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Programs for screening blood pressure values in the world: an integrative review

Programas para rastrear los valores de la presión arterial en el mundo: una revisión integrativa

Programas de rastreamentos dos valores da pressão arterial no mundo: revisão integrativa

ABSTRACT
Objective: to analyze the evidence available in the literature on the programs of tracing two values of arterial pressure in the world. Method: integrative literature review, carried out no more than September 2019 with the period from 2015 to 2019, based on data bases National Library of Medicine National Institutes of Health, Latin American and Caribbean literature in health science, Web of Science, not Scopus Dice Bank in the Cochrane Library. Results: A total of 13 studies were selected to integrate this review. Traces of arterial pressure carried out to highlight the importance of the same for awareness, early detection, control and prevention of elevating pressure values. Conclusion: Arterial pressure monitoring program is a low-custodial strategy and high efficiency, for the identification of diagnosis, treatment and control of arterial hypertension, according to developed and developing countries, and at the same time it contributed to the reduction of risks for cardiovascular diseases.
DESCRIPTORS: Blood Pressure Determination; Mass Screening; Hypertension; Blood Pressure; Nursing.

RESUMEN
Objetivo: analizar como evidências disponíveis en la literatura sobre los programas de rastreamentos dos valores de la presión arterial en el mundo. Método: revisão integrativa da literatura, realizada no mês de setembro de 2019 com artigos no período de 2015 a 2019, nas bases de dados National Library of Medicine National Institutes of Health, Literatura latino-americana e do Caribe em ciências da saúde, Web of Science, no Banco de Dados Scopus e na Biblioteca Cochrane. Resultados: Um total de 13 estudos seleccionados para integrar esta revisión. Rastreamentos da pressão arterial realizó ressaltam a importância do mesmo para conscientização, detecção precoce, control e prevenção de valores da pressão elevadores. Conclusión: Programa de rastreamento da presão arterial é uma estratégia de baixo custo e elevada eficácia, para identificação do diagnóstico, tratamento e controle da hipertensão arterial, seja em países desenvolvidos e em desenvolvimento, e ao mesmo tempo contribui para diminuição de riscos para doenças cardiovasculares.
DESCRIPTORES: Determinación de la presión arterial; Tamizaje Masivo; Hipertensión; Presión arterial; Enfermería.

RESUMO
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DESCRITORES: Determinação da Pressão Arterial; Programas de Rastreamento; Hipertensão; Pressão Arterial; Enfermagem.

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INTRODUCTION

Chronic Noncommunicable Diseases (CNCD) have shown a significant increase in recent years, the most common being Arterial Hypertension (AH), Cardiovascular Diseases (CVD), chronic respiratory diseases and Diabetes Mellitus. These are the leading cause of mortality in the world, corresponding to 70% of deaths and in Brazil the percentage reaches 75%. [1]

This growth of NCDs has occurred due to the increase in modifiable risk factors such as harmful use of alcohol and tobacco, physical inactivity and unhealthy eating. [2] Such risk factors are also mainly related to the increase in AH, which add to its risk factors, age, sex and ethnicity, overweight and obesity, salt intake, socioeconomic factors and genetics. [2-3]

AH is characterized by a multifactorial clinical condition, sustained by elevated blood pressure levels ≥ 140 mmHg systolic pressure and/or 90 mmHg diastolic pressure, being one of the main causes responsible for morbidity and mortality worldwide. It has been considered as the main global risk factor and an important public health problem. In Brazil, it affects 32,5% of the adult population and more than 60% of the elderly, and contributes to 50% of deaths from CVD, directly or indirectly. This chronic disease supports an independent relationship with events such as stroke, stroke, acute myocardial infarction (AMI), heart failure (HF), sudden death, among others, which are quite common complications. [2,4]

AH can be associated with metabolic disorders, functional and/or structural changes in target organs, in addition to being aggravated by the existence of risk factors such as advanced age; sex and ethnicity; overweight and obesity; excessive salt consumption; Diabetes Mellitus; socioeconomic factors; as well as genetic factors. [3]

AH is characterized by a multifactorial clinical condition, sustained by elevated blood pressure levels ≥ 140 mmHg systolic pressure and/or 90 mmHg diastolic pressure, being one of the main causes responsible for morbidity and mortality worldwide.

The effectiveness in the diagnosis and treatment of AH is through the correct measurement of Blood Pressure (BP), often considered the gold standard of diagnosis in conventional medicine. This procedure is one of the techniques most performed by health professionals and mainly by nurses, it is considered simple and the method is easy, but requires care to obtain reliable results. [3,5]

The BP measurement is performed to screen for AH, using initiatives such as the Blood Pressure Tracking Programs, which are low-cost and contribute to the early diagnosis of AH, help in controlling the disease and aim to reduce the morbidity and mortality of cardiovascular diseases in different countries. [6]

Thus, the nurse assumes a fundamental role in this context, since he has knowledge and skills to perform the screening and promote health education actions for the population to adopt better life habits. [7] These should act effectively in the screening and in the health education process for the population. These actions have as main objective the early detection of AH, the adaptation of the patient to the disease, the prevention of complications, including their adherence to treatment and medical monitoring, thus the individual becomes an agent of his self-care, reducing mortality. [8] Thus, the aim of the present study was to analyze the evidence available in the literature on programs for tracking blood pressure values worldwide.

METHOD

It is an integrative literature review, which aims to identify and analyze scientific evidence in a systematic and orderly manner, on the knowledge of the researched topic. For the methodological rigor of the study, six steps were taken. [9]

In compliance with the first stage of the integrative review, the PICO strategy was used, which is a tool used by eviden-

ce-based practice and is represented by the acronym of the English terms "Patient", "Intervention", "Comparison" and "Outcomes ". This strategy was applied in the initial phase of this review as a contribution to the elaboration of the research question and due to the need to identify keywords for the location of relevant studies in the selected databases. [10]

In this study, the P refers to the patient/problem: Blood pressure tracking; o I as Intervention or indicator: how has blood pressure screening been performed in the world. C, as Comparison or control, in this case does not apply, and O as an outcome: check if there are studies in the literature that have performed blood pressure tracking. Through the PICO strategy, the following guiding question was formulated for the present review: How have blood pressure screening programs been carried out in the world?

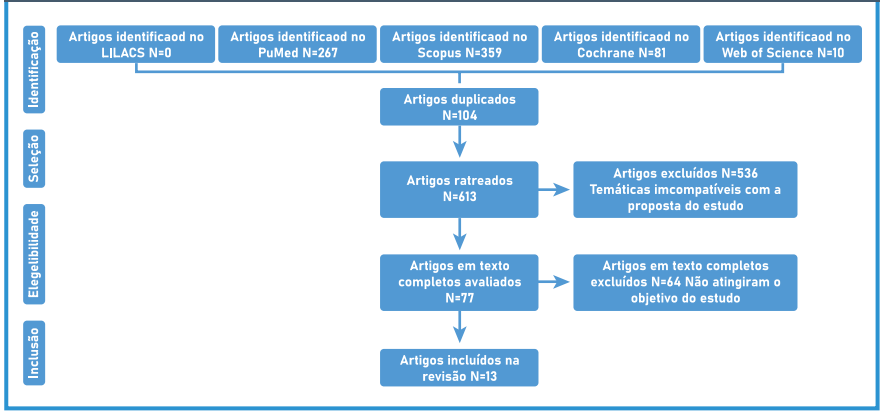
Included in the study were articles published in full, from 2015 to 2019 and written in Portuguese, English or Spanish, and duplicate articles, experience reports, theses, dissertations or articles whose theme were incompatible with the proposal of this study were excluded.

The bibliographic search was carried out in September 2019 in the databases National Library of Medicine National Institutes of Health (PuBMed), Latin American and Caribbean Literature in Health Sciences (LILACS), Web of Science, in the Database Scopus and the COCHRANE Library. The Health Sciences Descriptors (DeCS) of the Virtual Health Library and Medical Subject Headings (MeSH) descriptors used in the search were: Blood Pressure Determination, Blood Pressure Determination, Blood Pressure, Hypertension) and Mass Screening Programs with the application of the Boolean operator "AND" and "OR" between the terms.

In the screening phase of the articles, a screening program called Rayyan® was used (11). This allows the optimization of literature reviews. The program shows the title, summary, date of publication of the texts loaded from the databases for the researcher to analyze and allows the option of inclusion or exclusion, in addition to a tab designated as "maybe", if the researcher has a question about inclusion and want to review the appropriate article. In the end, the program allows an organization of the review, in which the researcher will know how many articles were excluded, included and duplicated.

After selecting articles through the Rayyan® program, the PRISMA strategy was used to promote the reporting of this review. The PRISMA recommendation consists of a checklist with 27 items and a four-step flowchart in order to help authors improve the reporting of systematic reviews and meta-analyzes. [12] Figure 1 illustrates the steps in the selection process for the studies included in this review according to the PRISMA recommendation.

Figure 1: Adapted Prism flowchart. Ribeirão Preto, 2020



To extract and analyze data from the articles included in the integrative review, an instrument was used that includes the following items: identification of the original article, methodological characteristics of the study, evaluation of methodological rigor, of the interventions measured and the results found. [13] Data analysis consisted of exploring the material after detailed readings of the articles and their synthesis was performed in a descriptive way.

The works included in the review were also analyzed in Levels of Evidence (NE), which the author classifies the quality of studies in seven levels: Level I (systematic reviews or meta-analysis of clinical study with randomization); Level II (clinical study with randomization); Level III (clinical study without randomization); Level IV (cohort study and case control); Level V (systematic review of descriptive/qualitative studies); Level VI (descriptive/qualitative studies); Level VII (expert opinion). According to this classification, levels I and II are considered strong evidence, levels III and IV are considered moderate evidence and levels V to VII are weak evidence. [14]

RESULTS

A total of 13 studies were selected to integrate this review, three (23%) of Cohort, 8 (61,5%) with a quantitative approach and two (15,5%) descriptive.

Regarding the origin of the studies, only one (7,6%) was developed in Brazil, the other 12 are distributed between China (7,6%), Israel (7,6%), Malawi (7,6%), United States (7,6%) South Africa (7,6%), India (7,6%), two (15,3%) in Italy, two (15,3%) England and two (15,3%) studies are multicentric, in which one was carried out in France and Morocco and another screening program involving 80 different countries. All were published in the English language (100%).

Regarding the levels of evidence, 10 studies were classified as level VI (77%) and 3 (23%) were classified as level IV,

which suggests that most of the articles analyzed presented levels of evidence considered weak, indicating the need for development of studies with stronger levels of evidence, capable of supporting safe and effective practices. [12] Chart 1 describes the articles selected in the sample according to title, authors, year of publication, main objective, type of study and main results/conclusion.

DISCUSSION

Blood pressure screening studies carried out in several countries highlight its importance for awareness, early detection, control and prevention of elevating blood pressure values. To identify the diagnosis, treatment and control of AH and, at the same time, the screening contribute to reduce risks for CVD.

Chart 1 - Articles selected according to authors, year of publication, main objective, type of study and main results.

AUTORES/ ANO	OBJETIVO/TIPO DE ESTUDO	RESULTADOS
Omboni S, Verberk WJ. 2019 [15].	Testar se um monitor de pressão automático oscilométrico que permite a medição simultânea da pressão arterial entre os braços. Quantitativo	Indivíduos com diferença significativa de pressão arterial anormal entre braços foram entre pessoas mais velhas, que apresentaram maior índice de massa corporal, maiores níveis de PA e foram mais propensos a relatar obesidade, história de HA ou DCV do que indivíduos com diferença de pressão entre braços normal. A medição simultânea da PA em ambos os braços deve ser realizada em indivíduos com risco para ou com DCV estabelecida.
Balsari S. et al. 2017 [16]	Realizar um programa de rastreamento de HA. Quantitativo	No Kumbh, 5760 pessoas optaram voluntariamente pelo rastreamento da HA e receberam uma única medida da pressão arterial. No total, 1783 apresentaram um rastreamento positivo, dos quais 1580 desconheciam previamente seu diagnóstico; 55 (18%) tiveram leituras normais da pressão arterial. Estudo demonstra que o rastreamento comunitário para HA não costuma consumir muitos recursos, precisa de pouca infraestrutura e treinamento e geralmente é econômica.
Goldberg E. M. et al. 2017 [17]	Avaliar a confiabilidade da pressão arterial do rastreamento de emergência e determinar se a identificação correta varia de acordo com gênero, raça ou qualidade da mensuração. Coorte	Dos 354 pacientes de unidade de emergência participaram do estudo com idade mediana de 39 anos, sendo 48,9% mulheres, 66,4% brancos e 17% negros. De todos os participantes 66,1% apresentaram resultados da pressão arterial ≥ 120/ 80 mmHg.. Dois terços dos pacientes sem diagnóstico de HA apresentaram pressão arterial acima do limiar de 120/ 80mmHg em rastreamento.
Beaney T. et al. 2018 [18]	Aumentar a conscientização sobre os valores da pressão arterial elevados. Quantitativo, transversal	Foram coletados dados de 1.201.570 indivíduos em 80 países. Desses, 34,9% indivíduos apresentavam hipertensão. 17,3% de 888.616 indivíduos que não estavam recebendo tratamento anti-hipertensivo eram hipertensos e 105.456 (46,3%) dos 227.721 indivíduos que receberam tratamento não tinham pressão arterial controlada. A campanha identificou mais de 335.000 adultos com HA controlada e não controlada não tratada ou inadequadamente tratada.
Bar-Dayan Y. et al. 2016 [19]	Avaliar a eficácia de uma operação de rastreamento de disglicemia, diabetes e alterações na pressão arterial em uma estação de saúde e ambiente público. Quantitativo, transversal	13.112 adultos foram submetidos ao rastreamento, dos quais 16,9% relataram diabetes e 23,2% hipertensão. Já entre os que não tinham conhecimento de hipertensão 9,6% possuíam níveis pressóricos elevados (≥140 / 90). O rastreamento pôde identificar indivíduos com altos níveis de pressão arterial e risco de disglicemia que foram encaminhados para diagnóstico e tratamento.
Handler, J. et al. 2015 [20]	Identificar a prevalência e características de pacientes com pressão arterial elevada na atenção não- primária em comparação com as visitas de cuidados primários. Coorte	Adultos normotensos com pelo menos 12 meses de adesão ao plano de saúde em 1 de janeiro de 2009 (n = 1.075.522) foram acompanhados para PA elevada até 14 de março de 2011. Dos 111.996 pacientes com PA ≥140 / 90 mm Hg, 82,7% foram medidos durante as visitas de cuidados primários e 17,3% durante as visitas de cuidados não primários.
Kachimanga, C. et al 2017 [21]	Analisar três programas de rastreamento para HA e diabetes implantados diretamente na comunidade de Neno, Malawi. Descritivo	Mais de 14.000 adultos (≥ 12 anos) foram rastreados, dos quais 58% foram rastreados para HA e 9% encaminhados para avaliação adicional. Desde o início do programa de rastreamento o número de pacientes em tratamento de DCNT quase triplicou.

Chen, S. et al. 2019 [22].	Estimar o impacto do rastreamento da pressão arterial baseado na comunidade sobre os níveis subsequentes de pressão arterial entre adultos mais velhos na China. Coorte	A amostra inicial foi composta por 6010 pessoas. Foram excluídas 437 pessoas, e entre os 5573 participantes restantes, 3899 (70%) tinham HA não diagnosticada. A intervenção reduziu a pressão arterial sistólica: -6,3 mmHg. O impacto na pressão arterial diastólica foi menor e não significativo.
Poulter, N. R. et al. 2017 [23]	Destacar a importância da avaliação da pressão arterial elevada. Descritivo	Como resultado dos exames da campanha de rastreamento, pode-se prever que um número significativo de novos adultos hipertensos será detectado, e se a pressão arterial for reduzida em apenas 10 mmHg em média, isso reduzirá a morbimortalidade cardiovascular em cerca de 25%. É esperado que a campanha fortaleça a capacidade de causar um grande impacto na prevenção, tratamento e controle da hipertensão mundial.
Destro, M. et al. 2015 [24]	Avaliar a prevalência de HA e avaliar outros fatores de risco cardiovasculares. Quantitativo	Entre maio de 2011 e maio de 2014, 1540 indivíduos foram avaliados, 890 declarados normotensos e 650 declarados hipertensos. De todos, 1137 apresentaram PA <140/ 90 mmHg, entre eles 408 individuos eram declarados hipertensos. Pressão Arterial >140 / 90 mmHg foi observada em 403 indivíduos. Esses resultados representam maior risco cardiovascular em indivíduos hipertensos do que normotensos.
Rheeder, P. et al. 2016 [25]	Melhorar a detecção e o manejo de DCNT em ambientes urbanos e rurais negligenciados. Quantitativo	Foram rastreados 7607 pessoas, dos quais 37,1% apresentaram resultados de pressão arterial em valor ≥ 140 mmHg na PA sistólica e ≥90 mmHg na PA diastólica. 8,3% apresentaram níveis aleatórios de glicose capilar aleatórios ≥ 7,8 mmol / l. Ao final da pesquisa a procura dos membros da comunidade em rastreamento por uma confirmação diagnóstica foi menor do que a esperada, o que mostrou pouca efetividade da conscientização sobre as DCNT.
Risse, J. et al. 2015 [26]	Avaliar uma estratégia de rastreamento da pressão arterial elevada para pacientes hipertensos que desconhecem o diagnóstico ou não o realizam. Quantitativo	Participaram 1011 na França e 299 pessoas em Marrocos. Foi identificado uma porcentagem muito alta de pacientes hipertensos não tratados em Marrocos (70,2%) e França (25,7%). Na França, 40,2% dos que apresentaram uma PA ≥ 135/85 mmHg procuraram um médico após o rastreamento.
Jardim, T. et al. 2015 (27).	Comparar as diferenças nas taxas de prevalência, conscientização, tratamento e controle da HA. Quantitativo	Foram incluídos 1000 indivíduos. A prevalência de HA foi maior nos homens (34,6%) do que nas mulheres (27,2%). Entre os hipertensos, 62,5% tinham conhecimento de seu diagnóstico, 82,4% estavam em tratamento e 60,0% tinham pressão arterial controlada.

Source: prepared by the author, 2020.

Thus, with the objective of increasing the population's awareness and the control of AH, it was created in partnership with the World Hypertension League, in English, World Hypertension League (WHL) and the International Hypertension Society, in English, International Society Hypertension (ISH), World Hypertension Day, in English, "World Hypertension Day" (WHD) "May 17th", which became the standardized month of May as the month of global blood pressure measurement. [28]

One of the main challenges encountered in establishing worldwide prevention is the standardization of blood pressure screening programs. The WHL and ISH recognize that there are complex challenges to early detection, prevention and control of AH and proposes that screening should be done based on rigorous blood pressure measurements and awareness of NCDs in the community. (28,29) These programs must emphasize the rigor along the steps of the BP measurement procedure, using validated devices, as recommended by national and international guidelines. [3,29]

Thus, it is worth highlighting important points for carrying out blood pressure screening programs: the team of volunteers who will be responsible for collecting data must be properly trained and receive standardized blood pressure measurement training, the result of blood pressure measurement should be by means of the average of the last two measures. Participants should receive health guidance, at a minimum on dietary and lifestyle advice to reduce BP. [23]

Blood pressure screening programs have been carried out for the control and prevention of AH, in which they provide a cost-effective and endorsed intervention by the WHL to improve rates of detection, control and treatment of AH, with the aim of reducing morbidity and cardiovascular mortality. [30] The studies identified in this review demonstrate the effectiveness of screening programs worldwide.

In India, a tracking was performed using the electronic device Omron

HEM8712, and a single measurement was performed per person, where those who had a BP value ≥ 140 mmHg (systolic) and / or ≥ 90 mmHg (diastolic), were informed to undergo medical monitoring since a single reading is not amenable to diagnosing AH. The results of this study showed that 5760 people were screened, of which 1783 had AH, of which 1580 were unaware of the diagnosis. The low rates of awareness, treatment and control of AH underscore the ongoing challenge of screening and treating AH in India. [16]

Tracking developed in the United States, performed a tracking that sought to identify important BP measurement variables such as (≥120/80 mmHg; ≥140/90 and ≥160/100 mm Hg) using a high precision BpTRU device, this device discounts the initial measurement and takes an average of the last five. In the screening of 354 patients, it can be seen that two thirds of patients without a diagnosis of AH had BP above the threshold of 120/80mmHg in screening using the BpTRU device. The arm with the highest BP value was chosen, according to the instructions contained in the BpTRU manual, and a sequence of 5 measurements was performed with an interval of 1 minute, taking the average of the measurements. [17]

Another globally standardized screening performed using digital sphygmomanometers (OMRON), and through this campaign it was possible to identify that more than a quarter (33,4%) of the participants were hypertensive with more than half (59,5%) aware of their diagnosis and 55,3% underwent drug treatment. In addition, 335.000 untreated hypertensive patients or inadequate treatments were identified. [18]

In a study carried out in Malawi, 3 NCD screening programs with a focus on AH and diabetes were analyzed in a public health system, with people waiting for outpatient care and in a clinic. This link between the service already provided, the outpatient or clinic, with the screening program proved to be viable and with positive results in the focus of the user's proximity to the health service. [21]

In a screening conducted in China with 3899 elderly people without a previous diagnosis of AH, professionals were trained to perform the measurement with a mercury sphygmomanometer on the right arm, thus using a screening standard. Those who showed altered values during home measurement were instructed to undergo medical follow-up and change their lifestyle habits, proving in two years that actions like these have a positive long-term impact. [22]

Screening and searching for patients without knowledge of their diagnosis is a way to prevent complications from NCDs.

A study conducted in Israel created a station in a public environment with non-hospitalized people showed the effectiveness of this service, thinking that preventive medicine cannot always achieve its purposes because there is no search for health services. The main objectives of this station were: to perform dysglycemia, diabetes and blood pressure changes; bringing the local community closer to the health service in a more informal way. Preventive health care is important in health practice and can bring significant improvements to the population. [20]

In Italy, he also used the extra-hospital environment technique, but in order to assess the prevalence of AH and other CVDs, bringing the expected result where hypertensive patients have a higher cardiovascular risk. [24]

In Switzerland in 2015, a study was developed that showed that the use of extra-hospital spaces is indeed effective in tracking hypertensive patients. Therefore, it can be concluded that the development of new strategies designed outside the hospital environment, that would target undiagnosed hypertensive patients or those with incorrect treatment, should be developed, in addition to the focus on preventing other complications arising from these diseases. [26]

Screening and searching for patients without knowledge of their diagnosis is a way to prevent complications from NCDs. To achieve this, it was proposed in Johannesburg to implement a project that carried out the tracking of home visits in a suburb. At the end, it was found that a smaller number of people than expected sought the health service for diagnostic confirmation of hypertension and hyperglycemia, which shows a failure to perform the screening done initially. [25]

With regard to BP measurement, a study points out the importance of BP measurement in both arms, since an abnormal difference between the arms in BP is associated with an increased risk of vascular abnormalities and CVD. Double arm measurement not only helps to highlight potential cardiovascular risk factors, but can also improve the diagnosis of AH in general. And such a measure must be carried out in an appropriate way to obtain reliable results. [15,31]

In the present study, 10% of the subjects appeared to have high blood pressure in one arm (usually the dominant arm), but not in the other. Thus, they concluded that the failure to measure the double arm can therefore lead to a

failure to detect important cardiovascular risk factors, including the diagnosis of AH. [15]

A survey to determine the effectiveness of intervention on blood pressure, cholesterol and CVD education in college freshmen, carried out a BP screening, in which the 25 participants had their blood pressure measured three times in the non-dominant arm with a digital pressure monitor arterial valve validated by HEM-907X and an appropriately sized cuff. Mean systolic and diastolic BP was calculated from the last two measurements. [32]

Three visits were made to the study, the first of which consisted of answering questionnaires, providing a blood sample and measuring blood pressure. The second visit was an educational awareness session and the third was a repeat of the first, which occurred approximately two months after the first visit. At the end of the study, they identified the importance of health education and changes in habits to reduce blood pressure and cholesterol, as these resulted in strong risk factors for CVD. [32]

In Brazil, a survey that evaluates the adherence and quality of treatment for AH comparatively between men and women, showed that although the prevalence of the disease is higher in males, females are part of the group with the highest adherence and search for knowledge of their diagnosis and disease control. [27]

One of the main steps for people to seek health care is to raise awareness of AH, and only then can they gain control and changes in lifestyle. [22,33] Studies suggest that screening programs can improve detection and contribute to the control and prevention of AH. However, for an adequate screening approach, an effective system is necessary to ensure adequate monitoring if abnormal blood pressure is detected. [20,34] AH screening programs may allow for exclusive investigations at national, regional, ethnic and global levels related to clinical blood pressure measurement. [31]

CONCLUSION

Blood pressure screening program is a low cost and highly effective strategy for early identification of AH, preventing and controlling high blood pressure levels, both in developed and developing countries.

The study allowed an exploration of HA screening in several countries and each highlighted the importance of tracking high blood pressure values, to work on the prevention, control and awareness of HA and its risk factors.

New studies on the subject are suggested, so that more HA screening programs can be carried out and thus a greater number of people screened and made aware, in order to reduce cardiovascular risks. ■

REFERENCES

1. Christofoletti M, Del Duca GF, Gerage AM, Malta DC. Simultaneidad de enfermedades crónicas no transmisibles en 2013 en las capitales brasileñas: prevalencia y perfil demográfico. Epidemiol. Serv. Saúde. 2020;29(1). Doi: 10.5123/S1679-49742020000100006

2. Malta DC, Bernal RTI, Lima MG, Araújo SSC, Silva MMA, Freitas MIF. et al. Doenças crônicas não transmissíveis e a utilização de serviços de saúde: análise da Pesquisa Nacional de Saúde no Brasil. Rev. Saúde Públ. 2017b; 51(Supl 1):4s. Doi:10.1590/s1518-8787.2017051000090

3. Sociedade Brasileira de Cardiologia. 7ª Diretriz Brasileira de Hipertensão Arterial. Arq Bras Cardiol [Internet]. 2016 [citado 2018 Dez 06]. 107(3Supl.3):1-83.Disponível em: http://publicacoes.cardiol.br/2014/diretrizes/2016/05_HIPERTENSAO_ARTERIAL.pdf

4. Dias EG, Almeida FG, Caires HLD, Santos TAS, Antunes Jorge S, Mishima SM. Evaluation of a Family Health Strategy about the promotion of adherence to treatment and control of hypertension under the optics of the elderly. J Health Sci Inst [Internet]. 2016 [cited 2020 jan 06];34(2):88-92. Available from: https://www.unip.br/presencial/comunicacao/publicacoes/ics/edicoes/2016/02_abr-jun/V34_n2_2016_p88a92.pdf

5. Oliveira TMF, Almeida TCF. Adequação do manguito durante a medida da pressão arterial: uma revisão integrativa. Ciência e Saúde, 8(1):35-41, 2015. Doi: 10.15448/1983-652X.2015.1.19419

6. Nerenberg KA, Zarnke KB, Leung AA, Dasgupta K, Butalia S, McBrien K. et al. Hypertension Canada Guidelines for Diagnosis, Risk Assessment, Prevention, and Treatment of Hypertension in Adults and Children. Canadian Journal of Cardiology, 34(5):506-25, 2018.

7. Seabra CAM, Xavier SPL, Sampaio YPCC, Oliveira MF, Quirino GS, Machado MFAS. Health education as a strategy for the promotion of the health of the elderly: an integrative review. Rev. Bras. Geriatr. Gerontol. 2019;22(4) Doi:10.1590/1981-22562019022.190022

8. Rêgo AS, Laqui VS, Trevisan FG, Jaques AE, Oliveira RR, Radovanovic, CAT. Factors associated with inappropriate blood pressure in hypertensive patients. Cogitare Enferm. 2018; 1(23):e54087. Doi: 10.5380/ce.v23i1.54087

9. Mendes KDS, Silveira RCCP, Galvão CM. Revisão integrativa: método de pesquisa para a incorporação de evidências na saúde e na enfermagem. Texto Contexto Enferm 2008; 17(4):758-64. Doi: 10.1590/S0104-07072008000400018.

10. Considine J; Shaban RZ, Fry M, Curtis K. Evidence based emergency nursing: designing a research question and searching the literature. International Emergency Nursing. 2017; 32:78-82. doi:10.1016/j.ienj.2017.02.001.

11. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A.

REFERENCES

Rayyan - a web and mobile app for systematic reviews. Syst Rev. 2016;5:210.

12. Galvão TF, Pansani TSA. Principais itens para relatar Revisões sistemáticas e Meta-análises: A recomendação Prisma. Epidemiol. Serv. Saúde. 2015;24(2). Doi:10.5123/S1679-49742015000200017

13. Souza MT, Silva MD, Carvalho R. Integrative review: what is it? How to do it? einstein. 2010; 8(1 Pt 1):102-6

14. Melnyk BM, Fineout-Overholt E. Evidence-based practice in nursing and healthcare. A guide to best practice. 2 edition Philadelphia:Wolters Kluwer, Lippincott Williams and Wilkins, 2011.

15. Omboni S, Verberk WJ. Simultaneous double arm automated blood pressure measurement for the screening of subjects with potential vascular disease: a community study. Blood Press. 2019;28(1):15-22. doi: 10.1080/08037051.2018.1539619.

16. Balsari S, Vemulapalli P, Gofine M, Oswal K, Merchant R, Saunik S. et al. A retrospective analysis of hypertension screening at a mass gathering in India: implications for non-communicable disease control strategies. J Hum Hypertens. 2017;31(11):750-753. doi: 10.1038/jhh.2017.54.

17. Goldberg E. M. , Wilson T, Saucier C, Brody AM, Levy PD, Eaton CB. et al. Achieving the BpTRUth: emergency department hypertension screening and the Centers for Medicare & Medicaid Services quality measure. J Am Soc Hypertens. 2017;11(5):290-294. doi: 10.1016/j.jash.2017.03.003.

18. Beaney T, Schutte AE, Tomaszewski M, Ariti C, Burrell LM, Castillo RR. et al. May Measurement Month 2017: an analysis of blood pressure screening results worldwide. The Lancet. 2018; 6(7):E736-E743. Doi: 10.1016/S2214-109X(18)30259-6

19. Bar-Dayan Y, Boaz M, Landau Z, Zeev F, Jakubowicz D, Wainstein J. Using a public health station for screening of undiagnosed dysglycemia and hypertension Prim Care Diabetes. 2016 Oct;10(5):324-8. Doi: 10.1016/j.pcd.2016.02.001.

20. Handler J, Mohan Y, Kanter MH, Reynolds K, Li X, Nguyen M. et al. Screening for High Blood Pressure in Adults During Ambulatory Nonprimary Care Visits: Opportunities to Improve Hypertension Recognition. J Clin Hypertens (Greenwich).2015;17(6):431-9. Doi: 10.1111/jch.12517.

21. Kachimanga C, Cundale K, Wroe E, Nazimera L, Jumbe A, Dunbar E. et al. Novel approaches to screening for noncommunicable diseases: Lessons from Nono, Malawi. Malawi Med J. 2017;29(2):78-83. doi: 10.4314/mmj.v29i2.1.

22. Chen S, Sudharsanan N, Huang F, Liu Y, Geldsetzer P, Bärnighausen T. Impact of community based screening for hypertension on blood pressure after two years: regression discontinuity analysis in a national cohort of older adults in China. BMJ. 2019; 366. Doi: 10.1136/bmj.l4064

23. Poulter NR, Schutte AE, Tomaszewski M, Lackland DT. May Measurement Month: a new joint global initiative by the International Society of Hypertension and the World Hypertension League to raise awareness of raised blood pressure. J Hypertens. 2017 May;35(5):1126-1128. doi: 10.1097/HJH.0000000000001346.

24. Destro M, Dognini GP, Pozzi A, Cagnoni F, Galimberti VC, C Cavalleri. et al. Hypertension and cardiovascular risk factors: a shot on northern Italy population in real life setting. J Hypertens. 2015; 33(Suppl 1). Doi: 10.1097/01.hjh.0000467536.84037.ae

25. Rheeder P, Muthembe T, Lawson S, Brink J. Diabetes and hypertension in Zandspruit, Johannesburg 2012–2014. J South African Family Practice. 2016;58(6):219-224. Doi:10.1080/20786190.2016.1198089

26. Risse J, Laurière, E, Iraqi M, Fay R, Burnier M, Boivin JM . Screening for Hypertension in the Barbershop: A Franco-Moroccan feasibility study (The DECOIFFA study). J Hypertens. 2015; 33:e69. Doi: 10.1097/01.hjh.0000467534.06908.a5

27. Jardim T, Neiva T, Rodrigues R, Arantes A, Barros C, Chinem B. et al. Diferences in prevalence, awareness, tratament and control rates of hypertension between male and female. J Hypertens. 2015;33:e69. Doi: 10.1097/01.hjh.0000467535.06908.ec

28. Campbell NRC, Lackland DT, Lisheng L, Zhang XH, Peter M. Nilsson, Niebylski ML. et al. The World Hypertension League: where now and where to in salt reduction. Cardiovasc Diagn Ther. 2015; 5(3): 238–242. Doi: 10.3978/j.issn.2223-3652.2015.04.08

29. Nerenberg KA, Zarnke KB, Leung AA, Dasgupta K, Butalia S, McBrien K. et al. Hypertension Canada's 2018 Guidelines for Diagnosis, Risk Assessment, Prevention, and Treatment of Hypertension in Adults and Children. Canadian Journal of Cardiology. 2018;34(5):506e525. Doi: 10.1016/j.cjca.2018.02.022

30. Mangat BK, Campbell N, Mohan S, Niebylski ML, Khalsa TK, Berbari AE et al. Resources for Blood Pressure Screening Programs in Low Resource Settings: A Guide From the World Hypertension League. J Clin Hypertens. 2015;17(6) :418-20. Doi: 10.1111/jch.12499.

31. Destefano RM, Schmitt FRA, Starke S, Santa Helena ET. Adequacy of sphygmomanometer cuff to brachial circumference of people attended in Primary Health Care Centers. Rev B ras Epidemiol. 2017; 20(1):81-90. Doi: 10.1590/1980-5497201700010007.

32. Melnyk J, Panza G, Zaleski A, Taylor B. Awareness and Knowledge of Cardiovascular Risk Through Blood Pressure and Cholesterol Testing in College Freshmen. Am J Health. 2015;46(3). doi: 10.1080/19325037.2015.1023474.

33. Oliveira PTG, Almeida JM. Healthy living group: lifestyle change analysis of patients with systemic arterial hypertension and type 2 diabetes. Rev Fac Ciênc Méd Sorocaba. 2018;20(3):142-9. Doi: 10.23925/1984-4840.2018v20i3a5

34. Beaney T, Schutte AE, Stergiou GS, Borghi C, Burger D, Charchar FJ. et al. May Measurement Month 2019: The Global Blood Pressure Screening Campaign of the International Society of Hypertension. Hypertension. 2020. Doi: 10.1161/HYPERTENSIONAHA.120.14874