Analysis of Pharmaceutical Sciences and Public Health Applications

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KEYWORDS

Health, Health care, drugs, pharmaceutical care

ABSTRACT

Growing in frequency in both rural and urban parts of India, growing percentage of people at risk of diabetes, Indian population's genetic susceptibility to diabetes risk factors related to the environment, Globalisation causing a decline in physical exercise Some of the challenges that the disease poses in India are low patient awareness of hypertension, undiagnosed hypertension due to a variety of factors such as low healthcare facilities and economic status, inadequate disease control, and an increasing incidence of complications related to hypertension. Although there are solutions, the healthcare team will need to work in tandem with the clinician who is battling the illness on an individual basis. This will prevent the patient from receiving the proper care, the clinician from being able to listen to the patient's problems and find solutions, the patient from receiving the psychological support they need for a chronic illness, and the nation from suffering from economic hardship after the patient's illness. The purpose of this study was to identify the services provided by pharmaceutical care and evaluate the barriers to pharmaceutical care in various settings in order to provide relevant recommendations.

1. Introduction

Globally, cardiovascular disease (CVD) is the leading cause of death. More than 80% of these fatalities take place in middle-class and lower-class nations. Chronic diseases (CVD) are more common in environments with high tobacco smoking rates, lots of bad dietary options, low physical activity levels, and high stress levels [1]. Whether a risk factor for CVD is changeable or not is the main element to consider. The risk variables that cannot be changed are genetic predisposition, age, and gender. The leading modifiable risk factors for cardiovascular disease (CVD) include lipid disorders, body mass index ~25, hypertension, and sedentary lifestyle. It is concerning that the prevalence of hypertension is rising quickly in India, affecting both urban and rural people.3,4 The prevalence of hypertension in adults is 20–40% in cities and 12–17% in rural areas [2]. Currently, one of the major global causes of premature death is hypertension. One significant risk factor for cardiovascular disease is elevated blood pressure [4]. In India, it has resulted in the deaths of 57% of patients from stroke and 24% from coronary heart disease, respectively [7]. Elevated systolic and/or diastolic blood pressure is known as hypertension. Blood pressure (BP) greater than or equal to 140/90 mmHg was long considered to be hypertension; however, according to the 2017 American College of Cardiology and American Heart Association updated guidelines, BP higher than or equal to 130/80 mmHg is now considered hypertension. A blood pressure reading of 120/80 mmHg is considered ideal [3]. Numerous illnesses, including stroke, myocardial infarction, and kidney disease are known to be correlated with hypertension.

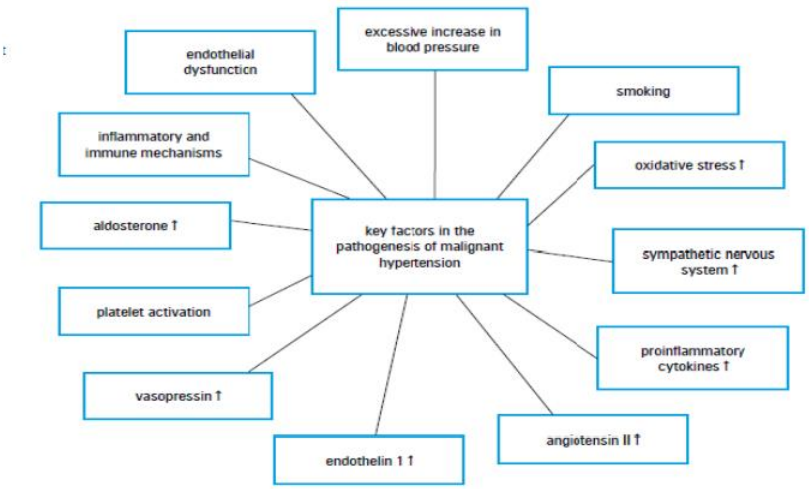

Figure 1. Postulated pathophysiological mechanisms of malignant hypertension

As to the World Health Organisation (WHO), hypertension has been recognised as a major risk factor for morbidity and mortality globally, accounting for over nine million deaths per year. A significant public health issue, hypertension accounts for 4.5% of the world's illness burden [11]. According to research, hypertension is the leading health-related risk factor in India, accounting for the greatest share of the country's death and illness burden. According to estimates, 1.13 billion people globally will have hypertension in 2023, and the number of deaths linked to this avoidable risk factor has previously been projected to be 9.4 million annually. Though it affects over a billion people globally, essential hypertension is defined as the 95% of cases that do not exhibit established secondary causes of hypertension, such as renal failure or pheochromocytoma. Heart rate (BP) is determined by multiplying cardiac output by total peripheral resistance. An increase in one or both of these factors can lead to high BP [5].

2. Materials And Methods

Faculty from one of the Indian hospitals' departments of family medicine and general medicine oversaw this investigation [6]. Patients with hypertension presenting to the outdoor patient department (OPD) of the rural hospital's family medicine and general medicine departments who met the eligibility requirements were randomised by lottery into the Intervention Group (I) and Control Group (C). By lottery, all patients who met the eligibility requirements were randomised to the Intervention Group (I) and the Control Group (C) [12]. Microsoft Excel spreadsheets were used for data coding and entry, and SPSS version 21 (Statistical Package for Social Sciences) was used for descriptive and inferential statistical analysis [8]. To highlight key information, the unprocessed data was sorted, combined, and tabulated. Frequency, proportion, mean, median, and standard deviation were used in the descriptive analysis. Chi-square analysis is used to analyse qualitative data. • The Friedman test, ANOVA, and unpaired t test were used for quantitative data analysis [9].

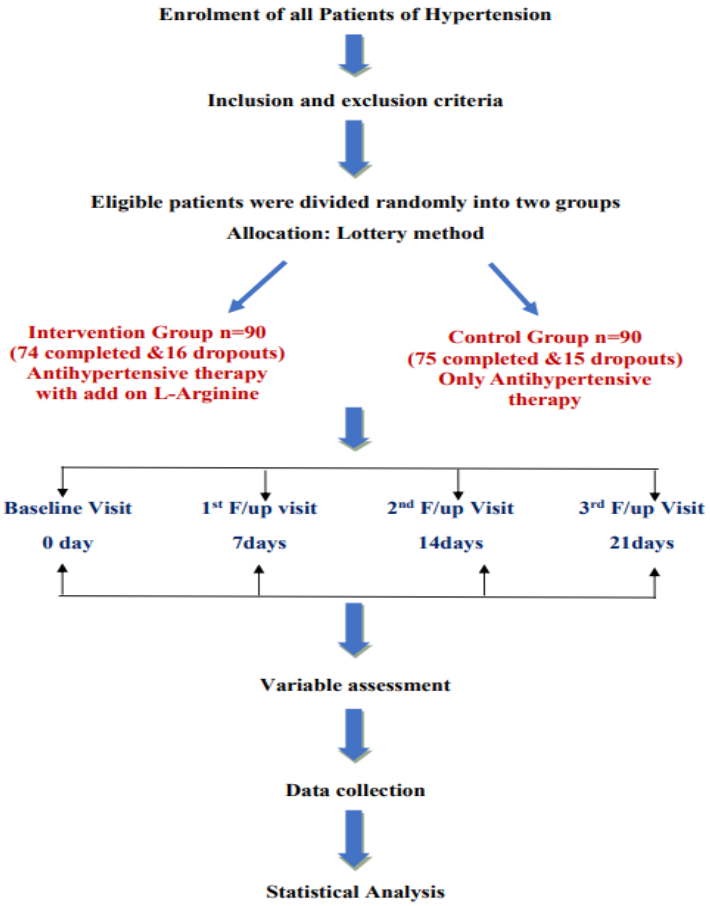

Figure 2. Study procedure flow diagram

3. Analysis

There were 149 participants in all, 86 of whom were men and 63 of whom were women, as shown in Figure 3. In the Control group, there were 42 men and 33 women, and in the Intervention group, there were 44 men and 30 women.

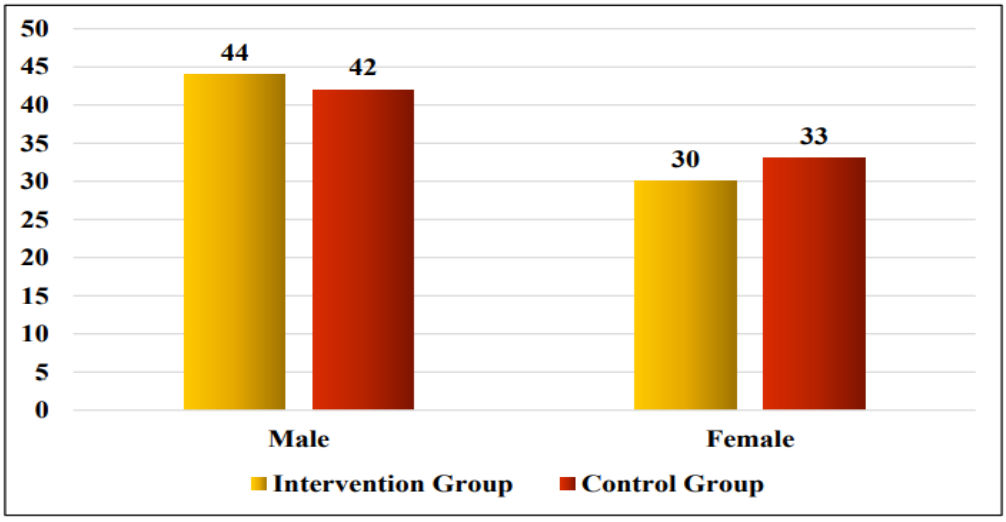

Figure 3. Gender wise distribution

The age distribution of the participants in both groups is displayed in Figure 4. The patients in our study ranged in age from 31 to 60 years old, with a mean age of 49.93±7.62 years. The mean age of the Control Group was 50.97±7.45, while the mean age of the Intervention Group was 48.87± 7.69.

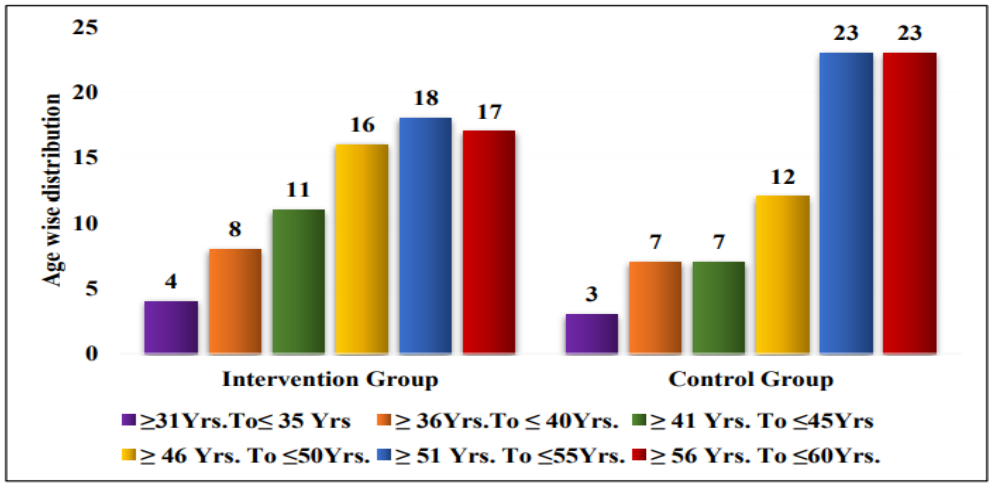

Figure 4. Gender wise distribution

Figure 5 indicates that the mean duration of HTN was 31.13 months (2.7 years) in the Intervention Group and 28.84 months (2.4 years) in the Control Group. The Unpaired t-test and "Z" test of significance were used to evaluate the data, and the results were found to be statistically non-significant.

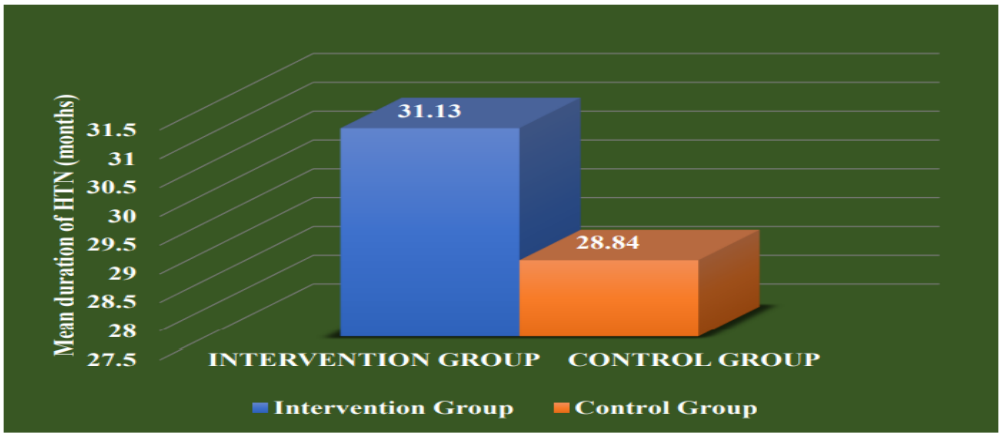

Figure 5. Distribution of Participants According to Duration of Hypertension

The weight of participants in the Intervention Group and Control Group was compared in Figure 6 from baseline to each 7-day follow-up of Visits 1 through 3. The results of the Unpaired t-test and the "Z" test of significance indicated that the differences were not significant.

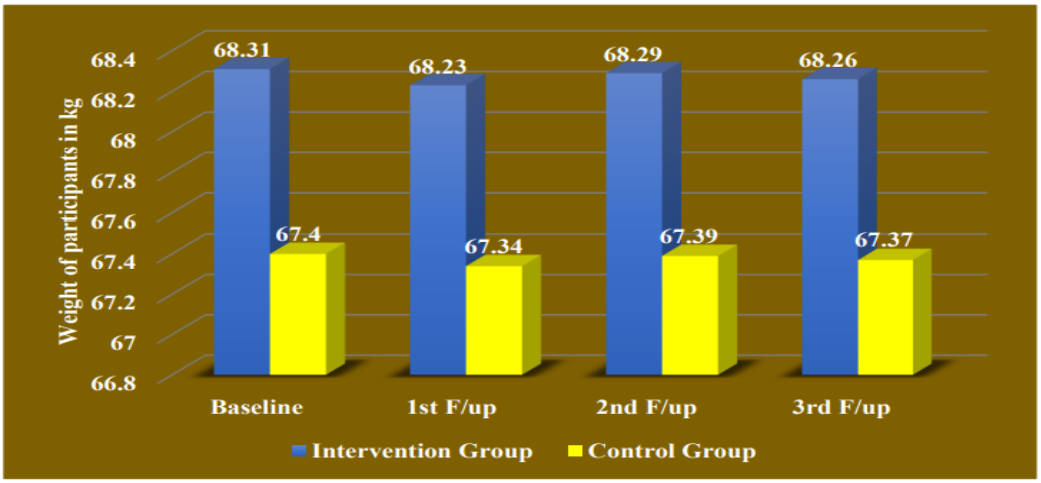

Figure 6. Weight of Participants in Intervention Group & Control Group at follow up visit

At baseline, there is no statistically significant difference between the two groups (p-value = 0.7646). When compared to the Control Group, the Intervention Group's first and second follow-up visits revealed a statistically significant rise in the number of individuals with improved working capacity (p-value < 0.0001). As shown in figure 7, there was a decrease in the number of participants in the Intervention Group (54%) compared to the first (81%) and second (86%) follow-up visits, despite a statistically significant increase in the number of participants with better working capacity compared to the Control Group (p value = 0.0003).

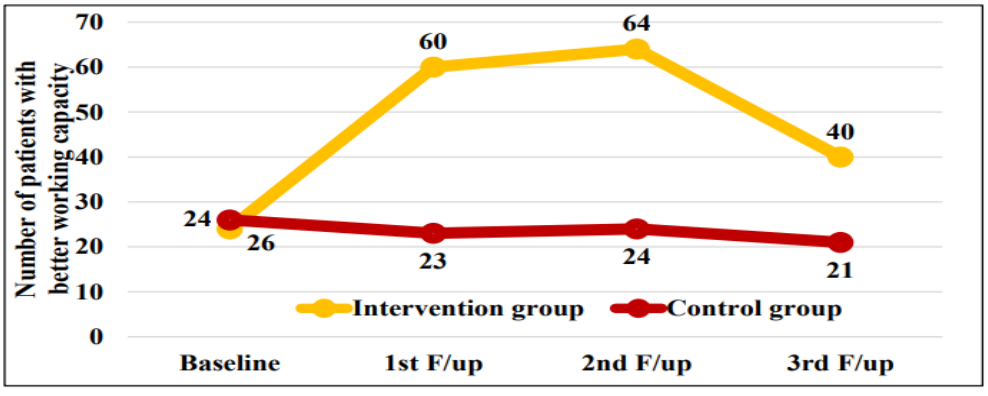

Figure 7. Line graph showing working capacity in Intervention Group Vs Control Group

At baseline, there is no statistically significant difference between the two groups (p-value = 0.7677). When compared to the Control Group, the Intervention Group's first and second follow-up visits revealed a statistically significant drop in the number of participants who were fatigable (p-value < 0.0001). Figure 8 shows that although the number of participants with fatigability in the Intervention Group was significantly lower than in the Control Group at the third follow-up visit (p value = 0.0405), it was higher in the Intervention Group (40.54%) than in the first (16.21%) and second (12.16%) follow-up visits.

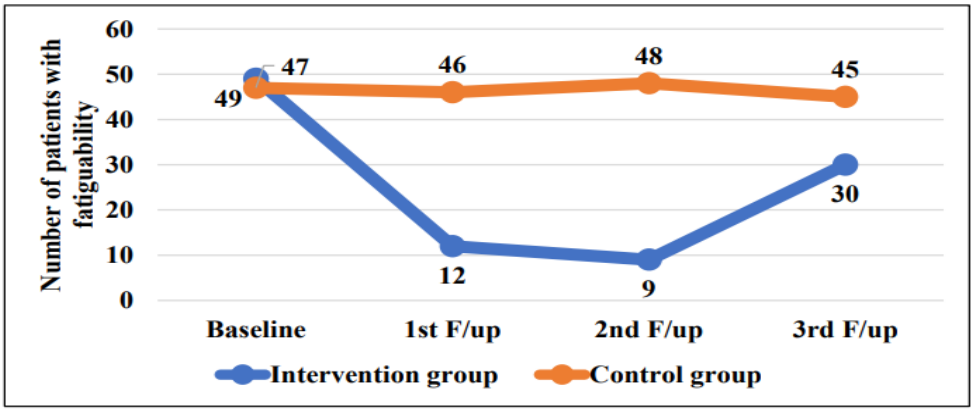

Figure 8. Line graph showing Fatigability in Intervention Group Vs Control Group

4. Discussion

In our study, the proportion of male patients with hypertension was higher than that of female patients. There were 149 participants, of which 86 (58%) were men and 63 (42%) were women. (Graph: 08 & Table: 04). Prior research by Ast J et al 254 and Miller AL250 similarly revealed that a greater proportion of men than women in their investigations had hypertension. The number of patients in the Intervention Group who were able to work better than those in the Control Group is depicted in Figure 7. At baseline, there is no statistically significant difference between the two groups (pvalue = 0.764). Figure 8 compares the number of patients in the Intervention Group to the Control Group who were fatigable. At baseline, there is no statistically significant difference between the two groups (p-value = 0.7677). When compared to the Control Group, the Intervention Group's first and second follow-up visits revealed a statistically significant drop in the number of patients with fatigability (p-value < 0.0001). [10].

5. Conclusion

Another well-researched topic is how distress affects the way this disease is managed and how its consequences affect different morbidities and mortality rates. The main goal of this study was to determine whether or not the chronic, demanding disease can be better managed with the help of a skilled technical professional a pharmacist and whether or not distress levels can be reduced. If so, this could break the cycle of diabetes complications, distress, and diabetes, improving quality of life and achieving better disease control through the use of individualised care plans. Regarding patient demographics, education, family history, treatment initiation interval, and number of clinic visits, there was no statistically significant difference found between the control and test groups, indicating that they are comparable. The test or pharmaceutical care group received an additional pharmaceutical care intervention that offered the patients in the test group individualised care options, while the control group continued to receive standard treatment from the doctor and dietitian. Patients who received pharmaceutical care had better compliance and better care with achievement of disease control and less distress than patients receiving usual care thanks to the patient education program, awareness and counselling activities, medication adherence suggestions, scouting for the DRPs, and other patient support activities.

References

[1] Ohoro, C. R., A. O. Adeniji, A. I. Okoh, and O. O. Okoh. "Distribution and chemical analysis of pharmaceuticals and personal care products (PPCPs) in the environmental systems: a review." International journal of environmental research and public health 16, no. 17 (2019): 3026.
[2] Dănescu, Tatiana, and Maria-Alexandra Popa. "Public health and corporate social responsibility: exploratory study on pharmaceutical companies in an emerging market." Globalization and health 16 (2020): 1-9.
[3] Khan, Hamid, and Javed Ali. "UHPLC: Applications in pharmaceutical analysis." Asian Journal of Pharmaceutical Analysis 7, no. 2 (2017): 124-131.
[4] Stephen, K. V. K., Mathivanan, V., Manalang, A. R., Udinookkaran, P., De Vera, R. P. N., Shaikh, M. T., & Al-Harthy, F. R. A. (2023). IOT-Based Generic Health Monitoring with Cardiac Classification Using Edge Computing. Journal of Internet Services and Information Security, 13(2), 128-145.
[5] Keerthi, Anusha Mysore, Soujanya Ramapriya, Sriraksha Bharadwaj Kashyap, Praveen Kumar Gupta, and B. S. Rekha. "Pharmaceutical management information systems: A sustainable computing paradigm in the pharmaceutical industry and public health management." Sustainable and Energy Efficient Computing Paradigms for Society (2021): 33-51.
[6] Peña-Fernández, Antonio, Mark D. Evans, and Marcus S. Cooke, eds. Toxicology for the health and pharmaceutical sciences. CRC Press, 2021.
[7] Sathyanarayanan, S., & Srikanta, M.K. (2024). Heart Sound Analysis Using SAINet Incorporating CNN and Transfer Learning for Detecting Heart Diseases. Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications (JoWUA), 15(2), 152-169. https://doi.org/10.58346/JOWUA.2024.I2.011
[8] Nassiri Koopaei, Nasser, and Mohammad Abdollahi. "Health risks associated with the pharmaceuticals in wastewater." DARU Journal of Pharmaceutical sciences 25, no. 1 (2017): 9.
[9] Chauhan, Abhishek, and Tanu Jindal. Microbiological methods for environment, food and pharmaceutical analysis. Springer Nature, 2020.
[10] Surendar, A.Short communication: Role of microbiology in the pharmaceutical &medical device(2018) International Journal of Pharmaceutical Research, 10 (3), p. 433.
[11] Damiati, Safa A. "Digital pharmaceutical sciences." AAPS PharmSciTech 21, no. 6 (2020): 206.
[12] Yeung, Andy Wai Kan, Atanas G. Atanasov, Helen Sheridan, Elisabeth Klager, Fabian Eibensteiner, Sabine Völkl-Kernsock, Maria Kletecka-Pulker, Harald Willschke, and Eva Schaden. "Open innovation in medical and pharmaceutical research: a literature landscape analysis." Frontiers in pharmacology 11 (2021): 587526.
[13] Neuwelt, Pat M., Deborah Gleeson, and Briar Mannering. "Patently obvious: a public health analysis of pharmaceutical industry statements on the Trans-Pacific Partnership international trade agreement." Critical Public Health 26, no. 2 (2016): 159-172.