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Theoretical models that can be applied to address therapeutic adherence.

Modelos teóricos que se pueden aplicar en la adherencia terapéutica.

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Abstract:

Adherence is defined by the World Health Organization (WHO) as "The degree of the patient's behavior, about taking medication, following a diet or changing lifestyle, corresponds with the recommendations agreed upon with the healthcare professional." Good adherence implies control of the disease, greater effectiveness of the treatment, and an improvement in the patient's quality of life. Lack of adherence can lead to serious complications of the disease, ineffectiveness of the treatment and an increase in health costs. The WHO reports that the prevalence of non-adherence goes from 25% to 50%, particularly in patients with chronic diseases. Lack of adherence to pharmacological treatment is a prevalent and relevant problem in clinical practice and it is necessary to address it through interventions that are supported using theoretical models of behavior change that focus on understanding and improving people's ability to follow medical indications. This review aims to mention some theoretical models of behavior change that health professionals can use as scientific support for the design of interventions to address the lack of therapeutic adherence considering cognitive, motivational, and environmental aspects.

Keywords:

Theoretical models, therapeutic adherence, change in behavior

Resumen:

La adherencia es definida por la Organización Mundial de la Salud (OMS) como "el grado en que el comportamiento de los pacientes, en relación con la toma de medicación, seguimiento de la dieta o cambios de estilo de vida, se corresponde con las recomendaciones acordadas con el profesional sanitario". Una buena adherencia implica el control de la enfermedad, una mayor efectividad del tratamiento y una mejoría en la calidad de vida del paciente, mientras que la falta de adherencia puede llevar a complicaciones graves de la enfermedad, una ineficacia del tratamiento y un aumento en los costos sanitarios. La OMS informa que la prevalencia de la falta de adherencia oscila entre 25% y 50% principalmente en pacientes con enfermedades crónicas. La falta de adherencia al tratamiento farmacológico es un problema prevalente y relevante en la práctica clínica y es necesario abordarla mediante intervenciones que se sustenten mediante el uso modelos teóricos del cambio de comportamiento que se centran en comprender y mejorar la capacidad de las personas para seguir las indicaciones médicas. El objetivo de esta revisión es mencionar algunos modelos teóricos del cambio de comportamiento que pueden utilizar los profesionales de la salud como sustento científico para el diseño de intervenciones para abordar la falta de adherencia terapéutica considerando aspectos cognitivos, motivacionales y ambientales.

Palabras Clave:

Modelos teóricos, Adherencia terapéutica, Intervenciones, cambio de comportamiento

INTRODUCTION

Therapeutic Adherence (TA) is an extensive, multiple, and multifactorial concept; there is high variability in the terms used to describe patient behavior related to taking medications.[1,2] TA can be described as the patient's behavior concerning taking medications.[1,2] The World Health Organization (WHO) defines adherence as: *"The degree to which the patient behaves about taking medication, following diet or lifestyle changes, corresponds to the recommendations agreed upon with the healthcare professional"*, which includes the active role of the patient and collaboration and agreement with the healthcare professional about their medication[1], that is, adequate doctor-patient communication must be created to facilitate shared decision-making.[3] In 2003, the WHO reported that approximately 25% to 50% of patients are not adherent to their treatments, especially those with chronic diseases.[4] Currently, lack of adherence is a problem in Mexico and the world, and it

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is necessary to know the true prevalence of each disease to reduce it and improve the patient's level of health.[5] In this sense, behavioral science offers theories, models, and strategies[6-13], from which only some are useful in helping patients improve their treatment adherence. They may also be helpful to change the behavior of healthcare providers and healthcare systems.[6,7] This review aims to talk about each model that can be applied in TA.

Various models have been described that explain therapeutic adherence[6-13], among which cognitive behavioral models[14] can be noted since they combine learning theory with aspects of information processing and focus on how human behavior is learned or acquired.[15] Currently, no studies have been found that use these models to design interventions to address the lack of therapeutic adherence.

Adherence is considered a behavior; for this reason, it is relevant to use theoretical models that explain adherence and address the lack of TA to carry out precise interventions in patients with this problem[6-13]; however, no research or studies have been found in Mexico in which any of these models of behavioral change are used in the design of interventions to improve the lack of TA.

To address the lack of therapeutic adherence using one of the models to be described later[6-13], it is necessary to know its characteristics, such as, for example, the phases of adherence, the nature of the lack of adherence, and the barriers that prevent the patient from adhering to their treatment.

PHASES OF THERAPEUTIC ADHERENCE

Adherence is divided into 3 phases: initiation, implementation, and discontinuation, as described in Figure 1. Adherence phases are different depending on the conditions.[1,15-17] This is because the general determinants impact each situation in several ways. Furthermore, there is a big difference depending on the severity of the disease. In general, adherence to treatments is lower in chronic processes than in acute ones, which is known as lack of adherence or non-adherence.[18]

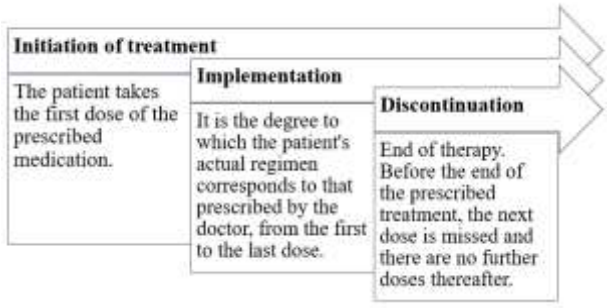

Figure 1. Phases of therapeutic adherence.[1,15-17]
*Discontinuation. End of therapy. Before ending the prescribed treatment, the patient misses the next dose and all further doses.

In this context, patients are considered non-adherent when they take less than 80% of the doses prescribed by the doctor.[19] It is challenging to achieve TA since, due to a lack of knowledge of the disease and the importance of pharmacological treatment, patients forget or avoid taking their medications, especially if they feel relieved or controlled. Polypharmacy is a factor that affects adherence because it has been determined that as the number of prescribed drugs increases, adherence to treatment decreases.[20] It is important to mention that the appearance of adverse reactions, the appearance of drug interactions, the probability of forgetting, and the complexity of taking medications are the main consequences of polypharmacy that will prevent adequate TA.[21]

NATURE OF LACK OF ADHERENCE

Non-adherence (NA) can be classified from different points of view. It can be classified as intentional NA or unintentional NA, primary and secondary non-adherence[22-24], whose characteristics are described in Table 1.

Table 1. *Phases of therapeutic adherence depending on its origin.* [18,22,24]

Intentional non-adherence	It is one in which the patient does not want to take his medication due to barriers in his perception, because of erroneous beliefs about the health problem, treatment, alterations in his family and social environment, low motivation, or a poor relationship between the doctor and the patient.
Unintentional non-adherence	It is one in which the patient cannot take their medication correctly; it is caused by practical barriers derived from a lack of skills, complex guidelines, forgetfulness, routines, and poor organization.
No Primary adhesion	It refers to when a new treatment is prescribed to a patient and the patient does not arrive to pick up the medication at the pharmacy.
No Secondary adhesion	It is the inappropriate taking of medication once it is picked up at the pharmacy, including taking the wrong dose at the wrong time, forgetting to take one or more doses or increasing or decreasing the frequency of the dose and stopping the treatment too soon, stopping the medication, or taking it before the date indicated by the doctor.

The previous classification[18,22,24] is used to identify voluntary and involuntary behavior patterns, highlighting the need to address each one through interventions directed to the guy if no adherence is detected.[2]

THEORETICAL MODELS THAT COULD EXPLAIN THERAPEUTIC ADHERENCE

Among the cognitive behavioral models that can be used to explain adherence, the literature refers to the Health Belief Model (HBM)[10,25-27,28], the Theory of Reasoned Action (TRA)[29-31], and the Leventhal's Self-Regulatory Systems model (LSRSM)[28], which are shown in Figure 2.

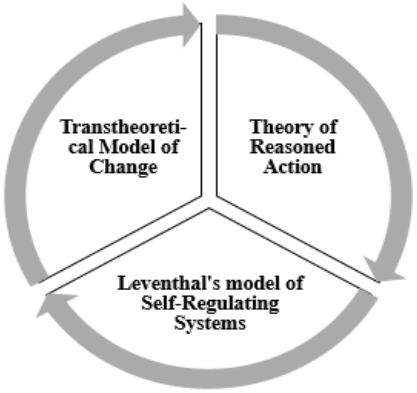

Figure 2. Example of Cognitive-Behavioral Models that can be applied in Therapeutic Adherence.[10,27-31]

Health Belief Model (HBM)

This model explains the modification of the behavior by working on the beliefs or perceptions that the subject has and focuses on criteria that provide data on the possibility of the subject following the educational guidelines or not.[10,27,28] This model is criticized because it does not consider the context and does not consider it appropriate to modify the behavior of healthy people. Even though it is useful to apply when we want to address compliance with a therapeutic plan.[11]

The HBM was developed and adapted by Becker and Maiman in 1974, Janz and Becker in 1984, and Glanz and Rimer in 1995.[28] This model is based on expected value theories (expectations) whose premise is that behavior depends on two variables, the value that the person gives to an objective and the estimate that the person makes about the probability that carrying out a specific action will achieve the desired objective.[32,33]

This model explains that someone's behaviors are determined by the perception of a threat to their health. This vulnerability experienced is conditioned by the perception about susceptibility to the disease and the perceived severity of the consequences of acquiring it. A vulnerability perception increase to a health threat produces motivation and a strengthening of protective behaviors towards that threat.[34]

The contribution of the model is to consider beliefs as the main elements for interpreting the individuals' behaviors regarding health and illness.[32] Some of its limitations are that it is a rationalist model since the subjects often do not behave consistently with their beliefs; it does not consider the influence of more objective social elements derived from environments in which the subject is immersed; and downplays the individual and social-emotional element produced by a certain illness; it does not include as study variables the various previous forms of coping that individuals carry out when faced with the disease and perceive the subject as a logical-economic processor.[32-34]

Theory of Reasoned Action (TRA)

From 1973 to 1975, Fishbein and Ajzen developed this model reiterating the role of cognitive factors and motivation as determinants of health behavior.[29] This theory established a model with better predictive power for behavior based on studying attitudes that other expected value models could not set.[29-31]

The most relevant thing Fishbein and Ajzen propose is to protect the idea that beliefs determine attitudes and norms. Therefore, they will indirectly determine our intentions and behaviors.[31]

When applying the model to the study of behaviors related to health and illness, the authors argue that people capture from the environment the information they consider sufficient and relevant about health risks, benefits, and consequences of carrying out or not certain behaviors.[30,31] An antecedent of behavior is the behavioral intention, on which both the execution of the motivated behavior and the intensity with which it is carried out depend. The intention is determined by two variables: a personal one, which is deferred to the person's attitude towards the behavior, that is, a favorable or unfavorable evaluation by the subject of that behavior, and a social variable, which refers to the expectations that, regarding this behavior, the subject perceives in his social environment as, for example, the social pressure that incites him to perform or not perform some behavior, called normative social influence or subjective norm.[33]

Subsequently, Ajzen, during the years 1985 to 1991, added a new variable to the model, the degree of perceived control over behavior, with the intention that the model could predict behaviors over which individuals have incomplete volitional control; that is, it does not only depend on the will of the subject to carry them out. Perceived control refers to the perception of two types of obstacles: those that refer to the subject's lack of skills or competencies to carry out the behavior and situational impediments such as the opportunities and resources available to execute the behavior. Motivated behavior will be carried out effectively if there is the intention and the possibility of carrying it out.[33]

Leventhal Self-Regulatory Systems Model (LSRSM)

This model was developed in 1980-1987 by Diefenbach[35], Leventhal, Meyer and Nerez[36] to overcome the difficulties encountered in research based on the Health Belief Model and the Theory of Reasoned Action.[29-31]

Through the Leventhal model[36], Meyer, and Nerez tried to explain how people are immersed in a self-regulatory process that allows them to adapt in the short and long term to disease situations.[36] Behaviors in the face of illness would be determined by common sense representations or beliefs about

the disease: symptoms, cause, consequences, existing body state, absolute body state, emotional experience, and plans for change. And how the patient evaluates all these aspects.[31]

The model proposes two parallel channels in this process. The first results in the development of an objective representation of the health threat and the development of coping responses to control it.[35-37] The second involves processing emotional reactions to that threat and implementing strategies to control that emotion. Therefore, these are two independent systems that can occasionally interfere with each other.[35-37]

The self-regulatory system of perception of internal and environmental stimuli that initiate self-regulatory progress is described below.[33]

- The cognitive, schematic, and representational processing of stimuli through common sense representations of the disease and the dangerousness with which the disease is perceived, its possible consequences of suffering it, and the perceived vulnerability.
- Action plans and the selection of behaviors to face the disease.
- Evaluation of the results of the behaviors carried out, considering the progress according to the achievement of the ideal state; that is if the objectives that triggered this self-regulation process have been achieved.

The three levels mentioned above correspond to the emotional representational processing of the stimuli, where emotions are conceived as subjective feelings that integrate the affective response to the stimuli that serve as guiding elements of behavior. The emotional state may be activated in any of the three stages and interact with the cognitive processing of specific stimuli.[33]

For Leventhal, the two self-regulatory systems are relatively independent[28], but, at the same time, they are interactive because both are involved in conscious perception and the emotions associated with a specific disease, as well as with people and situations. Regarding the disease, harmful stimulation is processed simultaneously in the informational or objective system and the emotional system (threat, fear). Both systems act similarly based on stimuli, interacting through the various stages: interpretation, coping, and evaluation.[36]

The model has contributed new elements to the study of beliefs about health and illness. Essentially, it includes emotions as relevant factors in the health-illness problem. Likewise, some limitations can be pointed out; among them are the importance given to individual logical analysis based on physiological and environmental sensations and the fact that individuals evaluate the disease fundamentally from physiological symptoms.[33,35-37]

Information-Motivation-Behavior Skills Model (IMBSM)

This model proposed by Fisher et al. in 2002[12,38] points out that information is a relevant element for any behavioral change; however, it is insufficient to achieve it, it will require the intervention of other factors, such as motivation and behavioral skills; the latter would be decisive for the needed change. However, information and motivation increase the probability of adherence, so it must be ensured that the patient has these behavioral tools.[33] The person's beliefs about the ability and self-regulation to implement said behavior will be decisive. In this context, people will be motivated if they perceive that their actions can be adequate if there is the conviction that they have personal capabilities that allow them to regulate their actions.[39-41]

THEORETICAL MODELS OF HEALTH EDUCATION

The most used models in health education are described as follows:

Model Transtheoretical of the Behavior (MTB)

Prochaska and DiClemente proposed a seven-stage spiral model of the behavior change process described in 1984 and adapted in 1992.[6-9] This model allows us to understand how people manage to make significant changes in their behaviors, mainly in the context of health. This model assists practitioners in developing appropriate interventions for individuals at different stages of change.[42] The stages of this model are described in Table 2.

Table 2. *Description of the seven stages of the MTB.*[6-9]

Precontemplation	There is no intention of change in the near future. It is not that the solution is not seen, it is that the problem is not seen.
Contemplation	The person is aware that there is a problem and thinks about overcoming it, but has not decided to act.
Preparation	Intention and decision-making are combined, and small changes begin to be introduced. If it does not change, the person regresses to the contemplation stage.
Action	A change occurs in the problem to be solved.
Maintenance	The results obtained in its action persist and are consolidated. People try hard to prevent relapses.
Relapse	The behavior that had changed or was in the process of changing is repeated.
Termination	The new habit is now solid and difficult to abandon. It is now part of your life. The therapeutic objective is adherence.

The model contributes to recognizing the nature of behavioral change. It is considered a spiral model, as shown in Figure 3,

where the person revolves around the process several times before reaching a stable change.[6,7,43]

Figure 3. Spiral model of the MTB change process.[5-7]

Model of Development Staff and Skills Social (MDSSS)

The model poses the need for appropriate development staff and the acquirement of social skills that train the individual to resist the social pressure in developing unhealthy behaviors and be competent in making responsible decisions for the individual's welfare.[44] The activities of this model are a guide to achieving the following skills[33]:

- Effective Communication
- Expression of feelings
- Self-esteem
- Self-concept
- Assertiveness
- Decision making
- Solution of issues

The Education Sanitary (ES) is the fundamental pillar of health education because it modifies attitudes and produces behavioral changes. All individuals experience different phases in the process of change in health-related behaviors. These changes were defined through theoretical models of behavior change.[45]

Model of Perceived Need and Concerns (MPNC)

This model assumes that the beliefs or opinions people have about prescribed medications. They are based on two aspects: the need to take the medication to maintain or improve health and the concern related to the adverse effects.[46]

Beliefs and concerns can affect treatment adherence; therefore, it is important to inquire about the patient's beliefs and the people around them. It must be considered that patients' beliefs do not remain constant over time. Therefore, they can change for various reasons, one of them is because they acquire more information. Maintaining good communication with patients is crucial, as they may struggle to express their concerns, expectations, and fears regarding their illness and treatment. Both verbal and non-verbal communication are essential to address the needs and concerns of patients effectively.[33]

Motivational Interviewing (MI)

Motivational Interviewing[11], is defined as a style of direct patient-centered care, to stimulate intrinsic motivation and provoke changes in behavior by exploring and resolving ambivalence.[47] Patients are encouraged to evaluate their behavior and to explore this behavior for his or her aspirations, values, and interests.[13] Additionally, they are encouraged to address any discrepancies that may arise. This entire process evokes psychological and behavioral changes in patients.[47]

The model was created specifically to achieve a positive and lasting change in the patient's lifestyle or behavior, informing a frank discussion about the risks to increase awareness and replace denial with insight and motivation in a guided exploration of factors that lead to empowerment with the capacity for change. MI is a skill used to support the discovery of the personal value of change and to build confidence to achieve change.[13] Table 3 describes the principles and skills of MI.

Table 3. *Basic principles and skills of Motivational Interviewing.*[13]

Express empathy: Understand the patient's perspective, accept and propose solutions.	Using open-ended questions that provide information.
Create discrepancy: Confront current behavior and desired objectives and raise doubts.	Reflective and active listening using verbal and non-verbal communication.
Avoid discussions: Do not assume a defensive attitude because it provokes resistance. The strategy must be changed.	Affirm supporting the patient through positive understanding comments and phrases.
Promote self-efficacy: Increase your perception to confront obstacles and achieve success.	Summarize by reinforcing and confirming what was said by the pharmacist or the patient.

Three steps are used in motivational interviewing[47]:

- Assess the stage of readiness for change: this may require a discussion of risk to overcome denial.
- Increase conviction (motivation) to change through reflection to discover the personal benefits of change. As conviction (motivation) grows, the focus can shift to building trust.
- Foster confidence in the ability to change by exploring individualized solutions to the individual's perceived barriers.

BARRIERS THAT PREVENT ADHERENCE AND THEIR APPROACH WITH THEORETICAL MODELS

There are two types of barriers that prevent the patient from being adherent. They are related to the non-adherence type. For intentional NA, practical barriers (resources and skills) correspond, and for unintentional NA, perceptual barriers (beliefs and motivation) correspond.[48-50]

Intentional NA: Perceptual barriers

Intentional NA is related to erroneous beliefs, lack of motivation, excessive worry, and social fear of lack of intentional adherence. The patient decides not to follow his treatment correctly, he does not want to do so.[2,22] This type of barrier can be addressed with the Personal Development and Social Skills Model[44,45], Perceived Need and Concerns[33,46,51-53], Model of Health Beliefs[54,55], and Motivational Interviewing.[10,13]

Unintentional NA: Practice Barriers

Related to the lack of skills and resources are forgetfulness, the complexity of treatment, and low capacity to handle complex procedures, due to a lack of not intentional adherence. The patient cannot follow his treatment correctly or finds it difficult.[22] In this barrier, the patient's capacity must be increased, using a combination of behavioral strategies such as the Transtheoretical Model of Behavior[6-9,43], the Information-Motivation-Strategy model[56-58] and Motivational Interviewing.[10,13]

THEORETICAL MODELS USED TO ADDRESS THERAPEUTIC ADHERENCE

As mentioned above, several behavior change models can help design interventions for non-adherence. However, five main ones that health professionals can choose to address are highlighted. Figure 4 summarizes these models.

Each model offers a unique perspective on the factors influencing patient behavior and guidance for developing effective interventions. MS plays a fundamental role, as it can explore and reinforce a person's motivation to make positive changes in their health. The basic principles and skills that underpin this model must be used.[13,47,59-61]

CONCLUSIONS

Nowadays, no studies in Mexico use any theoretical model to design strategies and interventions to improve the lack of AT. This is the reason it is relevant to publicize each model's approaches. It is a space of opportunity to conduct more studies on the effectiveness of their use as scientific support in the design of interventions for the lack of AT. Understanding the theoretical behavior change models in the context of TA is essential to designing effective individual or group interventions in improving the patient's health and quality of life. The wide diversity of approaches of these models provides tools to address the complexities of health behavior modification; on the other hand, the integration of these theories into clinical practice can significantly enhance the efforts of healthcare professionals to improve therapeutic adherence, promoting successful outcomes, in this sense, good adherence to treatment provides significant benefits to patients, such as prevention of complications, improvement in the effectiveness of treatment and an improvement in quality of life.[61,62]

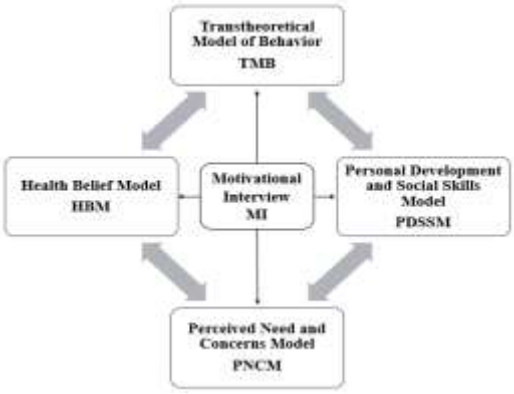

Figure 4. Main models for addressing therapeutic adherence.[12,13,33,44,54]

REFERENCES

[1] Chaudri NA. Adherence to Long-term Therapies Evidence for Action. Ann. Saudi. Med. 2004;24(3):221-2.

[2] Pagès-Puigdemont N, Valverde-Merino MI. Adherencia terapéutica: factores modificadores y estrategias de mejora. Ars. Pharm. 2018;59(4):251-8.

[3] Dilla T, Valladares A, Lizán L, Sacristán JA. Adherencia y persistencia terapéutica: causas, consecuencias y estrategias de mejora. Aten. Primaria 2009;41(6):342–8.

[4] Torres-Robles A, I Benrimoj S, Gastelurrutia MA, Martínez-Martínez F, Peiro T, Pérez-Escamilla B, et al. Effectiveness of a medication adherence management intervention in a community pharmacy setting: a cluster randomized controlled trial. BMJ Qual. Saf. 2022;31(2):105-15.

[5] Pérez-Escamilla B, Aguilar J, Valverde MI, Amaro L, Torres AJ, Varas R, et al. Proyecto adherenciaMED: impacto- diseño y evaluación de un servicio de adherencia terapéutica en la farmacia comunitaria. Caracterización al inicio del estudio. Farm. Comunitarios 2018;10(1):1-2.

[6] Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. Am. Psychol. 1992;47(9):1102-14.

[7] Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. Am. J. Health Promot. 1997;12(1):38-48.

[8] Horne R. Patients beliefs about treatment the hidden determinant of treatment outcome? J. Psychosom. Res. 1999;47(6):491-5.

[9] Rondón Bernard J, Reyes Fernández B. Introducción al Modelo Transteórico: Rol del apoyo social y variables sociodemográficas. Rev. Elec. Psic. Izt. 2019:22(3):2601-33.

[10] Moreno San Pedro E, Rosales-Nieto JG. The health belief model: theoretical review, critical consideration and alternative proposal: towards a functional analysis of health beliefs. Int. J. Psychol. Psychol. Ther. 2003;3(1):91-109.

[11] Matarazzo JD. Behavioral health and behavioral medicine. Frontiers of a new health psychology. Am. Psychol. 1980;35(9):807-17.

[12] Fisher JD, Fisher WA, Bryan AD, Misovich SJ. Information-motivation-behavioral skills model-based HIV risk behavior change intervention for inner-city high school youth. Health Psychol. 2002;21(2):177-86.

[13] Rivera Mercado S, Villouta Cassinelli MF, Ilabaca Grez A. Motivational interviewing: what is its effectiveness in prevalent primary care problems? Aten. Primaria 2008;40(5): 257-61.

[14] Organización Mundial de la Salud [Internet]. Adherencia a los tratamientos a largo plazo, pruebas para la acción. Washington, D.C. Biblioteca de la OPS. 2004 - [Cited 2024 Feb 19]. Available from: https://www.paho.org/hq/dmdocuments/2012/WHO-Adherence-Long-Term-Therapies-Spa-2003.pdf.

[15] Ramos Morales MLE. La adherencia al tratamiento en las enfermedades crónicas. Rev. Cubana Angiol. Cir. Vasc. 2015;16(2):175-89.

[16] Vrijens B, De Geest S, Hughes AD, Przemyslaw K, Demonceau J, Ruppar T, et al. A new taxonomy for describing and defining adherence to medications. Br. J. Clin. Pharmacol. 2012;73(5):691-705.

[17] Márquez Contreras E, Casado Martínez JJ, Márquez Cabeza JJ. Estrategias para mejorar el cumplimiento terapéutico. Form. Med. Cont. Aten. Primaria 2001;8(8):558–73.

[18] Valverde Merino M, Martinez Martinez F, García Mochon L, Benrimoj S, Malet Larrea A, Pérez Escamilla B, et.al. Cost Utility Analysis of a Medication Adherence Management Service Alongside a Cluster Randomized Control Trial in Community Pharmacy. Patient Prefer. Adherence 2021;15:2363-76.

[19] SEFH [Internet]. Sociedad Española de Farmacia Hospitalaria - [Cited 2024 Feb 14]. Available from: https://www.sefh.es.

[20] Benavides A, Jaramillo Rosero L, Rendón S, Valenzuela A, Argotty Pérez E, Mafla A. Determinantes de adherencia al tratamiento antihipertensivo de adultos ≥ 35 años de edad. Univ. Salud 2013;15(2):136-49.

[21] Fajreldines A, Balderraín M, Valerio M, Rodríguez V, Pellizzari, M. Polimedicación, prescripción inapropiada y eventos adversos a fármacos en ancianos hospitalizados: un problema de seguridad del paciente. Rev. Colomb. Cienc. Quim. Farm. 2021;50(2):522-32.

[22] Martínez Martínez F. Informe Global 2019 AdherenciaMED: Diseño, evaluación del impacto e implantación de un Servicio profesional de Adherencia Terapéutica desde el ámbito de la Farmacia Comunitaria. Madrid: 2019.

[23] Adams AJ, Stolpe SF. Defining and measuring primary medication nonadherence: development of a quality measure. J. Manag. Care Spec. Pharm. 2016;22(5):516-23.

[24] Consejo General de Colegios Oficiales de Farmaceuticos. Informe de resultados AdherenciaMED. Informe global. Granada: 2019.

[25] Secretaría de Salud [Internet]. Guía clínica para el médico de primer nivel de atención de adherencia terapéutica, Instituto Mexicano del Seguro Social. 2017 – [Cited 2024 Feb 25]. Available from: https://www.gob.mx/cms/uploads/attachment/file/482209/GUIA_ADHERENCIA_TERAP_UTICA.pdf.

[26] Fischer MA, Stedman MR, Lii J, Vogeli C, Shrank WH, Brookhart MA, et al. Primary medication nonadherence: analysis of electronic prescriptions. J. Gen. Intern. Med. 2010;25(4):284-90.

[27] Soto Mas F, Lacoste Marín JA, Papenfuss RL, Gutiérrez León. El modelo de creencias de salud. Un enfoque teórico para la prevención del sida. Rev. Esp. Salud Pública 1997;71(4):335-41.

[28] Ortego Maté M, López González S, Álvarez Trigueros M. [Internet]. Ciencias Psicosociales I, la adherencia al tratamiento. 2009 – [Cited 2024 Feb 20]. Available from: https://ocw.unican.es/pluginfile.php/424/course/section/214/tema_14.pdf.

[29] Reyes Rodríguez L. La Teoría de la Acción Razonada: Implicaciones para el estudio de las actitudes. Inv. Edu. Dur. 2007;7:66-7.

[30] Stefani, D. Teoría de la acción razonada: una aplicación a la problemática de la internación geriátrica. Rev. Lat. Psicol. 1993;25(2):205-23.

[31] Tobón S, Vinaccia S. Modelo de la acción razonada, modelos Psicológicos de la Salud que han abordado el VIH/SIDA. Psicol. Salud 2003;13(2):161-74.

[32] Pinilla Análida E. Modelos pedagógicos y formación de profesionales en el área de la salud. Acta Med. Colomb. 2011;36(4):204-18.

[33] PAPCAST. [Internet] Promoción de la salud y programación sanitaria. 2009 – [Cited 2024 Feb 19]. Available from: https://www.macmillaneducation.es/wp-content/uploads/2019/02/pap_unidad_cast.pdf.

[34] Rogers R. Cognitive and Psychological processes in fear appeals and attitude change. In: Cacioppo JT, Petty R, editors. A revised theory of protection motivation. Chicago. Social Psychol. Sourcebook; 1983:153-77.

[35] Diefenbach, M.A., Leventhal, H. The common-sense model of illness representation: Theoretical and practical considerations. J. Soc. Distr. Homls. 1996;5(1):11–38.

[36] Leventhal H, Diefenbach M. The active side of illness cognition. In: Skelton JA, Croyle RT, editors. Mental representation in health and illness. New York: Springer-Verlag. 1991;1:247-72.

[37] Meyer D, Leventhal H, Gutmann M. Common-sense models of illness: the example of hypertension. Health Psychol. 1985;4(2):115-35.

[38] Paz Bermúdez M, Herencia-Leva A, Uribe Rodríguez A. Strong and weak versions of the Information Motivation-Behavioral Skills Model in prediction of condom use. Rev. Lat. Psicol. 2009;41(3):587-98.

[39] Bandura A. Organizational Application of Social Cognitive Theory. Aus. J. Mgmt. 1988;13(2):275-302.

[40] Olivari Medina C, Urra Medina E. Autoeficacia y conductas de salud. Cienc. Enferm. 2007;13(1):9-15.

[41] Bandura A, Vittorio Caprara G, Barbaranelli C, Gerbino M, Pastorelli C. Role of Affective Self-Regulatory Efficacy in Diverse Spheres of Psychosocial Functioning. Child Dev. 2003;74(3):769-82.

[42] Riquelme M. Metodología de educación para la salud. Rev. Pediatr. Aten. Primaria 2012;14(22):77-82.

[43] Prochaska JO, DiClemente CC. Stages of change in the modification of problem behaviors. Prog. Behav. Modif. 1992;28:83-218.

[44] Díaz Brito Y, Pérez Rivero JL, Báez Pupo F, Conde Martín M. Generalidades sobre promoción y educación para la salud. Rev. Cubana Med. Gen. Integr. 2012;28(3):299-308.

[45] De La Guardia Gutiérrez MA, Ruvalcaba Ledezma JC. Health and its determinants, health promotion and health education. J. Neg. Posit. Res. 2020;5(1):81-90.

[46] Paisley CM, Sparks, P. Expectations of Reducing Fat Intake: The Role of Perceived Need within the Theory of Planned Behavior. Psychol. Health 1998;13(2):341–53.

[47] Miller WR. Motivational interviewing: research, practice, and puzzles. Addict. Behav. 1996; 21(6):835-42.

[48] Horne R, Weinman J, Barber N, Elliott R, Morgan M. [Internet] Concordance, Adherence and Compliance in Medicine Taking. 2005 - [Cited 2024 Feb 19]. Available from: https://www.ahpo.net/assets/NCCSDO%20Compliance%202005.pdf.

[49] Lehane E, McCarthy G. Intentional and unintentional medication nonadherence: A comprehensive framework for clinical research and practice? A discussion paper. Int. J. Nurs. Stud. 2007;44(8):1468-77.

[50] Bae SG, Kam S, Park KS, Kim KY, Hong NS, Kim KS. et.al. Factors related to intentional and unintentional medication no adherence in elderly patients with hypertension in rural community. Patient Prefer. Adherence 2016:1979-89.

[51] Horne R, Chapman SC, Parham R, Freemantle N, Forbes A, Cooper V. Understanding patient's adherence related beliefs about medicines prescribed for long term conditions: a meta-analytic review of the Necessity-Concerns Framework. PLoS One 2023;8(12):e80633.

[52] Phillips LA, Diefenbach MA, Kronish IM, Negron RM, Horowitz CR. The necessity concerns framework: a multidimensional theory benefits from multidimensional analysis. Ann. Behav. Med. 2014;48(1):7-16.

[53] Foot H, La Caze A, Gujral G, Cottrell N. The necessity concerns framework predicts adherence to medication in multiple illness conditions: A meta-analysis. Patient Educ. Couns. 2016;99(5):706-17.

[54] Bowers KA. Explaining health behavior: the health belief model. Nurs. Adm. Q. 1980;4(2):41-6.

[55] Carpenter CJ. A meta-analysis of the effectiveness of health belief model variables in predicting behavior. Health Commun. 2010;25(8):661-9.

[56] Kamran A, Sadeghieh Ahari S, Biria M, Malepour A, Heydari H. Determinants of Patient's Adherence to Hypertension Medications: Application of Health Belief Model Among Rural Patients. Ann. Med. Health Sci. Res. 2014;4(6):922-7.

[57] DiMatteo MR, Haskard-Zolnierek KB, Martin LR. Improving patient adherence: a three-factor model to guide practice. Health Psychol. Rev. 2012;6(1):74-91.

[58] Martin LR, Feig C, Maksoudian CR, Wysong K, Faasse K. A perspective on nonadherence to drug therapy: psychological barriers and strategies to overcome nonadherence. Patient Prefer. Adherence 2018;12:1527-35.

[59] Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. Am. J. Health Promot. 1997;12(1):38-48.

[60] Palacio A, Garay D, Langer B, Taylor J, Wood BA, Tamariz L. Motivational Interviewing Improves Medication Adherence a Systematic Review and Meta-analysis. J. Gen. Intern. Med. 2016;31(8):929-40.

[61] Spears J, Erkens J, Misquitta C, Cutler T, Stebbins M. A Pharmacist-Led, Patient-Centered Program Incorporating Motivational Interviewing for Behavior Change to Improve Adherence Rates and Star Ratings in a Medicare Plan. J. Manag. Care Spec. Pharm. 2020;26(1):35-41.

[62] Maffoni M, Traversoni S, Costa E, Midão L, Kardas P, Kurczewska-Michalak M, et al. Medication adherence in the older adults with chronic multimorbidity: a systematic review of qualitative studies on patient's experience. Eur. Geriatr. Med. 2020;11(3):369-81.