

The Role of Health Locus of Control and Social Support in Accepting Physical Motor Therapy among Patients with Hemiplegia Resulting from Stroke (AVC)

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Abstract:

The study aimed to identify the relationship between health locus of control and acceptance of physical motor therapy in the presence of a mediating variable, namely social support. The researchers used the descriptive method due to its suitability to the nature of the study. The instruments employed for data collection included the Health Locus of Control Scale, the Social Support Scale, and the Treatment Acceptance Scale. The research population consisted of patients with hemiplegia resulting from stroke in physical motor therapy centers in the wilayas of M'sila, Djelfa, and Biskra. The sample size was (242) individuals. The study found a positive correlation between health locus of control and acceptance of physical motor therapy among patients with hemiplegia resulting from stroke. It also revealed a positive correlation between social support and acceptance of physical motor therapy, in addition to a correlation between health locus of control and social support. Furthermore, the results showed that social support plays a mediating role in the relationship between health locus of control and acceptance of physical therapy.

Keywords: Health locus of control, social support, acceptance of physical motor therapy, stroke.

Introduction and Research Problem:

Stroke (A.V.C) is considered the second leading cause of death worldwide, affecting a large proportion of the elderly. In Algeria alone, it accounts for 16,000 deaths annually (saha). More importantly, stroke is the main cause of disability, especially motor disability, which negatively impacts the psychological health of patients who struggle to adapt to their new condition.

Social support plays a vital role in improving the patient's psychological state and is considered a therapeutic necessity for accepting physical motor therapy, which represents the first stage of adaptation. Studies such as those by *James Dravier (J. Dravier)*, *Berkman and Syme*, and the *World Health Organization report (2003)*, emphasize the importance of social support in enhancing patient acceptance of their condition and increasing their hope for recovery (Bayoumi, 1996, pp. 92–119).

The effectiveness of support depends on the individual's perception of it, which is linked to their health locus of control. Individuals who believe in an "internal locus of control" think their health depends on their own behaviors, while those with an "external locus of control" attribute their health to external factors such as luck or fate. Based on this, the study was entitled:

“Health Locus of Control and Social Support and Their Relationship with Acceptance of Physical Motor Therapy among Patients with Hemiplegia Resulting from Stroke (A.V.C).”

General Research Question:

The study aims to answer the following general question:

Do health locus of control and social support play a role in the acceptance of physical therapy among patients with hemiplegia resulting from stroke?

Research Objectives:

The importance of this study stems from the nature of the subject and the problems it raises. The objectives can be summarized as follows:

- **Theoretical Objectives:** This study seeks to enrich theoretical knowledge about social support provided to individuals with special needs, particularly those with hemiplegia. It also aims to raise awareness among physical therapists and family members about the importance of psychological support and health locus of control in promoting the patient's acceptance of physical therapy.
- **Practical Objectives:** This study seeks to determine the relationship between health locus of control, social support, and acceptance of physical therapy among individuals with hemiplegia. To achieve this goal, the study aims to verify the existence of relationships between each pair of variables, in addition to examining whether social support plays a mediating role in the relationship between health locus of control and acceptance of physical therapy.

Hypotheses:

- There is a relationship between health locus of control and acceptance of physical motor therapy.
- Social support contributes to increasing the degree of acceptance of physical motor therapy.
- There is a relationship between health locus of control and social support.
- Social support acts as a mediating variable in the relationship between health locus of control and acceptance of physical therapy.

Definition of Research Concepts

Health Locus of Control:

- **Conceptual Definition:** Refers to the extent to which an individual believes that health outcomes are under their control (internal locus) or are the result of external factors such as luck or the influence of others (external locus) (Rotter, 1966, p. 1).
- **Operational Definition:** Measured through a scale adapted to the Algerian context (Jebaïli Nourdine, 2007), consisting of three dimensions: internal locus of control, external locus of control (others), and external locus of control (luck).

Social Support:

- **Conceptual Definition:** The support received by an individual from their social environment (Cobb, 1976). It includes support from the family and the physical therapist, whether emotional, verbal, or financial (Yekhlef, 2001, p. 138).
- **Operational Definition:** Measured through a scale adapted to the Algerian context (Kara Saïd), and consists of two dimensions: support from the family and support from the physical therapist.

Treatment Adherence:

- **Conceptual Definition:** Defined as the patient's commitment to the instructions of doctors and therapists (Adoubi et al., 2006).

- **Operational Definition:** Measured through a scale developed by Dr. Kara Saïd, based on previous questionnaires such as the Morisky questionnaire (Adoubi et al., 2006).

Previous Studies:

First Study: Yvan Paquet (2006) conducted a study entitled “Verification of the Factorial Structure of the Health Locus of Control Scale among Injured Athletes in France.”

This study aimed to verify the factorial structure of the Health Locus of Control Scale for injured athletes using confirmatory factor analysis. It employed the Health Locus of Control Scale by Wallston, adapted to the French context by Bruchon-Schweitzer. The sample consisted of 260 students (170 males and 90 females) with an average age of 20–26 years, all of whom had good knowledge of the sports environment, either through their studies or personal practice. The study indicated that the model fit the data as follows:

Indices	×2	CFI	RMSEA	GFI	RMR	PNFI
Valeur	232/132=1.74	0.84	0.055	0.91	0.04	0.60

Second Study: Coffman – Maren Jill (2005) conducted a study entitled “The Relationship of Depression and Perceived Social Support to Self-Efficacy in a Statistical Sample of Older Adults with Diabetes in Puerto Rico.”

The study aimed to examine the relationship between depression and social support and their impact on self-efficacy. The study sample consisted of (115) elderly Hispanic individuals with type II diabetes. The study employed a descriptive correlational design. During interviews, patients completed the Self-Efficacy Scale, the Preliminary Depression Test, the Social Support Scale, and a demographic questionnaire.

It was noted that the variables predicting improvement in diabetes self-regulation included the patient’s participation in educational programs about diabetes, higher educational attainment, and absence of depressive symptoms.

The most important results indicated:

- The strongest predictor of diabetes self-regulation was perceived social support.
- The types of support most needed by elderly diabetic patients were transportation and communication.
- Family members represented the primary source of support.

Exploratory Study:

The final field application was preceded by several preparatory steps for the main study, as follows:

1. Visiting the physical motor therapy centers in the wilayas of M’sila, Djelfa, and Biskra to request permission to conduct the study, which was granted with the cooperation of some physical therapists, and the times for conducting the study were scheduled.
2. Surveying the study setting.
3. The researcher became acquainted with some of the existing cases, and with the assistance of the physical therapist and his assistants, introduced the patients to his role and the purpose of the work with them, then selected the exploratory sample.
4. Selecting the tools consistent with the study’s objectives and verifying their suitability for the target sample. This included reviewing a set of scales designed to measure the variables (health locus of control – social support – treatment acceptance).

An initial application of the selected study tools was carried out to examine the extent to which the exploratory sample responded to them and understood their items, as well as to calculate the psychometric properties (validity and reliability) of the three scales in order to ensure the suitability of the research tools.

The characteristics of the sample were also defined, and some shortcomings in the application procedures were identified at this stage, to be avoided when carrying out the final study procedures.

Exploratory Study Sample:

The exploratory sample was selected from the physical motor therapy centers in the wilayas of M'sila, Djelfa, and Biskra. It was a purposive sample, meaning that the sample was chosen to suit the researcher's objectives. Patients with hemiplegia resulting from stroke were selected based on their medical records and available information about their condition. The exploratory sample included (197) hemiplegic patients of both genders, with ages ranging from 52 to 74 years.

Research Method:

The descriptive method was employed, using the descriptive approach to illustrate the nature of the relationship between the study variables—directly between health locus of control and treatment acceptance, and indirectly with the presence of the mediating variable, social support. The logical analysis method was also used through inference, analysis, and discussion, as statistics do not provide absolute knowledge that cannot be questioned, but rather knowledge open to critical review (Tighza, n.d., p. 7).

Research Tools (Validity and Reliability Testing):

Every study relies on one or more tools to achieve objective results. In this research, the following scales were used:

- Health Locus of Control Scale.
- Social Support Scale.
- Physical Motor Therapy Acceptance Scale.

Confirmatory Factor Analysis (CFA):

The researchers used the confirmatory factor analysis model to verify the validity of the three scales employed in the study. CFA examines whether the proposed factorial structure of the scale fits the data, and if the measured construct provides a good fit, this is considered strong evidence of construct validity.

1) Health Locus of Control Scale

Starting from Rotter's original internal–external locus of control scale, many researchers (Phares, Spector, Levenson, ...) developed this scale into others with three dimensions (internal – external – chance/fate). Based on Levenson's locus of control scale, Wallston (1978) developed the Multidimensional Health Locus of Control (MHLC) scale, which is still widely used today.

This scale was adapted into Arabic by Jebaïli Nourdine at Batna University, Algeria, and has since been applied in numerous studies (Kara, Alioua, Azzouz, ...), after confirming its psychometric properties under the classical test theory framework. The MHLC scale, designed by Wallston et al. (1978) and adapted and standardized for the Algerian context by Jebaïli (2007), is considered one of the most widely used scales in health psychology.

The MHLC scale aims to measure individuals' self-assessments regarding their health. Some individuals believe in their personal role in resisting illness (internal locus), while others attribute health to fate or the influence of others such as doctors or family members.

The scale consists of 18 self-report items, answered on a 5-point Likert scale ranging from strongly agree to strongly disagree. The items are divided into three factors:

1. **Internal Health Locus of Control (IHLC):** 6 items (1, 6, 8, 12, 13, 17).

2. **External Health Locus of Control – Powerful Others (PHLC):** 6 items (3, 5, 7, 10, 14, 18).

3. **External Health Locus of Control – Chance (CHLC):** 6 items (2, 4, 9, 11, 15, 16).

Psychometric Properties of the Scale in the Algerian Context (according to Classical Test Theory)

Reliability:

Jeballi Nourdine (2007) calculated the reliability of the scale on an Algerian sample using Cronbach's Alpha and split-half methods. The results were as follows:

- Internal dimension: high reliability, Cronbach's Alpha = 0.70, correlation = 0.71.
- Chance dimension: lower reliability, Alpha = 0.53, correlation = 0.43.
- Powerful Others dimension: moderate reliability, Alpha = 0.62, correlation = 0.58.

These results indicate that the scale enjoys acceptable to high reliability across its dimensions.

Validity:

Two types of validity were assessed: construct validity and discriminant validity.

• **Correlation of Internal Locus Items with the Total Score:**

All items related to internal locus showed strong positive correlations with the total score, significant at the 0.01 level, ranging from 0.50 to 0.78.

Examples:

- "My personal behavior determines how quickly I recover from illness" ($r = 0.50$).
- "I believe I am in control of my health" ($r = 0.55$).
- "If I take good care of my health, I can avoid illness" ($r = 0.78$).
- "I can maintain my health if I look after myself" ($r = 0.77$).

• **Correlation of Powerful Others Items with the Total Score:**

All items related to the influence of others were also significantly correlated at the 0.01 level, ranging from 0.51 to 0.67.

Examples:

- Following doctor's instructions ($r = 0.51$).
- Regularly visiting doctors ($r = 0.67$).
- "My family plays a major role in whether I get sick or stay healthy" ($r = 0.58$).

These findings confirm high construct validity.

Discriminant Validity (T-test):

• **Internal Locus:** Significant differences ($p < 0.01$) between high and low groups.

- High group: Mean = 25.21, SD = 1.21.
- Low group: Mean = 16.04, SD = 3.69.
- $T = 17.54$ (significant).

• **External Locus – Chance:** Significant differences ($p < 0.01$).

- High group: Mean = 19.79, SD = 2.64.
- Low group: Mean = 10.29, SD = 1.14.
- $T = 24.48$ (significant).

• **External Locus – Powerful Others:** Significant differences ($p < 0.01$).

- High group: Mean = 23.50, SD = 2.49.
- Low group: Mean = 13.71, SD = 1.52.
- $T = 24.90$ (significant).

Conclusion on Scale Properties:

The results confirm that the research scales (health locus of control, social support, treatment acceptance) possess high levels of reliability and validity, ensuring their appropriateness for use in the Algerian context.

General Model of the Study:

This model brings together all the causal relationships between the latent variables, as well as between the latent variables and their measured variables. The general model of the study was developed based on the researchers' review and in-depth study of previous research. It consists of two parts:

- **Measurement Model:** which represents the latent variables and their relationship with their indicators.
- **Structural Model:** which represents the relationships among the latent variables themselves.

A – Measurement Model: The measurement model consists of three variables as follows:

- **Independent Variable:** Health Locus of Control.
- **Mediating Variable:** Social Support.
- **Dependent Variable:** Treatment Acceptance.

The following diagram of the measurement model illustrates the relationship between the independent variable (Health Locus of Control), the mediating variable (Social Support), and the dependent variable (Treatment Acceptance), as shown in the following figure:

Diagram of the Structural Model:

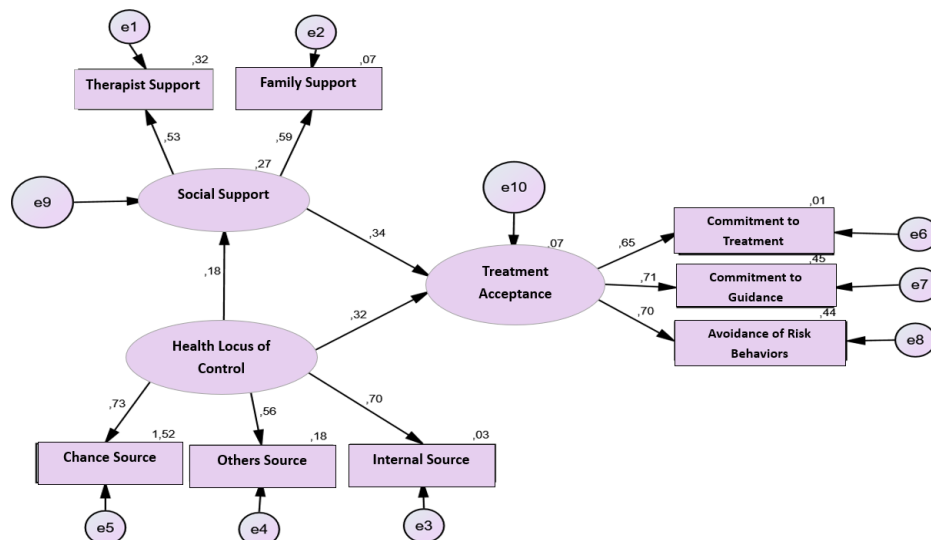


Figure (01): Diagram of the Structural Model (Amos Outputs).

Hypotheses Related to the Model:

1. Health locus of control contributes to increasing the acceptance of physical motor therapy among patients with hemiplegia resulting from stroke.
2. Social support contributes to increasing the acceptance of physical motor therapy among patients with hemiplegia resulting from stroke.
3. There is a relationship between health locus of control and social support among patients with hemiplegia resulting from stroke.
4. Social support acts as a mediating variable in the relationship between health locus of control and acceptance of physical therapy among patients with hemiplegia.

The following presents a summary of the model fit indices outputs, calculated as follows:

Table (01): Model Fit Indices

Model	GFI	SRMR	TLI	CFI	RMSEA
	0.92	0.06	0.86	0.96	0.04

It is clear from Table (01) that the model achieved good fit indices. The Root Mean Square Error of Approximation (RMSEA) value is good at (0.040). The Comparative Fit Index (CFI) value is (0.96), which is acceptable. The Goodness of Fit Index (GFI) value is (0.92), which is also acceptable. The Standardized RMR value is (0.06), which is acceptable as well. Therefore, the model obtained good values with respect to the fit indices, which are encouraging, and this result indicates that the model represents the data well.

Presentation of Results:

Results of the First Hypothesis:

There is a relationship between health locus of control and acceptance of physical motor therapy among patients with hemiplegia resulting from stroke.

This is evident from Figure (01) of the general study model and from the analytical outputs of the Amos program, which are summarized in Table (02).

Table (02): Results of the First Hypothesis.

Independent Variable	Dependent Variable		
	Treatment Acceptance		
Health Locus of Control	Regression Coefficient	Significance Level	Residuals
	0.32	0.001	0.15
Total Direct Effect	0.32		

Analysis of the Results of the First Hypothesis:

Based on Figure (01) and Table (02), the results indicate the existence of a positive correlation between the variable health locus of control and the variable treatment acceptance at a significance level of 0.001, where the value of the regression coefficient reached 0.32. Moreover, the residuals of the relationship between the variable health locus of control and the variable treatment acceptance equal 0.15, which is close to zero. Accordingly, all the mentioned evidence illustrated in the graphical figure supports the hypothesis that the variable health locus of control contributes to increasing treatment acceptance among patients with hemiplegia caused by stroke, within the limit of 0.32%.

Discussion of the Results of the First Hypothesis:

This result is consistent with the findings of the study by (Eachus, 1991), who argued that health locus of control is an intermediate factor in the occurrence of illness, and showed that it is important in predicting treatment acceptance and adherence, as well as being a contributing factor in predicting preventive behavior against disease. It is also a significant factor in the interactive behavior between the patient and healthcare workers (Jebali, 2007, p.15).

It also aligns with the study by (Phares, 1978), which demonstrated that individuals with an internal health locus of control always seek information about their physical condition and possess such information. They are more inclined to quit smoking, look for dental preventive measures, wear seat belts when driving, accept preventive vaccinations, engage in activities that ensure their physical well-being, make great efforts to maintain their weight, and use the safest contraceptive methods (Jebali, 2007, p.61).

It is further consistent with the study by (Karen Andrea Armstrong, 2007), which revealed that health locus of control is a key factor in adults' acceptance of treatment, and that those with an internal health locus of control generally enjoy better health conditions.

Presentation of the Results of the Second Hypothesis:

Social support contributes to increasing acceptance of physical motor therapy among patients with hemiplegia caused by stroke.

Based on Figure (01) of the general study model, and from the analytical outputs of the AMOS program summarized in Table (03):

Table (03): Presents the results of the second hypothesis.

Independent Variable	Dependent Variable		
	Treatment Acceptance		
Social Support	Regression Coefficient	Significance Level	Residuals
	0.34	0.001	0.15
Total Direct Effect	0.34		

Analysis of the Results of the Second Hypothesis:

Based on Figure (01) and Table (03), the results indicate the existence of a positive correlation between the variable *social support* and the variable *treatment acceptance* at a significance level of 0.001, where the value of the regression coefficient reached **0.34**. Moreover, the residuals of the relationship between *health locus of control* and *treatment acceptance* equal **0.15**, which is close to zero. Accordingly, all the mentioned evidence illustrated in the graphical figure supports the hypothesis that the variable *social support* contributes to increasing treatment acceptance among patients with hemiplegia caused by stroke, within the limit of **34%**.

Discussion of the Results of the Second Hypothesis:

This result is consistent with the findings of the study by **Bousselor Sharon (2004)** entitled "*Social Support and Self-Care Practices of Adults with Type II Diabetes*", which showed a significant correlation between the level of social support and adherence to medical treatment. That is, individuals who enjoy higher levels of social support tend to demonstrate greater commitment to medical treatment, which leads to greater stability of disease symptoms.

This makes the obtained results logical. The correlation observed between social support and acceptance of physiotherapy can be explained by the fact that an increase in social support produces a series of positive psychological changes, which in turn lead to greater comfort with the situation, resulting in stronger acceptance of physical motor therapy.

It should be noted, however, that the correlation is above average but not strong. This confirms what previous studies have shown: there are several additional factors that facilitate treatment acceptance in general (such as self-efficacy, therapeutic education, etc.). Therefore, social support alone is not the sole determining factor in the acceptance of physiotherapy, which makes the results obtained consistent and logical.

This finding is also in agreement with the study conducted by **David Spiegel (D. Spiegel)** on groups of women suffering from malignant breast cancer during their treatment at the Stanford University School of Medicine. In that study, cancer had recurred and spread after the initial

surgical treatment, and medically it was considered only a matter of time before the patients would die from the metastasis. However, the head of the research team was astonished by the results: women with advanced breast cancer who met weekly

Presentation of the Results of the Third Hypothesis:

There is a relationship between *health locus of control* and *social support* among patients with hemiplegia caused by stroke.

Based on Figure (01) of the general study model, and from the analytical outputs of the AMOS program, summarized in Table (04).

Table (04): Presents the results of the third hypothesis.

Independent Variable	Dependent Variable		
	Social Support		
Health Locus of Control	Regression Coefficient	Significance Level	Residuals
	0.18	0.001	0.45
Total Direct Effect	0.18		

Analysis of the Results of the Third Hypothesis

Based on Figure (01) and Table (04), the results indicate a positive correlation between the variable Health Locus of Control and the variable Social Support at a significance level of 0.001, where the regression coefficient reached 0.18. The residuals of the relationship between Health Locus of Control and Social Support equal 0.45, a value not very close to zero. Accordingly, all the evidence presented and illustrated in the diagram confirms the validity of the hypothesis, which states that the Health Locus of Control variable has a less than moderate correlation among patients with hemiplegia resulting from stroke, within the limits of 0.18%.

Discussion of the Third Hypothesis

This result is consistent with the findings of NEAL CRAUSE (1987) regarding the relationship between Health Locus of Control and Social Support in understanding the stress process. It was shown that social support reduces the impact of stress, but little is known about how this absorptive effect occurs. The aim of that study was to demonstrate that social support operates by enhancing the internal locus of control beliefs.

Data derived from a longitudinal study of older adults indicate that the relationship between social support and perceived locus of control is nonlinear. An increase in social support tends to enhance feelings of control and locus of control, but only up to a certain point. Beyond this threshold, additional social support tends to reduce personal feelings of control (locus of control).

Presentation of the Results of the Fourth Hypothesis

Research Question:

Does Social Support play a mediating role in the relationship between Health Locus of Control and Acceptance of Physical Therapy?

Formulated Hypothesis:

Social Support plays a **mediating role** in the relationship between Health Locus of Control and Acceptance of Physical Therapy among patients with hemiplegia resulting from stroke.

Based on Figure (01) of the general research model and the outputs of the Amos analytical program, the results are summarized in Table (05).

Table (05): Results of the Fourth Hypothesis

Independent Variable	Mediating Variable		Dependent Variable	
	Social Support		Treatment Acceptance	
Health Locus of Control	Direct Effect	Indirect Effect	Direct Effect	Indirect Effect
	0.18		0.32	0.06
Total Effect			0.38	

Analysis of the Results of the Fourth Hypothesis:

From Figure (01) and Table (05), the value of the direct relationship between the independent variable (health locus of control) and the dependent variable (treatment acceptance) reached **0.32**. The indirect relationship between the independent variable (health locus of control) and the dependent variable (treatment acceptance) in light of the mediating variable (social support) reached **0.06**, with a total combined relationship value of **0.38**. This indicates that the relationship between the independent variable (health locus of control) and the dependent variable (treatment acceptance) increased with the presence of the mediating variable (social support).

Thus, based on the obtained results, the hypothesis that the variable of social support plays a mediating role in the relationship between health locus of control and physical therapy treatment acceptance among hemiplegic patients can be accepted. This means that there is a difference in the relationship between health locus of control and treatment acceptance among stroke-induced hemiplegic patients in the presence of the mediating variable social support, by approximately **0.06%**, compared to the ordinary relationship between health locus of control and treatment acceptance, which equals **0.32**.

Discussion of the Fourth Hypothesis:

These results are consistent with the findings of **Sarason et al. (1983)**, whose study examined the relationship between stressful life events, self-esteem, locus of control, and social support on a sample of 295 university students. Using tools such as the Life Stress Questionnaire, Rosenberg Self-Esteem Scale, Social Support Questionnaire, and Locus of Control Scale, results showed a positive correlation between stressful life events and mental illness in the absence of social support and low self-esteem. This confirmed the protective role of social support as a mediating social variable that reduces life stress, as well as the role of high self-esteem as a mediating psychological variable in mitigating stress.

The results also agreed with **Dean et al. (1990)**, who investigated the protective role of social support from various sources against depression in a sample of 997 participants (both genders, aged 50–85 years). Using multiple regression analysis, they found that stressful life events significantly and positively affected depressive symptoms. Low social support increased depressive symptoms, whereas high social support was associated with fewer depressive symptoms.

Similarly, **Lara et al. (1997)** studied the relationship between social support and depression, aiming to determine whether social support was associated with depression after statistically

controlling for neuroticism. Conducted on a sample of 59 patients diagnosed with major depressive episodes (DSM-III-R), the study revealed that social support was significantly associated with both depression severity and treatment outcomes after controlling for neuroticism. The researchers concluded that social support may mediate the relationship between neuroticism and depression.

In addition, the findings aligned with the study of **Imad Ali Abdel Razek (1998)** on social support as a mediating variable between economic hardship and marital conflicts, conducted on a sample of 170 married individuals (100 males, 70 females) with an average age of 37.09 years. Results showed a positive correlation between economic hardship and marital conflicts among spouses. However, when the effect of social support was isolated, the correlation between the two variables decreased significantly, indicating that social support moderates the relationship between economic hardship and marital conflicts.

Conclusion:

The study found a positive correlation between health locus of control and acceptance of physical motor therapy among patients with hemiplegia resulting from stroke, as well as a positive correlation between social support and acceptance of physical motor therapy among these patients. It also revealed a correlation between health locus of control and social support among patients with hemiplegia resulting from stroke. Furthermore, the study showed that social support acts as a mediating variable in the relationship between health locus of control and acceptance of physical therapy among hemiplegic patients.

In light of the results of the present study, several practical suggestions can be made. These include emphasizing the importance of adopting the modern model in treatment (the health and illness perspective), employing modern methodologies (structural equation modeling) in social research for their advantages (direct and indirect relationships, mediating and moderating variables), reinforcing therapeutic education for both therapists and patients, and highlighting the importance of psychosocial training for physical therapists to improve their beliefs and attitudes towards therapy. Moreover, it is essential to work on understanding the psychosocial condition of patients with hemiplegia and to develop a comprehensive strategy to improve the psychological and social care conditions for this category of patients.

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