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## **The relationship between locus of control orientation and patients' adherence to therapeutic recommendations after percutaneous coronary intervention**

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**Abstract---**As life expectancy has increased and the global population has aged, the global burden of chronic diseases has risen alarmingly. This study aims to determine if there is any significant correlation between adherence to therapeutic recommendations and locus of control orientation. Cross-sectional quantitative correlational design carried out in Al-Najaf City. Non-randomized purposive sampling consisted of 120 patients with coronary artery disease after percutaneous coronary intervention. The data collected from June 20th, 2021 and last to November 27th, 2021 through interview method by Multi-dimensional health locus of control questionnaire form (C) which include 18 items, and adherence questionnaire which include 54 items in addition to multi-dimensional health locus of control instrument which include 18 items regarding internal, chance, and power full others domains. This study finds that patients adherence to therapeutic recommendations and their locus of control orientation is significantly correlated through statistical indicator of Pearson correlation of 0.539 at probability value of less than 0.05. The study findings also reveals that it is possible to predict patient's adherence to therapeutic recommendations through their locus of control orientation. Internal LOC. Orientation appear to be associated with disease prevention and control in addition to health promotion. Patients with internal LOC Orientation are predicted to have a good adherence level, while the externally oriented don't. The study recommends that intensive wide-ranging population-based studies could be conducted to assess the same topic, with appropriate solutions aimed at perfection of both LOC. Orientation and patients' adherence to therapeutic recommendations.

**Keywords**---relationship, locus of control, orientation, adherence, recommendations, percutaneous coronary intervention.

## Introduction

As life expectancy has increased and the global population has aged, the global burden of chronic diseases has risen alarmingly. Chronic diseases such as coronary artery disease (CAD) are ailments that last more than a year and require continuing care. They jeopardize people's physical and social well-being, as well as the economic viability of healthcare systems. Chronic diseases are now a public health problem in many populations due to their extraordinary global prevalence. A quarter of the European population has at least one chronic ailment, while multimorbidity, the co-occurrence of two or more chronic diseases, affects 50 million people. 60 percent of American adults have chronic diseases, and four in ten have multimorbidity [1]. Management of chronic diseases is critical to reducing their impact, improving health outcomes, preventing additional disability, and lowering healthcare expenditures. Adherence to therapy, or the ability to follow a doctor's orders, is an important aspect of chronic disease management. Medication adherence is a problem for public health because only half of chronic disease patients take their prescriptions as prescribed. The WHO says that patients' capacity to follow treatment instructions depends on a number of factors.

These variables interact and amplify each other's effects in five dimensions: social and economic, health-care team and system, condition, therapy, and patient [1]. As we know patients with heart disease are at risk of sudden heart attack and life threatening conditions. Also exertion or emotional stress can deteriorate their health status. Sometimes a little more time is sufficient to save patients life [5]. PCI is one of the most common and the best method for treatment of coronary artery diseases [9]. Waiting for the cardiac catheterization procedure can be a major source of stress and anxiety. These feelings are directly related to the invasive nature of the procedure and to uncertainties related to diagnosis [6]. So there are several steps and actions that the patients need to meet all of their demands. These steps and actions are the health care services that begin with entrance of patients to the healthcare building and cross through receiving their demands such as cardiac catheterization procedure and then finally advising them about ways of illness prevention, health maintenance and self-care at the home [7].

People seek health-care services for a variety of reasons, including curing illnesses and health conditions, repairing breaks and tears, preventing or delaying future health-care problems, reducing pain and improving quality of life, and sometimes simply to learn about their health status and prognosis. Health-care use might be suitable or ineffective, of high or poor quality, costly or affordable [7]. Nowadays, it has become evident that the care of hospitalized coronary patients is not only limited to the treatment of the disease and the prevention of complications but also involves assessment of their needs for the provision of high quality of care [8]. The effectiveness of medical care is being increasingly measured according to clinical criteria; the inclusion of patient's opinions in

assessment of service has gained greater importance over the past 25 years [8]. In certain research, the health locus of control hypothesis is utilized to assess therapy regimen adherence. A person with a strong sense of control may have healthier life because they are more likely to adopt health-promoting measures, according to the study's Ref.

This suggests that increasing a person's sense of control on their health may lead to better personal health [2]. Rotter believes that when a person offers a job, he or she knows exactly what to expect, whether he or she will succeed or fail, and that control is divided into two parts, one internal and one external, which helps him manage his life by drawing future strategy, whether at the level of the profession, thinking, or changing one's lifestyle. In order, many individuals believe they can improve their sickness by exercising self-control over their activities, and many people have been successful, so they have a strong feeling of self-control [3]. One of the attributes of a good personality is the locus of control and the ability to control behaviors, which are very useful in cases of chronic diseases and contribute to the sense of control and health behavior, through learning and changing behavior toward positive results to reach the person to cross the disease threshold, that people's actions are dependent on internal and external control of their actions and attitudes to the participation of others and co-participation. The purpose of this internal control is to ensure that the patient takes his or her medication as prescribed, allowing the patient to recover or decrease difficulties [4].

### **Material and Methods**

The current paper employs a cross-sectional, quantitative, correlational methodology to examine the link between patients' locus of control and their adherence to therapeutic recommendations following percutaneous coronary intervention. This study began on October 1st, 2020 and concludes on May 1st, 2022 in order to accomplish the aforementioned objectives. During the study period, 120 patients who had undergone percutaneous coronary intervention for at least six months ago, were included in this study using a non-probability purposive design (according to the researcher-determined inclusion and exclusion criteria) design at Al-Najaf center of cardiac surgery and cardiac Cath. in Al-Najaf Al-Ashraf. Clients at this center receive therapeutic suggestions for nutrition, behavior, medicine, and medical follow-up following percutaneous coronary intervention, particularly prior to release by a health care practitioner. The Adherence questionnaire had 52 items divided into four categories: dietary, behavioral, medicine, and medical follow-up domain to assess patients adherence to therapeutic recommendations through 3 Likert scale measure. Also the multi-dimensional health locus of control instrument include 18 items regarding internal, chance, and power full others domains. The current study's data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20 and Microsoft Excel (2010). These data are evaluated using two statistical methodologies that may aid in determining the outcomes like: descriptive statistics, and inferential statistics

## Results

Table 1  
Assessment of Overall Patients' Locus of Control by Three Level Scale

| Subject          | Rating   | F   | %    | M.S  | Asses.   |
|------------------|----------|-----|------|------|----------|
| Locus of Control | LOW      | 20  | 16.7 | 3.56 | Moderate |
|                  | MODERATE | 78  | 65.0 |      |          |
|                  | HIGH     | 22  | 18.3 |      |          |
|                  | Total    | 120 | 100  |      |          |

M,S indicates mean scores/ low indicates mean score of 1 to 2.66/ moderate indicates mean score of 2.67 to 4.33/ high indicates mean score of 4.34 or more/ F indicates frequency/ % indicates the percent/ and Asses. Indicates assessment.

Table (1) represents another scale for assessment of study participant's locus of control there by three level scale of low, moderate, and high. According to this scale the majority of sample size 65 percent have moderate locus of control, and the high locus of control is slightly more than the low locus of control between patients through 18.3, and 16.7 consequently. In addition, this table shows that the general assessment of locus of control concerning study sample is moderate.

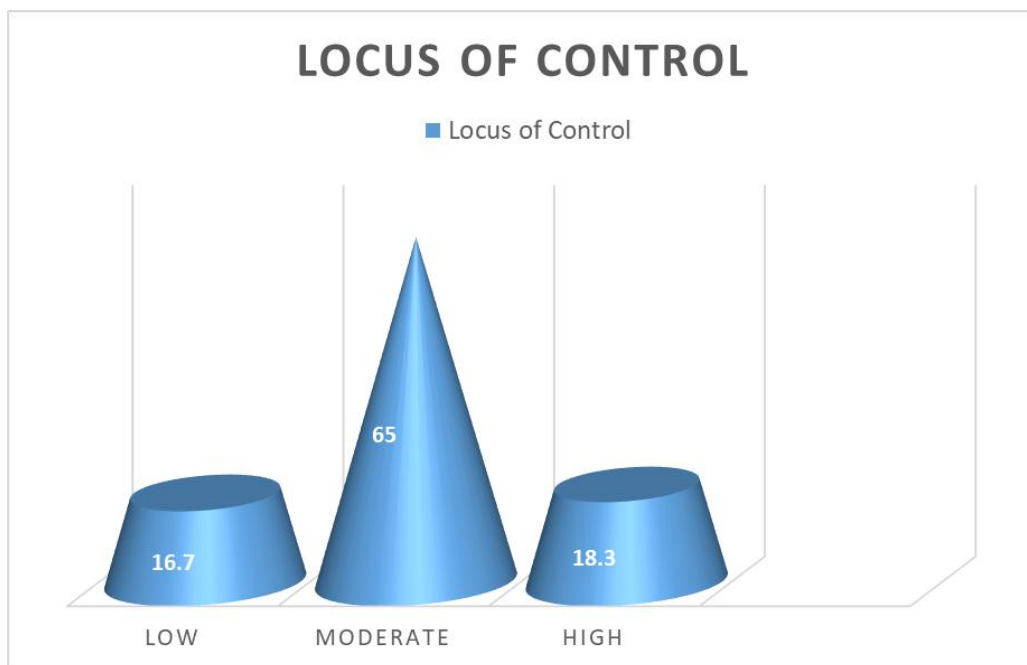


Figure 1. Assessment of Overall Patients' Locus of Control by Three Level Scale

Table 2  
Adherence to Therapeutic Recommendations in Patients Following Percutaneous Coronary Intervention

| Main Domains                               | Rating & ranking | F   | %    | M.S. | Asses. |
|--------------------------------------------|------------------|-----|------|------|--------|
| Overall assessment for patients' adherence | Poor             | 11  | 9.2  | 2.07 | Fair   |
|                                            | Fair             | 85  | 70.8 |      |        |
|                                            | Good             | 24  | 20.0 |      |        |
|                                            | Total            | 120 | 100  |      |        |

M,S indicates mean scores/ poor indicates mean score of 1 to 1.66/ fair indicates mean score of 1.67 to 2.33/ good indicates mean score of 2.34 or more/ F indicates frequency/ % indicates the percent/ and Asses. Indicates assessment.

To answer the study objective which is in concerning with assessment of patients adherence to therapeutic recommendations after percutaneous coronary intervention table (2) find that the majority of study sample have fair level at mean of score of (2.07) and range of (70.8) percent. In addition, the table reveals that good adherence level is greater than poor adherence consequently by (20) and (9.2) percent.

Table 3  
Relationship between the Patients' Locus of Control Orientation and their Adherence to Therapeutic Recommendations by chi-square and correlation

| Main domain         | Rating | Locus of Control Orientation |          |      | R     | Significance                                         |
|---------------------|--------|------------------------------|----------|------|-------|------------------------------------------------------|
|                     |        | Low                          | Moderate | High |       |                                                      |
| Patients' Adherence | Poor   | 7                            | 3        | 1    | 0.539 | Chi-square value (66.289)/ df. (4)<br>p-value (0.00) |
|                     | Fair   | 11                           | 69       | 5    |       |                                                      |
|                     | Good   | 2                            | 6        | 16   |       |                                                      |

S: significant at p-value less than 0.05, R: correlation value, d.f: degree of freedom

Table (3) use chi-square and correlation to find out if there is a significant association between the two main study variables. The remembered table shows that there is a highly significant relationship between patient's locus of control and their adherence to therapeutic relationship at p-value 0.00, degree of freedom 4 and chi-square value of 66.289 according to last column. In addition regarding quality and quantity of the relationship according to R= 0.539 we can see that it is positive in nature and more than 0.5 towards 1 which mean very high correlation.

Table 4  
Regression between the Patients' Locus of Control Orientation and their  
Adherence to Therapeutic Recommendations

| Regression |                |                             |                   |                           |                            |                   |
|------------|----------------|-----------------------------|-------------------|---------------------------|----------------------------|-------------------|
| Model      | R              | R Square                    | Adjusted R Square |                           | Std. Error of the Estimate |                   |
| 1          | .539           | .291                        | .285              |                           | 16.77788                   |                   |
| Model      | Sum of Squares | df                          | Mean Square       | F                         | Sig.                       |                   |
| 1          | Regression     | 13608.626                   | 1                 | 13608.626                 | 48.344                     | .000 <sup>b</sup> |
|            | Residual       | 33216.674                   | 118               | 281.497                   |                            |                   |
|            | Total          | 46825.300                   | 119               |                           |                            |                   |
| Model      |                | Unstandardized Coefficients |                   | Standardized Coefficients | t                          | Sig.              |
|            |                | B                           | Std. Error        | Beta                      |                            |                   |
| 1          | (Constant)     | 68.449                      | 5.870             |                           | 11.661                     | .000              |
|            | L.O.C          | .615                        | .088              | .539                      | 6.953                      | .000              |

R (Regression value), L.O.C (Locus of Control), df (degree of freedom), sum (summation), F (Anova value), Sig. (Significance), Std. (Standard), B (Beta value).

The last result (table 4) shows the statistical marker “regression” between the main variables of the study to know if prediction is possible or not. According to the p-value in the fourth row of less than 0.05, the researcher can depends the regression formula to predict the adherence level from the locus of control orientation. So according the correlation magnitude of 0.539, the independent variable affect the dependent variable. The R Square value of .291 is the effect size of the independent variable on the dependent one for each X in front of each Y in the regression formula ( $Y = \alpha + \beta (X)$ ), when X represent the independent variable (locus of control orientation), and Y represent the dependent variable (patients adherence to therapeutic recommendations).

## Discussion

There are three levels of control in the study participant's locus of control, which are represented in Table (1) by a three-level scale with the following values: low, moderate, and high. Following the guidelines of this scale, a majority of the sample size (65 percent) has a moderate loci control, & the highly estimated LoC

between patients is slightly greater than the low locus of control between patients through 18.3 and 16.7, respectively. In addition, this table demonstrates that the overall assessment of locus of control in relation to the study sample is moderate in nature. Referencing [10], who are conducting a thesis on the link among both loci of control orientation and patients' adherence to medication after chronic obstructive pulmonary disease, will be used to support the findings of this study. The findings of this study show that the majority of study participants (74 percent) have a moderate level of locus of control, and that the general assessment is also moderate. Another point to note is that the findings of this study are similar to those of Ahmedani [11], who conducted a study titled Asthma therapeutic regimen adherence, role of God aspect and the remainder health related loci of control determinants. The researchers' findings indicate that the majority of participants were poorly oriented to their disease, and that the general assessment of their locus of control orientation was moderate, with a mean score of 6.5. (3.1).

The findings of this study are consistent with those of the current study. Patients' adherence to therapy suggestions is found to be fair in the majority of research participants, according to the study's findings, which have a mean score of (2.07) and a rate of (70.8) percent. Furthermore, the data demonstrates that excellent adherence levels are much higher than bad adherence levels, by a factor of (20) and (9.2) percent, respectively. Among cardiac patients in Iran, the researchers at a study [12], conducted a study in 2015 on the relationship between awareness of disease and adherence to therapeutic regimens. According to the findings of the study, the majority of study participants had a high degree of adherence to therapy recommendations, with just a tiny proportion of them having a low level of adherence. However, the findings of this study differ from those of the current study on the one hand, and they are consistent with them on the other, as this study demonstrated that patients who are highly committed to their treatment have the highest percentage of patients who adhere to treatment recommendations. The findings of this study were in agreement when they demonstrated that the minority of participants in this study were those who did not follow to treatment suggestions to a high enough degree. Another study conducted at the Department of Public Health and Caring Sciences, Uppsala University, Sweden in 2013 regarding coping to and beliefs in Fat-lowering medical therapy, a structural formula modeling method involving the necessary concerns framework [13], found that 54.5 percent of patients had high adherence to their statin, and 45.5 percent had low adherence to their statin. The results of this study were published in the journal *Adherence* in 2013. The findings of the current investigation are in contrast to these findings.

Because of the differences in geographical location, environment, and general culture of societies, the previously mentioned study findings differ from the current study findings. For example, Iraq is a country where the media does not play a significant role in educating people about the importance of adhering to therapeutic recommendations, whereas in other countries such as Iran, Sweden, and others, where the previously mentioned studies were conducted, there is a strong media role to educate people about the importance of adhering to therapeutic recommendations. On the other hand, the health system in Iraq as a whole is beset with flaws and poor quality health-care services as a result of

political corruption, resulting in disparities in patient outcomes across the country. The current study's findings show that the aforesaid subject has a very significant positive association with a p-value of 0.00 and a power of 0.539 in magnitude. This suggests that patients with an internal locus of control are more likely to follow therapy suggestions than those with an externally oriented loci of control. Is patient empower the key to promoting adherence? supports this conclusion. Is patient empowerment the key to promote adherence? [14], was published underneath the subject of, Is client empowerment the main key to accelerates adherence to therapeutic regimen. According to a thorough assessment evaluating the link among both self-efficacy, health related LoC, and treatment adherence, enhanced levels of self-efficacy and Internally Healthy Loci of Control are consistently appears to become better treatment adherence.

With the exception of the doctor Health-related LoC, which illustrate a positive link with treatment adherence, externally oriented control were found to have mostly bad (probability and God ascribed control beliefs) or unclear (Power full others ascribed control perception) relation to adherence. The study on Health related LoC and iron supplement consumption adherence among pregnant in Bali [15], is in accord with the current study's findings. Internal HLOC and patient adherence were found to be linked in the research discussed. According to the findings of study published in 2020, there is a direct, high significant, and positive association between locus of control orientation and medication adherence [10]. In addition, another research on the "Correlation between compliance regimens and healthy oriented loci of control concerning chronic illness patients" [16] their study results illustrates that adherence to medicine has a direct and positive relationship with internal health locus of control in individuals with chronic diseases. Furthermore, patients with a strong locus of control were able to limit illness development and consequences. Pretty et al. 2020 found that a one-unit increase in diabetic locus of control (i.e. more internal diabetic LOC) was associated with a lower depression score (OR=-0.11; 95 percent confidence interval: -0.15, -0.06) and a lower likelihood of having depression (OR=0.91; 95 percent confidence interval: 0.85, 0.96). This outcome is consistent with the findings of the current investigation [17].

Wang, R., et al., 2021 published a paper titled Patient empowerment and self-management behavior of chronic illness patients: A moderated mediation model of self-efficacy & healthy loci of control, which was published in the Journal of the American Medical Association. Significant differences were found in the moderating influence of the chance HLC and the interaction effect on self-efficacy and self-management behavior [18]. The findings of the another research in 2022, which will lead to a survey of persons with chronic diseases, are as follows: When multiple linear regression was used to examine the relationship between patient activation and health locus of control, it was discovered that participants who reported higher scores in Chance MHLC had higher patient activation, whereas participants who reported higher scores in Internal MHLC had lower patient activation [19]. Religious views of Muslim American women influence their chance of receiving breast and cervical cancer screenings, according to the American Cancer Society. As a result of his research on the associations between spiritual health related loci of control, perceived discrimination, and breast and cervix

malignancy diagnostic tests among American Muslim women in New York City in 2022, came to this conclusion [20].

As additional support for the current study findings, the study about The Influence of the Locus Of Control Construct on the Efficacy of Physiotherapy Treatments in Patients with Chronic Pain concludes that the locus of control construct is a predictor of the outcomes of physiotherapy treatment in patients with chronic pain. The presence of an internal center of control is associated with improved outcomes. Physiotherapy treatments should be designed with the individuals' personality features in mind, since they are a significant consideration [21].

## **Conclusion**

Internal LOC. Orientation appear to be associated with disease prevention and control in addition to health promotion. Patients with internal LOC Orientation are predicted to have a good adherence level, while the externally oriented don't.

## **Ethical Considerations**

### **Compliance with ethical guidelines**

In this study all ethical affairs and rules were has been handled carefully. as well as, informed the study participants about the main purpose of conducted this research and its implementation steps.

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## **Authors' contributions**

All authors equally contributed to preparing this article.

## **Conflict of interest**

The authors declared no conflict of interest.

## **References**

1. Fernandez-Lazaro, C. I., García-González, J. M., Adams, D. P., Fernandez-Lazaro, D., Mielgo-Ayuso, J., Caballero-Garcia, A., ... & Miron-Canelo, J. A. (2019). Adherence to treatment and related factors among patients with chronic conditions in primary care: a cross-sectional study. *BMC family practice*, 20(1), 1-12.
2. Zaky, N. H. (2016). The Relationship between Health Locus of Control, Knowledge and Adherence to Antihypertensive Regimen among Woman with Preeclampsia. *American Journal of Nursing Research*, 4(2), 41-50.

3. Moussa, A. F., & Abd-Ali, D. K. (2020). The Link between Locus of Control Orientation and Patients' Adherence to Medication After Chronic Obstructive Pulmonary Disease. *Indian Journal of Public Health Research & Development*, 11(4).
4. West, L. M., Theuma, R. B., & Cordina, M. (2018). Health locus of control: Its relationship with medication adherence and medication wastage. *Research in Social and Administrative Pharmacy*, 14(11), 1015-1019.
5. Mikosch P, Hadrawa T, Laubreiter K, Brandl J, Pilz J, Stettner H, and Grimm G. "Effectiveness of respiratory-sinus-arrhythmia biofeedback on state-anxiety in patients undergoing coronary angiography." *Journal of Advanced Nursing*. 2010; 66 (5): p.p. 1101-1110.
6. Jamshidi N, Abaszade A, and Najafi-Kaliani M. "Stress, anxiety and depression of patients before coronary angiography." *Zahedan Journal of Research in Medical Sciences*. 2012; 13 (10): p. 29.
7. Mahdi, M., & Mohammad, S. (2016). Cardiac Catheterization Patients Satisfaction towards Health Care Services Provided At Cardiac Center in AL-Najaf AL-Ashraf Governorate. *International Journal of Scientific and Research Publications*, 6(9), 518-529.
8. Polikandrioti M, and Babatsikou F. "Information to coronary disease patients." *Health science journal*. 2013; 7 (1), p.p. 3-10.
9. Moradi T, and Adib-Hajbaghery M. "The Effect of a Multi-Modal Preparation Package on Anxiety in Patients Undergoing Coronary Angiography." *International Cardiovascular Research Journal*. 2015; 9(1): p.p. 10-16.
10. Moussa, A. F., & Abd-Ali, D. K. (2020). The Link between Locus of Control Orientation and Patients' Adherence to Medication After Chronic Obstructive Pulmonary Disease. *Indian Journal of Public Health Research & Development*, 11(4).
11. Ahmedani, B. K., Peterson, E. L., Wells, K. E., Rand, C. S., & Williams, L. K. (2013). Asthma medication adherence: the role of God and other health locus of control factors. *Annals of Allergy, Asthma & Immunology*, 110(2), 75-79.
12. Heydari, A., Ziaee, E. S., & Gazrani, A. (2015). Relationship between awareness of disease and adherence to therapeutic regimen among cardiac patients. *International journal of community based nursing and midwifery*, 3(1), 23.
13. Berglund, E., Lytsy, P., & Westerling, R. (2014). The influence of locus of control on self-rated health in context of chronic disease: a structural equation modeling approach in a cross sectional study. *BMC Public Health*, 14(1), 1-9.
14. Nafradi, L., Nakamoto, K., & Schulz, P. J. (2017). Is patient empowerment the key to promote adherence? A systematic review of the relationship between self-efficacy, health locus of control and medication adherence. *PloS one*, 12(10), e0186458.
15. Wulandari LPL, Craig P, Whelan AK. Foetal Health Locus of Control and iron supplementation adherence among pregnant women in Bali. *J Reprod Infant Psychol*. 2013;31(1):94-101.
16. Taher, M., & Bayat, Z. S. (2015). Correlation between compliance regimens with health locus of control in patients with hypertension. *Medical journal of the Islamic Republic of Iran*, 29, 194.
17. Pretty, J. (2020). Diabetes Locus of Control and Depression in Older Adults with Type 1 and Type 2 Diabetes: The Study of Longevity in Diabetes.

18. Wang, R., Zhou, C., Wu, Y., Sun, M., Yang, L., Ye, X., & Zhang, M. (2021). Patient empowerment and self-management behaviour of chronic disease patients: A moderated mediation model of self-efficacy and health locus of control. *Journal of Advanced Nursing*.
19. Imeri, H., Holmes, E., Desselle, S., Rosenthal, M., & Barnard, M. (2022). A survey study of adults with chronic conditions: Examining the correlation between patient activation and health locus of control. *Chronic Illness*, 17423953211067431.
20. Azhar, S., Wyatt, L. C., Jokhakar, V., Patel, S., Raveis, V. H., Kwon, S. C., & Islam, N. S. (2022). Associations between Spiritual Health Locus of Control, Perceived Discrimination and Breast and Cervical Cancer Screening for Muslim American Women in New York City. *Clinical Breast Cancer*.
21. Álvarez-Rodríguez, J., Leirós-Rodríguez, R., Morera-Balaguer, J., Marqués-Sánchez, P., & Rodríguez-Nogueira, Ó. (2022). The Influence of the Locus of Control Construct on the Efficacy of Physiotherapy Treatments in Patients with Chronic Pain: A Systematic Review. *Journal of Personalized Medicine*, 12(2), 232.