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Perception of Complementary Medicine and Treatment Adherence as Predictors of Self-Efficacy in Individuals with Chronic Conditions in Mexico

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Abstract: Chronic conditions like type 2 diabetes mellitus (T2DM), arterial hypertension (HTN), and obesity are major global health issues, causing significant morbidity and mortality. In Latin America, these conditions contribute to millions of premature deaths annually, posing challenges exacerbated by limited healthcare access and poor primary care quality, particularly in Mexico. Complementary medicine presents a potential solution, offering minimally invasive techniques to improve physical, mental, and spiritual well-being. Effective treatment adherence, crucial for positive outcomes, is influenced by self-efficacy, the ability to manage one's behavior in response to medical conditions. However, treatment adherence rates remain low, indicating a pressing public health concern. This study aimed to explore how perception of complementary medicine and treatment adherence predict self-efficacy among individuals with chronic conditions in Mexico. Analyzing data from 113 participants revealed significant correlations between variables, with treatment adherence positively associated with self-efficacy and perception of holistic medicine negatively correlated with self-efficacy. Regression analysis showed that incorporating perception of complementary medicine and treatment adherence significantly explained self-efficacy levels, suggesting the potential of complementary therapies in holistic healthcare approaches. However, collinearity between variables highlights the need for further research to better understand these relationships and their implications for improving healthcare outcomes in Mexico. Integrating complementary therapies with conventional treatments could enhance overall well-being and treatment adherence, offering promising avenues for addressing chronic conditions in the region. These findings underscore the importance of comprehensive healthcare approaches that integrate both conventional and complementary modalities to optimize health outcomes and quality of life for individuals with chronic conditions in Mexico and beyond.

Keywords: complementary therapies; treatment adherence; self-efficacy; chronic diseases; Diabetes Mellitus; type 2; hypertension; obesity

1. Introduction

Chronic conditions such as type 2 diabetes mellitus (T2DM), arterial hypertension (HTN), and obesity affect various dimensions (biological, psychological, and social) and constitute the leading cause of death and disability worldwide [1]. This term refers to a set of diseases that are not predominantly acute infections but have long-term effects on health, generating the need for prolonged care and treatment [2], highlighting the need for a comprehensive approach by healthcare

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personnel. It is estimated that annually, these chronic conditions cause the death of 41 million people, representing 71% of deaths worldwide [2]. In the Americas region, 5.5 million deaths due to these conditions are recorded each year. Globally, more than 15 million people aged 30 to 69 dies prematurely from chronic diseases, and over 85% of these deaths occur in low- and middle-income countries. In Latin America, 2.2 million people die from complications of these diseases before reaching the age of 70. The prevalence of overweight and obesity in Latin America is significant, affecting 31.5% and 40.6% of the population over 20 years old, respectively. T2DM has a prevalence ranging from 6% to 17%, while HTN affects 11.7% and 39.7%. In this context, Mexico faces significant health challenges, with high rates of T2DM, HTN, and obesity. Poor quality primary care and inadequate hospitals, along with limited access to healthcare services and low wages for over 70% of the population, may be barriers to timely detection and proper treatment of these chronic diseases [3].

Despite these challenges, adequate training of healthcare personnel can enable the application of complementary and alternative medicine (CAM) as adjuncts at all levels of care, providing comprehensive care [4]. These therapies, which are minimally invasive techniques, aim to improve the physical, mental, and spiritual well-being of individuals, promoting self-efficacy to effectively address health issues [5]. This can enhance therapeutic adherence and communication with the environment [6]. This comprehensive care, known as holistic care, focuses on the whole person, considering biopsychosocial dimensions to achieve internal harmony. Complementary medicine, as a minimally invasive technique, is presented as an option to provide personalized and holistic care. Although these therapies are designed to complement pharmacological treatment, treatment adherence is crucial for positive outcomes.

The World Health Organization (WHO) defines treatment adherence as the fulfillment of instructions, including the proper intake of medications according to prescribed dosages and persistence over time. In developed countries, only 50% of chronic patients comply with treatment, turning adherence into a public health issue [7]. Literature suggests that if treatment adherence is effective, patient self-efficacy will also increase [8–10]. Self-efficacy refers to the developed and stable capacity of an individual to effectively manage their behavior in response to their medical condition. This component acts as a moderator, stimulant, and protective factor, being fundamental to treatment success [11].

For public health, the use of complementary medicine can provide physical, psychological, and spiritual well-being in combination with conventional treatment and control of chronic health problems [12]. Additionally, they could help individuals achieve the best desirable health status, better adaptation to the environment, proper treatment adherence, and consequently, empower patients in their illness by improving their self-efficacy, as well as enjoying personal relationships [13]. Therefore, the present research aimed to determine the explanatory capacity of a model of perception of complementary medicine and treatment adherence on self-efficacy in people with chronic conditions (T2DM, HTN, and obesity).

2. Materials and Methods

2.1. Design

A quantitative research with an explanatory correlational design [14] was conducted, using a sample of 113 chronic patients over 18 years old, where 85 (75.2%) identified as female and 28 (24.8%) as male, with a mean age of 42.4±2.3, mostly employed (52.2%), who had at least one chronic condition, such as T2DM, HTN, and obesity diagnosed for at least 6 months.

2.2. Sample

Participants were selected through convenience sampling. The sample size was estimated using G*power software version 3.1 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, AL) with a one-tailed test, an effect size of 0.10, an error probability of 1 or alpha of 0.05, and a power of 0.95, with two predictors. Data collection was carried out through the Qualtrics form, the link of which was distributed in primary care clinics in Mexico.

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The sociodemographic characteristics of the study population are presented below (Table 1).

Table 1. Sociodemographic characteristics of study participants (n=113).

Variable	*Frequency*	*Percentage (%)*
Age		
18-25	15	13.3
26-30	5	4.4
31-39	26	23.0
40-49	30	26.5
50-59	21	18.6
60-69	12	10.6
70-79	4	3.5
Sex		
Female	85	75.2
Male	28	24.8
Marital status		
Single	38	33.6
Married	55	48.7
Common-law marriage	10	8.8
Divorced/Separated	8	7.1
Widowed	2	1.8
Level of Education		
Elementary school	4	3.5
High school	12	10.6
Bachelor´s degree	51	45.1
Postgraduate (Master's and Doctorate)	46	40.7
Socioeconomic Status		
Low (Barely makes ends meet)	21	18.6
Middle (Live comfortably, but without luxuries)	88	77.9
High (Live very comfortable with luxuries)	4	3.5
Occupation		
Student	15	13.5
Employee	58	52.3
Retired	8	7.2
Self-employed	22	19.8
Homemaker	8	7.2
State		
San Luis Potosí	22	19.5
Coahuila	21	18.6
Guanajuato	10	8.8
Nuevo León	9	8.0
Estado de México	7	6.2
Tabasco	7	6.2
Others	37	32.7
Health conditions		
Obesity	77	68.1
Type II Diabetes Mellitus	21	18.6
Arterial hypertension	32	28.3
More than one disease	37	32.7

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2.3. Measures

Sociodemographic Data Sheet: age, gender, marital status, level of education, socioeconomic status, highest occupation, and place of residence.

Holistic Complementary and Alternative Medicine Questionnaire (HCAMQ) [15]: Used to assess patients' perception of complementary and alternative medicine. It consists of 11 items in Likert scale format with six points coding as follows: strongly agree (1), agree (2), slightly agree (3), slightly disagree (4), disagree (5), and strongly disagree (6). Items 2, 4, 6, and 9 were reverse-scored, while the rest were positively scored. The scale comprises two subscales: one with questions about complementary and alternative medicine (2, 4, 6, 8, 9, and 11) and the other about holistic health (1, 3, 5, 7, and 10). A lower score on the HCAMQ indicates more positive attitudes toward complementary and alternative medicine. Internal consistency was measured using Cronbach's alpha, which was 0.69 in the Latin American population.

MBG Scale (Martin-Bayarre-Grau) [16]: Used to measure treatment adherence. Comprised of 12 Likert-type items with five response options. The total possible score is 48, and it is evaluated by proportionally dividing the total points obtained by the patient. Scores between 38 and 48 are considered fully adherent, between 18 and 37 are partial adherents, and between 0 and 17 are classified as non-adherent. It has three subscales: Treatment compliance (1, 2, 3, and 4), Personal involvement (5, 6, 8, 9, and 10), and Transactional relationship (7, 11, and 12). This scale, which has a Cronbach's alpha of 0.88 in Spanish-speaking patients, allows for a quick assessment of responses and classification into three levels of adherence.

General Self-Efficacy Scale [17]: Measures the constant sense of personal ability to handle stressful situations. Comprised of ten items assessed on a four-level scale. Scores range from 10 to 40, and the original scale shows an acceptable internal consistency index of 0.81, according to Baessler and Schwarzer. This scale has three dimensions: magnitude (2, 4, 5, 7); strength (1, 3, 6, 8); generality (9 and 10).

2.4. Statistics

Data analysis was performed using the Statistical Package for Social Sciences (SPSS) ver. 27 (IBM, CA, USA). Scale reliability was assessed using the internal consistency index, employing Cronbach's alpha coefficient. Subsequently, univariate descriptive statistics were calculated, including minimum, maximum, mean, and standard deviation. To verify data normality, skewness and kurtosis tests were applied. In this case, the data did not meet normality parameters, so the Spearman correlation test was used to examine associations between variables of interest. Finally, a multiple linear regression test was conducted using the stepwise method to determine the impact of the variables.

2.5. Ethics

The research received approval from the Ethics Committee of the Universidad Contemporánea de las Américas with registration number: EAD0012021-027. To comply with the provisions of the General Health Law of Mexico [18], recognizing the participant as a human being and emphasizing the importance of respecting their dignity, protecting their rights, and ensuring their well-being. The study was classified as minimal risk, and participants were assured they could stop responding at any time if they experienced any health harm during the instrument's application. Clear and precise informed consent was implemented. Ultimately, this study followed the ethical provisions of the Helsinki Declaration [19] and the principles of justice, beneficence, respect, and non-maleficence of the Belmont Report [20].

3. Results

Regarding the participants' health, it was observed that 68.1% reported the presence of some metabolic disorder, such as overweight or obesity, 28.3% had arterial hypertension, and 18.6% had been diagnosed with T2DM (n=21). Additionally, 32.7% indicated the presence of at least two or more diseases. 44.2% (n=50) of the sample reported currently using some MAC therapy at the time of the

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survey and 78.8% (n=89) mentioned using 1 to 3 complementary therapies, the most used being meditation (36.3%), aromatherapy (29.2%), acupuncture (29.2%)

3.1. Scales

Table 2 provides details of the univariate statistics of the scales, revealing a mean score of 26.59 for perception of complementary medicine, indicating a positive perception towards this type of therapy. A mean score of 32.59 was also found for treatment adherence, suggesting partial adherence by the participants. Regarding self-efficacy, a mean score of 32.67 was obtained, indicating a moderately high level of self-efficacy.

Table 2. Univariate statistics of the study scales.

Scale	$\bar{x}$	*SD*	min.	máx.	CI	α
Perception of complementary and alternative holistic medicine (HCAMQ)	26.59	5.72	12	41	25.51-27.66	.69
Dimension 1: Complementary Medicine	19.51	4.53	7	30	18.66-20.36	.62
Dimension 2: Holistic Health	7.07	2.31	5	15	6.63-7.50	.70
Treatment Adherence (MBG)	32.59	9.01	5	48	30.90-34.29	.86
Dimension 1: Treatment Compliance	11.77	3.17	2	16	11.17-12.36	.77
Dimension 2: Personal Involvement	13.77	3.97	0	20	13.03-14.52	.72
Dimension 3: Transactional Relationship	7.05	3.64	0	12	6.37-7.74	.83
General Self-Efficacy by Baessler and Schwarzer	32.67	5.85	13	40	31.56-33.77	.89
Dimension 1: Magnitude	6.29	1.46	2	8	6.01-6.56	.79
Dimension 2: Strength	13.10	2.38	5	16	12.65-13.55	.69
Dimension 3: Generality	13.28	2.60	5	16	12.79-13.77	.86

SD= Standard deviation, $\bar{x}$ = mean, min=minimal, max.=maximal, CI=Confidence interval, α = Cronbach alpha

3.2. Spearman Correlation and Simple Linear Regression Model

Table 3 shows that there is a significant negative correlation of -0.264** ($p < 0.001$) between perception of holistic complementary and alternative medicine and self-efficacy. This indicates that as perception of holistic medicine worsens, self-efficacy tends to decrease. There is a significant positive correlation of 0.269** ($p < 0.001$) between perception of holistic complementary and alternative medicine and gender. This suggests that perception of holistic medicine tends to vary by gender, with men having a poorer perception of complementary and alternative medicine. There is a significant positive correlation of 0.212* ($p < 0.05$) between perception of holistic medicine and the presence of arterial hypertension. This indicates that perception of holistic medicine tends to be poor in individuals with arterial hypertension. Additionally, there is a significant positive correlation of 0.343** ($p < 0.001$) between treatment adherence and self-efficacy. This suggests that as treatment adherence increases, self-efficacy also tends to increase. There is a significant positive correlation of 0.344** ($p < 0.001$) between age and the presence of arterial hypertension. This indicates that the likelihood of having arterial hypertension tends to increase with age. Furthermore, there is a significant positive correlation of 0.306** ($p < 0.001$) between the presence of arterial hypertension and the presence of T2DM. This suggests that there is a positive association between both conditions. Lastly, there is a significant positive correlation of 0.253** ($p < 0.001$) between gender and the presence of T2DM. This indicates that there are differences in the prevalence of T2DM by gender, in this case, in men.

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Table 3. Correlations between study variables.

Variables	*r*	*P*
Perception of complementary and alternative holistic medicine and self-efficacy	-0.26**	<.001
Perception of complementary and alternative holistic medicine and gender	0.26**	<.001
Perception of complementary and alternative holistic medicine and presence of arterial hypertension (AHT)	0.21 *	<.05
Treatment adherence and self-efficacy	.34**	<.001
Age and presence of arterial hypertension (AHT)	.34**	<.001
Presence of arterial hypertension (AHT) and presence of Type 2 Diabetes Mellitus (T2DM)	.30**	<.001
Gender and presence of Type 2 Diabetes Mellitus (DM2)	.25**	<.001

Spearman correlation.

In order to assess whether self-efficacy can be predicted by perception of complementary therapies and treatment adherence, a regression analysis was conducted using the stepwise method. The results presented in Table 4 indicate that the significance index, statistical power, and effect size are adequate and predict 41.9% (p=0.001) of self-efficacy.

Table 4. Simple Linear Regression Model: Treatment Adherence and Self-Efficacy.

Model	F	R^2	ΔR^2	B	Standard Error	β	P	1- β	F^2
Self-efficacy	11.691	.419	.175	35.430	2.951		<.001	.95	.72
Perception of CAM				-.338	.090	-.328	<.001		
Treatment adherence				.191	.057	.289	.001		

F= ANOVA, ΔR^2=Adjusted R^2, B= Unstandardized beta, β= Standarized beta, p= significance level, 1-β=Statistical power, F^2= Effect size.

The results obtained from the regression analysis using the stepwise method show that when incorporating the variables of perception of CAM and treatment adherence, they have explanatory power over self-efficacy, demonstrating a higher level of statistical power and elevated effect size. The first index surpasses 0.80, allowing to assert that the results are relevant for predicting self-efficacy. Additionally, the collinearity indicators VIF (Variance Inflation Factor) exceeding 10 and tolerance values greater than 0.20 indicate high correlations between factors in the model; and lastly, the Durbin-Watson indicator is above 2.2, which does not allow for data generalization.

4. Discussion

The study presents significant findings that highlight the relationship between the perception of CAM, adherence to treatment and self-efficacy in individuals with chronic conditions. The results reveal that a considerable proportion of participants present metabolic disorders, such as overweight or obesity, T2DM and HTN, highlighting the relevance of exploring complementary strategies in the management of these conditions.

The perception of complementary and alternative medicine in chronic diseases is a topic of interest in various communities, especially in the treatment of T2DM, HTN and cancer, and several studies have explored the perception of complementary medicine in the context of chronic diseases.

Regarding the perception of complementary therapies, a positive perception (M=26.59) was found in general, and it is especially good in women. These findings are consistent with those reported by Hill et al [21] in their research aimed at documenting the prevalence of the use of traditional, complementary, and alternative medicine in adult cancer patients at a national teaching hospital in Malawi, where female sex was found to be a predictor of the use of traditional, complementary, and alternative medicine over the use of conventional treatment.

Regarding the use of CAM therapies, it was found that 78. 8% (n=89) mentioned using 1 to 3 complementary therapies, it is observed that a large part of the sample is resorting to them, with meditation, aromatherapy, acupuncture and homeopathy being the most common, this is similar

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with what was mentioned by Villar [22] in his 2016 study, where the most known and accepted alternative therapy was acupuncture followed by phytotherapy (77.8 and 65.9% respectively), while the most used was phytotherapy (22.4%). This trend suggests an interest and active search for therapeutic alternatives by participants, possibly motivated by dissatisfaction with conventional treatments or the search for more holistic approaches to their well-being.

Self-efficacy is related in several ways to the use of complementary therapies in chronic diseases. Studies [23] have shown that a higher level of self-efficacy is associated with better adherence to a healthy diet, including the Mediterranean diet, and the ability to resist unhealthy foods. In addition, higher self-efficacy is associated with lower levels of perceived stress and higher levels of interpersonal support. This is similar to what was found in the present research, as a negative correlation was found between levels of self-efficacy and perception of complementary therapies, suggesting that those with a more negative perception of complementary therapies tend to have lower levels of confidence in their ability to manage their health. The use of complementary therapies is often associated with higher self-efficacy, which may lead to better compliance with therapeutic recommendations and better health outcomes [24].

Moreover, the present study identifies a positive correlation between treatment adherence and self-efficacy, indicating that those who more faithfully follow their treatments tend to have greater confidence in their ability to do so. Like that reported by a study [25] of chronic patients in Michoacán, Mexico, which analyzed the relationship between self-efficacy, perceived social support, and adherence to treatment The results showed that self-efficacy was directly related to lower levels of noncompliance and greater perceived social support. In addition, mediational analyses indicated that self-efficacy had a significant direct and indirect effect (through perceived social support and satisfaction with support) on patients' adherence, specifically in relation to diet and physical exercise.

Regression analysis confirms the importance of perception of MAC and treatment adherence in predicting self-efficacy, suggesting that a positive perception of complementary therapies and increased adherence to treatment may contribute significantly to increasing individuals' confidence in their ability to manage their health.

5. Conclusions

The findings of this study provide a comprehensive view on the relationship between the perception of holistic complementary and alternative medicine (CAM), treatment adherence, and self-efficacy in individuals with chronic conditions. The high prevalence of metabolic disorders among participants underscores the importance of exploring complementary strategies in the management of these health conditions.

The results reveal a mostly positive perception of complementary therapies, especially notable among women, which is consistent with previous research suggesting differential gender interest in these alternative practices. In addition, a wide use of various CAM therapies is observed, indicating a growing interest and active search for more holistic therapeutic options by the participants.

Self-efficacy emerges as a key factor in this equation, showing a significant association with both perception of complementary therapies and treatment adherence. These findings suggest that a positive perception of complementary therapies and increased adherence to treatment may play a key role in strengthening individuals' confidence in their ability to manage their health.

In summary, the results of this study provide a solid foundation for understanding the interrelationship between perception of complementary therapies, treatment adherence, and self-efficacy in individuals with chronic conditions. These findings offer valuable insights to inform future public health interventions aimed at improving health management and quality of life in this population.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The datasets presented in this article are not readily available due to ethical considerations. The data were collected as part of a research study involving human participants, and strict confidentiality measures were implemented to protect their privacy and confidentiality.

Public Involvement Statement: Patients were actively involved in this research through their participation in the study process. Upon agreeing to take part, patients provided informed consent, demonstrating their willingness to contribute to the investigation. Additionally, patients played a crucial role by completing a survey containing various measurement instruments relevant to the study's objectives.

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