Journal of Community Medicine & Health Education

Niazi U, J Community Med Health Educ 2022, 12:7

Research Article | Open Access

The Association between COVID-19 and Risk of Hypertension among Afghan Participants: A Quantitative Descriptive Research

Ubaidullah Niazi[1], Hasamudin Sayedi[2], Abu Zar Shinwari[3], Naseer Ahmad Shinwari[4], Ahmad Mujtaba Barekzai[5,6,7*], Rasool Khan[8], Abdul Rafey[9], Abdullah Sahr[10] and Rayhana Rahyab[11]

[1]*Laboratory department, Spinghar Institute of Higher Education, Afghanistan*
[2]*Department of Biotechnology, Spinghar Institute of Higher Education, Afghanistan*
[3]*Department of Business Administration and economics, Spinghar Institute of Higher Education, Afghanistan*
[4]*Department of Biotechnology and Microbial technolog, Spinghar Institute of Higher Education, Afghanistan*
[5]*Research Director, Spinghar Institute of Higher Education, Afghanistan*
[6]*Department of Public Health, Spinghar Institute of Higher Education, Afghanistan*
[7]*Department of Food Safety, UN-WFP, KIC, Afghanistan*
[8]*Department of Molecular Biology, Afghan Japan Hospital, Afghanistan*
[9]*Department of Molecular Biology, City health Hospital, Afghanistan*
[10]*Department of Microbiology, Spinghar Institute of Higher Education, Afghanistan*
[11]*Department of Stomatology, Spinghar Institute of Higher Education, Afghanistan*

Abstract

Objective: According to reports in Afghanistan, hypertension has been widely reported in COVID-19 among all ages. To the best of our knowledge, there if no study revealed the association of hypertension with COVID 19 among the adult population in Kabul, Afghanistan. Therefore, we aimed to investigate the association between hypertension and the risk of COVID 19 in Kabul.

Method: Quantitative descriptive research design has been used to analyze the primary data collected from the hospital. The data has been collected from 98 hospitalized patients from two government and private hospitals (Adie Medical Teaching Complex (AMTI) and Afghan japan is a government hospital). The formal letters have been written to both ADEI medical complex (AMTI) and Afghan japan hospital to collect data.

Result: The study population consisted of 98 adult hypertension patients with COVID-19 infections. Our analysis demonstrated that in these 98 hospitalized patients 65 (65.31%) were male and 33 (34.69%) were females. Our research revealed that 29.6% of participants had primary hypertension. The 66.3% and 4.1% of the population had secondary and pro hypertension. The table shows that (96.9%) of patients had a cough and only (3.1%) didn't have a cough while having COVID-19 and hypertension.

Conclusion: Hypertension with COVID-19 was significantly and more likely to have essential comorbidities and mortality in old ages. it is recommended to COVID-19 old patients stay normal not to worry about the infection, which they have their blood pressure level stay normal.

Keywords: COVID-19; Risk of hypertension; Afghan participants; A quantitative descriptive research

Introduction

Blood pressure normally rises and falls throughout the day, but it can damage your heart and cause health problems if it stays high for a long time [1]. An estimated 26% of the world population (972 million people) has hypertension is expected to increase by 29% by 2025 worldwide [2]. The prevalence of hypertension among adult Kabul citizens was 32.3%, and the economic burden of hypertension was 947 $ the first year of treatment, 575 $ the second year, and 420 and per year thereafter [3]. Several factors may contribute to hypertension risk, including family history, dietary intake, tobacco and alcohol, physical activity, and lifestyle [4-8]. Furthermore, Coronavirus disease (COVID-19) is a new respiratory disease caused by a novel coronavirus (designated as SARS-CoV-2), which was reported in Wuhan, China in December 2019 [9]. The outbreak of COVID-19 is currently continuously evolving globally [10]. The symptoms of COVID-19 include; dry cough, a high temperature, fatigue, and shortness of breathe [11]. In many severe cases, the coronavirus infection caused interstitial pneumonia, leading to severe acute respiratory syndrome (SARS) and even death [11]. Thus, the COVID-19 becomes an ongoing public health emergency of international significance. Most people fall sick with (COVID-19) and have mild to moderate symptoms and they recover without any special treatment [12].

The coronavirus disease 2019 (COVID-19) outbreak has spread across the world affecting 510887255 and causing deaths of 6249104 till 12 April 2022, and spread in Afghanistan affecting 178769 and causing over deaths 7683 till 12 April 2022 [13-15].

Hypertension, diabetes, and cardiovascular diseases were soon identified as common comorbidities in COVID-19 patients; the following studies revealed that hypertension is an important risk factor for adverse outcomes in COVID-19 patients. Investigations in China, Wuhan raised the question of whether hypertension would be a predictor of outcome in COVID-19 patients, the relationship between blood pressure level and weakness to SARS-CoV-2, or outcome in COVID-19 patients has

***Corresponding author:** Ahmad Mujtaba Barekzai, Department of Public Health, Spinghar Institute of Higher Education, Afghanistan, E-mail: mujtaba.barekzai.7@gmail.com

Received: 28-June-2022, Manuscript No. jcmhe-22-69224; **Editor assigned:** 30-June-2022, PreQC No. jcmhe-22-69224 (PQ); **Reviewed:** 14-July-2022, QC No. jcmhe-22-69224; **Revised:** 19-July-2022, Manuscript No. jcmhe-22-69224 (R); **Published:** 26-July-2022, **DOI:** 10.4172/2168-9717.1000765

Citation: Niazi U, Sayedi H, Shinwari AZ, Shinwari NA, Barekzai AM, et al. (2022) The Association between COVID-19 and Risk of Hypertension among Afghan Participants: A Quantitative Descriptive Research. J Comm Med Health Educ 12:765.

been inadequately investigated, and probable blood pressure target value in these patients is still unknown [16,17]. According to reports in Afghanistan, hypertension has been widely reported in COVID-19 among all ages. To the best of our knowledge, there if no study revealed the association of hypertension with COVID 19 among the adult population in Kabul, Afghanistan. Therefore, we aimed to investigate the association between hypertension and the risk of COVID 19 in Kabul (Table 1).

Variables		Frequency	Percentages
Gender	Male	65	65.31%
	Female	33	34.69%
Age	1-35 years old	1	1.1%
	36-50 years old	22	22.4%
	51-70 years old	66	67.3%
	Above 70 years old	9	9.2%
Hypertension level	Primary hypertension	29	29.6%
	Secondary hypertension	65	66.3%
	Pro-hypertension	4	4.1%
Test	RT- PCR	98	100%

Table 1: The demographic of participants from gender, age, hypertension level, and test result of patients.

Methodology

Study design

Quantitative descriptive research design has been used to analyse the primary data collected from the hospital.

Study participants

The way and methods which has been used to collect data on hypertension and COVID-19 here in Kabul, Afghanistan. The data has been collected from 98 hospitalized patients from two government and private hospitals (Adie Medical Teaching Complex (AMTI) and Afghan japan is a government hospital). The formal letters have been written to both ADEI medical complex (AMTI) and Afghan japan hospital to collect data. Permission has been taken from the administration of hospitals as permission has been given to collect the data. The data has been taken from OPD to see the patients' files and noted hypertension with COVID-19 patients then visited award to see patients talk with them and ask different questions as I ask their conditions and check their BP levels statoscope and write their last level of BP so some of the patients have been following up. I went to HMIS (Health Management Information System) to see 544 admitted COVID-19 patients 'files from 1 March 2021 to 30 April, so I find 73 out of all COVID-19 confirmed positive cases with hypertension patients, so then I write all their signs and symptoms with the last level of BP before discharge or die and noted with myself and include in my data and did analysis together with ADEI hospital's patients. Our study includes 98 patients with Hypertension and the excluded from our study are 446 COVID 19 patients. Where the data has been extracted from 98 hospitalized COVID-19 patients with hypertension. The data was taken from laboratory records and patients' files and followed up with some patients. The study was ethically approved by the medical bioethics committee of the Spinghar Institute of Higher Education (code: 1386-1409).

Assessment of variables

We use the materials to identify COVID-19 and hypertension, (Patients Registration Files, PPE (Mask, Glove, Gown, Shoe Cover, Face Shield, Head Shield, Hand Sanitizers), VTM+Swabs, Qi a gene RNA Extraction Kits, MGI Nucleic Acid Extraction kits, Sun Sure PCR Amplification Kits, Filter tips different volumes, Different size jousters (pipet) from pipet man, PCR Machine Rotor-Gene Q MDx S/No0717331 Made by Germany, GeneXpert Full automated PCR System Made by Cepheid USA, Computers and Laptop for PCR Analyzers, BSC Biosafety Cabinets, Freezers, Centrifuges+Micro or Spin fugue, Stethoscope) (Table 2)

Symptoms		Stages of hypertension							
		Pre hypertension		Secondary hypertension		Pro hypertension		Total	
Cough	Yes	29	100.00%	63	96.90%	3	75.00%	95	96.90%
	No	0	0.00%	2	3.10%	1	25.00%	3	3.10%
Fever	Yes	27	93.10%	63	96.90%	3	75.00%	93	94.90%
	No	2	6.90%	2	3.10%	1	25.00%	5	5.10%
Ards	Yes	26	89.70%	60	92.30%	4	100.00%	90	91.80%
	No	3	10.30%	5	7.70%	0	0.00%	8	8.20%
Headache	Yes	26	89.70%	60	92.30%	4	100.00%	90	91.80%
	No	3	10.30%	5	7.70%	0	0.00%	8	8.20%

Pneumonia	Yes	15	51.70%	35	53.80%	2	50.00%	52	53.10%
	No	14	48.30%	30	46.20%	2	50.00%	46	46.90%
Sore throat	Yes	26	89.70%	62	95.40%	4	100.00%	92	93.90%
	No	3	10.30%	3	4.60%	0	0.00%	6	6.10%
Chest pain	Yes	22	75.90%	49	75.40%	2	50.00%	73	74.50%
	No	7	24.10%	16	24.60%	2	50.00%	25	25.50%
Shortness of breath	Yes	23	79.30%	50	76.90%	3	75.00%	76	77.60%
	No	6	20.70%	15	23.10%	1	25.00%	22	22.40%
Body pain	Yes	23	79.30%	60	92.30%	4	100.00%	87	88.80%
	No	6	20.70%	5	7.70%	0	0.00%	11	11.20%
Sepsis	Yes	23	79.30%	60	92.30%	4	100.00%	87	88.80%
	No	6	20.70%	5	7.70%	0	0.00%	11	11.20%
Renal failure	Yes	23	79.30%	60	92.30%	4	100.00%	87	88.80%
	No	6	20.70%	5	7.70%	0	0.00%	11	11.20%
Fatigue	Yes	20	69.00%	48	75.00%	4	100.00%	72	74.20%
	No	9	31.00%	16	25.00%	0	0.00%	25	25.80%
Anorexia	Yes	20	69.00%	47	73.40%	4	100.00%	71	73.20%
	No	9	31.00%	17	26.60%	0	0.00%	26	26.80%
Sleeping problem	Yes	8	27.60%	27	41.50%	4	100.00%	39	39.80%
	No	21	72.40%	38	58.50%	0	0.00%	59	60.20%
Cardiac vascular disease	Yes	3	10.30%	10	15.40%	3	75.00%	16	16.30%
		26	89.70%	55	84.60%	1	25.00%	82	83.70%

Table 2: Signs and symptoms of hypertension and covid-19 patients

Statistical analysis

The data has been collected from 98 hospitalized patients from two hospitals in Afghanistan data was recorded in an excel sheet and the data was analyzed using SPSS version 20. Firstly, the variables were coded in the SPSS for data entry purposes. Secondly, the data was entered in an excel sheet through collected forms. Thirdly the data was transferred from excel to SPSS coded files. Finally, the data frequency distribution was found to check the data accuracy for analysis. Moreover, frequency distribution, custom tables, and graphs have been used to analyse the data (Table 3).

Month	COVID-19 admitted patients	Hypertension		W/O Hypertension		Total Death	Total Rescued
March	253	**Frequency**	**Percentage**	**Frequency**	**Percentage**	42	211
		32	12.64%	221	87.35%		
		Death	Discharge	Death	Discharge		
		14	18	28	193		
April	540	Frequency	Percentage	Frequency	Percentage	121	419
		66	12.22%	474	87.77%		
		Death	Discharge	Death	Discharge		
		25	41	96	378		

Table 3: The relation of hypertension with Covid 19 patients

Data collection

The data has been collected from 98 hospitalized patients from two hospitals in Afghanistan that are Afghan japan and ADEI medical complex. Primary data was collected from patients. Furthermore, secondary data was obtained from various research papers, and research articles that were found on Google scholar, through searching such as "the effect of COVID-19 and hypertension or COVID-19 and hypertension".

Results

The study population consisted of 98 adult hypertension patients with COVID-19 infections. According to our analysis, demonstrated that in these 98 hospitalized patients 65 (65.31%) were male and 33 (34.69%) were females. Our research revealed that 29.6% of participants had primary hypertension. The 66.3% and 4.1% of the population had secondary and pro hypertension. The table shows that (96.9%) of patients had a cough and only (3.1%) didn't have a cough while having COVID-19 and hypertension. The data analysis shows that (94.9%) have experienced fever the analysis proves that (91.8%) have suffered from headaches. It is already clear that headache is the sign of both COVID-19 hypertension, The data analysis illustrates that (72.2%) have experienced fatigue (tiredness) which is a common symptom of hypertension, The analysis explains that (88.8%) have experienced Sepsis the most numbers of signs are in secondary hypertension., The result of this COVID-19 with hypertension was significantly older and was more likely to have essential Comorbidities including ARDS (acute respiratory distress syndrome), cardiovascular disease, renal failure, and SOB (shortness of breath), and the result shows that more people have got hypertension after COVID-19 positive. Patients with hypertension tended to have a long time from start to admission and have higher positive COVID-19 PCR detection rates. Table 4 shows that (41.84%) of patients had before their COVID-19 PCR test result is positive and (58.16%) of patients found hypertension after they have known that their PCR result comes positive.

Variable	Frequency	Percentage
Pre COVID-hypertension	41	41.84%
Post-COVID hypertension	57	58.16%

Table 4: Variable Hypertension estimate

Our study population consisted of 98 adult hypertension patients with COVID-19 infections. Analysis shows that in these 98 hospitalized patients 65 (65.31%) were male and 33 (34.69%) were females; the data analysis shows that (94.9%) have experienced fever the analysis proves that (91.8%) have suffered from headaches. And it is already clear that headache is the sign of both COVID-19 hypertension, data analysis illustrates that (72.2%) have experienced fatigue (tiredness) which is a common symptom of hypertension, and symptomizes explain that (88.8%) have experienced Sepsis the harvest numbers of signs are in secondary hypertension. Additionally, the result demonstrated that more people have got hypertension after COVID-19 positive, and patients with hypertension tended to have a long time from start to admission and have higher positive COVID-19 PCR detection rates.

According to recent studies, a cross-sectional study in the American College of Cardiology (ACC) revealed that emerging data from various countries most affected by coronavirus disease 2019 (COVID-19) reveal that hypertension is strongly associated with poor clinical outcomes [18]. Guan et al. reported data from 1099 patients with confirmed COVID-19, of which the single highest risk factor of infection was hypertension reported in 15% of patients. Among patients who developed the severe disease (173 patients), the most common co-morbidity was hypertension (23.7%), and 35.8% of the patients requiring intensive care unit (ICU) admission or mechanical ventilation or who died also had hypertension [19]. Zhang et al. studied 140 patients with COVID-19 and found that 30% of all patients and 37.9% of those with severe disease had hypertension [20]. As well, a review study reported that 23.7-30% of patients were admitted with the infection and were linked to a more severe infection. Data from Italy looking at patients admitted to the ICU showed 49% (509/1043) had hypertension [21].

Furthermore, an observational study by Xiaobo Yang and colleagues in China revealed the most distinctive comorbidities of 32 non-survivors from a group of 52 intensive care unit patients with novel coronavirus disease 2019 (COVID-19) in the study Xiaobo Yang and colleagues 1 were cerebrovascular diseases (22%) and diabetes (22%) [22]. Another study 2 included 1099 patients with confirmed COVID-19, of whom 173 had severe disease with comorbidities of hypertension (23.7%), diabetes mellitus (16.2%), coronary heart diseases (5.8%), and cerebrovascular disease (2.3%) [23]. In a third study, 3 of 140 patients who were admitted to the hospital with COVID-19, 30% had hypertension and 12% had diabetes [24].

In Addition, an observational study in Wuhan, China demonstrated that a total of 274 patients, 75 with hypertension and 199 without hypertension, were included in the analysis [25]. Patients with hypertension were older and were more likely to have pre-existing comorbidities, including chronic renal insufficiency, cardiovascular disease, diabetes mellitus, and cerebrovascular disease than patients without hypertension [25,26]. Moreover, patients with hypertension tended to have higher positive COVID-19 PCR detection rates [27]. Patients with hypertension who had previously taken ACEI/ARB drugs for antihypertensive treatment have an increased tendency to develop severe pneumonia after infection with SARS-COV-2 (P=0.064) [28]. Furthermore, studies from Italy, Spain, and Germany demonstrated that Patients with arterial hypertension suffered significantly more from different complications including respiratory insufficiency (60.8% vs. 39.5%), heart failure (9.9% vs. 3.1%), acute kidney injury (25.3% vs. 7.3%), pneumonia (90.6% vs. 86%), sepsis (14.7% vs. 7.5%), and bleeding events (3.6% vs. 1.6%) [29]. The mortality rate was 29.6% in patients with concomitant arterial hypertension and 11.3% without arterial hypertension (P<0.001) [29]. Invasive and non-invasive respiratory supports were significantly more required in presence of arterial hypertension as compared without it. In the multivariate cox regression analysis, while age ≥ 65, benzodiazepine, antidepressant at admission, elevated LDH or creatinine, respiratory insufficiency, and sepsis might be a positive independent pre of mortality, antiviral drugs, interferon treatment, ACEI or ARBs at discharge or oral anticoagulation at discharge might be an independent negative predictor of the mortality [29].

A case control study indictor India shows, those 710 patients with laboratory confirmed COVID-19 was recruited from the 28th of March to the 31st of August 2020. The mean age was 48.4 ± 16.4 years. A total of 530 (74.6%) patients were male. Overall, the mean length of hospital stay was 12.7 days. In total, 645 patients (90.8%) were mild to moderate cases and did not require initial ICU care [30].

Diabetes mellitus and hypertension increase the risk of death in COVID-19 patients and negate the incremental effect of age on death in these patients [31]. The observational study in Italy detect that Hypertension was associated with a nearly 2.5-fold significantly increased risk of severe COVID-19 disease (OR: 2.49 [95%CI: 1.98-3.12] I2=24%), as well as with a similarly significant higher risk of mortality (OR: 2.42 [95%CI: 1.51-3.90] I2=0%) [32]. In meta-regression, a significant correlation was observed with an increase in the mean age of patients with severe COVID-19 associated with increased log odds of hypertension and severity (p=0.03) [33]. A significant increase of 2.7% (IC (95%) 2.6-4.4) was found in the mortality rate due to COVID-19 due to an increase of 1 μg/m3 of NO2 [34]. The results suggest an association between COVID-19 mortality and NO2 exposure.

Our study has several strengths, this is the first study in Afghanistan to demonstrate the association between hypertension and COVID-19" among Afghan patients. Without any hesitation, we collect the data from patients so that no one falls sick. As well, we have found signs and symptoms of both hypertension and COVID-19 in Afghanistan. On the other hand, our study has several limitations, As we wanted to do some tests like D. dimer, HBA1C, Urea, creatinine, and many more during hypertension of a patient but there was a lack of facilities to do all these works. The data has been collected from 98 patients who wanted to collect more data but due to political situations here in Afghanistan, I couldn't able to collect more data. As we couldn't collect more data due to the effect of COVID-19 on people in Afghan society.

Impact of patient characteristics on EHP-30

A lower BMI was positively associated with "emotional health" (rs=0.251, p=0.007) and "self-image" (rs=0.245, p=0.008). There was a significant negative correlation between partnership status and the emotional health category (rs=-0.191, p=0.041). Patients in a partnership had less negative impact on emotional health status. No significant correlations between age and such as emotional health or pain sensitivity were recorded.

Impact of endometriosis on EHP-30

Additionally, the EHP-30 categories were compared between the four endometriosis subgroups. The highest pre-operative pain levels were observed in patients DIE and DIE+ovarian endometrioma (42,2, ± 22,1). The most significant improvement in respect to EHP-30 was also seen in these categories (-27,8, ± 6,8).

Impact of surgery on the EHP-30

All of the five main categories show a positive change in the quality of life postoperatively: pain (HR 0.78, p<0.001); self-determination (HR 0, 92, p<0.001); emotional health (HR 0, 83, p<0.001); social environment (HR 0, 67, p<0.001); and self-image (HR 0, 47, p<0,001).

Analyzing the five categories regarding the four endometriosis subgroups separately reveals the most significant improvement in the groups of DIE and DIE+ovarian endometrioma. In the group of ovarian endometrioma there was a significant improvement postoperatively in the categories "pain", "self-determination" and "emotional health". In the patients with peritoneal endometriosis, there were no significant changes in any of the five categories.

Discussion

Aim of this study was to evaluate the effect of surgery on the HRQoL of patients with endometriosis. Using the EHP-30 questionnaire in the whole study group, we determined that all of the five main categories show a positive change and thus improvement of quality of life after laparoscopic surgery.

HRQoL changes were also calculated separately in the four subpopulations (peritoneal, ovarian, DIE and DIE+ovarian endometrioma). Significant improvements were seen in the categories "pain", "self-determination" and "emotional health" in all subgroups, except in the group of patients with peritoneal endometriosis.

In the categories "social environment" and "self-image", there was only a significant change in the groups of DIE and DIE+ovarian endometriosis. We observed, that patients with only peritoneal endometriosis had the lowest preoperative clinical symptoms. Due to the more pronounced preoperative clinical symptoms particularly in DIE and DIE+ovarian endometrioma, surgical improvement seems to result in a greater change in the score and consecutively a greater improvement in the quality of life. Thus, the results of this study highlight that especially patients with DIE and DIE+ovarian endometrioma benefit from a surgical intervention. A limitation of this study is the low patient number. Studies with larger subpopulations are thus required to validate our findings.

In clinical practice, routine evaluation of HRQoL in women who suffer from endometriosis is essential, both, for the health care provider and the patient [21]. In this study, longitudinal data of quality of life was obtained from a total of 115 patients with endometriosis. The median age of the recruited patients was 33 years, comparable to similar studies reporting an average age of 34 years [9,22,23]. Most of the included patients were in a partnership, a factor known to increase the probability of consulting a doctor because of painful intercourse or the desire to have children [15]. There was no correlation between age and "emotional health" (rs=-0.154 p=0.101). In contrast to another similar Austrian study in which older age led to deterioration in emotional health [15]. A negative correlation between the BMI and "emotional health" or "self-image" was recorded, which means that a higher BMI led to a deterioration in emotional health and self-image. This finding has also been confirmed by another study [10].

Our data is comparable to the study by Jones et al published in 2004, the greatest positive change in the total population was revealed in the aspect of "self-determination" [9].

One of the strengths of our data is that only patients with histologically confirmed endometriosis were included. In another study by Khong et al., patients with only suspected endometriosis due to pelvic pain or infertility were included in an EHP-30 questionnaire study [16]. Furthermore, one additional strength lies in the preoperative and postoperative collection of the data, which was not carried out in other studies [12]. In addition, our collective is part of a prospective cohort design of well characterized endometriosis patients [24].

However, due to the short follow up period (6-10 weeks), no statement about the long term effect can be given. In this regard, further studies are needed to assess the effectiveness of an operative treatment over a longer period. It should also be noted, that the questionnaires are always answered from a subjective perspective. Since the content validity of the EHP-30 is high, the results based on the questionnaire can be regarded as relevant despite the subjective answers. Nevertheless, it should be noted that many patients have been living with impairments in HRQoL such as pain for years and in some cases have learned to deal with its draw backs.

Confirming previous data our study highlights that the EHP-30 can be regarded as a reliable instrument that reacts sensitively to changes. The preoperative and postoperative values can be used to determine the individual effect of surgical therapy regarding different types of endometriosis [9,17,25].

Conclusion

As study explained that hypertension with COVID-19 were significantly and more likely to have essential comorbidities and mortality in old ages. It is recommended to COVID-19 old patients to stay normal not to worry about the infection which they have that their blood pressure level stays normal. Further research is needed to find out the relationship between COVID-19 and hypertension.

Acknowledgment

We all thank full from the data collection team.

Conflict of Interest

All authors declared no potential personal or financial conflicts of interest.

Ethical Approval Statement

This study was ethically approved by the medical bioethics committee of the SIHE ethics committee (code: 1386-1409). The patients/participants provided their written informed consent to participate in this study.

Author Contributions

UN, HS, and AS were involved in the study's conception, design, statistical analysis, and interpretation of the data. NAS, RK, AR, AS, and RR were involved in data collection, data cleaning, statistical analysis, and manuscript drafting. AMB supervised the study. All authors approved the final manuscript for submission.

Funding

The financial support for this study was provided by SIHE.

References

1. Guyton AC (1972) Arterial pressure regulation: Overriding dominance of the kidneys in long-term regulation and in hypertension. Am J Med 52(5): 584-594.
2. Kearney PM (2005) Global burden of hypertension: Analysis of worldwide data. Lancet 365(9455): 217-223.
3. Saeed KMI (2015) Burden of hypertension in the capital of Afghanistan: A cross-sectional study in Kabul City. Intern J Hypertens 2017.
4. Bezerra PC (2010) Family history of hypertension as an important risk factor for the development of severe preeclampsia. Acta obstetricia et gynecologica Scandinavica 89(5): 612-617.
5. Wang L (2008) Dietary intake of dairy products, calcium, and vitamin D and the risk of hypertension in middle-aged and older women. Hypertension 51(4):1073-1079.
6. Friedman GD, Klatsky AL, Siegelaub A (1982) Alcohol, tobacco and hypertension. Hypertension 4(5.2):143.
7. Diaz KM, Shimbo D (2013) Physical activity and the prevention of hypertension. Current hypertension reports 15(6): 659-668.
8. Beilin L, Puddey I, Burke V (1999) Lifestyle and hypertension. Am J hypertension 12(9): 934-945.
9. Ahmad Mujtaba, Barekzai BB, Marhaba B (2021) Dietary and weight changes during COVID-19 pandemic in Afghanistan. J Tropical Dis Public Health 11(5):7.
10. Das P, Choudhuri T (2020) Decoding the global outbreak of COVID-19: The nature is behind the scene. VirusDisease 31(2): 106-112.
11. Gallo MB (2021) Predictors of COVID-19 severity: A literature review. Rev Med Virol 31(1):1-10.
12. Syed A (2020) Coronavirus: A mini-review. Int J Curr Res Med Sci 6(1): 8-10.
13. Srivastava N (2019) Global trends in epidemiology of coronavirus disease (COVID-19), in Coronavirus disease (COVID-19). Springer 9-21.
14. Sahu P (2020) Closure of universities due to coronavirus disease 2019 (COVID-19): Impact on education and mental health of students and academic staff. Cureus, 12(4).
15. Banerjee D (2020) The COVID-19 outbreak: Crucial role the psychiatrists can play. As J Psych 50:102014.
16. Tadic M (2021) Hypertension and COVID-19: Ongoing controversies. Frontiers in Cardiovascular Medicine 8: 639222.
17. Ran J (2020) Blood pressure control and adverse outcomes of COVID-19 infection in patients with concomitant hypertension in Wuhan, China. Hypertension Res 43(11): 1267-1276.
18. Das Gupta R, Zaman SB, Al Kibria GM (2019) Factors associated with hypertension among adults in Nepal as per the Joint National Committee 7 and 2017 American College of Cardiology/American Heart Association hypertension guidelines: A cross-sectional analysis of the demographic and health survey 2016. BMJ Open.
19. Guan WJ (2020) Clinical characteristics of coronavirus disease 2019 in China. New Eng J Med. 382(18): 1708-1720.
20. Zhang JJ (2020) Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. Allergy 5(7):1730-1741.
21. Kulkarni S, Jenner BL, Wilkinson l (2020) COVID-19 and hypertension. J Renin-angiotensin-aldosterone system. 21(2):1470320320927851.
22. Fang L, Karakiulakis G, Roth M (2020) Are patients with hypertension and diabetes mellitus at increased risk for COVID-19 infection?. Lancet Respiratory Med 8(4): p. e21.
23. Fang L, Karakiulakis G, Roth M (2020) Antihypertensive drugs and risk of COVID-19?–Authors' reply. Lancet Respiratory Med 8(5):32-33.
24. Tignanelli CJ (2020) Antihypertensive drugs and risk of COVID-19?. Lancet Respiratory Med 8(5): 30-31.
25. Zeng Z (2020) Hypertension in patients hospitalized with COVID-19 in Wuhan, China: A single-center retrospective observational study. MedRxiv.
26. Ssentongo P (2020) Association of cardiovascular disease and 10 other pre-existing comorbidities with COVID-19 mortality: A systematic review and meta-analysis. PloS one 15(8): p. e0238215.
27. Yilmaz A (2021) Association between laboratory parameters and CT severity in patients infected with Covid-19: A retrospective, observational study. Am J Emerg Med 42: 110-114.
28. Zhang Y (2021) Hypertension in patients hospitalized with COVID-19 in wuhan, china a single-center retrospective observational study. Int Heart J 62(2):337-343.
29. El-Battrawy I (2021) COVID-19 and the impact of arterial hypertension—An analysis of the international HOPE COVID-19 Registry (Italy-Spain-Germany). Euro J Clin Invest 51(11): p. e13582.
30. Lightowler MS (2022) Effectiveness of typhoid conjugate vaccine in zimbabwe used in response to an outbreak among children and young adults: A matched case control study. Vaccine.
31. Gupta A (2021) Diabetes mellitus and hypertension increase risk of death in novel corona virus patients irrespective of age: A prospective observational study of co-morbidities and COVID-19 from India. SN Comprehensive Clinical Medicine. 3(4): 937-944.
32. Radwan NM (2020) Comorbidities and severity of coronavirus disease 2019 patients. Saudi Med J 41(11):1165.

33. Lippi G, Wong J, Henry BM (2019) Hypertension and its severity or mortality in coronavirus disease 2019 (COVID-19): A pooled analysis. Pol Arch Intern Med 130(4):304-309.

34. Norouzi N, Asadi Z (2022) Air pollution impact on the COVID-19 mortality in Iran considering the comorbidity (obesity, diabetes, and hypertension) correlations. Environ Res 204: 112020.