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Original Article

The Difference in Effectiveness Between Motivational Interviewing Counseling and the Health Belief Model on Medication Adherence in Patients with Hypertension

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Abstract

Background: Adherence to antihypertensive treatment is essential for therapeutic success, yet many patients fail to comply with their medication regimens. This study aimed to compare the effectiveness of motivational interviewing (MI) counseling and the health belief model (HBM) counseling in improving medication adherence among hypertensive patients in the Prolanis Program at Ciptomulyo Public Health Center.

Methods: A quasi-experimental design with a two-group pre-test–post-test approach was used. The study involved 50 participants selected through consecutive sampling, divided evenly into MI and HBM groups (25 each). The Morisky Medication Adherence Scale (MMAS-8) was used to assess adherence. Data were analyzed using the Wilcoxon and Mann–Whitney tests.

Results: In the MI group, adherence scores significantly increased from a median of 3 to 8 ($p < 0.001$), while in the HBM group, scores rose from a median of 2 to 6 ($p < 0.001$), indicating both methods were effective. However, the Mann–Whitney test showed MI counseling was more effective than HBM, with a post-test median of 8 vs. 6 ($p < 0.001$).

Conclusion: The study concludes that both Motivational Interviewing and the Health Belief Model are effective in improving medication adherence among patients with hypertension, with Motivational Interviewing showing significantly greater effectiveness. This supports the recommendation to integrate MI into patient counseling strategies in Prolanis programs.

Introduction

Hypertension is a dangerous disease which, if left untreated, can lead to heart failure, stroke, kidney failure, and even death.[1] Although hypertension cannot be cured, it can be controlled or managed through long-term treatment therapy. The compliance of hypertensive patients in undergoing treatment is a key determinant in achieving therapeutic success.[2] However, in reality, many hypertensive patients are still found to be non-compliant with treatment, often stopping medication when they feel better or experience no symptoms. This may be due to the absence of a counseling method that is truly effective in improving medication adherence among patients with hypertension.[3] Discontinuing antihypertensive medication can lead to poor blood pressure control, which significantly increases the risk of cardiovascular complications such as stroke, myocardial infarction, kidney failure, and early mortality. Sustained adherence is therefore critical to achieving long-term therapeutic outcomes and reducing the healthcare burden from preventable hypertensive crises.

The prevalence of hypertension is very high and is predicted to continue increasing each year. Data from the World Health Organization (WHO) shows that more than 1.1 billion people worldwide suffer from hypertension, meaning one in three people is hypertensive. It is estimated that by 2025, there will be 1.5 billion people living with hypertension, and of this number, only about 36% are willing to routinely take antihypertensive medication.[4] According to the 2018 Basic Health Research (Riskesdas), the prevalence of hypertension in Indonesia is 8.4% of the total population, with more than 45% of those affected not taking antihypertensive drugs regularly. In East Java, more than two million cases of hypertension were recorded at community health centers (Puskesmas) throughout 2018 a significant increase from only around five hundred thousand cases in 2017.[5]

A preliminary study at the Prolanis Program of Ciptomulyo Community Health Center, Malang City, conducted in March 2022, based on interviews with the Prolanis coordinator, revealed that the counseling provided to improve medication adherence was limited to educational counseling about hypertension treatment. Prolanis (Program Pengelolaan Penyakit Kronis) is a chronic disease management initiative under Indonesia's national health insurance system (BPJS Kesehatan). It aims to improve health outcomes among individuals with chronic diseases, such as hypertension and diabetes, through routine monitoring, health education, and structured interventions. There has been no structured and systematic counseling method aimed specifically at improving treatment adherence among patients with hypertension. Interviews with 10 hypertensive patients showed that all 10 (100%) stated that the information provided by healthcare workers only concerned the dosage, name of the medication, and how to take it. Regarding medication adherence, 4 out of 10 (40%) said they often forget to take their medication, while 6 out of 10 (60%) admitted to intentionally not taking medication because they felt they had recovered.

The low level of adherence to antihypertensive medication is caused by several factors, including a lack of knowledge about the benefits of taking medication and the consequences of non-adherence. Other contributing factors include forgetfulness, the high cost of medication, difficulty accessing medications at pharmacies, and patients' perception that their condition is

already under control and therefore no longer requires treatment.[6] This non-compliance can increase the risk of hypertension complications. In fact, patients diagnosed with hypertension require a combination of antihypertensive drugs such as Angiotensin Converting Enzyme Inhibitors (ACEIs), Angiotensin Receptor Blockers (ARBs), Calcium Channel Blockers (CCBs), and diuretics to achieve target blood pressure within normal limits.[7] A lack of adherence to antihypertensive medication leads to failure in controlling blood pressure, and uncontrolled hypertension can cause complications such as heart disease, stroke, kidney disease, retinopathy (retinal damage), peripheral vascular disease, neurological disorders, and even death.[6] Research at Dr. R. Soetrasno Hospital in Rembang in March 2020 revealed a significant relationship between the level of adherence to antihypertensive medication and the achievement of expected therapeutic effects.[8]

Efforts to improve medication adherence among hypertensive patients can be made through counseling. Counseling is a form of assistance provided by an expert (counselor) to an individual (counselee) experiencing a problem. The process aims to help the counselee overcome the problem they are facing. Generally, counseling approaches are divided into two groups: non-scientific approaches, which are not based on objective and verifiable evidence, and scientific approaches, which are based on objective, testable, and scientifically accountable evidence. Examples of counseling using a scientific approach include Motivational Interviewing (MI) and the Health Belief Model (HBM). Motivational Interviewing aims to build the patient's motivation to change their cognition in a positive direction by preventing ambivalence that can lead to negative behavior, thereby forming positive affirmation about themselves and their disease.[9] On the other hand, HBM counseling focuses on patients' perceptions and beliefs toward healthy behavior by discussing six key components: perceived susceptibility, perceived severity, perceived benefits, perceived acceptability, perceived barriers, and health motivation.[10] Although the stages of implementation are similar between MI and HBM counseling methods, the key difference lies in the substance of the discussionMI focuses on shaping positive patient affirmations,[9] while HBM targets changing patients' health-related perceptions and beliefs.[10] The Health Belief Model was selected due to its theoretical foundation in explaining health behaviors based on individual perceptions of disease risk, benefits of action, and barriers to treatment.

The objective of this study is to determine the difference in effectiveness between Motivational Interviewing (MI) counseling and Health Belief Model (HBM) counseling on medication adherence among hypertensive patients in the Prolanis Program at Ciptomulyo Community Health Center.

Methods

This study employed a quasi-experimental design with a two-group pre-test–post-test approach. The research was conducted from May 1 to May 31, 2022, involving participants from the Prolanis group at Ciptomulyo Public Health Center, Malang City. The population included all hypertensive patients enrolled in the Prolanis group during the study period. Using consecutive sampling, the participants were divided into two groups: the MI counseling group (n = 25) and the HBM counseling group (n = 25). The two groups were distinguished based on the timing of the intervention and data collection. The MI

group consisted of patients treated between May 1 and May 14, 2022, while the HBM group consisted of patients treated between May 15 and May 31, 2022. Data were collected using the Morisky Medication Adherence Scale (MMAS-8). Each group received a single counseling session lasting 30–45 minutes. The session included the following stages: building rapport, identifying and assessing initial problems, facilitating therapeutic change using either the motivational interviewing or health belief model approach according to group assignment, followed by evaluation and termination. Data were analyzed using the Wilcoxon test. Ethical approval was obtained from the Health Research Ethics Committee (KEPK) of STIKes Kepanjen, with the approval number 379/S.Ket/KEPK/STIKesKPJ/VI/2022.

Results

Table 1. Frequency Distribution of Respondent Characteristics

Characteristics		Group			
		MI		HBM	
		n	%	n	%
Age ≥ 60 years (elderly)	Yes	18	72	16	64
	No	7	28	9	36
Gender	Male	3	12	3	12
	Female	22	88	22	88
Education below high school	Yes	22	88	18	72
	No	3	12	7	28
Smoking habits	Yes	0	0	1	4
	No	25	100	24	96
There is a family with hypertension	Yes	9	36	4	16
	No	16	64	21	84
	Total	25	100	25	100

Table 1 describes the distribution of respondent characteristics. In the MI group, the majority (72%) were aged ≥ 60 years, categorized as elderly based on WHO standards. Almost all participants (88%) were female, and a similar proportion (88%) had an educational level below senior high school, equivalent to primary or basic education in Indonesia. All respondents (100%) were non-smokers, and most (64%) had a family history of hypertension. In the HBM group, most respondents (64%) were also aged ≥ 60 years, and 88% were female. The majority (72%) had an educational level below senior high school, 96% were non-smokers, and 84% had a family history of hypertension.

Table 2. Medication Adherence Scores Before and After MI and HBM Counseling

	Group MI		Group HBM	
	Compliance (n=25)		Compliance (n=25)	
	Pre	Post	Pre	Post
Mean	3,6	7,84	2,68	5,88
Median	3	8	2	6
SD	2,345	0,390	2,868	2,777
Minimum	0	5	0	3
Maximum	8	8	7	8

Table 2 presents the changes in adherence scores before and after MI and HBM counseling. There was an increase in both mean and median adherence scores in both groups. In the MI group, the mean score increased from 3.6 to 7.84, and the median from 3 to 8. In the HBM group, the mean score rose from 2.68 to 5.88, and the median from 2 to 6.

Table 3. Shapiro-Wilk Normality Test

	Shapiro-Wilk (n=25)		
	Statistic	*df*	*Sig.*
Pre MI	0,929	25	0,082
Post MI	0,286	25	<0,001
Pre HBM	0,795	25	<0,001
Post HBM	0,909	25	0,028

Table 3 shows the results of the Shapiro–Wilk test for normality. The p-value was < 0.05, indicating that the data were not normally distributed. Therefore, non-parametric tests (Wilcoxon and Mann–Whitney) were used for statistical analysis.

Table 4. Wilcoxon Test for the MI Group

Score	Median (Min-Max)	*p-value*
Pre Counseling MI	3 (0-8)	< 0,001
Post Counseling MI	8 (5-8)	

The Wilcoxon test results in Table 4 show that adherence scores increased in 24 subjects, decreased in 1, and remained the same in none. The p-value < 0.001 indicates a statistically significant difference in adherence before and after MI counseling. The median increased from 3 to 8, demonstrating that MI counseling was effective in improving medication adherence among hypertensive patients.

Table 5. Wilcoxon Test for the HBM Group

	Median (Min-Max)	*p-value*
Pre Counseling HBM	2 (0-7)	< 0,001
Post Counseling HBM	6 (3-8)	

Table 5 displays the Wilcoxon test results for the HBM group. Similar to the MI group, 24 subjects showed increased adherence, 1 subject decreased, and none remained unchanged. A p-value < 0.001 indicates a statistically significant improvement in adherence. The median score increased from 2 to 6, indicating that HBM counseling was also effective in improving medication adherence.

Table 6. Mann–Whitney Test

	Median (Min-Max)	*p-value*
Post Counseling MI	8 (5-8)	< 0,001
Post Counseling HBM	6 (3-8)	

Table 6 presents the Mann–Whitney test results comparing post-counseling adherence scores between the MI and HBM groups. A p-value < 0.001 indicates a statistically significant difference between the two groups. The median post-intervention score was 8 in the MI group and 6 in the HBM group, indicating that MI counseling was more effective than HBM counseling in enhancing medication adherence among hypertensive patients.

Discussion

The results of the study conducted on hypertensive patients in the Prolanis group at Ciptomulyo Community Health Center revealed that based on the Mann–Whitney test, the *p*-value obtained was < 0.001, indicating a statistically significant relationship between the choice of counseling method and adherence to taking antihypertensive medication. The difference in median between pre- and post-intervention in the MI counseling group was 5 (8–3), which was greater than the difference in the HBM counseling group, which was 4 (6–2). This finding suggests that MI counseling is more effective than HBM counseling. HBM counseling was more effective in improving medication adherence compared to conventional counseling. The difference occurred because the counseling method used as a comparison to HBM counseling was conventional counseling.[11]

MI counseling focuses on individuals and is designed to help them explore and overcome ambivalence in changing their behavior.[12] Motivational Interviewing works by activating intrinsic motivation within patients to change and comply with all stages of treatment. This client-centered approach encourages behavior change by resolving ambivalence and promoting autonomy, which is particularly relevant in chronic disease management. The approach in MI, when applied verbally, stimulates the auditory system and is transmitted to the brain through the temporal lobe (known as the "God Spot"), a small nerve area capable of responding, and then continues to the

prefrontal cortex. Learning processes take place in the prefrontal cortex, stimulated through motivational interviewing as a form of motivational counseling that triggers patients to make changes based on their own perceptions and willingness to follow the treatment plan prescribed by doctors or healthcare professionals.[13] On the other hand, HBM counseling is a method oriented toward patients' perceptions or beliefs regarding healthy behaviors, including prevention and the use of health services. HBM counseling discusses five key constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and health motivation.

Based on the Transtheoretical Model behavioral change occurs in stages, starting from precontemplation (no intention to take action in the near future), contemplation (re-evaluation of oneself), preparation, action, maintenance, and relapse. (1) The precontemplation stage is when individuals have no intention to act, typically within the next six months, often because they have not been informed of the consequences of their behavior. People in this stage tend to be resistant or unmotivated, making them less suitable for traditional health promotion programs. To move from precontemplation to contemplation, processes such as *consciousness raising*, *dramatic relief*, and *environmental re-evaluation* are required. (2) In the contemplation stage, individuals intend to change within the next six months, weighing the pros and cons of change, and are aware of the need for empowerment. This stage involves *self-reevaluation*. (3) The preparation stage involves a stronger intention to take action soon, often involving concrete steps such as joining a health education class or consulting a doctor. The transition to action occurs through *self-liberation*. (4) The action stage is where individuals actively modify their behavior. The transition to maintenance involves *contingency management*, *helping relationships*, *counterconditioning*, and *stimulus control*. (5) The maintenance stage focuses on preventing relapse. If the maintenance stage is successful, it leads to termination of the unhealthy behavior. If relapse occurs, individuals typically return to contemplation, preparation, or action not to precontemplation because intention and awareness are already formed.[14]

In this study, both MI and HBM counseling followed similar implementation phases. The main difference lies in the content: MI counseling focuses on individual behavior change regarding medication adherence, while HBM counseling focuses on changing health beliefs related to the meaning of medication as a preventive effort for hypertension complications. Statistical results showed that both counseling methods were effective in increasing medication adherence, although MI counseling was more effective than HBM counseling.

It is important to note that based on the Transtheoretical Model, the process of improving adherence observed in this study likely progressed through several early stages, such as intention, self-evaluation, and *self-liberation*, which were achieved through counseling interventions. However, due to the relatively short duration of the intervention, participants may not have reached the maintenance stage of behavioral change. This means that achieving a high and consistent level of adherence requires a longer period.

This is supported by the MMAS-8 score range of 0 to 8, where the median score after MI counseling was 8, and after HBM counseling was 6. Researchers believe that even after MI counseling, adherence may decline in

subsequent weeks. According to the Transtheoretical Model, this could happen because participants had not yet reached the maintenance stage, and even those who do may still relapse.

Therefore, researchers suggest that the management of the Prolanis group at Ciptomulyo Community Health Center should consider implementing a combination of both counseling methods, delivered repeatedly. The MI-based HBM communication model designed to build patient-centered relationships and address treatment barriers through HBM constructs is effective in improving treatment adherence and treatment success. Prolanis program managers may adopt both MI and HBM counseling methods, as both are proven effective, while still considering the available time and human resources.[15]

Conclusion

The research conducted on 50 hypertensive patients in the Prolanis program at Ciptomulyo Health Center concluded that motivational interviewing counseling is effective in increasing medication adherence among hypertensive patients, health belief model counseling is effective in improving medication adherence among hypertensive patients, and motivational interviewing counseling is more effective than health belief model counseling in enhancing medication adherence among hypertensive patients participating in the Prolanis program.

Declaration of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. This study was conducted independently, without any financial or commercial support that could be perceived as a potential conflict of interest.

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