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Prevalence of medication adherence in patients with hypertension in Iran: A systematic review and meta-analysis of studies published in 2000-2018

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Meta-Analysis

Abstract

BACKGROUND: Medication adherence (MA) has a crucial role in controlling of hypertension (HTN). A difference was observed in the prevalence of anti-hypertensive MA reported in different studies in Iran, so we aimed to determine the overall prevalence of MA.

METHODS: Using the English and Persian keywords extracted from Mesh, the databases of MagIran, Barakat Knowledge Network System, Scientific Information Database (SID), Web of Sciences, PubMed, Science Direct, and Google Scholar were reviewed from 2000 to 2018. The overall prevalence of MA was estimated using Random effect mode. The I^2 and Egger's tests were used to assess heterogeneity and publication bias, respectively. Meta-regression and subgroup analysis were conducted based on variables such as age, marital status, regions, and tools.

RESULTS: The overall prevalence of MA was 33%. Moreover, the prevalence of MA based on the 8-Item Morisky Medication Adherence Scale (MMAS-8), Hill-Bone Medication Adherence (HBMA) scale, researcher-made tools, and self-care tools, were 13%, 34%, 48%, and 47%, respectively. A higher MA prevalence (38%) was observed among older adults compared to other age groups, and married patients (32%) compared to single (23%) individuals. The highest MA prevalence (50%) was related to region 5 of the country. Meta-regression results showed a significant relationship between the used tools and MA prevalence.

CONCLUSION: The overall prevalence of MA is low in Iran. Furthermore, MA was measured using different questionnaires, such as standard international scales and researcher-made tools. It is proposed that a standard international questionnaire should be used in future studies.

Keywords: Medication Adherence, Prevalence, Hypertension, Systematic Review, Meta-Analysis, Iran

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Introduction

Despite recent advances in the prevention, diagnosis, and treatment of hypertension (HTN), the health and economic impacts of the disease are increasing.[1,2] The US Healthy Population Program's goal is for over half of patients with HTN to control their disease by 2020. The control rate of HTN is generally less than 50% in most countries. For example, in the UK and Japan, 32% and 24.8% of patients, respectively, were able to control their HTN in 2009.[3] The results of various studies in Asia show that the control rates of HTN in Taiwan and China were 29% and 9%, respectively.[4,5] Uncontrolled blood pressure levels have been generally undocumented in Iran, and only in Golestan province, Iran, it was reported that 42.7% of patients with HTN succeeded in controlling their blood pressure.[6]

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Lifestyle modification and accurate use of antihypertensive drugs are the two main strategies for controlling HTN.[5] In fact, recent studies have shown that antihypertensive drugs can effectively control HTN and its related complications.[5,7,8] However, for the drugs to be effective in HTN management, it is required that patients follow and adhere to their medicines.[5] Studies have shown that non-adherence is the most common cause of uncontrolled blood pressure.[9-12] Patients with HTN who are poorly treated are more likely to suffer complications, including coronary artery diseases (CAD), heart failure, and cerebrovascular diseases.[13] No meta-analysis study has been conducted on medication adherence (MA) in Iran. In order to increase the effectiveness of interventional programs for HTN control and the reduction of its consequences in Iran, comprehensive information is required on the status of MA in this group of patients. The goal of this study was to obtain the precise and general prevalence of MA and its related factors in patients with HTN in Iran.

Materials and Methods

The present systematic review and meta-analysis was conducted based on preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines[14] to determine the exact prevalence of MA in patients with HTN in Iran. The protocol of this study was registered by the registration system of systematic review studies (PROSPERO) with the ID number of CRD42017069512.

In the present systematic review and meta-analysis, the prevalence of MA in patients with HTN was reviewed in the Iranian society based on articles published in national and international journals between 2000 and 2018. The reason for excluding studies conducted before 2000 was the different definition of blood pressure offered by the World Health Organization before this date.[15] To search for studies conducted on MA in patients with HTN, databases such as MagIran, Barakat Knowledge Network System, SID, Web of Sciences, PubMed, Science Direct, and Google Scholar were utilized. The search was performed using standard keywords extracted from MESH, including compliance, non-compliance, adherence, non-adherence, medication adherence, medication non-adherence, medication persistence, and blood pressure.

All observational (non-interventional) studies addressing the prevalence of MA in patients with HTN in the Iranian society were included. Interventional articles, letters to the editors, and review studies were excluded from the analysis. If several articles were published from a demographic sample, the article with a more complete content was entered into the analysis.

Based on the inclusion and exclusion criteria, titles and abstracts of studies were independently analyzed by two researchers (M.J. and R.GG.). After the removal of irrelevant articles, the full-texts of the studies were evaluated. Observational studies reporting the prevalence of MA in a hypertensive population were reviewed. In case of any disagreement between the two researchers, the article would be judged by the third author. Subsequently, the full texts of the articles were reviewed and data were extracted by two of the authors (M.J. and R.GG.) independently. For the data extraction process, a form was used including items related to the first author, the publication year, setting, the location of the study, the sample size, the sample size in men and women, the prevalence of MA in general and by sex, and the MA measurement method.

To assess the quality of the studies, a scale for rating methodological quality of studies was used to assess the quality of the methodology of articles in various internal and external studies.[16-19] A Systematic Review of Psychosocial Factors Affecting Survival after Bone Marrow Transplantation. The tool consists of 5 items related to research design, sampling method, comparison group, sample size, and psychometric properties of the tool. Each item is scored on a scale of 0-3, with the overall score ranging from 0 to 15. Accordingly, the studies were divided into three groups of weak studies (0 to 5), moderate studies (5 to 10), and strong studies (above 10). The quality of the studies was assessed by two authors (M.J and R.G.), and any disagreements were solved by asking the opinion of the third author (F.M).

Data analysis was performed using STATA 12 software (version 12, StataCorp, College Station, USA). Results are presented in forest plots. In two studies, the prevalence of MA was directly reported, so researchers estimated its ratio by dividing the number of cases by the total sample size. Confidence interval (CI) was estimated at 95% for each prevalence. The prevalence has a binomial distribution, so the variance in prevalence was calculated using the binomial distribution variance formula. To evaluate the heterogeneity of the selected studies, Cochran's Q test and I2 statistic were used. Significant heterogeneity results were found throughout studies ($P < 0.001$) ($I2 = 99.50$), so the random effect model was used to estimate

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the prevalence of MA. To combine different prevalence rates of the studies, the weighted mean was used in each study, and the weight of each study would be the inverse of the variance. Egger's test was used to examine the bias of the publication. Using subgroup analysis and meta-regression, the effects of the underlying variables, including sex, age, five regions of provinces in Iran, the tool used, the population studied, the year of studies, and marital status, were assessed on the prevalence of MA and the heterogeneity of studies. it is necessary to mention that the five regions of the country (based on territorial division of the country) were divided as follows: Region 1: Tehran, Alborz, Qazvin, Mazandaran, Semnan, Golestan, and Qom provinces; Region 2: Isfahan, Fars, Bushehr, Chaharmahal Bakhtiari, Hormozgan, and Kohkiloyeh and Boyerahmad provinces; Region 3: East Azarbaijan, West Azarbaijan, Ardebil, Zanjan, Gilan and Kurdistan provinces; Region 4: Kermanshah, Ilam, Lorestan, Hamedan, Central, and Khuzestan provinces; Region 5: Khorasan Razavi, Southern Khorasan, Northern Khorasan, Kerman, Yazd, and Sistan and Baluchestan provinces. Meta-analyses were not carried out for MA predictors; only the correlation between them and MA were estimated in the studies. Therefore, only the most important factors related to MA were explained and categorized based on the existence or non-existence of a significant relationship.

Results

Selection of studies: In this study, all studies on the prevalence of MA in patients with HTN between 2000 and 2018 were systematically selected according to PRISMA guidelines.

In the initial search, 317 papers were identified. Finally, 17 studies were entered into the final analysis (Figure 1).

Characteristics of the studies: The total sample size was 7941with the mean being 467 samples per study. The characteristics of the articles selected are presented in table 1. Like other meta-analysis studies,[20] among our primary studies, there was some with large sample size like a study conducted by Zinat Motlagh et al.[21] The highest MA rate was reported in the study by Barati et al.[22] and the lowest MA rate was related to the studies by Mahmoudian et al.[23] and Najimi et al.[24] In all primary studies, the self-reporting method was used to measure MA. Questionnaires used were the 8-Item Morisky Medication Adherence Scale (MMAS-8),[24-27] Hill-Bone Medication Adherence (HBMA) scale,[28-30] self-care questionnaires,[21,27] researcher-made questionnaires,[31,32] a one-item questionnaire,[33] and the 4-Item Morisky Medication Adherence Scale (MMSA-4).[34] All of these tools measure medication adherence. The self-care questionnaires were multi-sectional including MA, diet adherence, exercise, weight control, and smoking.

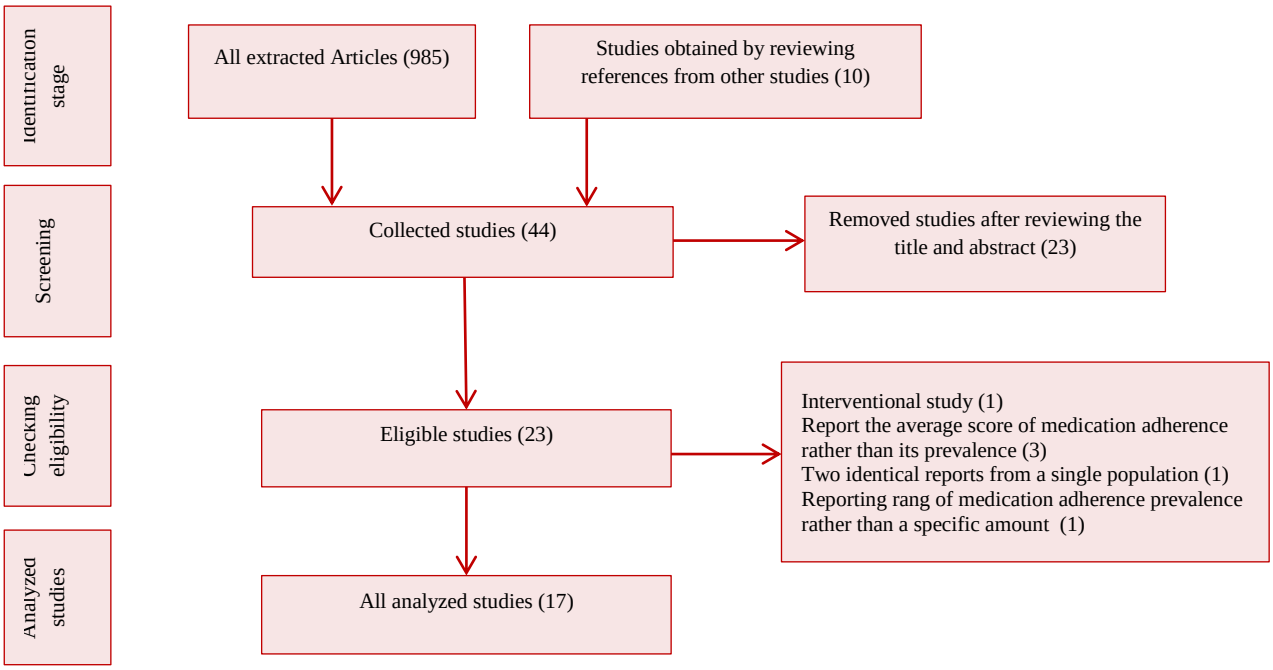

Figure 1. The process of selecting the primary articles according to preferred reporting items for systematic reviews and meta-analyses (PRISMA)

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Table 1. Characteristics of the primary studies

First author	Sample size	Target community	City	Questionnaires	Scoring of questionnaires	Overall prevalence	Prevalence•			Article quality score	Article language
							High	Moderate	Low		
Mahmoudian et al.[23]	300	adults	Isfahan	MMAS-8	Score 8 = adherent / score 1-7: Non- adherent to medication	12.0	-	-	-	10	English
Behnood-Rod et al.[26]	280	adults	Tehran, Bafq, and Kermanshah	MMAS-8	Score < 6: Poor adherence / Score 6-7: moderate adherence / Score 8: high adherence	-	16.0	34.00	50.0	8	English
Zinat Motlagh et al.[21]	1836	adults	Kohgiloyeh and Boyerahmad	Self-care questionnaire	Score 21: adherent / Score lower than 21: Non- adherent	36.1	-	-	-	8	English
Arbabshastan et al.[29]	400	adults	Zahedan	HBMA	Poor / moderate / high adherence	-	45.4	41.00	31.6	9	English
Izadirad and Zareban[31]	358	adults	Zabul	Researcher-made	score 0-9: poor adherence / score 10-15: moderate adherence / score > 15: high adherence	-	53.3 5	3.44	16.2	5	English
Roohafza et al.[30]	1055	People over 19	Isfahan, Najafabad, and Arak	Researcher-made	Answer Yes: adherent / Answer No: Non–adherent	45.0	-	-	-	9	English
Roohafza et al.[30]	619	people over 19	Isfahan, Najafabad, and Arak	Researcher-made	Answer Yes: adherent / Answer No: Non–adherent	45.0	-	-	-	9	English
Najimi et al.[24]	390	adults	Isfahan	MMAS-8	Score 8 = adherent /score 1-7: Non- adherent	12.0	-	-	-	8	English
Saadat et al.[27]	280	adults	Tehran, Bafq, and Kermanshah	MMSA-8	Score < 6: poor adherence / Score 6-7: moderate adherence / Score 8: high adherence	-	16.4	34.00	49.6	8	English
Dehghan et al.[30]	280	adults	Kerman	HBMA	poor / moderate / high adherence	-	51.0	42.60	6.4	7	English
Taher et al.[37]	130	adults	Tehran	HBMA	poor / moderate / high adherence	-	5.4	85.40	9.2	6	English
Moharamzad et al.[35]	200	adults	Tehran, Bafq and Kermanshah	MMAS-8	Score < 6: poor adherence / Score 6-7: moderate adherence / Score 8: high adherence	-	15.0	31.00	54.0	7	English
Kamran et al.[34]	671	adults	Ardebil	MMSA-4	Score 4 = adherent / Score 1-3: Non–adherent	24.0	-	-	-	7	English
Masror Roudsari et al.[32]	264	adults	Tehran	Researcher-made	Score < 500: poor adherence / score 500-750: moderate adherence / score > 750: high adherence	-	10.0	82.00	8.0	9	Persian
Asayeshi et al.[25]	300	elderly	Isfahan	MMAS-8	Score < 6: poor adherence / Score 6-7: moderate adherence / Score 8: high adherence	-	10.3	34.00	55.7	9	Persian
Barati et al.[22]	328	adults	Hamedan	Self-care questionnaire	score 0-5: poor adherence / score 6-10: moderate adherence / 11-16: high adherence	-	84.1	11.60	3.3	8	Persian
Hadi and Rostami-Gouran[33]	250	adults	Isfahan	One item with Yes / No answer	Adherent = Consumption of 90-100% of prescription / Non-adherent: Consumption of less than 90% of prescription	39.6	-	-	-	7	English

The low, moderate, and high MA are based on questionnaire scoring, for example, for the MMAS-8: scores of 0, 1-2, and 3-8 mean high, moderate, and low MA, respectively.
MMAS-8: 8-Item Morisky Medication Adherence Scale; MA: Medication adherence; HBMA: Hill-Bone Medication Adherence

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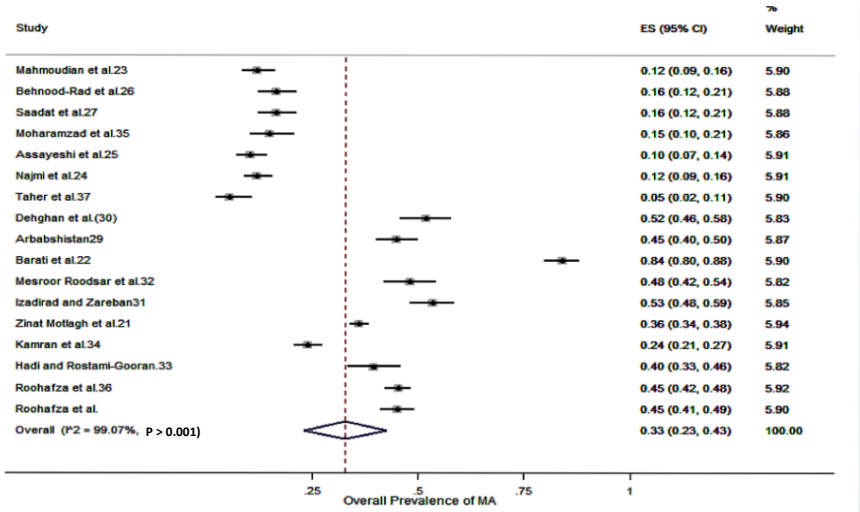

Figure 2. The forest plot of the overall prevalence of medication adherence
CI: Confidence interval; MA: Medication adherence

We used only the MA part of these questionnaires. All of the mentioned questionnaires were valid and reliable. For example, the MMAS and the HBMA scale have been used in many Iranian studies and various studies have reported their validity and reliability.[26,30,35]

Prevalence of medication adherence: In the primary studies, various prevalence rates of MA have been reported. The lowest MA rate (12%) was related to the studies of Mahmoudian et al.[23] and Najimi et al.[24], and the highest prevalence of MA (84%) was reported by Barati et al.[22] The lowest prevalence of MA was related to the MMAS-8 tool, and the highest was related to the researcher-made tools. According to figure 2, the overall prevalence of MA was 33% (95% CI: 23%-43%).

MA was reported as dichotomous (Yes/No) in 7 studies and as high, moderate, and poor on the Likert scale in 10 studies. Thus, we estimated the overall prevalence of MA for dichotomous and Likert scale questionnaires separately. For the studies with dichotomous response, overall prevalence was 31% (95% CI: 20-41). The prevalence of high, moderate, and low MA was 31% (95% CI: 14% -47%), 42% (95% CI: 28% -58%), and 27% (95% CI: 15% -38%), respectively (Figure 3).

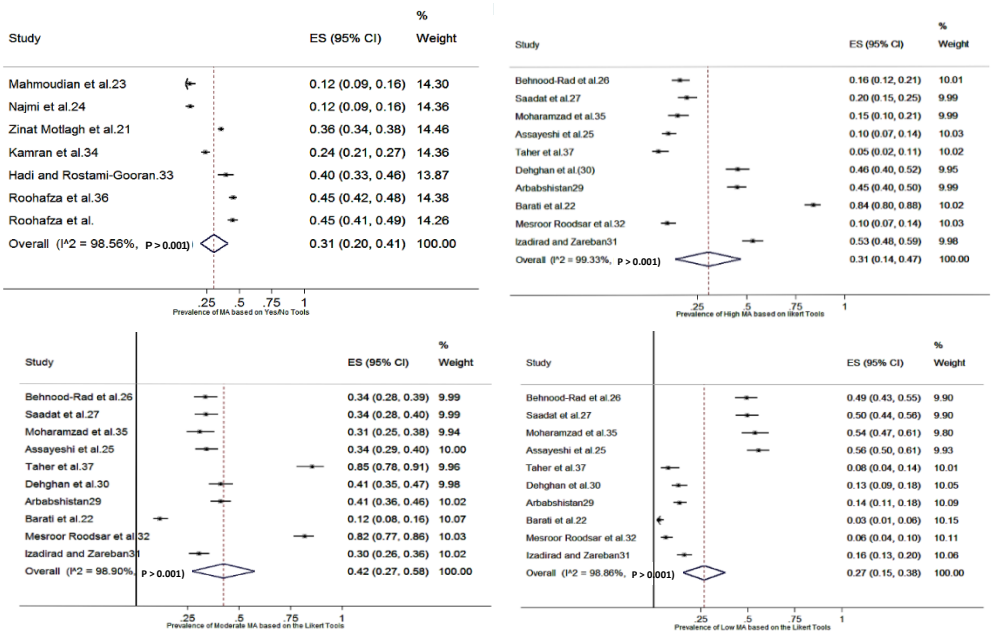

Figure 3. The forest plot of the prevalence of medication adherence in the studies with dichotomous and Likert scales
CI: Confidence interval; MA: Medication adherence

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Analysis of subgroups: The tools used to measure MA in the primary studies were the MMAS in 7 studies (6 studies with the MMAS-8 and 1 with the MMAS-4), the HBMA scale in 3 studies, a researcher-made tool in 4 articles, a self-care tool in 2 studies, and an one-item tool in 1 study. From among the studies conducted using the MMAS tool, the 6 studies using the MMAS-8 tool were analyzed and the 1 study with the MMAS-4 was excluded from the analysis. The prevalence of MA on the basis of the MMAS-8 tool was 13% (95% CI: 0.11-0.15). In the studies done using the HBMA, the prevalence of MA was measured as poorly, moderately, and highly adherent; but in this study, we reported only the highest prevalence of MA as 34% (95% CI: 0.4-0.44). The prevalence of MA in 4 studies conducted using the researcher-made tools was 48% (95% CI: 0.4-4.0). There was much heterogeneity among other tools. The 2 self-care questionnaires showed a prevalence of 47% (95% CI: 0.46-0.49). Because the studies conducted using the MMAS-4 and the one-item tool were not similar to those with other tools, the meta-analysis was not performed on them. Based on the tools, the findings showed that the highest prevalence of MA is related to the researcher-made tools (Figure 4).

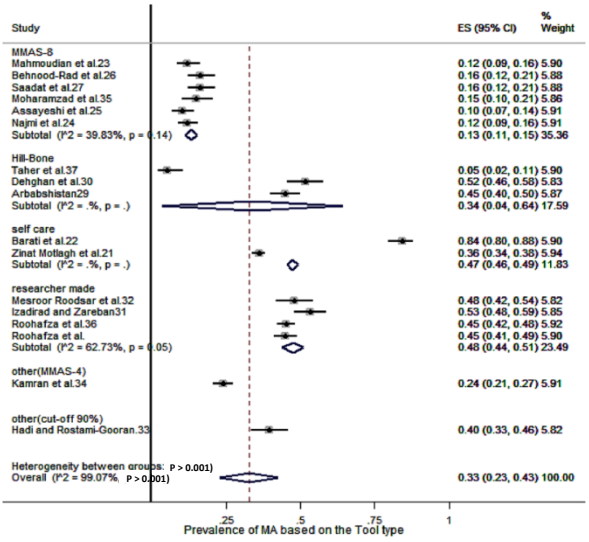

Figure 4. Forest plot, the prevalence of medication adherence based on questionnaires
CI: Confidence interval; MA: Medication adherence

Regarding Iran's regions, the findings also showed that the highest prevalence of MA was related to region 5 (50% with a 95% CI of 45-55). The prevalence of MA in regions 1 and 2 was 30% (95% CI: -51% -0.09%) and 29% (95% CI: 17% - 40%), respectively. In the 6 studies using MMAS-8, the prevalence of MA in region 2 and region 1 was 11% and 16%, respectively (Figure 5).

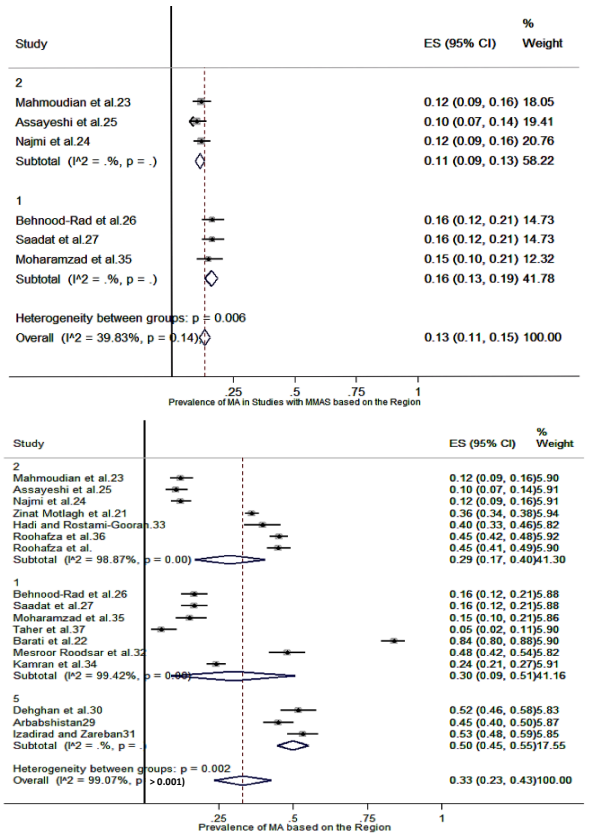

Figure 5. Forest plots of the prevalence of MA based on the five regions* of the country for all studies (Left) and the 6 studies using the MMAS-8 tool (Right)
CI: Confidence interval; MA: Medication adherence; MMAS-8: 8-Item Morisky Medication Adherence Scale
*(Region 1: Tehran, Alborz, Qazvin, Mazandaran, Semnan, Golestan, and Qom provinces ; Region 2: Isfahan, Fars, Bushehr, Chaharmahal Bakhtiari, Hormozgan, and Kohkiloyeh and Boyerahmad provinces; Region 3: East Azarbaijan, West Azarbaijan, Ardebil, Zanjan, Gilan, and Kurdistan provinces; Region 4: Kermanshah, Ilam, Lorestan, Hamedan, Central, and Khuzestan provinces; Region 5: Khorasan Razavi, Southern Khorasan, Northern Khorasan, Kerman, Yazd, and Sistan and Baluchestan provinces)

In relation to demographic variables, only in three studies the prevalence of MA was reported by age, gender, and marital status that allowed us to estimate MA prevalence by demographic variables (Table 2).

Meta-regression analysis: To investigate the relationship between the variables of tools, regions, and language of the studies with the prevalence of MA, a meta-regression was conducted once for all studies and once for studies performed using the MMDS-8 tool.

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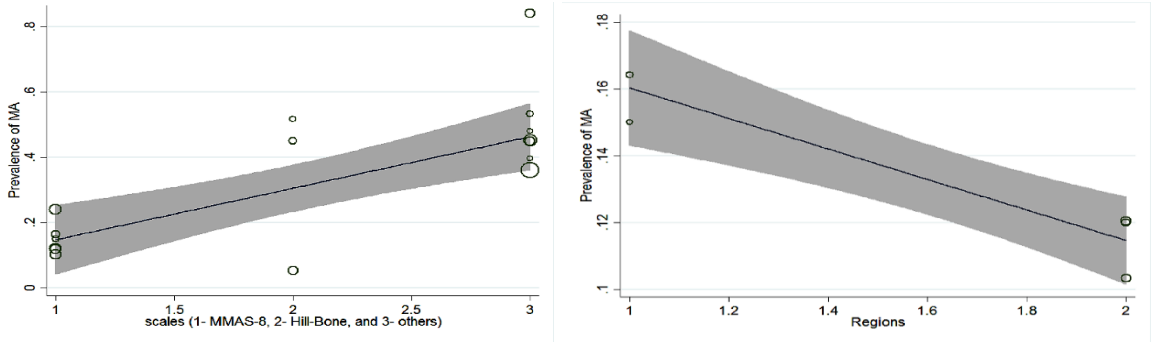

Figure 6. The meta-regression graph of the relationship of the used scales (Right) and the regions (Left) with the prevalence of medication adherence
MMAS-8: 8-Item Morisky Medication Adherence Scale; MA: Medication adherence

Table 2. Prevalence of medication adherence based on demographic variables

Demographic variables	Categories	Prevalence (%)	CI
Age (year)	30-39	30	24-35
	40-49	26	22-30
	50-59	32	28-35
	≥ 60	38	35-41
Gender	Male	33	30-36
	Female	32	30-34
Marital status	Single	23	16-29
	Married	32	30-34

CI: Confidence interval

The findings showed that, in all studies, only the tool type was associated with the prevalence of MA (Z = 4.02, P = 0.001), and among studies which used the MMDS-8 tool, only the regions of the study had a significant relationship with the prevalence of MA (Z = 2.73, P = 0.006). For the rest of the cases, there was no significant relationship among the variables and the prevalence of MA (P > 0.050) (Figure 6). According to figure 7, the results of Egger's test showed no bias in the publication of studies (t = 0.6; P = 0.550).

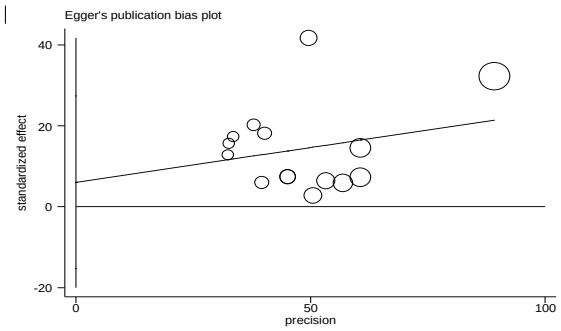

Figure 7. Egger's test diagram

Finally, we extracted and categorized predictors of MA in studies based on the existence of a significant or non-significant correlation between them and MA. We did not report odd ratio, because it was not possible to calculate using the data of the primary studies (Table 3).

Discussion

The findings of this meta-analysis showed a low prevalence of MA among patients with HTN in Iran. Based on the MMAS-8, HBMA scale, researcher-made tools, and self-care tools, the prevalence of MA was reported at different ranges. Nielsen et al. assessed the prevalence of MA in countries of medium and lower income in 2015 and estimated the overall prevalence of medication nonadherence in studies using MMAS-8 and tools with cut-off points of 80%-90% as 63.35%.[38] In other words, the prevalence of MA in the study conducted by Nielsen et al.[38] for studies using the MMAS-8 tool was 36.65%, and for articles with a cut-off point of 80%-90%, it was 55.54%. Abegaz et al. investigated the prevalence of MA in 15 countries in 2016.[39] They found that 54.8% of the patients had MA based on the MMAS-8 tool.[39] The results of the systematic review and meta-analysis by Durand et al. showed that the prevalence of MA in patients with HTN was 69% in European countries.[40] The results of the studies conducted in Palestine also showed that 54% of patients with HTN were non-adherent to medicine.[41] The findings of the study conducted by Lemstra and Alsabbagh in 2014 that assessed the prevalence of MA in patients with HTN in European countries showed that 48.5% (95% CI: 47.0-49/2-2.0) of patients adhere to their medication for up to one year. Comparing these findings with the findings of our study, it is evident that the MA rate among Iranian patients with HTN is lower compared with other countries.[42]

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Table 3. Predictors of medication adherence based on the significant or non-significant relationship

First author	Variables non-significantly correlated with medication adherence	Variables significantly correlated with medication adherence
Behnood-Rod et al.[26]	Gender, age, insurance, location of residence, smoking	Systolic and diastolic blood pressure, body mass index (BMI), experience of referring to the emergency room because of hypertension
Arbabshastan et al.[29]	-	Internal locus of control, social support
Taher et al.[37]	-	Understanding the necessity of taking medicines, concerns about drug use, age, sex, education, occupation, place of residence, duration of disease, duration of drug intake, polypharmacy, and history of comorbidity
Hadi and Rostami Gouran[33]	Duration of disease	Systolic and diastolic blood pressure, age, duration of drug intake, polypharmacy, stage of hypertension, knowledge of hypertension, forgetfulness, side effects of drugs, number of visits
Mahmoudian et al.[23]	Age, sex (patient), gender (physician), duration of disease	Education, satisfaction with communication with the doctor
Roohafza et al.[36]	-	Stress, knowledge
Saadat et al.[27]	Comorbidity	-
Zinat Motlagh et al.[21]	Duration of disease, body mass index (BMI), income, education level, place of residence, marital status, gender	Age
Asayeshi et al.[25]	Drug-related beliefs	Education and occupation
Kamran et al.[34]	-	Physical activity, being a non-smoker, perceived sensitivity, perceived severity, perceived damage
Najimi et al.[24]	-	Stressful life events, depression, interpersonal conflict

This difference may be attributed to the cultural context of people of different countries in relation to follow-up of their treatments. From the researcher's point of view, people in developed countries have a culture of self-care, pay attention to their health, and are more aware of the role of antihypertensive drugs in disease control, so they try to take their medications correctly.

In this study, the MA rate was measured only using self-report method. In studies that utilized the MMAS-8 tool, a low rate of MA was observed, and in studies that used tools with the cut-off point of 80%-90%, a high MA rate was reported; this was consistent with the results of previous similar study.[38] In a study by Durand et al., the highest rate of non-adherence to medication was related to biological tests (measuring the amount of the drug in the blood and the urine of patients) and the directly observed therapy (DOT), and the lowest rate of non-adherence was related to the medication possession ratio (MPR) measurement method.[40] In the present study, the MA rate was measured only through self-report method using questionnaires. The advantages of self-report questionnaires over other methods of measuring MA rate are that self-reporting can address the underlying causes of medication non-adherence such as disease perception, treatment beliefs, or cognitive impairment where other methods are unable to address them.[40]

The primary studies in our study used different tools to measure MA. The HBMA scale and tools with a cut-off point of 80%-90%, compared with MMAS-8, are associated with a high prevalence of MA. In a recent study, it was found that by using the MMAS-8 tool, the prevalence of MA was estimated as low compared with other tools, and tools with a cut-off point of 80%-90% provided a high MA prevalence.[38] By comparing the prevalence of MA based on different tools, researchers have concluded that using an international standard tool instead of a researcher-developed tool would provide an accurate measurement of MA rate and simplify the comparison and analysis of MA between different studies.

Regarding the geographical location, the findings showed that region 5 of Iran had high MA rates compared with the other regions. The reason for this difference is that, in the studies conducted in region 5, the HBMA scale and researcher-made tools were mostly used, and these tools show a high MA rate compared with the MMAS-8; therefore, a high MA rate was observed in the studies performed in this region.

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The correlation of age with the prevalence of MA indicated that elderly people have a higher MA rate compared with other age groups, which was consistent with the findings of similar studies.[29,41,43,44] In a study by Tong et al., it was demonstrated that 75% of the group under 25 years of age had 59% of MA rates, the age group of 18-44 years showed 55% of MA rate, and the age group of 45-40 years indicated 71% of MA rates, and the age group of 65 years showed 78% of MA, indicating a high MA rate in the elderly compared with other age groups.[43] Although the comparison shows that both the elderly in the study by Tong et al.[43] and the elderly in the current study had a high MA rate, the MA rate for the elderly in their study was higher than the MA rate for the elderly in our study. The possible cause can be traced back to the difference in the method of measuring the MA rate. In the study by Tong et al., the HealthStyles survey was used to measure the MA rate, yet in our study, the MMAS-8 tool was mostly used. A study in Hong Kong indicated that more than half of the elderly did not follow their treatment regimen.[43] Al-Ramahi reported that 52% of the elderly have poor MA and the rest of them have moderate and high MA.[41] Based on the experiences of researchers and their relationship with older adults, the elderly think that medicines are the best factors that can control their diseases, and due to their multiple chronic diseases compared with other age groups, they try to control their diseases by timely medicine intake. However, the physical and mental problems of the elderly hinder the correction of the way they take medicines.[1,45-47]

The findings of the current study showed that married women demonstrate a higher MA rate in comparison with single men. In the current study, married couples were compared with single individuals, and it was indicated that married individuals show a higher MA rate, which was similar to the results of previous studies.[43]

The results of our study showed different predictors of MA based on significant and non-significant correlations. These factors could be different based on the context of the study and the culture of the community and are mostly different in various individuals.

Study Limitations and Strengths: The following limitations of our study should be noted when generalizing our results to larger populations. The first limitation was the fact that the primary studies were limit to 17 articles. Moreover, although MMAS-8 as a standard questionnaire was used more in the primary studies, researcher-made questionnaires were also used. This could reduce the generalizability of our findings. However, the study also has strengths. Covering more databases and comprehensive reviews made it possible to access the majority of related primary studies. This is the first study to ascertain the overall prevalence of MA in Iran in patients with HTN.

Conclusion

The results of the current study show that the prevalence of MA among patients with HTN in the community is low. Given that HTN is easily controlled by adherence to treatment, it is essential to provide necessary trainings and interventional programs to increase MA rates in affected patients.

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Conflict of Interests

Authors have no conflict of interests.

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