British Journal of Healthcare and Medical Research - Vol. 12, No. 02
Publication Date: April 25, 2025
DOI:10.14738/bjhr.1202.18654.
Tjahjono, C. T., Mayangsari, V., Arthamin, M. Z., & Insanitaqwa, A. Z. (2025). Motivations as the Key Factor to Exercise Adherence Among Adults with Hypertension. British Journal of Healthcare and Medical Research, Vol - 12(02). 318-341.

Motivations as the Key Factor to Exercise Adherence Among Adults with Hypertension

Cholid Tri Tjahjono
ORCID: 0000-0002-6766-2792
Division of Cardiac Prevention and Rehabilitation,
Department of Cardiology and Vascular Medicine,
Universitas Brawijaya – Dr. Saiful Anwar Teaching Hospital,
Malang, Indonesia 65111

Veny Mayangsari
Division of Cardiac Prevention and Rehabilitation,
Department of Cardiology and Vascular Medicine,
Universitas Brawijaya – Dr. Saiful Anwar Teaching Hospital,
Malang, Indonesia 65111

Maimun Zulhaidah Arthamin
Department of Clinical Pathology, Universitas Brawijaya –
Dr. Saiful Anwar Teaching Hospital, Malang, Indonesia 65111

Aleyda Z. Insanitaqwa
Faculty of Medicine, Universitas Brawijaya,
Malang, Indonesia 65145

ABSTRACT

Aim: Regular exercise is a cornerstone of hypertensive treatment, yet many individuals struggle to maintain consistent exercise routines. Motivation plays a crucial role in fostering sustained engagement in health-promoting behaviors, including exercise. This literature review explores the multifaceted nature of motivation associated to exercise adherence, with a particular emphasis on hypertensive individuals. Result: Motivation is a key factor influencing exercise adherence among individuals with hypertension. The motivators and barriers to exercise adherence can be classified into three principal factors: intrapersonal, interpersonal, and environmental, according to the socioecological model. The motivational aspect of intrapersonal factors including as self-efficacy, responsibility to one's self, enjoyment, health beliefs, baseline physical activity, cognitive factors, knowledge, vicarious experience, socioeconomic income, sociodemographic factors, and appearance. Interpersonal factor, such as patient-healthcare providers relationship and social support, can either facilitate or hinder exercise adherence. Environmental factors can motivate exercise if there are supportive health care system, available health infrastructure, and suitable setting of exercise. Interventions to enhance motivation are essential for increasing exercise adherence and improving health outcomes. Increased social interaction, building strong social support, establishing of good therapeutic rapport, health education, cognitive-behavioral intervention, and strategies to enhance self-

efficacy are several approaches to increase motivation. Moreover, motivational interviewing can be applied by the healthcare providers as a counseling approach to elicit behavior change by resolving patient ambivalence and sustaining long-term motivation for exercise adherence. Conclusion: Existing literature indicates a robust association between motivation and exercise adherence in individuals with hypertension. While certain motivational strategies have demonstrated potential, further research is needed to facilitate long-term behavior change and alleviate the burden of hypertension at both individual and population levels.

Keyword: exercise adherence, motivation, cardiac rehabilitation, hypertension.

INTRODUCTION

Hypertension is a major predisposing factor in the development of cardiovascular disease (CVD), significantly contributing to both morbidity and mortality. Hypertension remains the most common modifiable determinant associated with population-attributable CVD in the United States, substantially elevating the incidence of heart failure, coronary heart disease, and stroke.(1) Globally, an estimated 1.28 billion aged 30-79 years are affected by hypertension, with a significantly higher prevalence in low- and middle-income countries, which account for approximately two-thirds of the cases.(2,3) Longitudinal data reveals a doubling in the number of hypertensive individuals within the 30-79 year age bracket, rising from 331 million females and 317 million males in 1990 to 626 million females and 652 million males in 2019.(4) In Indonesia, recent surveillance data revealed that the proportion of adults aged 18 years and older with hypertension was 30.8% in 2023, representing a decline from 34.11% in 2018. Despite this trend, hypertension remains a precursor to numerous chronic diseases and a principal determinant of premature mortality on a global scale. Furthermore, the leading cause of disability in individuals aged 15 years and older is non-communicable diseases, with hypertension being the most common, affecting 22,2% of this population.(5) A key global initiative targeting non-communicable diseases aims to achieve a 33% reduction in hypertension prevalence between 2010 and 2030.(3) Consequently, the prevention of CVD and hypertension-mediated organ damage is of utmost importance, given its profound effects on health-related quality of life. Current therapeutic strategies advocate for the integration of antihypertensive pharmacotherapy with comprehensive lifestyle modifications.(6)

Exercise, a structured and planned form of physical activity designed to improve or maintain physical fitness parameters, distinguishes itself from general physical activity, which includes any movement of the body produced by skeletal muscle. Exercise is acknowledged as an efficacious, non-pharmacological approach for hypertension. Its antihypertensive effect is evidenced by a reduction in systolic blood pressure (SBP) ranging from 2 to 7 mmHg, coupled with improvements in cardiorespiratory capacity.(7) Epidemiological data demonstrate that reducing systolic blood pressure (SBP) by 5 mmHg is associated with a 7% reduction in all-cause mortality, a 14% decrease in stroke-related mortality, and a 9% reduction in coronary heart disease mortality. Moreover, a 10 mmHg reduction is associated with a 27% lower risk of stroke, a 17% lower risk of coronary heart disease, a 28% decreased likelihood of heart failure, and a 13% drop risk of all-cause mortality.(8) Regular exercise is associated with improved glycemic and blood pressure control, potentially lessening the dependence on pharmacological intervention.(9) In addition, exercise can mitigate arterial stiffness and augment power, strength, and muscle mass. Recent findings also highlight a positive association between

exercise and cognitive function, with improvements observed in attention, memory, and executive function.(8) Exercise helps reduce low-grade vascular wall inflammation, improves endothelial dysfunction, slows the progression of age-related arterial stiffness, and enhances baroreflex sensitivity and autonomic function. These benefits are achieved through the promotion of vascular homeostasis, increased bioavailability of nitric oxide, enhanced antioxidant capacity., and improved insulin sensitivity.(10) Although the benefits of exercise are well-established, adherence to exercise regimens remains low among hypertensive patients, with only 32% of individuals in this population participating in regular exercise in the United States.(11) In Indonesia, the prevalence of insufficient physical activity among hypertension patients aged 18-59 years was 1.9 times higher than that of their sufficiently active counterparts.(5) Hypertensive patients continue to exhibit low participation rates in exercise, with adherence to exercise routines typically declining over time. More than 50% of patients tend to discontinue regular exercise within the first year of initiating a program.(10,12) Furthermore, exercise has been reported to exhibit the lowest adherence rates when compared to other lifestyle modifications.(12) Increased rates of nonadherence are linked to higher morbidity and mortality, placing a significant economic burden on both patients and the healthcare system.(13)

Patient motivation plays a crucial role in fostering sustained engagement in health-promoting behaviors, such as exercise. The word “motivation” derives from Latin word *movere*, which means “to move”. Fundamentally, motivation represents the “how” and “what” that drives an individual’s choices, actions, and persistence.(14) Patient motivation is described as the intrinsic drive to fulfill prescribed health intervention, facilitating the accomplishment of treatment goals.(15) It plays a pivotal role in promoting adherence to strict regimens by strengthening resilience in the face of challenges, as higher levels of patient motivation correlate with increased perseverance despite discomfort and maintain consistency.(16) The motivation to adhere to exercise is a multifaceted phenomenon influenced by subjective factors, yet comprehensive literature on these aspects remains limited. A thorough understanding of motivation is necessary to empower older adults by preventing complications through tailored educational materials and prioritizing interventions that enhance self-care, including exercise. Therefore, a thorough review was undertaken to evaluate the role of motivation in exercise adherence among hypertensive patients and to identify evidence-based interventions that support and enhance adherence.

METHODS

Literature review was performed to explore the motivational aspects influencing exercise adherence in hypertensive patients. Studies were included based on the following criteria: publication in the English language, inclusion of hypertensive patients aged 18 years or older, and a focus on the complexities of motivation related to exercise adherence. We included all study designs, such as reviews, experimental, and observational studies. Studies were excluded based on the following criteria: interventions not specifically aimed at supporting motivation for exercise adherence, involvement of individuals under the age of 18, and/or inclusion of pregnant individuals.

Search Strategy

A thorough literature search was performed using Google Scholar, PubMed, PROQUEST, and ScienceDirect to identify pertinent publications from January 2015 to February 2025. The

search strategy included a wide array of terms related to motivation, compliance, non-compliance, adherence, non-adherence, exercise, physical activity, rehabilitation, and hypertension. Furthermore, textbooks, cross-references, and bibliographies of the related articles were manually examined to identify further pertinent literature.

Study Selection

Following the completion of the literature searches, duplicate articles were removed. A preliminary screening of titles and abstracts was then conducted to identify potentially pertinent articles. Subsequently, the full texts of selected articles were examined to determine their eligibility for inclusion. Any conflicts that arose during the selection process were addressed through discussion.

Data Extraction and Synthesis

Data extracted from included studies encompassed information on theories and frameworks informing exercise adherence, the nature of motivation for exercise adherence, determinants of motivation, barriers to motivation, and interventions designed to enhance motivation.

RESULT AND DISCUSSION

Exercise Adherence

The World Health Organization (WHO) defines adherence as the degree to which an individual's behavior—such as medication intake, dietary compliance, and/or implementation of lifestyle modifications—aligns with the recommendations provided by a healthcare provider. In contrast, compliance refers to the extent to which patients accurately follow medical recommendations. While "compliance" denotes a passive adherence to physician's orders, "adherence" emphasizes active involvement in the decision-making process. Additionally, "persistence" refers to the length of time a patient maintains adherence to prescribed treatment regimen.(17) Adherence is critical for the success of medical intervention, as treatment outcomes are significantly influenced by the degree of adherence to prescribed regimens.(18) A high level of adherence is crucial in the management of chronic conditions, such as hypertension, to attain optimal therapeutic outcomes. In contrast, low adherence leads to suboptimal treatment outcomes, exacerbates the disease burden, and contributes to increased hospitalization rates, deterioration of physical function, higher healthcare costs, and preventable complications, all of which adversely impact patient health and well-being. Furthermore, adherence to treatment is closely linked to an improvement in health-related quality of life.(18,19)

Exercise adherence refers to the degree to which a patient follows to the prescribed exercise frequency, intensity, duration, and overall regimen. It is quantitatively measured as the proportion of completed exercise doses within a defined period to the total prescribed exercise doses during the same time frame.(14) A study involving 238 hypertensive patients reported that 54.2% engaged in regular physical activity.(2) Furthermore, a study comparing an exercise referral program with brief counseling demonstrated a decrease in adherence to 62% within the intervention group at a 24-week follow-up.(20) Exercise adherence facilitates improvements in overall physical capacity, reduction in psychological stress and anxiety, and maintenance of normal social interaction and roles, thereby enabling patients to engage in daily activities with fewer limitations.(10) Adherence is influenced by factors including family,

healthcare providers, community, and society. However, standardized protocols to support exercise adherence are currently lacking.(18)

Adherence is a complex phenomenon shaped by a variety of individual and environmental factors. Aligned with an ecological health model, exercise adherence is determined by intrapersonal factors (age, self-efficacy, emotional and physical conditions, motivation, health beliefs, baseline physical activity, and time-related factors), interpersonal factors (healthcare providers, social support, and family), and socioeconomic and environmental determinants (health system structure, logistic considerations, educational background, income, and exercise program design).(10) The common barriers to adherence include low health literacy, poor communication from healthcare providers, the absence of a caregiver, limited access to healthcare facilities, and financial constraints.(18) Study suggested that lower adherence rates among older adults may be attributed to complex treatment regimens, polypharmacy, neurodegenerative functional disability, and lack of understanding of their illness.(13)

Self-Determination Theory

Various theories have been proposed to explain patients' motivation, such as Self-Determination Theory, Protection Motivation Theory (PMT), Social Cognitive Theory, and Theories of Reasoned Action and Planned Behavior. Self-determination theory (SDT), created by psychologists Edward L. Deci and Richard M. Ryan in the 1980s, is an integrative psychological framework that is particularly effective in understanding health-related behaviors.(14) Numerous studies have demonstrated that self-determined motivation is positively correlated with higher levels of physical activity.(21) A core principle of SDT is that human motivation operates on a continuum, ranging from autonomous motivation—where individuals engage in behavior driven by a genuine sense of choice and volition—to controlled motivation, where behavior is influenced by internal or external pressures.(14)

Autonomous forms of motivation include identified regulation, integrated regulation, and intrinsic motivation. Identified regulation involves engagement in an activity driven by the recognition of its personal importance or benefits, such as participating in exercise to enhance daily life functioning. Integrated regulation involves participating in an activity because it aligns with one's values and identity, for example, exercising because it is consistent with personal beliefs about health. Conversely, intrinsic motivation describes engagement in an activity for the inherent pleasure experienced during an activity. For instance, individuals driven by intrinsic motivation may engage in exercise solely due to associated feelings of pleasure and satisfaction.(14)

Both external regulation and introjected regulation are categorized as controlled forms of motivation. SDT encompasses introjected regulation, which pertains to the engagement in an activity primarily to prevent negative emotions, such as guilt or anxiety. For instance, individuals may exercise to prevent feelings of guilt associated with inactivity. External regulation is characterized by the performance of an activity to obtain tangible rewards, adhere to external mandates, or avert potential punishments. An illustrative example is engaging in exercise due to physician's recommendations. Additionally, SDT recognizes amotivation, which represents a lack of motivation, where individuals perceive no connection between their behavior and its outcomes.(14)

SDT hypothesizes that individuals may undertake exercise to attain goals external to the behavior itself, such as enhanced physical fitness or improvement in physical appearance, and that the value assigned to these goals may vary. For instance, achieving specific fitness gains necessitates adherence to prescribed exercise intensities, frequencies, and durations. A lack of perceived progress, coupled with motivation driven by controlled factors, may increase the likelihood of exercise relapse or cessation. In contrast, autonomous motives, such as the appreciation for enhanced levels of physical fitness, are indicative of maintained adherence to exercise.(22) Self-Determination Theory posits that behaviors exhibiting greater self-determination, characterized by elevated autonomous motivation and diminished controlled motivation, demonstrate a higher probability of long-term maintenance.(21) Such behaviors are considered to be initiated freely and voluntarily.(22)

Cognitive evaluation theory (CET), a sub-theory of SDT, proposes that human engagement in activities is fundamentally driven by the desire to satisfy innate psychological needs and to experience intrinsic rewards and the associated sense of satisfaction. CET further asserts that the introduction of extrinsic rewards to individuals who were previously intrinsically motivated may result in a diminished sense of 'locus of causality', thereby facilitating a transition towards extrinsic motivation. Intrinsic motivation can be enhanced through actions and events that offer feedback, rewards, or communication that elicit perceptions of competence. However, external factors may serve to either enhance or undermine intrinsic motivation for a specific behavior.(14)

SDT proposes that the psychological needs for relatedness, competence, and autonomy serve as essential requirements for healthy human development, well-being, and resilience. Relatedness reflects the inherent human need for connection and care from others. The need to feel understood can significantly influence motivation, particularly in the context of social interactions or clinical settings where empathetic listening is crucial. Support from family, peers, or community groups plays a key role in motivating hypertensive patients to adhere to exercise programs. The feeling that exercise is valued by others may positively influence an individual's commitment to maintain their exercise regimen.(14)

Competence, defined as the need to exert control over and master desired outcomes, is fundamentally linked to self-efficacy and the conviction in one's capacity to attain particular objectives.(14) It is considered a critical determinant to facilitate autonomous motivation.(10) Goal setting and action planning can effectively enhance feelings of competence. When hypertensive patients experience progress or improvement in their fitness levels (e.g., ability to walk longer distances), it reinforces their sense of competence.(14) Furthermore, SDT asserts that the social environment, especially the patient-healthcare provider relationship, can foster perceived competence, autonomous motivation, and participation in health-promoting behaviors. Research findings indicate that higher levels of perceived competence, autonomous motivation, and perceived autonomy support are associated with increased physical activity among obese and overweight patients, potentially through mechanisms related to enhanced self- regulation and intrinsic drive.(10)

Autonomy, or the sense of independence and self-governance, is equally vital. Healthcare providers should prioritize patient involvement in goal-setting and decision-making, avoiding the imposition of personal opinions or beliefs. For instance, patient adherence to exercise

regimens is more likely when individuals perceive a sense of choice in the types of activities they undertake, as opposed to being subjected to rigid, physician-directed routines. Failure to satisfy these three fundamental needs may lead to frustration, heightened vulnerabilities, and defensive mechanisms.(14) Fulfillment of all three needs is essential for sustained commitment and engagement in a given behavior.(23)

Motivational Factors Influencing Exercise Adherence

Patients' motivation is associated with psychological drive, intention to adopt health-promoting behaviors, and engagement in goal-directed action. A psychological drive is the persistence to achieve things when patients recognize their necessity. (16) Motivation also includes the determination to improve mental and emotional well-being, physical appearance, as well as professional, social, and/or educational functioning through the implementation of behavior modification, self-care techniques, and adherence to treatment plans.(16) The significance of preventing complications and sustaining overall health is underscored when serious complications arise, often prompting patients to re-assess their priorities.(24) Then, the goal-oriented action reflects the value assigned to those action, which may be categorized as either intrinsic and extrinsic.(16)

	Motivators	Barriers
Intrapersonal factor	• Self-efficacy • Responsibility to one's self • Enjoyment • Positive health beliefs • Good baseline physical activity • Cognitive factors • Knowledge • Vicarious experience • Socioeconomic income • Sociodemographic factors • Appearance	• Low-priority • Diminished enjoyment • Loss of autonomy • Negative health beliefs • Negative self-image • Psychological factors
Interpersonal factor	• Social support • Patient-healthcare provider relationship	
Environmental factor	• Supportive health care system • Available health infrastructure • Suitable setting of exercise	• Lack of transportation • Unavailable and high cost of rehabilitation center • Distance to rehabilitation center • Climate conditions

Fig. 1: Motivators and barriers of exercise adherence in hypertensive individuals

Higher levels of motivation are positively correlated with an increased probability of sustained engagement in exercise programs.(10) Lower self-motivation has been found to correlate with diminished adherence to home-based exercise programs, highlighting the role of self-motivation in exercise adherence. Furthermore, participants exhibiting high levels of motivation demonstrated a significantly greater weekly training frequency compared to those with low motivation.(25) Acknowledging the importance of healthy lifestyle, motivated

patients not only participate in higher levels of physical activity but also demonstrate a robust commitment to maintaining long-term compliance with health-related behaviors, facilitated by underlying mechanisms hat drive voluntary action and goal attainment.(18) Various factors have been recognized as influencing both the enhancement and reduction of motivation and adherence to exercise (**Fig. 1)**.(14)

Intrapersonal Factors:

An individual's self-perception significantly influences the likelihood of initiating an exercise program and may impede participation even when exercise is medically recommended. An individual's relatively stable disposition is characterized by various factors, including self-efficacy, responsibility to one's self, enjoyment, health beliefs, baseline physical activity, cognitive factors, knowledge, vicarious experience, socioeconomic income, sociodemographic factors, and appearance. (14) A study involving 12,000 students in the United States identified positive health beliefs, strength and endurance, and appearance as the primary reported motives for exercise, although these factors were not consistently associated with exercise adherence. Conversely, affiliation, competition, health pressures, and social recognition were reported as the least influential motives.(23)

Self-efficacy:

As stated in the Health Belief Model, self-efficacy, defined as an individual's belief in their capacity to execute behavior necessary to produce specific performance attainments, plays a significant role in influencing motivation and guiding goal-directed behavior.(2,16) This encourages individuals to establish attainable objectives and to develop effective strategies for enacting the behavior required to achieve them. Patients with high self-efficacy are inclined to view health behaviors as manageable and exhibit strong motivation to persevere, even when faced with adversity.(16) Self-efficacy beliefs form the foundation of human motivation, well-being, and the attainment of personal accomplishments.(14)

Self-efficacy is critical for initiating and maintaining specific tasks, and higher self-efficacy may enhance participation in exercise programs.(10,21) Patients who have a sense of responsibility and a strong conviction in the effectiveness of exercise are more prone to self-empowerment, fostering a more positive outlook on their exercise regimen.(24) A systematic review indicated that greater self-efficacy contributes to greater adherence to exercise, particularly in home-based settings.(25) Hypertensive and diabetic patients reported that self-efficacy is a key factor in adhering to healthy lifestyles, including exercise, highlighting its significance in fostering adherence. Greater confidence in acquiring health knowledge and managing one's condition is associated with increased adherence among patients.(26) Moreover, emotional attitudes towards exercise are a key determinant of adherence to exercise programs and their long-term maintenance following program completion. Individuals with positive attitudes adhering at higher rates than those reporting negative emotions.(10)

Responsibility to One's Self:

A qualitative cross-sectional study revealed that 31% of hypertensive patients attributed their adherence to a sense of self-worth, expressing sentiments that reflect a commitment to self-care and personal well-being. These patients exhibited optimal adherence, with only occasional deviations from the prescribed treatment. Moreover, approximately 53% of the patients linked their adherence to a sense of autonomy, expressing the belief that self-care was essential due

to a perceived lack of external support. These individuals view their treatment as their responsibility and value their independence, preferring to manage their health rather than rely on the care of others.(27)

Enjoyment:

Enjoyment, characterized as an intrinsic motive, is anticipated to correlate with sustained exercise patterns, based on prior research findings. The study indicated that enjoyment levels tend to be higher among male participants compared to female participants.(23) A prospective study of individuals participating in regular exercise (≥2 sessions/week) during their initial year of fitness club membership demonstrated that regular exercisers rated both enjoyment (e.g., the pleasurable sensation of physical exertion) and challenge (e.g., the presence of goals to strive towards) significantly higher than their non-regular exercising counterparts.(22) While not the highest-rated motivational dimensions, stress management and competition have also shown positive associations with exercise adherence.(23) In Malaysia, stress relief was identified by 70.1% of hypertensive patients as a key motivation for engaging in regular exercise.(2)

Health Beliefs:

The primary motivations for successfully completing an exercise program are the desire to improve overall health and achieve weight loss. Health beliefs play a significant role in fostering motivation. Hypertension often presents without noticeable symptoms, potentially reducing patients' perceived need for physical activity. However, a qualitative study identified health beliefs as a motivational factor for hypertensive and diabetic patients in Malaysia, who expressed discomfort with unhealthy lifestyles due to their awareness of the associated health risks. For some participants, a robust belief in the association between lifestyle choices and health outcomes acts as a significant motivator for adherence.(26) Patient adherence also tends to increase when they perceive their disease to be serious but controllable; conversely, a perceived lack of control over the disease can diminish motivation.(24)

Some individuals may also hold the belief that exercise is detrimental or requires excessive effort. However, when patients hold positive perceptions of exercise, adherence is positively influenced, leading to an improved attitude towards exercise compared to before the program starts.(10) For example, having sufficiently lost weight can boost the motivation to exercise even more.(9) Conversely, weight gain can lead to higher program dropout rates.(10) A study even indicated that weight management was both highly rated and predictive of exercise adherence.(23)

Health status is a critical factor influencing the initiation and adherence to exercise among older adults, based on their self-perception of overall health. Assessing past exercise history can inform strategies to optimize future exercise behavior by identifying preferred and disliked activities, as well as perceived and actual barriers and rewards. Conversely, poorer health status is generally associated with decreased adherence to exercise programs.(14)

Positive health beliefs are generally associated with good adherence to exercise. A prospective study in Norway revealed that the perceived necessity of maintaining a healthy physique, increasing endurance and strength, and enhancing mobility were the most prominent motivators among both regular and non-regular exercisers during their initial year of fitness

club membership.(22) A qualitative cross-sectional study revealed that 44% of hypertensive patients attributed their adherence to the treatment programs to a desire for better health conditions. Three specific perspectives emerged from these patients: recognition of tangible benefits (e.g., observing reduction in blood pressure and experiencing an enhanced sense of well-being), fear of potential complications (e.g., expressing apprehension regarding the consequences of non-adherence), and the anticipation of further improvements in health status (e.g., acknowledging the potential for even greater well-being with improved adherence). However, only 59% of these patients sufficiently adhered to the program.(27) The desire for improved health and longevity also motivates patients to exercise. The Health Belief Model posits that individuals are motivated to engage in health-promoting behaviors when they perceive a threat to their health, highlighting the intrinsic value that participants place on their well-being.(26) A study involving 238 hypertensive patients in Malaysia found that the primary motivation for engaging in self-care behavior was the goal to maintain and improve health, reported by 79.4% of participants, followed by the desire to keep fit, which was noted by 76.6% of respondents.(2)

The experience of perceived deterioration in health, for example, abrupt high rise of blood pressure in the past, can prompt patients to adhere to treatment regimens due to heightened concern about their well-being. Drawing from the Health Belief Model and Self-Determination Theory, perceived severity (perceived seriousness of hypertension), perceived susceptibility (the risk of disease progression), and health motivation (concern about one's health) play critical roles in driving health-related behaviors.(2,26)

Baseline Physical Activity:

Individuals demonstrating high levels of physical activity (≥600 MET-min/week) exhibit a greater propensity to participate in regular exercise or leisure-type physical activity, such as cycling or walking, compared to less active individuals whose activity levels fall below 600 MET-min/week.(9) For individuals who regularly exercise prior to a rehabilitation program, adherence to the exercise regimen is often less challenging. A qualitative cross-sectional study found that 31% of hypertensive patients reported adhering to the treatment program because "it is not a big effort". For these patients, lifestyle changes did not elicit significant emotional responses (e.g., fear, sadness), and they were able to maintain their usual routines without difficulty.(27)

Cognitive Factors:

Cognitive factors involve the processes by which individuals perceive and interpret a situation or action, shaping their emotional and behavioral responses. If individuals perceive a situation as uncontrollable, they are less likely to attempt a behavior or may anticipate failure in its execution. Furthermore, a lack of confidence in their ability to successfully adhere to prescribed exercise guidelines may reduce individual's willingness to engage in the activity. Education plays a critical role in fostering cognitive factors and enhancing individual's belief in their capacity to engage in behaviors that positively impact health.(14)

Knowledge:

A clear understanding of the disease can enhance motivation, as patients become aware of the potential complications of hypertension they may face if they do not adhere to the prescribed treatment. The Health Belief Model suggests that individuals are more likely to adopt health-

promoting behaviors when they understand the severity and potential consequences of given a health condition. Therefore, patients' comprehension of their disease has a substantial impact on their adherence to treatment plans.(26) Additionally, individuals with higher levels of education are generally more consistent in their adherence to exercise programs compared to those with lower levels of education.(14)

Vicarious Experience:

A qualitative study conducted in Malaysia involving three elderly hypertensive and diabetic patients identified vicarious experiences as a key factor contributing to good adherence. These experiences included witnessing deaths due to cardiovascular disease, discomforting symptoms, and other negative consequences of non-adherence experienced by family members and friends, Additionally, observing the positive outcomes of effective disease management encouraged hypertensive patients to recognize the benefits of proper care. This, in turn, motivated them to prioritize their health and adhere more consistently to treatment regimens. These findings support the principles of social cognitive theory, which underscore the role of observational learning in shaping behavior. (26)

Socioeconomic Status:

Socioeconomic status is a significant factor in promoting exercise adherence, particularly among the older population. Low-income levels can limit an individual's ability to afford exercise-related advice, equipment, and access to fitness facilities. It is imperative for the healthcare providers to gather information regarding patients' income to effectively tailor interventions that meet their needs, thereby enhancing the likelihood of adherence to an exercise and/or rehabilitation program.(14)

Sociodemographic Factors:

Empirical evidence suggests a positive correlation between age and adherence to exercise programs.(14) A study found indicated that older adults demonstrated elevated levels of self-determined motivation throughout the phases of an exercise program, including before, during, and after participation. They also demonstrated moderate to high confidence in their ability to engage in exercise despite facing barriers.(21) On the contrary, another study reported a decline in engagement and adherence to an exercise program among older adults, which may be explained by factors such as health issues, lack of time, fear, and an unsafe environment. The most prominent barrier reported was the competing demands of daily life, including household responsibilities and caregiving duties, which restricted the time available for regular exercise. Moreover, menopausal symptoms during this life stage have been identified as a significant barrier to engage in physical activity.(14)

Research suggests that men exhibit greater engagement and adherence in physical activity, exercise, and cardiac rehabilitation compared to women.(14) A study involving 812 college students in the United States found that men and women have different motivations for exercise. Female participants placed higher importance on revitalization, health, appearance, fitness, and stress management than male participants. For females, factors such as strength and endurance, weight management, and revitalization were found to be positive predictors of exercise adherence. However, concerns regarding appearance emerged as a negative predictor of exercise adherence among this demographic. In contrast, male participants placed greater emphasis on social motives, enjoyment, competition, and challenge than females. Interestingly,

among the various motivational factors, stress management was the only one significantly related to exercise adherence in male participants.(23)

Exercise adherence tends to be lower among single individuals compared to married individuals, potentially due to disparities in social support.(14) Furthermore, racial and ethnic disparities in exercise participation have been observed, with Caucasian individuals generally engaging in higher levels of physical activity compared to other racial and ethnic groups. Specifically, African Americans are reported to have lower attendance rates in cardiac rehabilitation compared to Caucasians.(14)

Appearance:

An observational study found that higher emphasis on appearance among females was associated with lower total exercise scores.(23) In Malaysia, 28% of hypertensive patients identified appearance as the key motivator for engaging in regular exercise.(2)

Interpersonal Factors:

Patient-physician Relationship:

Physicians can foster positive communication to motivate behavioral change by acknowledging resistance, demonstrating empathy, and prioritizing active listening. Patient motivation is enhanced when they feel comfortable discussing health concerns with their physician. Communication strategies such as open-ended questions, contemplative listening, summarization, affirmations, education, and counseling, are effective in prompting patient motivation for behavioral change.(16) A strong therapeutic alliance, characterized by mutual trust, meaningful interaction, and compassion, is a critical determinant of exercise adherence. Patient satisfaction, significantly influenced by the amount of information received during consultations, is a consistent factor in adherence. Effective communication, follow-up, positive feedback, regular monitoring, and encouragement from physicians contribute to developing rapport and promoting adherence.(10,18) Research indicates that home visits and phone calls to evaluate home safety and to facilitate the establishment of an individualized exercise routine can lead to increased exercise duration.(28) Moreover, a personal trainer's leadership style and expertise in exercise are also associated with patient exercise adherence.(14) Structured training environments and engagement within groups are associated with increased motivation levels. Goal setting and consistent monitoring are beneficial for maintaining participation in exercise programs.(10,14)

Social Support by Family and Community:

The degree to which social support is available and accessible exerts a considerable influence on an individual's motivation to adopt healthier behaviors. The cultivation of relationships that diminish feelings of loneliness can foster positive psychological outcomes for individuals living with chronic illnesses. A well-developed social network can facilitate various aspects of health management, including enhanced comprehension of health issues, appointment scheduling, informed related decision-making, and improved capacity to overcome challenges associated with adopting healthy behaviors.(16) Emotional and listening support from teammates, combined with personal assistance from family members, is associated with improved adherence to home-based exercise programs. These support mechanisms provide crucial social stimulation and sustained encouragement, facilitating continued exercise progression for some patients.(25)

Patients with strong family support systems, positive reinforcement, and emotional care exhibit higher adherence rates compared to those with limited interpersonal support. Family and friends can lessen the negative impact of a disease, provide encouragement, and offer reminders to adhere to a prescribed treatment. The absence of a primary caregiver accompanying a patient to healthcare appointments can be perceived as a barrier, particularly for individuals with disabilities.(18) An observational French study suggested that social support is a strong motivator for exercise, particularly among active individuals.(9)

Within the patient community, peer support can increase positive experiences and social interaction, promoting behavioral change by cultivating a less intimidating atmosphere and encouraging greater engagement in exercise. Health communities comprised of individuals with similar health concerns play an important role in providing mutual support for exercise program participation. Communities with greater access to diverse resources and exercise programs demonstrate higher exercise adherence rates.(10) Relationships with other patients served as a motivating factor for attending rehabilitation centers.(26)

A qualitative cross-sectional study showed that 73% of hypertensive patients reported adherence to their treatment programs as a means of fostering closer social connections. These patients linked their adherence to treatment with a sense of responsibility toward supporting the well-being of others, a motivation to maintain meaningful social engagement, and an appreciation for the care and support provided by healthcare provider and family members. Approximately 58% of patients exhibiting these motivations demonstrated sufficient exercise adherence.(27)

Environmental Factors:

Health Care System:

Determinants of healthcare systems, including financial constraints, language barriers, and negative experiences such as excessive medical appointments, lack of insurance coverage, and inadequate referrals for exercise programs can influence motivation to engage in exercise.(10) Conversely, healthcare facilities with accessible services, robust patient support systems, affordable diagnostic procedures, community resources, and well-trained healthcare providers are associated with better adherence to exercise regimens. Inadequate infrastructure, prolonged waiting time, and difficulties in securing clinical appointments are linked to poorer adherence outcomes.(18)

Available Infrastructure to Exercise:

The availability of nearby infrastructure, such as parks, serves as a motivational factor for patients, particularly those residing at a distance from healthcare facilities.(9) The convenience of exercise facility locations and the accessibility of exercise opportunities are key facilitators of adherence. The quality of interaction between patients and healthcare providers also plays a significant role.(14) A study investigating the impact of varying levels of external resistance on self-determined motivation in elderly individuals found that the degree of external resistance employed did not significantly influence motivation during training.(21)

Setting of Exercise:

The temporal and spatial context of exercise plays a crucial role for individuals, as preferred times of day and environment often maximize comfort and, consequently, adherence to

established exercise protocols. Older adults exhibit specific time preferences for exercise. Research indicates that individuals aged 74-85 years prefer to exercise between 9 AM-12 PM, whereas those older than 85 years tend to prefer exercising between 12 – 3 PM. Therefore, it is essential for practitioners to tailor the environment and circumstances to meet the individual's specific needs, thereby optimizing adherence to exercise regimens.(14)

Barriers to Motivation to Exercise Adherence

Non-adherence to exercise should not be interpreted as indicative of irrational or maladaptive personality traits; rather, it represents a manifestation of internal conflict arising from competing motivations.(27) Research indicates that barriers, rather than motivators, serve as predictors of adherence across various associated factors.(14) Perceived barriers are recognized as a critical factor in the adoption of positive health behaviors, as outlined by the Health Belief Model.(2) To develop effective strategies to avoid the high rate of exercise cessation, it is crucial to investigate perceived barriers to adherence.(21) Understanding the barriers to non-adherence and reasons for dropout in cardiac rehabilitation programs can inform the design of successful interventions aimed at increasing long-term participation.(14) In accordance with socioecological model, barriers of exercise can be classified into three primary factors, including intrapersonal, interpersonal, and environmental.(21) The interplay of these perceived barriers may impede participation in leisure-time physical activity. (22) Furthermore, individuals exhibiting lower levels of daily physical activity tend to encounter more significant barriers compared to those who are more active.(9) The MOBILE observational study (Motivations and BarrIers to Physical Activity in patiEnts with type 2 diabetes and hypertension) noted that reduced exercise levels were significantly associated with a greater number of perceived barriers to physical activity and a lower mean motivation score (2.6±0.8 vs 3.2±0.6, $p<0.001$).(9)

It is important to note that individuals respond differently to these barriers; thus, the extent to which a barrier constrains exercise engagement is not uniform. Furthermore, it has been proposed that the total number of perceived barriers may be of greater importance, as it may be more feasible to address one or a few barriers rather than to confront multiple obstacles simultaneously.(22) These are factors that have been identified as a barrier to motivation to exercise adherence in hypertensive patients.

Intrapersonal:

Low-priority:

Intrapersonal factors are commonly cited by older adults as significant barriers to maintaining an exercise regimen. A lack of time, energy and diminished interest in alternative physical activities negatively impact motivation to exercise.(10) The most commonly reported intrapersonal barriers were a perceived lack of time (46%) and a stronger preference for other physical activities (40%).(21) The lack of time and energy has been recognized as the most commonly cited barrier among fitness club members within the initial 3, 6, and 12 months of membership. This barrier may serve both as a genuine obstacle and a potential excuse for non-adherence.(22) In a study conducted in Malaysia, approximately 72.2% of hypertensive patients indicated that time constraints and demanding work schedules were the primary barriers to engaging in regular exercise.(2) These findings suggest that participants struggle to integrate exercise into their schedule without the support of professional guidance.(21)

In a study focusing on older adults, the most frequently reported barriers to maintaining exercise were perceived lack of time (46%), stronger interest in other physical activities (40%), seasonal factors (40%), and financial costs (28%).(21) Forgetfulness was also identified as a potential barrier.(25) Moreover, family responsibilities and obligations may outweigh the importance of rehabilitation and exercise. The prioritization of work-related goals and tasks may also overshadow participation in exercise programs. In conclusion, rehabilitation and exercise specialists should implement flexible scheduling strategies to address the specific needs of patients, thereby improving adherence rates within this population.(14)

Diminished Enjoyment:

Approximately 67% of hypertensive individuals who exhibit low adherence to exercise believe that certain components of their hypertension treatment adversely affect their quality of life. These patients report experiencing diminished enjoyment in life, an excessively restrictive lifestyle, and significant stress due to persistent worries and the need to manage their laziness. While these individuals typically comply with medication regimens, they often struggle to adhere to lifestyle modifications, including exercise.(27) In Malaysia, laziness is identified as the primary barrier to regular exercise among hypertensive individuals, with a prevalence of 72.2%.(2) In Indonesia, this factor is reported by 19.3% of patients as a significant reason for non-compliance, ranking as the second highest barrier.(5)

Loss of Autonomy:

A significant proportion of hypertensive patients (53%) perceive adherence to treatment as a loss of personal freedom. These individuals often prioritize their independence and autonomy, valuing the ability to make their own decisions without external directives."(27)

Negative Health Beliefs:

A lack of motivation to exercise among hypertensive patients is often associated with the perception that the benefits of increased adherence do not outweigh the required effort. These individuals may believe their current health status is adequate, suggesting that they would only increase exercise adherence if their condition worsened. Additionally, some patients perceive exercise as an excessive burden. Consequently, these individuals tend to exhibit insufficient adherence or complete dropout from exercise programs, with improvements typically occurring only when external factors, such as increased hope, enhanced emotional support from family and medical team, or improved self-efficacy, are present.(27) Furthermore, lower adherence to exercise regimens tends to be observed in patients who perceive their condition as less severe. Individuals with chronic diseases, such as hypertension, also demonstrate a tendency toward reduced compliance compared to those with acute illnesses.(14) Data from the 2023 Indonesian Health Survey indicate that 62.8% of hypertensive patients who are non-compliant with treatment programs cited "feeling well" as a reason.(5)

Side effects of exercise, including, worsening pain, have also been reported as a barrier to adherence in home-based exercise programs. Conversely, a systematic review noted that pain reduction following participation in an exercise program can positively predict exercise behavior.(25) Around 57% of hypertensive patients who exhibit low adherence to exercise had direct experiences with negative side effects of the exercise, such as mood changes or less energy, which further contributes to their reluctance to adhere to the prescribed exercise.(27)

Reduced exercise adherence, particularly among elderly individuals, is also influenced by poor health status that limits physical capacity.(14) Physical disabilities, including injuries and movement limitations, are associated with reduced physical activity levels.(10) Moreover, fear of blood pressure elevation, musculoskeletal disorder, heart attack, or injury further contributes to exercise avoidance, especially among inactive individuals.(9) The MOBILE study indicated that a significant proportion of patients identified fear of injury and health concerns as barriers to exercise adherence.(9)

Negative Self-Image:

Negative self-image, characterized by feelings of fatigue, excess weight, lack of motivation, poor fitness, and self-consciousness regarding appearance, emerges as the most significant barrier preventing individuals with low physical activity from initiating exercise. In addition to the aforementioned barriers, a lack of support and encouragement, medical concerns, and fear of injury further contributed to reduced adherence.(9) Additionally, approximately 51% of hypertensive patients who did not adhere to their treatment associate their condition with perceptions of low self-worth, linking hypertension to being hypochondriacal, elderly, or lacking the strength to manage their health. These individuals often believe that only those who are severely ill, elderly, or weak require care, including exercise.(27)

Psychological Factors:

Psychological factors play a significant role in influencing motivation to exercise, as feelings of depression, anxiety, and helplessness are linked to reduced adherence to exercise programs. Studies investigating exercise adherence among older veterans revealed that individuals diagnosed with depression and/or post-traumatic stress disorder demonstrated significantly lower adherence rates at both 1-month and 11-week intervals compared to their counterparts without these conditions. Further supporting this, another study reported that individuals with the highest dropout rates displayed higher depression and anxiety, as well as a reduced quality of life, particularly in younger female patients. Compared to men, women demonstrated higher levels of psychological distress, lower quality of life, and reduced distance walking capacity.(14) A research involving patients with musculoskeletal disease reported that depression and feelings of helplessness negatively predicted exercise maintenance. Moreover, negative mood and poor stress management have been shown to result in reduced completion of home-based exercise programs.(25)

Interpersonal Factor:

Inadequate Professional Healthcare Supervision:

Insufficient supervision and guidance regarding exercise can impede adherence. The absence of follow-up to assess progress or goal achievement, coupled with demanding schedules, often leads to non-adherence. Certain older adults or those with pre-existing health conditions may require support in the planning and implementation of an exercise program. If the intensity of the activity exceeds their comfort level, they are more prone to program dropout or injury. The need for monitoring and evaluation of exercise regimens by qualified professionals is more pronounced among older adults with higher levels of pain. Furthermore, evidence suggests that a supervised home-based program can positively predict adherence during the transition to independent home-based exercise.(14) Physicians should also address unfamiliarity with exercise equipment or devices. Even in the absence of face-to-face interaction, treatment

programs should be tailored to individual interests, and interactive communication should be facilitated.(9)

Loss of Social Support:

Exercise adherence can be positively influenced by the social support of family and friends, particularly through encouragement, motivation, and invitations from loved ones can prove beneficial. However, it is important to note that overly rigid support structures may have a counterproductive effect. Research indicates that patients with overly controlling family environments tend to exhibit lower adherence to medication regimens, suggesting that rigid control can foster conflict with authority figures and lead to denial of the disease. Moreover, approximately 41% of hypertensive patients associate adherence to treatment with social isolation and reduced interaction with others. These individuals may perceive adherence as requiring them to distance themselves from their peers or spend less time with their families, which can result in decreased adherence to lifestyle medication, including exercise, despite maintaining medication compliance.(27)

Environmental Factors:

Environmental barriers, including the expense of fitness center membership, inadequate transportation, unfavorable climate conditions, and distance to rehabilitation facilities, can significantly impede exercise adherence, especially among older adults and individuals living in low-income areas. While some communities offer free access to fitness equipment, transportation costs may remain a prohibitive factor for many. Furthermore, walking may not be a viable option for patients living in high-crime neighborhoods. Research has demonstrated that elderly individuals residing far from recreational facilities tend to exhibit lower rates of regular exercise and increased sedentary behavior. Patients with physical disabilities may also perceive fitness facilities as unwelcoming due to a lack of adaptive space and accessible equipment. Climatic conditions can further influence exercise adherence, with extreme weather potentially precluding individuals from participating in regular exercise for up to six months annually.(14) In Malaysia, a lack of safe space for exercise was cited by 27% of hypertensive individuals as a significant barrier to regular physical activity.(2)

Strategies to Enhance Motivation of Exercise Adherence

Intervention to enhance motivation in hypertensive patients are essential for enhancing exercise adherence and improving health outcomes. A multifaceted approach can be employed, focusing on both intrinsic and extrinsic motivational factors.(10)

Establishment of Therapeutic Rapport:

The establishment of rapport between patients and healthcare providers, coupled with effective communication, is essential for enhancing motivation and adherence to exercise regimens.(14) Physicians must identify and understand their patients' priorities, emotions, and values to effectively motivate them through an emotional, psychological, and economic approach.(29) Effective communication necessitates incorporating the underlying, implicit affective meanings conveyed, including patients' individual interpretations of various facets within the treatment program. To facilitate effective communication and build strong therapeutic alliances, physicians should strive to understand patients' unique needs, values, and beliefs as shaped by both individual experiences and cultural context.(27) Furthermore, physicians should adopt a nonjudgemental approach when inquiring about adherence to

exercise programs. When patients acknowledge non-adherence, they are typically being truthful; conversely, when they deny it, they may only be partially accurate. During follow-up consultations, physicians should explore whether patients understand the rationale behind their exercise programs and the benefits associated with adherence.(17)

Various communication strategies can be employed to enhance discussions with patients. Initially, enhancing health literacy is essential by increasing patients' understanding of the impact of hypertension on various health conditions. Given the asymptomatic nature of hypertension, patients may easily overlook its significance. Even following severe cardiovascular events, adherence to recommended lifestyle changes remains suboptimal. Consequently, informing patients about other potential consequences, including dementia, erectile dysfunction, cancer, and diminished quality of life, may heighten motivation by addressing more pressing health concerns.(29).

Secondly, it is important to integrate discussions about the health of patients' loved ones into the conversation. Physicians can address the negative consequences of a sedentary lifestyle, emphasizing how it affects not only the patient but also their family and social connections. Maintaining good health can lessen the burden on caregivers. Furthermore, physicians should emphasize the concept of "years of joy lost" in a patient's life and the associated opportunity costs associated resulting from the progression of hypertension mediated organ damage.

Thirdly, actively engaging selected patients as health experts, particularly regarding hypertension within their families and communities, can significantly enhance their motivation by assigning them an active and leadership role. Providing training followed by regular meetings would foster confidence in these individuals, enabling them to share insights within their social networks. This approach is anticipated to enhance patient engagement and motivation for sustained participation in exercise programs, thereby amplifying the effectiveness of recommendations though diffusion of health-promoting behaviors within their broader social network. Furthermore, this strategy facilitates a peer-group-based support system wherein hypertensive patients interact and empathize, creating a supportive environment for addressing challenges in disease management.(29)

Data-driven analysis of the economic burden associated with CVD events and other HMOD are essential for informing patient decision-making and resource allocation. This discussion should emphasize the potential cost savings associated with preventing hospitalization and avoiding expensive medical procedures. If the cost of care is contributing non-adherence, physicians should be encouraged to address this issue in order to evaluate its effects on patients' health and overall well-being. However, several barriers impede the provision of such discussions, including time constraints during consultations.(29)

Another essential tips for establishing rapport are the provision of feedback. Positive reinforcement can enhance both the likelihood and sustainability of physical activity among patients. Additionally, monitoring and supervision by qualified healthcare professionals have been shown to improve exercise adherence. Patients exhibiting the perception that their therapist is satisfied with their efforts in exercise tend to demonstrate greater adherence compared to those who are unaware of their clinicians' attitudes toward their exercise habits. Furthermore, patients exhibiting higher levels of adherence often report that their therapists

actively involve them in the development of their exercise regimens and provide frequent supervision during implementation.(14) Research indicated a positive correlation between individualized graphic feedback and exercise adherence, which is aligns with Social Learning Theory. This theory posits that individuals can learn through the observation of others, their behaviors, and the consequences of those behaviors. (28) In Malaysia, patients with hypertension and diabetes have reported that feedback on health outcomes, including input from physicians and laboratory monitoring, significantly enhances their motivation. The observation of positive health outcomes, such as stable blood pressure, generates feelings of satisfaction and reinforces adherence behaviors. In contrast, the experience of negative health outcomes may induce uncertainty and undermine confidence in the efficacy of treatment regimens, potentially leading in non-adherence.(26)

Social Support:

Social support networks, encompassing family, friends, peers, and/or healthcare providers, constitute a critical factor in fostering enhanced self-efficacy. Interventions designed to promote physical activity behavior by developing, strengthening, and maintaining social networks that foster supportive relationships have shown promise in facilitating behavior change. Such interventions may include establishing buddy systems, developing collaborative agreements for achieving specific physical activity goals, and forming walking or exercise groups to provide social support and encouragement. Elevated levels social interaction has been correlated with enhanced motivation for cardiac rehabilitation. Consequently, healthcare providers are encouraged to involve individuals who hold significance in their patients' lives as part of the care process.(14) Additionally, storytelling and peer-led support groups may serve as effective strategies to enhance connections among patients. Participating in regular exercise with friends not only provides accountability but also delivers emotional support, thereby reinforcing patients' commitment to adherence.(26)

Health Education and Promotion:

Individual Health beliefs significantly shape perceptions of one's health status and consequently influence adherence to treatment regimens. Health education and promotion initiatives are crucial for cultivating positive health beliefs and behavior among individuals managing hypertension. Furthermore, educational interventions may enhance disease comprehension, potentially leading to improved adherence.(26)

Cognitive Behavioral Intervention:

Research conducted by McLean et. al. has demonstrated that a motivational cognitive behavioral program effectively enhances attendance at clinic sessions. (28) Moreover, this intervention aims to enhance self-efficacy.(26)

Self-efficacy Intervention:

Research has shown that both self-efficacy and motivation serve as notable predictors of exercise behavior at six months. Strategies to enhance self-efficacy include: realistic goal setting, peer support, observational learning from peers, supervised exercise training, verbal persuasion from authoritative figures such as physicians support from family and friends, and positive physiological states, such as reductions in pain or fatigue.(14) The rehabilitation environment can be structured to facilitate observational learning, wherein patients observe

and interpret the positive experiences of other patients with similar injuries or diagnoses, thereby enhancing their self-efficacy.(14)

Motivational Interviewing

Motivational interviewing (MI) is a collaborative, person-centered counseling approach aimed at initiating and enhancing an individual's motivation for behavior change. It has been widely applied in various domains, including healthcare, to facilitate positive behavioral modifications. The MI approach enables healthcare providers to engage patients in discussing the advantages and disadvantages of specific behaviors, thereby supporting informed decision-making and fostering behavior change. For example, in patients with congestive heart failure, a six-month intervention that employed MI and additional strategies to enhance self-efficacy for exercise led to a 25-30% increase in exercise adherence among the intervention groups compared to the control groups. By building a constructive provider-patient relationship, MI encourages patients to articulate their rationale for change, emphasizing a guiding rather than directive communication approach. As a structured clinical method, MI effectively enhances intrinsic motivation for change and has demonstrated efficacy in improving adherence to physical activity routines among adults.(14)

Ambivalence represents a state of conflict in which conflicting attitudes or emotions within an individual, resulting in a struggle between the desire to change and the reluctance to do so. This phenomenon is particularly pronounced in situations where there is a tension between immediate gratification and potential long-term negative outcomes, such as in weight management.(14) MI, with its empathetic and non-directive approach, is designed to explore and resolve such ambivalence, fostering a stronger commitment to behavior change. Even following the resolution of the initial contemplation phase, ambivalence in patients may continue to exist; effective change requires that the motivations for change surpass the motivations against it.(27)

MI is grounded in based on several core principles, including the expressing empathy through counselor acceptance, avoiding argumentation by empowering the patient to be responsible for change, developing discrepancy by highlighting inconsistencies between the patient's behavior and goals, rolling with resistance by exploring the patient's arguments against change, and supporting self-efficacy by helping patient identify resources to implement new behaviors and overcome barriers. A fundamental principle underlying MI, derived from social psychology, posits that any initial step a patient takes toward positive behavioral modification increases the likelihood of continued progress and ultimate success. (14)

To effectively implement MI, clinicians should prioritize four key strategies: employing empathetic listening, understanding the patient's motivations, resisting the "righting" reflex, and empowering the patient. Empathetic listening skills are essential to understand what will motivate the patient. A core principle of MI emphasizes that consultation time should be evenly distributed between listening and speaking. Moreover, behavior change is ultimately driven by the patient's own motivations rather than those of the physician. When patients are allowed to freely explore their interests, concerns, and values, and when physicians actively participate in discussing these motivations for change, a more comprehensive understanding of the patient's motivations and potential barriers to change can be achieved.

The "righting" reflex, which refers to the tendency of healthcare professionals to provide advice regarding optimal health advice, must be consciously suppressed. Instead, MI necessitates that clinicians focus on exploring and understanding the patient's motivations for change. Refraining from unsolicited advice is crucial, as it can elicit resistance and undermine the patient's autonomy. Therefore, the direction of the intervention should be guided based on the patient's own insights and perspectives.(14) Furthermore, empowering patients entails building a collaborative therapeutic relationship that encourages them to explore their own ideas regarding how to implement changes that can enhance their health.(14)

Future Research

Future research is warranted to address limitations in the current understanding of motivation for exercise adherence among individuals with hypertension. Determinants that stimulate and sustain motivation to behavior change require further investigation, particularly through longitudinal studies with extended follow-up. Larger-scale research in diverse geographic and cultural contexts are also necessary to ensure the generalizability of findings. Moreover, further studies are required to delineate the difference in motivations and barriers to exercise adherence between home-based and hospital-based exercise.

The development and validation of comprehensive assessment tools are essential for evaluating the motivation of exercise adherence, particularly within hypertensive populations. A recent study conducted in India introduced the Hypertension Awareness, Exercise, and Motivation Questionnaire (HAEM-Q) to address the factors influencing awareness and motivation related to exercise among individuals with systemic hypertension.(30) Future research should focus on validating such instruments to ensure their effectiveness in capturing the multifaceted nature of motivation and its impact on exercise adherence.

Investigating the effectiveness of interventions targeting specific motivational factors may provide valuable insights into optimal strategies for promoting exercise adherence among elderly individuals with hypertension. Behavioral interventions, including motivational interviewing, warrant further exploration to address ambivalence towards exercise and foster a more proactive attitude towards health behavior. Moreover, investigating the application of technology (e.g., mobile apps, wearable devices) to monitor exercise and provide feedback could motivate patients by increasing accountability for their exercise routine.(10)

CONCLUSION

In this paper, we review the nature of motivations and their barriers to exercise adherence in individuals with hypertension. Motivation is a critical factor in exercise adherence among individuals with hypertension, as regular exercise is essential for managing blood pressure and improving cardiovascular health. According to the socioecological model, the motivations and barriers to exercise adherence can be classified into three principal factors: intrapersonal, interpersonal, and environmental. The motivational aspect of intrapersonal factors includes self-efficacy, responsibility to one's self, enjoyment, health beliefs, baseline physical activity, cognitive factors, knowledge, vicarious experience, socioeconomic income, sociodemographic factors, and appearance. Intrapersonal factors can also act as barriers, such as low priority, diminished enjoyment, loss of autonomy, negative health beliefs, negative self-image, and psychological factors. Interpersonal factors, such as patient-healthcare provider relationships and social support, can both motivate and serve as barriers. Environmental factors can

motivate exercise if there are supportive healthcare system, available health infrastructure, and a suitable setting for exercise. However, these factors can also present barriers, including the expense of fitness center membership, lack of transportation, distance to rehabilitation facilities, and climate conditions.

Interventions to enhance motivation are essential for increasing exercise adherence and improving health outcomes. Increased social interaction, building strong social support, establishing good therapeutic rapport, health education, cognitive-behavioral intervention, and strategies to enhance self-efficacy are several approaches to increase motivation. Moreover, motivational interviewing can be applied by healthcare providers as a counseling approach to elicit behavior change by resolving patient ambivalence and sustaining long-term motivation for exercise adherence.

Ultimately, an integrated approach—combining tailored exercise programs, psychological support, social encouragement, and accessible resources—holds the potential to significantly improve exercise adherence, thereby supporting better hypertension management and long-term health outcomes.

References

1. Carey RM, Wright JT, Taler SJ, Whelton PK. Guideline-Driven Management of Hypertension: An Evidence-Based Update. Circulation Research. 2021 Apr 2;128(7):827–46.

2. Tan PPS, Sandhu RS, Zain SM, Hall D, Tan NC, Lim HM, et al. Health motivations and perceived barriers are determinants of self-care behaviour for the prevention of hypertension in a Malaysian community. Babatunde OO, editor. PLoS ONE. 2022 Dec 7;17(12):e0278761.

3. World Health Organization. Hypertension [Internet]. Hypertension. 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/hypertension

4. Zhou B, Carrillo-Larco RM, Danaei G, Riley LM, Paciorek CJ, Stevens GA, et al. Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: a pooled analysis of 1201 population-representative studies with 104 million participants. The Lancet. 2021 Sep;398(10304):957–80.

5. Ministry of Health of The Republic of Indonesia. Indonesian Health Survey 2023 in Numbers [Internet]. Ministry of Health of The Republic of Indonesia; 2023. Available from: https://drive.google.com/file/d/1NMZwTtFMamkmMe-H8OpZwan105kiSQtq/view?pli=1

6. Tri Tjahjono C, Lestari D, Arthamin M. Best Recommended Exercise for patients with Hypertension. CRJIM. 2023 Nov 25;4(2):481–9.

7. Pescatello LS, MacDonald HV, Lamberti L, Johnson BT. Exercise for Hypertension: A Prescription Update Integrating Existing Recommendations with Emerging Research. Curr Hypertens Rep. 2015 Nov;17(11):87.

8. Rêgo ML, Cabral DA, Costa EC, Fontes EB. Physical Exercise for Individuals with Hypertension: It Is Time to Emphasize its Benefits on the Brain and Cognition. Clin Med Insights Cardiol. 2019 Jan;13:1179546819839411.

9. Dejager S, Fiquet B, Duclos M, Postel Vinay N, Quere S, Di Nicola S. Physical activity in patients with type 2 diabetes and hypertension – insights into motivations and barriers from the MOBILE study. VHRM. 2015 Jun;361.

10. Lopes S, Félix G, Mesquita-Bastos J, Figueiredo D, Oliveira J, Ribeiro F. Determinants of exercise adherence and maintenance among patients with hypertension: a narrative review. Rev Cardiovasc Med. 2021 Dec 22;22(4):1271.

11. Mu L, Cohen AJ, Mukamal KJ. Prevalence and predictors of resistance and aerobic exercise among hypertensive adults in the United States. J Hum Hypertens. 2015 Jun;29(6):394–5.

12. Uzun S, Kara B, Yokuşoğlu M, Arslan F, Yilmaz MB, Karaeren H. The assessment of adherence of hypertensive individuals to treatment and lifestyle change recommendations. Anadolu Kardiyol Derg. 2009 Apr;9(2):102–9.

13. Panahi S, Rathi N, Hurley J, Sundrud J, Lucero M, Kamimura A. Patient Adherence to Health Care Provider Recommendations and Medication among Free Clinic Patients. Journal of Patient Experience. 2022 Jan;9:23743735221077523.

14. Magee DJ, Zachazewski JE, Quillen WS, Manske RC, editors. Pathology and intervention in musculoskeletal rehabilitation. Second edition. Maryland Heights, Missouri: Elsevier; 2016. 1219 p. (Musculoskeletal rehabilitation series).

15. Yan Y, López-Alcalde J, Stallings E, Jimenez Tejero E, Witt CM, Barth J. Patient motivation as a predictor of digital health intervention effects: A meta-epidemiological study of cancer trials. Demsash AW, editor. PLoS ONE. 2024 Jul 8;19(7):e0306772.

16. Khomkham P, Kaewmanee P. Patient motivation: A concept analysis. Belitung Nurs J. 2024 Oct 15;10(5):490–7.

17. Maningat P, Gordon BR, Breslow JL. How Do We Improve Patient Compliance and Adherence to Long-Term Statin Therapy? Curr Atheroscler Rep. 2013 Jan;15(1):291.

18. Mahmood A, Nayak P, Deshmukh A, English C, N M, Solomon M J, et al. Measurement, determinants, barriers, and interventions for exercise adherence: A scoping review. Journal of Bodywork and Movement Therapies. 2023 Jan;33:95–105.

19. Religioni U, Barrios-Rodríguez R, Requena P, Borowska M, Ostrowski J. Enhancing Therapy Adherence: Impact on Clinical Outcomes, Healthcare Costs, and Patient Quality of Life. Medicina. 2025 Jan 17;61(1):153.

20. Gallegos-Carrillo K, Garcia-Peña C, Salgado-de-Snyder N, Salmerón J, Lobelo F. Levels of Adherence of an Exercise Referral Scheme in Primary Health Care: Effects on Clinical and Anthropometric Variables and Depressive Symptoms of Hypertensive Patients. Front Physiol. 2021 Dec 21;12:712135.

21. Van Roie E, Bautmans I, Coudyzer W, Boen F, Delecluse C. Low- and High-Resistance Exercise: Long-Term Adherence and Motivation among Older Adults. Gerontology. 2015;61(6):551–60.

22. Gjestvang C, Abrahamsen F, Stensrud T, Haakstad LAH. Motives and barriers to initiation and sustained exercise adherence in a fitness club setting—A one-year follow-up study. Scandinavian Med Sci Sports. 2020 Sep;30(9):1796–805.

23. Ednie AJ, Stibor MD. Extrinsic Motivations: Relevance and Significance for Exercise Adherence. Journal of Physical Activity Research. 2016;1(1):26–30.

24. Kvarnström K, Westerholm A, Airaksinen M, Liira H. Factors Contributing to Medication Adherence in Patients with a Chronic Condition: A Scoping Review of Qualitative Research. Pharmaceutics. 2021 Jul 20;13(7):1100.

25. Bachmann C, Oesch P, Bachmann S. Recommendations for Improving Adherence to Home-Based Exercise: A Systematic Review. Phys Med Rehab Kuror. 2018 Feb;28(01):20–31.

26. Liu R, Dahlan A, Mohd Fahmi Teng NI, Zhan X. Motivational Factors in Adherence among Elderly with Diabetes and Hypertension. E-BPJ. 2024 Mar 16;9(28):175–81.

27. Herrera PA, Moncada L, Defey D. Understanding Non-Adherence From the Inside: Hypertensive Patients' Motivations for Adhering and Not Adhering. Qual Health Res. 2017 Jun;27(7):1023–34.

28. Room J, Hannink E, Dawes H, Barker K. What interventions are used to improve exercise adherence in older people and what behavioural techniques are they based on? A systematic review. BMJ Open. 2017 Dec;7(12):e019221.

29. Duffy EY, Ashen D, Blumenthal RS, Davis DM, Gulati M, Blaha MJ, et al. Communication approaches to enhance patient motivation and adherence in cardiovascular disease prevention. Clinical Cardiology. 2021 Sep;44(9):1199–207.

30. Gajinkar G, Chandramohan Jaiswal V, Kangude M, Burman D. Development and Validation of the Hypertension Awareness, Exercise, and Motivation Questionnaire (HAEM-Q) Using the Delphi Technique. Pak Heart J. 2024 Dec 31;57(4):278–84.