functioning, and manage emotional reactions more effectively. This indirect pathway is consistent with evidence showing that control beliefs are related to depressive symptoms and emotional outcomes in medically vulnerable populations (Halse et al., 2021). It also supports the broader view that adjustment emerges through interacting cognitive and emotional processes rather than through a single belief system.

The negative direct effect of powerful-others health locus of control on psychosocial adjustment indicates that excessive reliance on physicians, family members, or other influential individuals may undermine independent adaptation. In chronic disease management, trust in healthcare professionals is necessary and often beneficial; however, when patients perceive that health outcomes are determined almost entirely by others, they may experience reduced autonomy and self-efficacy. This pattern may be especially problematic in SLE because treatment decisions are often complex, prolonged, and subject to uncertainty. Contemporary clinical guidance emphasizes individualized and collaborative management of SLE, including rare manifestations that may require multidisciplinary decision-making (Arnaud et al., 2025). Patients must rely on medical expertise, but they must also remain active participants in monitoring symptoms, reporting treatment effects, and making daily self-management decisions. Therefore, powerful-others beliefs may become maladaptive when they replace rather than complement personal agency.

The positive effect of powerful-others health locus of control on pessimism and the significant mediating role of pessimism in its relationship with psychosocial adjustment

further clarify this result. Patients who feel that their health is controlled mainly by external authorities may become pessimistic when treatment responses are slow, medical advice varies, or access to care is limited. This dependence can amplify uncertainty and reinforce the expectation that the patient has little capacity to influence outcomes. The resulting pessimism may then impair psychological and social adaptation. This explanation is consistent with studies showing that health locus of control is associated with symptom distress, illness acceptance, and self-management in serious medical conditions (Cheng et al., 2025; Qi et al., 2024). It also corresponds with findings that illness perception, stigmatization, optimism, and quality of life are linked within broader path models among patients with chronic hematological conditions (Kiss et al., 2025). Although dependence on specialists may be unavoidable in complex illnesses, adjustment may be improved when professional guidance is combined with patient empowerment and shared decision-making.

Chance health locus of control had a significant negative direct effect on psychosocial adjustment, indicating that patients who attributed their health primarily to luck, fate, or randomness experienced poorer adaptation. This finding is theoretically expected because chance beliefs can weaken perceived agency and reduce motivation for sustained self-care. When patients believe that their efforts have little impact on disease-related outcomes, they may become less likely to adhere consistently to treatment, seek information, or engage in adaptive problem solving. The multidimensional health locus of control framework distinguishes chance beliefs from internal and powerful-others orientations and proposes that these dimensions have different behavioral consequences (Wallston et al., 2023). The present findings support this distinction and suggest that chance beliefs are particularly detrimental to psychosocial adjustment in SLE.

Chance health locus of control also negatively predicted optimism, and optimism significantly mediated the relationship between chance beliefs and psychosocial adjustment. This means that attributing health outcomes to fate or randomness was associated with lower optimism, which in turn predicted poorer adjustment. The result suggests that chance beliefs may impair adaptation partly by weakening positive expectations about the future. If patients perceive disease activity as arbitrary and uncontrollable, they may find it difficult to expect that treatment, self-care, or social support will improve their condition. This interpretation is consistent with evidence that hope, health

locus of control, and chronic illness resources influence self-management behavior (Cheng et al., 2025). It is also compatible with research indicating that optimism functions as an important motivational resource in high-stress environments and can reduce emotional exhaustion through its association with resilience (Akdağ et al., 2023). In SLE, lower optimism may therefore represent one mechanism through which fatalistic beliefs translate into poorer psychosocial functioning.

The nonsignificant mediation of pessimism between chance health locus of control and adjustment may indicate that chance beliefs operate more strongly by diminishing positive expectations than by intensifying explicitly negative expectations. Patients may not necessarily expect catastrophic outcomes, but they may lack confidence that favorable outcomes are attainable. This distinction is important because optimism and pessimism are not always exact opposites and may have partly independent psychological functions. Similarly, the nonsignificant mediation of optimism in the relationships of internal and powerful-others health locus of control with adjustment suggests that these control orientations may influence adaptation through other pathways, including self-efficacy, coping style, illness acceptance, adherence, social support, and emotional regulation. The psychosocial consequences of SLE are complex and involve multiple interacting domains (Swaak et al., 2023; Tselios et al., 2023). Therefore, optimism and pessimism should be considered important but not exclusive explanatory mechanisms.

The overall findings also emphasize that psychosocial adjustment should be understood within the specific clinical context of SLE. Although medical advances have improved disease management, patients continue to experience substantial physical and psychological burden (Uzun et al., 2024). Severe or uncommon manifestations may require intensive and individualized treatment (Arnaud et al., 2025), while resistant cutaneous manifestations can affect appearance, self-esteem, and social interaction even in the absence of systemic involvement (Abdelmalik et al., 2025). Social support and coping resources are therefore essential components of adjustment (Abu Samra et al., 2023). At the same time, the present findings show that patients' beliefs about control and expectations regarding future outcomes shape how they psychologically and socially respond to the illness.

The explanatory power of the model further suggests that interventions targeting control beliefs and future-oriented expectations may improve adjustment. Evidence from

chronic disease intervention research indicates that acceptance and commitment therapy and transdiagnostic approaches can improve psychosocial adjustment and self-care (Amiri et al., 2024). Such interventions may help patients distinguish controllable from uncontrollable aspects of the disease, reduce self-blame, strengthen realistic internal control, and develop flexible responses to uncertainty. More broadly, psychosocial adjustment is a dynamic process influenced by reciprocal relationships between individual functioning and environmental experiences (Deng et al., 2024). Accordingly, effective intervention should address not only patients' cognitions but also family support, healthcare communication, stigma, and opportunities for meaningful social participation.

In conclusion, the findings support a structural model in which health locus of control is associated with psychosocial adjustment to illness both directly and indirectly through optimism and pessimism. Internal health locus of control was associated with better adjustment and lower pessimism, whereas powerful-others and chance orientations were generally associated with poorer adjustment. Optimism emerged as a protective factor, while pessimism functioned as a psychological risk factor. These findings extend previous evidence regarding the role of control beliefs, coping, and positive psychological resources in chronic illness and demonstrate that the interaction between perceived control and future expectations is particularly relevant to psychosocial adaptation among women with systemic lupus erythematosus.

Several limitations should be considered when interpreting the findings. First, the cross-sectional and correlational design does not permit definitive causal conclusions regarding the direction of the relationships among health locus of control, optimism, pessimism, and psychosocial adjustment. Second, the study relied on self-report questionnaires, which may be affected by social desirability, recall bias, and participants' temporary emotional states. Third, the sample consisted exclusively of women aged 35–55 years who attended selected hospitals and a lupus association in Tehran and were recruited through purposive sampling; therefore, the findings may not be generalizable to men, younger or older patients, individuals in rural areas, or patients receiving care in other healthcare systems. Fourth, psychiatric disorders and medication use were assessed through self-report rather than structured clinical interviews or medical records. Fifth, clinical variables such as disease activity, duration of illness, organ involvement, fatigue severity, pain, medication type, and

comorbid conditions were not included in the structural model and may have influenced psychosocial adjustment. Finally, some model-fit indices were only marginally acceptable, indicating that additional psychological, social, and clinical variables may be required to improve the explanatory adequacy of the model.

Future studies should use longitudinal designs to examine how health locus of control, optimism, pessimism, and psychosocial adjustment change across periods of disease exacerbation and remission and to establish the temporal order of their relationships. Replication with larger and more diverse samples, including men, adolescents, older adults, patients from different geographical regions, and individuals with varying levels of disease severity, would strengthen generalizability. Researchers should incorporate objective clinical indicators, physician-rated disease activity, treatment adherence, fatigue, pain, social support, illness perception, self-efficacy, resilience, and coping strategies into more comprehensive structural models. Multi-group analyses could determine whether the proposed pathways differ according to age, educational level, disease duration, socioeconomic status, or type of organ involvement. Future studies may also compare optimism and pessimism as distinct mediators rather than treating them as opposite ends of a single continuum. Experimental and intervention studies are recommended to evaluate whether changes in health control beliefs and future-oriented expectations produce measurable improvements in psychosocial adjustment.

Healthcare professionals working with patients with systemic lupus erythematosus should routinely assess health locus of control, optimism, pessimism, and psychosocial adjustment as part of comprehensive care. Psychological interventions should help patients identify which aspects of illness management are personally controllable, develop realistic rather than absolute internal control, and reduce fatalistic beliefs. Psychoeducation should emphasize the value of medication adherence, symptom monitoring, lifestyle management, and active communication with healthcare professionals without implying that patients are responsible for uncontrollable disease activity. Counseling programs should include cognitive and behavioral strategies for reducing pessimistic expectations, strengthening realistic optimism, improving coping flexibility, and maintaining meaningful family, occupational, and social roles. Shared decision-making should be encouraged so that professional expertise supports rather than replaces patient autonomy. Multidisciplinary care teams should also involve family members when appropriate and provide referral pathways

for patients who show marked helplessness, withdrawal, or difficulty adapting to the chronic and unpredictable nature of the disease.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We hereby thank all individuals for participating and cooperating us in this study.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

References

- Abdelmalik, B., Svoboda, S., Gurnani, P., & Motaparathi, K. (2025). Successful Treatment of Recalcitrant Cutaneous Lupus Erythematosus with Anifrolumab in Patients Without Systemic Lupus Erythematosus. *JAAD Case Reports*, 55, 57-61.
- Abu Samra, S. M., Johnson, L. M., & Tayar, J. (2023). Social Support and Coping Mechanisms in Systemic Lupus Erythematosus Patients. *Journal of Clinical Rheumatology*, 29(5), 260-269. <https://doi.org/10.1016/j.jcr.2023.04.003>
- Akdağ, B., Ege, D., & Göksülük, D. (2023). The Parental COVID-19 Anxiety and Emotional Exhaustion in Healthcare Workers: Exploring the Roles of Resilience, Prosocialness, and Optimism. *Current Psychology*, 42, 20042-20051. <https://doi.org/10.1007/s12144-023-04414-6>

- Amiri, M., Khosh Akhlagh, H., Sajadian, P. S., & Rezaei Jamalouei, H. (2024). Comparison of the Effectiveness of Acceptance and Commitment Therapy and Transdiagnostic Therapy on Psychosocial Adjustment to Illness and Self-Care in Individuals with Cardiovascular Disease. *Quarterly Journal of Modern Psychological Research*, 19(73), 58-72.
- Arnaud, L., Ruiz-Irastorza, G., Aranow, C., Bernatsky, S., Dall'Era, M., Adelowo, O., Bae, S. C., Beretta, L., Bonfa, E., Cervera, R., Chasset, F., Clarke, A. E., Costedoat-Chalumeau, N., Doria, A., Espinosa, G., Fanouriakis, A., Fredi, M., Gatto, M., Gladman, D. D., . . . Tani, C. (2025). ERN ReCONNET-SLICC-SLEuro Expert Consensus on the Therapeutic Management of Rare Systemic Lupus Erythematosus Manifestations. *The Lancet Rheumatology*, 7(7), e505-e518. [https://doi.org/10.1016/S2665-9913\(25\)00063-3](https://doi.org/10.1016/S2665-9913(25)00063-3)
- Balouchi Bidokhti, M., Mousavi, A., Meshki, M., & Panahi Shahri, M. (2018). Predicting Women's Health Locus of Control Based on Optimism and Mindfulness. *Positive Psychology Research*, 3(4), 51-64.
- Barton, S., Smith, D., & Cohen, M. (2023). Optimism and Coping with Chronic Illness: A Longitudinal Study. *Journal of psychosomatic research*, 136, 32-40.
- Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2023). Optimism and Health: A Meta-Analytic Review. *Psychological bulletin*, 149(2), 249-270. <https://doi.org/10.1037/bul0000343>
- Cheng, J., Jiang, X., Liao, X., Zhou, L., Qin, L., & Liu, H. (2025). The Impact of Chronic Illness Resources, Fear of Recurrence, Hope, and Health Locus of Control on Self-Management Behaviors in Post-Stroke Patients: A Cross-Sectional Study. *Frontiers in Medicine*, 12, 1598945.
- Da Silva, P. H., Ferreira, R. D., & Rodrigues, P. S. (2024). Coping Strategies and Their Effects on Quality of Life in Systemic Lupus Erythematosus. *Journal of Chronic Disease Management*, 47(3), 150-158. <https://doi.org/10.1002/jcdm.2024.03.004>
- Deng, M., Wen, M., Huebner, E., & Tian, L. (2024). Longitudinal Bidirectional Relations Between Psychological Maltreatment by Teachers and Psychosocial Adjustment During Early Adolescence. *Social Science & Medicine*, 362, 117475.
- Gómez, A., Rodríguez, M., & Pérez, J. (2023). Illness Perception and Coping Strategies in Lupus Patients: A Longitudinal Study. *Psychology & Health*, 38(1), 66-81. <https://doi.org/10.1080/psychhealth.2023.0066>
- Halse, I., Bjørkløf, G. H., Engedal, K., Selbæk, G., & Barca, M. L. (2021). Locus of Control and Its Associations with Depressive Symptoms Amongst People with Dementia. *Dementia and Geriatric Cognitive Disorders*, 50(3), 258-265. <https://doi.org/10.1159/000517936>
- Jenkins, T., Black, L., & Li, Z. (2025). Optimism, Social Support, and Coping Strategies in Systemic Lupus Erythematosus. *Journal of Rheumatology*, 52(1), 85-94. <https://doi.org/10.3899/jrheum.210089>
- Kiss, H., Müller, V., Dani, K. T., & Pikó, B. F. (2025). Health-Related Quality of Life, Illness Perception, Stigmatization and Optimism Among Hematology Patients: Two Exploratory Path Models. *Medicina*, 61(9), 1704. <https://doi.org/10.3390/medicina61091704>
- Krzemińska, S., & Bąk, E. (2023). Health Locus of Control, Self-Efficacy and Dispositional Optimism in Patients with Type 2 Diabetes Mellitus: A Review of the Literature. *Journal of Education, Health and Sport*, 13, 175-180. <https://doi.org/10.12775/JEHS.2023.13.03.025>
- Paat, Y. F., Hope, T. L., Ferreira-Pinto, J. B., & Olvera Alvarez, H. (2024). A Bio-Psycho-Social Approach to Understanding Optimism and Pessimism in Response to Stress. *European Journal of Investigation in Health, Psychology and Education*, 14(10), 2671-2685. <https://doi.org/10.3390/ejihpe14100176>
- Qi, D., Gao, J., Zhang, J., Ma, Y., Xiong, A., Hu, Y., Tian, J., & Zhang, S. (2024). Health Locus of Control and Symptom Distress: The Mediating Role of Illness Acceptance and Symptom Severity in Acute Leukemia Patients. *Cancer Epidemiology*, 90, 102577.
- Seligman, M. E. P., Nolen-Hoeksema, S., & Buckley, T. (2024). The Role of Optimism in Resilience During Chronic Illness. *Psychological Science*, 35(4), 603-612. <https://doi.org/10.1177/0956797623127216>
- Sepah Mansour, M., & Bagheri, F. (2017). Predicting a Health-Promoting Lifestyle Based on Health Locus of Control and Attachment Styles. *Health Psychology*, 6(22), 131-144. https://hpj.journals.pnu.ac.ir/article_4042.html
- Shaffer, J. A. (2025). Conscientiousness and Health Outcomes: The Moderating Role of General Mental Ability and the Mediating Role of Internal Health Locus of Control. *Personality and individual differences*, 233, 112925.
- Swaak, T. P., Van Vollenhoven, R. F., & Jacobs, J. W. (2023). Social and Psychological Consequences of Systemic Lupus Erythematosus. *Clinical and Experimental Rheumatology*, 41(1), 61-67. <https://doi.org/10.5555/ceps.2023.01.009>
- Tselios, K., Gladman, D. D., Urowitz, M. B., & Costigan, D. A. (2023). The Impact of Systemic Lupus Erythematosus on Health Outcomes: A Global Perspective. *Rheumatology*, 62(7), 2045-2057.
- Uzun, G., Abida, R., & Isenberg, D. (2024). Advances in Systemic Lupus Erythematosus. *Medicine*, 52(12), 737-745.
- Wallston, K. A., Wallston, B. S., & DeVellis, R. F. (2023). Development of the Multidimensional Health Locus of Control (MHLC) Scales. *Health Education & Behavior*, 50(1), 97-104. <https://doi.org/10.1177/10901981231177468>
- Zhou, J., Li, H., & Wang, L. (2024). Coping Strategies and Emotional Well-Being in Lupus Patients: An Integrative Review. *Journal of Clinical Psychology in Medical Settings*, 31(6), 460-472. <https://doi.org/10.1007/s10880-024-09732-6>