Medical Science

pISSN 2321–7359; eISSN 2321–7367

Awareness, knowledge of healthy lifestyle behaviours related to hypertension among secondary schools teachers in KSA

Mohammad Saeed Alshahrani[1], **Aziz Jarman M Alsubaie**[2], **Alla Musaed Alnooh**[3], **Majed Shuraya M Alshaharani**[2], **Raghad Khalid Alammari**[4*], **Abdulrahman Saad F Alshahrani**[2], **Mohammed Mihmas B Alqahtani**[2], **Abrar Hassan M Alnujaidi**[5], **Eman Ali A Alzain**[5], **Ahmed Abdulrahman Alolah**[6]

To Cite:
Alshahrani MS, Alsubaie AJM, Alnooh AM, Alshaharani MSM, Alammari RK, Alshahrani ASF, Alqahtani MMB, Alnujaidi AHM, Alzain EAA, Alolah AA. Awareness, Knowledge of Healthy Lifestyle Behaviours Related to Hypertension among Secondary Schools Teachers in KSA. Medical Science 2022; 26: ms274e2352.
doi: https://doi.org/10.54905/disssi/v26i125/ms274e2352

Authors' Affiliation:
[1]Assistant Professor and Consultant of Family Medicine, Ministry of Health, Riyadh, Saudi Arabia
[2]College of Medicine, University of Bisha, Bisha, Saudi Arabia
[3]College of Medicine, Alfaisal University, Riyadh, Saudi Arabia
[4]College of Medicine, Almaarefa University, Riyadh, Saudi Arabia
[5]College of Medicine, Medical University of Silesia, Katowice, Poland
[6]College of Medicine, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia

[*]**Corresponding Author**
College of Medicine, Almaarefa University, Riyadh, Saudi Arabia
Email: Raghadkhaleda@gmail.com

Peer-Review History
Received: 14 June 2022
Reviewed & Revised: 15/June/2022 to 02/July/2022
Accepted: 05 July 2022
Published: 08 July 2022

Peer-review Method
External peer-review was done through double-blind method.

URL: https://www.discoveryjournals.org/medicalscience

DISCOVERY SCIENTIFIC SOCIETY

ABSTRACT

Background: Hypertension is a chronic disease attributed to underlying multifactorial causes. Awareness and management of modifiable risk factors of hypertension can increase the quality of life and health outcomes. *Aim:* Assessment of knowledge of secondary school teachers in KSA regarding the association between hypertension and lifestyle habits and daily behaviours. *Methodology:* A Cross-Sectional research targeting secondary school teachers in Saudi Arabia. The study period was from March 2022 to May 2022. An online questionnaire was distributed; data was gathered with a pre-structured data collection tool. The survey tool was used after an intensive literature review and expert's consultation. A pilot study on 25 teachers evaluated tool applicability, clarity and reliability with α-Cronbach of 0.71. *Results:* The study was conducted on 400 Saudi teachers, averaging 41.1 ± 7.9 years old. The study showed that 243 (60.8%) were interested in raising awareness regarding high blood pressure, and 39.3% participated in hypertension educational activities. A percentage of 79.5% of teachers were well educated in regards to high blood pressure, and 62.3% had given a precise definition of it. A total of 73.8% have stated the correlation between hypertension and diet. Moreover, 76.8% understand the importance of treatment compliance. *Conclusions:* In conclusion, secondary school teachers in Saudi Arabia were found to be well educated about hypertension, its risk factors, symptoms, outcomes, and complications. Teachers with a family history of hypertension were found to have more knowledge regarding hypertension.

Keywords: hypertension, risk factors, lifestyle, knowledge, attitude, teachers, Saudi Arabia.

1. INTRODUCTION

Hypertension is considered the main risk factor for cardiovascular diseases (CVDs) with a rising incidence and improper control, mainly in developing countries (Ibrahim & Damasceno, 2012). In developed countries, hypertension is the fourth factor causing premature death, and the seventh factor in developing countries (Boateng et al., 2017). Globally, nearly one billion people are diagnosed with hypertension causing approximately nine million deaths (Whelton, 1994). Prevention of hypertension is practicable in cases of improving awareness and knowledge of its associated risk factors and this could minimize hypertension associated high morbidity and mortality (Haldar, 2013). Hypertension and other cardiovascular diseases are primarily a lifestyle disease, adjustment of the risk factors needs knowing these risk factors followed by initiation of a knowledgeable focused change in lifestyle behaviours, otherwise reducing one's hazard for hypertension and other CVD is unachievable (Hendriks et al., 2012; Damasceno et al., 2009; Elsheikh et al., 2021). It has been assumed that personal risk awareness for a disease such as cardiovascular diseases including hypertension is essential for commit preventative behaviours and prevents serious complications (Forman, 2009; Hammond et al., 2007; Reiner et al., 2010).

2. METHODOLOGY

A Cross-Sectional questionnaire-based research was done targeting secondary school teachers in Saudi Arabia during the study period from March 2022 to May 2022. Teachers at administrative positions, and those who refused to participate were excluded while teachers for at least 1 year teaching experience were included. A cross-sectional design with a stratified multistage cluster sample technique was used. Stratification will be according to the type of school (Governmental vs. private). In the first stage, two districts within each region were randomly selected. At second stage, 2 governmental and 1 private schools within each district were randomly selected from each region. At third stage, all eligible teachers available within the selected schools were invited to participate in the study. A total of 376 (rounded to 400) teachers are required to assess average knowledge level regarding risk factors of hypertension of 40% (Muntner et al., 2020; Cutler et al., 2008) with precision of 7% at 95% confidence level and design effect of 2. After obtaining permission from Institutional ethics committee, data collection will start. Data will be collected from teachers using online self-administered pre- structured data collection tool. Study participants are expected to fill the survey and return it in the envelope sealed with no identifiers. The cover letter served as the front pages that explained the purpose of the study and invited the teachers to participate voluntarily and at his/her own leisure. The researchers constructed the survey tool after intensive literature review and expert's consultation. A pilot study on 25 teachers was conducted to assess tool applicability, clarity and reliability with α-Cronbach's of 0.71.

Data analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was statistically significant. In order to evaluate knowledge and awareness, all answers were calculated, a one point score was given for each correct answer for each awareness domain (general knowledge and awareness, clinical symptoms, and complications). A result of 60 percent and less was considered as poor awareness and knowledge; whereas a teacher with a score of 60 percent and more means that the teacher is well aware and knowledgeable in hypertension.

Descriptive analysis was done on percent distribution and frequency, including all aspects such as; teachers' socio-demographic data, school type, and experience in training for high blood pressure control. Also, teacher's medical and family history for hypertension and other co-morbidities were tabulated. Teachers' knowledge and awareness items regarding hypertension and life style changes were also tabulated and graphed. Besides, participants' Perceived attitude of the study teachers regarding hypertension and importance of life style changes was displayed by frequency and distribution analysis. Cross tabulation was done to evaluate Factors associated with teachers' knowledge and awareness regarding hypertension and life style changes. Association was assessed by Pearson chi-square test and exact probability test for small frequency distributions.

3. RESULTS

A total of 400 teachers completed the study questionnaire. The age ranges of teachers were between 20 to 60 years of age with mean age of 41.1 ± 7.9 years old. A total of 258 (64.5%) teachers were males and 341 (85.3%) were married. A total of 329 (82.3%) study teachers were at governmental schools and 314 (78.5%) had monthly income of 10000 SR or more. As for teaching experience, it exceeded 5 years among 328 (82%) of the study teachers and 157 (39.3%) reported that they participated in raising awareness about high blood pressure as 243 (60.8%) were interested in high blood pressure awareness activities (table 1).

Table 1 Socio-demographic data of secondary school teachers, Saudi Arabia

Socio-demographic data	No	%
Age in years		
20-29	30	7.5%
30-39	128	32.0%
40-49	177	44.3%
50-60	65	16.3%
Gender		
Male	258	64.5%
Female	142	35.5%
Marital status		
Not married	59	14.8%
Married	341	85.3%
School type		
Governmental	329	82.3%
Private	71	17.8%
Monthly income		
< 10000 SR	86	21.5%
> 10000 SR	314	78.5%
Teaching years of experience		
< 5 years	72	18.0%
> 5 years	328	82.0%
Have you ever participated in raising awareness about high blood pressure?		
Yes	157	39.3%
No	243	60.8%
Are you interested in high blood pressure awareness activities?		
Yes	243	60.8%
No	157	39.3%

Table 2 shows the medical data of secondary school teachers in Saudi Arabia. A sum of 280 (70%) teachers had family history for hypertension. Also, 279 (69.8%) reported that they were diagnosed with hypertension which was essential (primary) among 195 (69.9%) of them while secondary among 84 (30.1%). Also, 170 (42.5%) teachers complained of DM, 66 (16.5%) had other cardiovascular disease, 77 (19.3%) complained of asthma, and hyperthyroidism was reported among 16 (4%) teachers.

Table 2 Medical data of secondary school teachers, Saudi Arabia

Medical data	No	%
Family history of HTN?		
Yes	280	70.0%

No	120	30.0%
Do you diagnose with HTN?		
Yes	279	69.8%
No	121	30.3%
Type of HTN?		
Essential HTN	195	69.9%
Secondary HTN	84	30.1%
Chronic health problems		
DM	170	42.5%
CVD	66	16.5%
Asthma	77	19.3%
Hyperthyroidism	16	4.0%
Others	14	3.5%
None	131	32.8%

Table 3 shows Teachers' knowledge and awareness regarding hypertension, clinical symptoms and complications. A total of 79.5% of the teachers know what high blood pressure is, and 62.3% correctly defined hypertension. A total of 87% know that Smoking / alcohol increase risk for HTN, 67.5% reported that HTN is fatal disease, 75.8% agreed that Exercises are important to control blood pressure, 73.8% told that Foods are important as a cause of hypertension, and 76.8% know that Disease return if treatment stopped. As for symptoms, the most known were headache (56%), followed by nervousness (40.5%), Sleep disturbance / fatigue (39.5%), Nasal bleeding (34%), Tachycardia / chest pain (34%), tinnitus (32%), blurred vision (32%), and abdominal pain (11%) while 20.3% don't know about symptoms. Considering complications associated with HTN, heart attack was the most reported (30.3%), followed by brain shock (25.8%), cardiomegaly (20.5%), chronic renal failure (16.3%), Congestive heart failure (12.5%), and retinopathy (10%) while 55.8% don't know about complications.

Table 3 Teachers' knowledge and awareness regarding hypertension, clinical symptoms and complications

Knowledge and awareness	No	%
Do you know what high blood pressure is?		
Yes	318	79.5%
No	82	20.5%
What is hypertension?		
SBP>140; DBP > 90	249	62.3%
A disease that affects adults more than children	104	26.0%
A disease that occurs due to chronic diseases	152	38.0%
Dont know	73	18.3%
Smoking / alcohol increase risk for HTN		
Yes	348	87.0%
No	52	13.0%
HTN is fatal disease		
Yes	270	67.5%
No	130	32.5%
Exercises are important to control blood pressure		
Yes	303	75.8%
No	97	24.3%
Foods are important as a cause of hypertension		
Yes	295	73.8%
No	105	26.3%
Disease return if treatment stopped		
Yes	307	76.8%

No	93	23.3%
Symptoms of hypertension		
Headache	224	56.0%
Nervousness	162	40.5%
Sleep disturbance / fatigue	158	39.5%
Nasal bleeding	136	34.0%
Tachycardia / chest pain	136	34.0%
Tinnitus	128	32.0%
Blurred vision	128	32.0%
Abdominal pain	44	11.0%
Dont know	81	20.3%
Complications of hypertension		
Heart attack	121	30.3%
Brain shock	103	25.8%
Cardiomegaly	82	20.5%
Chronic renal failure	65	16.3%
Congestive heart failure	50	12.5%
Retinopathy	40	10.0%
Dont know	223	55.8%

Table 4 showed the Perceived attitude of the study teachers regarding hypertension and importance of life style changes. Exact of 96.8% of the study teachers think that consuming less salt is beneficial for controlling high blood pressure, 85.8% think that stopping smoking is an important factor for the control of high blood pressure, 85.5% think that a balanced diet is useful for controlling high blood pressure, 83% believed that exercising regularly is important as a part of management of high blood pressure, 79.5% believed eating vegetables is crucial for the measurement of high blood pressure, 56% think that keeping the body hydrated is useful for high blood pressure, 48% think that taking a dose of vitamin D is also useful and 42.8% think that increasing the intake of calcium can play a role in having a normal blood pressure readings.

Table 4 Perceived attitude of the study teachers regarding hypertension and importance of life style changes

Perceived attitude	Strongly disagree		Disagree		Agree		Strongly agree	
	No	%	No	%	No	%	No	%
Do you think consuming less salt is beneficial for controlling high blood pressure?	3	.8%	10	2.5%	106	26.5%	281	70.3%
Do you think that taking a dose of vitamin D is useful for controlling high blood pressure?	45	11.3%	163	40.8%	156	39.0%	36	9.0%
Do you think that increasing the intake of calcium is beneficial for controlling high blood pressure?	61	15.3%	168	42.0%	122	30.5%	49	12.3%
Do you think that a balanced diet is useful for controlling high blood pressure?	9	2.3%	49	12.3%	137	34.3%	205	51.3%
Do you think that keeping the body hydrated is useful for controlling high blood pressure?	52	13.0%	124	31.0%	147	36.8%	77	19.3%
Do you think stopping smoking is useful for controlling high blood pressure?	14	3.5%	43	10.8%	113	28.3%	230	57.5%
Do you think that exercising regularly is beneficial for controlling high blood pressure?	10	2.5%	58	14.5%	133	33.3%	199	49.8%

Do you think eating vegetables is beneficial for controlling high blood pressure?	14	3.5%	68	17.0%	141	35.3%	177	44.3%

Figure 1 shows the overall teachers' knowledge and awareness regarding hypertension and life style modifications. A total of 109 (27.3%) teachers had good knowledge and awareness level while 291 (72.8%) had poor knowledge level. Table 5 shows the Factors associated with teachers' knowledge and awareness regarding hypertension and life style changes. A total of 36.9% of teachers aged 50-60 years had good knowledge level regarding the disease and associated life style changes compared to 16.7% of others aged 20-29 years with recorded statistical significance (P=.048). Also, 36.6% of teachers who were interested in high blood pressure awareness activities had good knowledge level versus 12.7% of others who did not (P=.001). Additionally, 32.5% of teachers with family history of hypertension had good knowledge in comparison to 15% of others without (P=.001). Other factors were insignificantly associated with teachers' knowledge and awareness level.

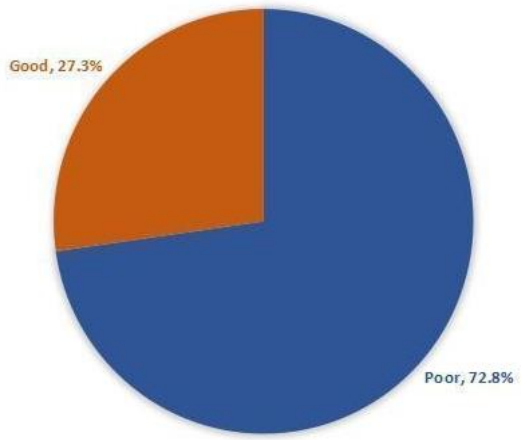

Figure 1 Overall teachers' knowledge and awareness regarding hypertension and life style modifications

Table 5 Factors associated with teachers' knowledge and awareness regarding hypertension and life style changes

Factors	Knowledge level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					
20-29	25	83.3%	5	16.7%	
30-39	92	71.9%	36	28.1%	.048*$
40-49	133	75.1%	44	24.9%	
50-60	41	63.1%	24	36.9%	
Gender					
Male	185	71.7%	73	28.3%	.527
Female	106	74.6%	36	25.4%	
Marital status					
Not married	45	76.3%	14	23.7%	.511
Married	246	72.1%	95	27.9%	
School type					
Governmental	235	71.4%	94	28.6%	.201
Private	56	78.9%	15	21.1%	
Teaching years of experience					.444
< 5 years	55	76.4%	17	23.6%	

> 5 years	236	72.0%	92	28.0%	
Have you ever participated in raising awareness about high blood pressure?					.271
Yes	119	75.8%	38	24.2%	
No	172	70.8%	71	29.2%	
Are you interested in high blood pressure awareness activities?					.001*
Yes	154	63.4%	89	36.6%	
No	137	87.3%	20	12.7%	
Family history of HTN?					
Yes	189	67.5%	91	32.5%	.001*
No	102	85.0%	18	15.0%	
Do you diagnose with HTN?					.331
Yes	199	71.3%	80	28.7%	
No	92	76.0%	29	24.0%	
Other co-morbidities					
Yes	191	71.0%	78	29.0%	.261
No	100	76.3%	31	23.7%	

P: Pearson X^2 test *$: Exact probability test*

** P < 0.05 (significant)*

4. DISCUSSION

In the past few years, hypertension prevalence showed increased trend in developing countries including Saudi Arabia (Alm-Roijer et al., 2004). In spite of the improvement in awareness conception and the flood of information on hypertension internationally, the knowledge of the people about hypertension and related life style still remains significantly insufficient as the people indulge in activities and behaviours that predispose them to the condition (Cubbin & Winkleby, 2005). In fact, teachers live lifestyles and show attitudes such as sedentary lifestyles, smoking cigarette, poor dieting habits contribute to the rising levels of hypertension predisposition. Among all the risk factors for hypertension, stress is the indication in the determination of the disease progress (Meischke et al., 2000). Teaching career is one among the stressful jobs and can be classified as occupation at high risk for hypertension (Muntner et al., 2020; Cutler et al., 2008). Also, studies to evaluate the awareness of risk factors, life style modifications and preventive practices on hypertension particularly among school teachers were very few in Saudi Arabia where the magnitude of the problem is not low.

The current research objective is to evaluate awareness, knowledge of healthy lifestyle behaviours related to hypertension among Secondary schools' teachers in Saudi Arabia. The study showed that less than three quarters (70%) of the teachers had a family history of hypertension and also more than two-thirds (69.8%) were diagnosed with HTN. Regarding teachers' knowledge and awareness of hypertension, about one-fifth of the study teachers had good knowledge and awareness regarding HTN and related life style. In more details, more than three-quarters (79.5%) of the teachers correctly knows about the level of high blood pressure, and two-thirds correctly defined hypertension. Vast majority of the teachers (87%) know that Smoking / alcohol increase risk for HTN, while about two-thirds reported that HTN is fatal disease. Also, three-quarters of the teachers agreed that exercises are important to control blood pressure, and also foods are important as a cause of hypertension, and besides that they know disease return if treatment stopped. As for symptoms, the most known were headache (56%), followed by nervousness, Sleep disturbance / fatigue, Nasal bleeding, Tachycardia / chest pain, tinnitus, and blurred vision. Considering complications associated with HTN, heart attack was the most reported, followed by brain shock, cardiomegaly, chronic renal failure, Congestive heart failure, and retinopathy while more than half of them don't know about complications.

Knowledge was significantly higher among teachers who were interested with blood pressure disorder, and teachers with family history of HTN. Annadurai (2018) reported that 7.8% of the teachers had high knowledge score on hypertension which is much lower than our study estimated level only 2.9% of the teachers were smokers. Around 19.4% were doing one or other type of physical activity. Also, vast majority of the participants (92.2%) measured their blood pressure at least once in the past and 37.9% were cautious about their daily salt intake. In fact, the reported risk factors of hypertension were smoking cigarette (31.5%), consumption of alcohol (43.4%), intake of salt (59.6%) and a sedentary lifestyle (60.6%) nearly 15.8% know that they were hypertensive. About 41% consume alcohol. Increase of salt consumption was found in 7.9%, approximately one-tenth (9.4%) smoke cigarette and 27.1% have hypertension running in the family (Al-Asadi & Ali, 2009) assessed the frequency of lifestyle risk factors among the study population were physical inactivity (67.7%), overweight (40.9%), obesity (37.7%), contraceptive pills use (18.6%), salty diet (18.1%), fatty diet (15.4%), drugs intake (mostly non-steroidal anti-inflammatory drugs) (12.4%), coffee intake (6.5%), and smoking (0.5%).

Bernard et al., (2021) found that less than half (49.3%) of the participants correctly defined hypertension by increased force of blood through the blood vessels while 90.8% think that having of antihypertensive drugs can control hypertension. Also, the study showed that about 92.2% recognized exercise as a significant factor in controlling hypertension and 32.7% reported using herbal preparations to control their hypertension. None of the demographic variables were associated with lifestyle practices among government school teachers with hypertension. In Saudi Arabia, a study in Jeddah, Bakhsh et al., (2017) revealed that the awareness level about hypertension was high among most cases (72.6%) and knowledge level was about 54.7% which is much higher that estimated in the current study which may be explained by that the study participants were cases who had more concern about the disease and its related factors. As for self-care practices level, it was below average (74.4%). This study concluded that older age groups (50 years of age and older) are less educated on hypertension risk factors, symptoms, and complications. Moreover, illiterate people are found to have poor awareness and knowledge in regards of hypertension.

5. CONCLUSIONS AND RECOMMENDATIONS

In conclusion, this paper revealed that about one out of each five teachers was knowledgeable regarding hypertension, risk factors and clinical manifestations with complications. Teachers with family history or concerns about the diseases showed significantly higher knowledge levels. Teacher's attitude and perception about life style modifications including dietary habits, smoking control, and exercise's role was satisfactory. More effort should be paid to improve public awareness regarding cardiovascular diseases and the role of healthy life style in controlling diseases with minimizing complications. This can be done through health education sessions at health care setting mainly PHCCs, and through public campaigns.

Author's Contributions

Mohammad Alshaharani, Aziz Alsubaie, Majed Alshaharani, Eman Alzain contributed to the design, Mohammad Alshaharani, Aziz Alsubaie, Mohammed Alqahtani, Abrar Alnujaidi prepared the study protocol and questionnaire. Mohammad Alshaharani, Abdulrahman Alshahrani, Mohammed Alqahtani contributed to the data collection, analysis and interpretation of the result. Mohammad Alshaharani, Aziz Alsubaie, AlaaAlnooh, Majed Alshaharani, Raghad Alammari, Ahmed Alolah contributed to drafting of the manuscript. Aziz Alsubaie, AlaaAlnooh, Raghad Alammari, Eman Alzain contributed to reviewing and editing the manuscript. The final version of the manuscript was approved by all authors.

Ethical Approval

The ethical research committee of the Institutional Review Board (IRB) of Imam Mohammad Ibn Saud Islamic University (IMSIU), Riyadh, Saudi Arabia, approved this study (HAPO-01-R-0011, Project No. 236-2022, session no. 54). All participants in the research gave their verbal and written informed consent.

Acknowledgement

We would like to express our deep and sincere gratitude to our research supervisor; Dr. Mohammad Alshaharani, our team members, and everyone who helped out in the process of writing this paper. We cannot express enough thanks to our committee for their continued support and encouragement.

Funding

This study has not received any external funding.

Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

1. Al-Asadi J, Ali H. Prevalence and lifestyle determinants of hypertension among secondary school female teachers in Basrah. Med J *Basrah* Univ 2009; 27(2):90–4.
2. Alm-Roijer C, Stagmo M, Udén G, Erhardt L. Better knowledge improves adherence to lifestyle changes and medication in patients with coronary heart disease. Eur J Cardiovasc Nurs 2004; 3(4):321–30.
3. Annadurai K. Awareness and preventive practices related to hypertension among government school teachers in rural Tamil Nadu. J Compr Health 2018; 6(1):09-13
4. Bakhsh LA, Adas AA, Murad MA, Nourah RM, Hanbazazah SA, Aljahdali AA, Alshareef RJ. Awareness and knowledge on hypertension and its self- care practices among hypertensive patients in Saudi Arabia. Ann Int Med Dent Res 2017; 2(5).
5. Bernard S, Addison O, Christopher A, Patrick Tetteh A, Mavis Deladem N. Knowledge, attitude and lifestyle practices pertaining to hypertension among the people of Ahoe-ho. J Hypertens Manag 2021; 7(1).
6. Boateng D, Wekesah F, Browne JL, Agyemang C, Agyei-Baffour P, Aikins Ade-G, Smit HA, Grobbee DE, Klipstein-Grobusch K. Knowledge and awareness of and perception towards cardiovascular disease risk in sub-Saharan Africa: A systematic review. PLoS One 2017; 12(12).
7. Cubbin C, Winkleby MA. Protective and harmful effects of neighborhood-level deprivation on individual-level health knowledge, behavior changes, and risk of coronary heart disease. Am J Epidemiol 2005; 162(6):559–68.
8. Cutler JA, Sorlie PD, Wolz M, Thom T, Fields LE, Roccella EJ. Trends in hypertension prevalence, awareness, treatment, and control rates in United States adults between 1988–1994 and 1999–2004. Hypertension 2008; 52(5):818–27.
9. Damasceno A, Azevedo A, Silva-Matos C, PristaAntónio, Diogo D, Lunet N. Hypertension prevalence, awareness, treatment, and control in Mozambique. Hypertension 2009; 54(1):77–83.
10. Elsheikh E, Al Gharash A, Almohammed B, AlJumaah M, Al Omaish M, Albahrani A, Al Musaileem H, Ebrahim S. Social knowledge of symptoms, risk factors, causes and complications of hypertension among Al-Ahsa population, Saudi Arabia. Medical Science 2021; 25(112):1355-1363
11. Forman JP. Diet and lifestyle risk factors associated with incident hypertension in women. JAMA 2009; 302(4):401.
12. Haldar RN. Global brief on hypertension: Silent Killer, Global Public Health Crisis. *Int J* Pharm Med Res 2013; 24(1):2
13. Hammond J, Salamonson Y, Davidson P, Everett B, Andrew S. Why do women underestimate the risk of cardiac disease? A literature review. Aust Crit Care 2007; 20(2):53–9.
14. Hendriks ME, Wit FW, Roos MT, Brewster LM, Akande TM, de Beer IH, Mfinanga SG, Kahwa AM, Gatongi P, Van Rooy G, Janssens W, Lammers J, Kramer B, Bonfrer I, Gaeb E, van der Gaag J, Rinke de Wit TF, Lange JM, Schultsz C. Hypertension in Sub-Saharan africa: Cross-sectional surveys in four rural and urban communities. PLoS One 2012; 7(3).
15. Ibrahim MM, Damasceno A. Hypertension in developing countries. Lancet 2012; 380(9841):611–9.
16. Meischke H, Sellers DE, Sellers DE, Goff DC, Daya MR, Meshack A, Taylor J, Zapka J, Hand MM. Factors that influence personal perceptions of the risk of an acute myocardial infarction. J Behav Med 2000; 26(1):4–13.
17. Muntner P, Hardy ST, Fine LJ, Jaeger BC, Wozniak G, Levitan EB, Colantonio LD. Trends in blood pressure control among us adults with hypertension, 1999-2000 to 2017-2018. JAMA 2020; 324(12):1190.
18. Reiner Ž, Sonicki Z, Tedeschi-Reiner E. Public perceptions of cardiovascular risk factors in Croatia: The Percro Survey. Prev Med 2010; 51(6):494–6.
19. Whelton PK. Epidemiology of Hypertension. Lancet 1994; 344(8915):101–6.