Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/14969
DOI URL: http://dx.doi.org/10.21474/IJAR01/14969

RESEARCH ARTICLE

MANAGEMENT OF HIGH BLOOD PRESSURE IN MOROCCO:WHAT PLACE FOR RGMPS ?

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Manuscript Info

Manuscript History
Received: 25 April 2022
Final Accepted: 27 May 2022
Published: June 2022

Key words:-
High Blood Pressure (HBP), Outpatient Care, Recommendations For Good Medical Practice (RGMP), Practices of Physicians in the PHC

Abstract

Background: High blood pressure (HBP) is the main cardiovascular risk factor and a public health problem that is easy to recognize and treat. Therefore, good practice recommendations for treating hypertension in adults were developed in Morocco in 2012 as part of the ten recommendations of good medical practice (RGMPs). The objective of our study was to explore the degree of use of RGPMs for HBP among physicians in primary health care facilities (PHCFs).

Methods: This mixed-methods exploratory study was based on the NHS* sustainability model. Physicians from 21 PHCFs in the Skhirat-Temara prefecture were interviewed using pretested questionnaires over a period of 6 weeks. We observed their practice in the management of HBP to assess the degree of application of RGMPs. The research strategy was based on a methodological triangulation validation technique. Quantitative data were analysed using Epi Info software version 7.2.2.6, and the significance of associations was determined using Student's t test (significant if the P value<0.05). The qualitative analysis consisted of a thematic content analysis of specific grids.

Results: Fifty-eight questionnaires were completed, with a predominance of female participation. The average age was 48.60 years (±5.57 years) [39;61]; 83% worked in urban areas. The average age of seniority of function was 10 years (±5.61 years) [1;21]. Most participants (78%) had received continuing education on hypertension. Sixty-six percent were aware of RGMPs for HBP, but only 58% followed them. The total average degree of compliance with all recommendations was 73.27%. The statistical analysis revealed a significant difference in the degree of compliance between rural (79.72%) and urban (71.92%) areas (p=0.01) and among trained (75.44%) and untrained (65.73%) physicians (P=0.001). The main determinants related to their application were the adaptability and credibility of the RGMPs, information on and sharing of the recommendations, and staff training.

Conclusions: Our study indicated that the degree of application of RGMPs in the management of hypertension by physicians in the PHCFs of the Skhirat-Témara prefecture is satisfactory and allowed us

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to make recommendations for action on the determinants of their proper application.

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Introduction:-

High blood pressure (HBP) is a public health problem. The number of patients diagnosed with hypertension worldwide is estimated to be more than one billion [1]. Hypertension is a risk factor for ischaemic and haemorrhagic stroke, myocardial infarction, heart failure, chronic renal failure, cognitive decline and death [1].

In Morocco, 34% of deaths are due to cardiovascular diseases [2]. High blood pressure is the main risk factor for cardiovascular disease (CVD), with an estimated prevalence of 27.8% according to World Health Organization (WHO) projections for the year 2010 [3].

More than one-third of the Moroccan population aged 20 years and older is hypertensive; this proportion increases progressively with age, and it is 72.2% in people aged 65 years and older [4]. According to the ETHNA (Epidemiological Trial of Hypertension in North Africa) study conducted in 2009 in Morocco, HBP represents 23.2% of general practice consultations [5]. It is the leading preventable cause of premature death worldwide [6].

The study on the National Accounts of Noncommunicable Diseases (NCDs) in Morocco conducted by the WHO in 2014 showed that the expenses for the four NCDs, including HBP, represent 14% of total health expenses and that household spending on the 4 NCDs is 47% of total expenses for NCDs, including curative care and medicotechnical devices [7].

HBP is easy to recognize and can be actively treated, especially by a health care system, which has improved the accessibility of the citizens to care and easily integrates the management of hypertension; however, the quality of this management depends on training and evidence-based protocols.

Thus, management protocols have the capacity to ensure that a patient is treated with the minimum of resources to ensure efficiency in the care system. For health insurance, the culture of using referrals will save financial resources, as the cost of the disease will remain at the lowest level that does not cost as much as the levels where complications are treated, such as university hospitals.

Therefore, the recommendations for good practice of HBP in adults were among the ten priority recommendations of good medical practice (RGMPs) developed in Morocco in 2012. These recommendations were the result of a collaboration between the Ministry of Health and Social Protection (MSPS), the National Health Insurance Agency (ANAM), the Moroccan Society of Medical Sciences and the National Order of Physicians [8].

However, although the MSPS implemented these RGMPs for the management of hypertensive patients in 2012 and with a training plan that extended to 2016, we do not have information on the degree of implementation of these recommendations.

The objective of our study was to explore the degree of use of RGMPs for hypertension among physicians at primary health care facilities (PHCFs).

Method:-

Our study employs an exploratory and mixed design based on the UK National Health Service (NHS) sustainability model. Our approach included input from experts in the field of HBP management to design a method for estimating implementation scores reflecting the weight of each recommendation [APPENDIX 1].

Our expert method relied on interviewing practitioners to understand what they follow as practice. We also observed physicians' practice in the management of hypertension to assess the degree of implementation of RGMPs for the screening, diagnosis, and follow-up of hypertensive patients.

We chose 21 PHCFs in the Prefecture of Skhirat-Témara as the study site. The population of our study is composed of all the physicians who monitor hypertensive patients in the 21 PHCFs and the managers in the Skhirat-Témara Prefecture.

In the quantitative analysis, the unit of analysis is knowledge. The practice of physicians in relation to the application of RGMPs is translated by their therapeutic conduct in the management of hypertensive patients.

The inclusion criteria were physicians who treated and monitored hypertensive patients at the PHCF level, and the exclusion criteria were those who refused to participate in the survey or who were not present at the time of our visit.

We used pretested questionnaires administered to physicians involved in the management of hypertension and interviews with managers and physicians. An observation grid was used to observe the structures and clinical practice of the management of hypertension. The duration of data collection was 6 weeks.

Our research strategy was based on a validated technique using methodological triangulation, which allowed us not only to verify the results obtained but also to address the limitations specific to each of the data collection methods.

For the analysis of quantitative data, we used Epi Info software version 7.2.2.6. First, descriptive analyses in the form of frequencies, percentages, and averages were performed for the data from the questionnaires.

Afterwards, a statistical analysis of the association of the degree of application with the socioprofessional characteristics of the physicians involved in the management of hypertensive patients was calculated with Student's test. The association was considered significant at a threshold P value<0.05.

The qualitative analysis consisted of a thematic content analysis. Three sources of information were subjected to qualitative analyses: the content of the semistructured interviews, the qualitative data obtained from the open-ended questions of the stakeholder questionnaire, and the observation data. Specific grids were used to process the data that emerged from the interviews.

Ethical considerations

We obtained permission to conduct the study from local officials. In our study, we kept our commitments to strictly adhere to the rules and operating principles ofPHCFs. In addition, we obtained written, informed and signed consent forms from the participants with an assurance of anonymity and confidentiality of the information collected.

Results:-

We were able to conduct 58 questionnaires with all physicians in the 21 urban and rural health centres involved in the management of patients with hypertension at the PHCF level and 21 interviews with physicians and managers. The majority (79%) of participants were women; the average age was

48.60 years (±5.57 years) [39; 61]; 83% practised in urban areas. The average number of years in the current position was 10 years (±5.61 years) [1; 21] (Table I).

Table I:- Sociodemographic characteristics of physicians.

Variable		Number of physicians (percentage) N (%)
Sex	Female Male	46 (79) 12 (21)
Age (years)	35-44 45-54	16 (28) 33 (57)
	55 and older	9 (15)
	General Practitioners	34 (59)

Profile	Sports medicine	14 (24)
	Occupational medicine	6 (10)
	Public health physician	3 (5)
	Family medicine	1 (2)
Practice environment	Urban	48 (83)
	Rural	10 (17)
Length of time in the current positic (in years)	1-5 6-11	14 (24) 25 (43)
	12-17	10 (17)
	18-24	9 (16)

More than three-quarters of the participants (78%) had received continuing education on hypertension. More than half of the participants (66%) were aware of RGMPs for hypertension, but only 58% of them followed them (Table II).

Table II:- Description of the training data for the HBP recommendations.

		N (%)
Training on HBP (n=58)	Yes No	45(78) 13(22)
The training provider (n=45)	MH Others	38(84) 07(16)
Did the training help you improve your management of HBP? (n=45)	Yes No	41(91) 4(9)
Are you familiar with RGMPs for HBP?(n=58)	Yes No	38(66) 20(44)
Are you following RGMPs for HBP? (n=58)	Yes No	22(38) 38(62)

The total average level of compliance for all recommendations was 73.27%. Recommendation no. 5 (R5) was applied at 100%, followed by recommendation no. 4 (R4), with an average of 98%. These two recommendations successively concern the nonpharmacological treatment and the minimum initial assessment for a hypertensive patient. Recommendation no. 1 (R1) on the diagnosis of hypertension and recommendation no. 6 (R6) on pharmacological treatment had the same average compliance rate of 82%. Recommendation no. 3 (R 3) on cardiovascular risk factors and recommendation no. 2 (R2) on ambulatory measurement had two similar average application rates of 77% and 74%, respectively. Last, recommendation no. 7 (R7) on combination therapy and recommendation no. 8 (R8) on follow-up had average implementation rates of 53% and 34%, respectively (Table III).

Table III:- Results of the degree of application of RGMPs for high blood pressure.

Recommendations	Average percentage of application (%)	Standard deviation (%)	Median (%)	Min (%)	Max (%)
R1	82	14	79	42	100%
R2	74	43	100	0	100%
R3	77	25	76	0	100%
R4	98	13	100	0	100%
R5	100	0	100	100	100%
R6	82	19	76	38	100%

R7	53	50	100	0	100%
R8	34	16	32	0	64%

The statistical analysis revealed a significant differences in the degree of compliance between rural (79.72%) and urban (71.92%) areas (p=0.01) and among trained (75.44%) and untrained (65.73%) physicians (P=0.001) (Table IV).

Table IV:- Levels of RGMP implementation stratified by socioprofessional characteristics.

		Number of Physicians (N)	**Average application (%)**	**P value**
Sex	Female Male	46 12	73,31 73,12	0,95
Age (in years)	35-44 45-54 55 and older	13 33 9	71,73 73,60 74,77	0,72
Practice environment	**Urban** **Rural**	**48** **10**	**71,92** **79,72**	**0,01**
Length of time in the current position (in years)	1-5 6-11 12-17 18-24	14 25 10 9	69,29 76,93 70,64 72,19	0,07
Training on HBP	**Yes** **No**	**45** **13**	**75,44** **65,73**	**0,001**

The study indicated the involvement of several determinants related to the application of the RGMPs for hypertension, the most important of which are the adaptability and credibility of RGMPs; information on and sharing of recommendations; staff training; other determinants related to the disease itself and the patient's profile; professionals and their adherence to the therapeutic protocol; infrastructure and human, material and financial resources; and finally, the organizational culture.

Discussion:-

At the international level, several articles describe the reluctance of practitioners to apply RGMPs in health care. Thus, we analysed the degree of application of RGMPs by practitioners in the field of hypertension with the aim of proposing recommendations to improve physician adherence to good practice. This adherence would undoubtedly facilitate improvements in the effectiveness of the HBP program in the field and subsequent improvements in health indicators related to this disease.

In France, recommendations are produced by the state in collaboration with the health insurance system to regulate medical information and frame practices, with the aims of controlling health expenditure, the quality of care provided and public health objectives [9].

Another recent study conducted in South Africa was designed to analyse whether health professionals correctly diagnose hypertension based on good practice guidelines. This study was based on a clinical audit of the medical records of patients diagnosed with hypertension between 2009 and 2011 and concluded that doctors applied the guidelines in 75% of cases; however, nurses applied them in 56% of cases [10]. In Morocco, the physician has the responsibility for the treatment of patients, and delegation of tasks in prescription and follow-up is not performed.

A literature review on research that has evaluated the degree of application of RGMPs for HBP distinguishes three types: one type that is based on the analysis of the medical prescription, another that is based on survey data and one

that uses the medical record as a source. Only a few studies have examined the relationship between the treatment of hypertension and blood pressure control. Regardless of the type of method adopted, the review shows that the majority of research has focused on the aspect of pharmacological therapy [11].

In 2007, a study examined the degree of implementation of national guidelines for hypertension among family physicians in Slovenia based on data from 2752 patients. Follow-up according to the guidelines was performed in 1492 patients (55.3%). Only 256 patients (9.3%) whose management was performed according to the guidelines was completely based on the guidelines and only 347 (15.5%) of the study population reached the target values of blood pressure [12].

Another paper by Hayman et al. concluded that despite the availability of international and national recommendations for the management of hypertension, a considerable gap exists between evidence-based recommendations and the management of patients with hypertension in practice [14].

In the article by Siko et al. published in 2017, the authors concluded that the physician's compliance with the recommendations seems to be influenced by the knowledge and awareness of the recommendations [10]. On the other hand, in the article by Frank et al. published in 2005, the authors concluded that effective compliance with good practice recommendations seems to be related to the duration of professional practice. A shorter duration of professional practice seemed to be associated with better compliance with RGMPs [15].

In our study, the recommendation related to combination therapy also represents a weakness, despite its relatively low weight according to the experts. This result indicates the problem of updating physicians' knowledge of therapeutic protocols and questions the process of continuing education as organized by the MSPS or the degree of dissemination of the training content.

Regarding the detailed results for each recommendation, our study concluded that different degrees of application exist. The first recommendation is a screening issue. In the third recommendation, a deficiency regarding cardiovascular risk assessment is noted. In the sixth recommendation, a problem with prescribing medication exists, and the problem with the eighth recommendation is the follow-up assessment.

A meta-analysis by Karmali et al. published in 2018 revealed that a blood pressure-lowering treatment strategy based on predicted cardiovascular risk is more effective than a strategy based on blood pressure levels alone across a range of thresholds. These findings support the use of a cardiovascular risk assessment to guide blood pressure treatment decision-making for moderate- and high-risk individuals, particularly primary prevention [16].

Therefore, a cardiovascular risk assessment has been considered in the latest edition of the American College of Cardiology and American Heart Association hypertension treatment guidelines. Treatment targets have become more individualized according to cardiovascular risk, with lower blood pressure goals in patients with CVD or diabetes, as well as in those at risk for a cardiovascular problem in 10 years [17].

A literature review by Gabana MD et al. concluded that appropriate knowledge of the recommendations and physician attitudes are prerequisites for improved adherence to the recommendations. The authors identified a variety of barriers to adherence to recommendations, which include a lack of awareness, lack of familiarity, lack of agreement, lack of self-efficacy, lack of assurance of outcome, prior practice inertia, and external barriers. The latter are classified as patient-related factors due to the inability to reconcile patient preferences with recommendations, recommendation characteristics factors are characterized by the presence of conflicting recommendations, and environmental factors are characterized by lack of time, lack of resources, organizational constraints, lack of reimbursement, and heightened perception of professional liability [18].

Limitations of the study

This study was conducted in a prefecture close to the central administration, which may influence the degree of implementation of the recommendations. The proximity of the central administration facilitates access to information and facilitates the travel and frequency of the central-level supervision teams. This proximity should therefore be considered a limitation that might influence the results, but the comparison with international studies shows that we are on the same order of magnitude. The other limitation, given the time constraint, was that the study

should be conducted at the level of the entire Rabat-Salé-Kénitra region because a study in one prefecture does not emphasize the variation from one province to another within the region.

In our study, we did not control for confounding variables. This bias is common to many other research strategies.

Policy Implications

Our study highlighted the complexity of the process of implementing RGMPs in the context of Moroccan health centres and facilities. Indeed, both the conceptual dimension of these recommendations and organizational aspects and even the architecture of health programs require the involvement of the learned society in their design. The decision to implement RGMPs requires support in several dimensions. Support in terms of the availability of resources to implement RGMPs is more than decisive; the reality, as our study has shown, is that this level is lacking. An effort to increase awareness should be made before implementing RGMPs. An increase in awareness is also the first step in a change management process and in modifying the elements of organizational culture. Therefore, particular importance should be assigned to the communication and awareness-raising dimension before implementing any form of practical recommendation, which has been performed quickly in the case of theRGMPs. The involvement of managers and their support in the implementation of the RGMPs determines and affects the degree of their application. The work of managers must not be limited solely to the introduction of RGMPs but must extend further to include monitoring, knowledge sharing among PHCFs and ensuring the availability of the necessary resources. The conditions for ongoing training must be in place.

Conclusions:-

In the present study, we have tried to focus on an issue of great importance for controlling high blood pressure and other related diseases. In fact, we established the degree of application of RGMPs using an approach that included the participation of experts in the field of management to design a method for estimating the application scores. Our study led to recommendations for action on the determinants of the proper application of RGMPs to ensure the effectiveness of the HBP program, particularly with regard to communication, training, organization, infrastructure, and resources.

Supporting information

S1: Scoring chart of RGMPs

Competing interests

The authors have no competing interests to declare.

Acknowledgements:-

The authors would like to gratefully acknowledge the technical support and guidance of the MOH team at different levels, including Professeur Rabia Bayahya, Head of the Nephrology Department at the Ibn Sina Hospital Center and Dr. Fadoua Rahhaoui, Head of the Cardiovascular Diseases Department at theDirectorate of Epidemiology and Disease Control. The authors would like to thank all key interviewees and other participants for their support during this study.

Authors' contributions:

BA and NI made substantial contributions to the conception and design of the study. BA and NI coordinated the data collection. NI analysed the data. NI, FZC and BA wrote the first draft of the manuscript. BA, NI and FZC interpreted the results. All authors participated in the revision of the manuscript and have read and approved the final version for submission.

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Appendix 1:- Scoring chart.

Recommendation number	**Recommendation score**
Recommendation n°1: BP measurement is performed by sphygmomanometer or validated electronic automatic device in a patient at rest, using the appropriate cuff, and repeating the measurements. The diagnosis of hypertension is made when the BP is >=140/90 mmHg at several measurements performed during separate consultations.	**17%**
Recommendation n°2: In case of diagnostic uncertainty, ambulatory measurement or self-measurement can be used to confirm permanent hypertension and eliminate a white coat effect. These devices can also be used, among other things, to confirm resistant hypertension, to look for orthostatic hypotension, and to give prognostic information.	**9%**
Recommendation n°3: The aim of the initial assessment is to evaluate the impact on the target organs and to look for associated risk factors: age, sex, family history of early cardiovascular events, smoking, dyslipidemia, diabetes.	**13%**

It also looks for possible elements of orientation in favor of a secondary hypertension: hypertension in a young subject, <30 years old, a severe hypertension from the start, complicated or resistant to medical treatment.	
Recommendation n°4 The minimal initial biological work-up includes a creatinine level with estimation of the glomerular filtration rate (Cockcroft and Gault formula); a urine dipstick to look for proteinuria and hematuria; a fasting blood sample for glycemia, total cholesterol, HDL-C and LDL-C, triglycerides, a kalemia (without tourniquet); a resting ECG	**9%**
Recommendation n°5 The management of a hypertensive subject necessarily includes, whatever the stage, hygienic and dietary measures with limitation of salt consumption (less than 6g/l); weight reduction in case of overweight or obesity; regular physical activity adapted to the status of the subject; cessation of smoking and/or alcohol; a diet rich in vegetables and fruits, low in saturated fats.	**13%**
Recommendation n°6 The choice of an antihypertensive will depend on the assessment of the subject's overall risk, associated co-morbidities, efficacy, tolerance and daily cost. Five families are admitted for first-line treatment: thiazide diuretics, calcium channel blockers, ACE inhibitors and angiotensin II antagonists; beta-blockers are preferentially used after failure of the four families and within the framework of a therapeutic association.	**13%**
Recommendation n°7 Fixed combinations of antihypertensives, normally or at low doses, can be used immediately as first-line therapy or in the event of monotherapy failure.	**9%**
Recommendation n°8 The follow-up of the hypertensive includes a consultation every three to six months, once blood pressure control is obtained. The search for proteinuria by reactive dipstick is carried out once a year if it is initially negative. Serum potassium and serum creatinine are monitored two weeks after initiation of diuretic treatment, with an ACE inhibitor or Angiotensin II Receptor Antagonist. blood sugar and lipid balance are checked every two to three years if they are normal. The ECG is checked every two years if it is normal. all these examinations and other optional examinations may be repeated more often and at shorter intervals, by decision of the attending physician, depending on the patient's condition, and the visceral repercussions or complications present.	**17%**