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Research Article

IMPACT OF DEMOGRAPHIC VARIABLES ON BLOOD PRESSURE AND GLYCEMIC CONTROL

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ABSTRACT

Objective: This study was designed to analyse the impact of demographic variables on blood pressure and glycaemic levels in patients with diabetes and hypertension.

Methods: A community-based prospective observational study was conducted over a span of six months in the rural villages of Nagamangala Taluk, Mandya Dist, Karnataka.

Results: Among 320 subjects, 285 patients had been enrolled in the study. The demographic variable such as age was found to be significantly correlated with random blood sugar and blood pressure level. Whereas gender was significantly correlated to the RBS level, while negatively correlated to blood pressure level. Even though the economic status was not significant, educational status was significant to both RBS and blood pressure level.

Conclusion: This inquest portrayed that educational stature brings out an immense reverberation on glycemic and blood pressure control apart from other demographic variables. So this study confers an insight that, strategies for educating patients especially in rural areas thereby making them aware of long-term complications leads to augment overall health outcome.

Keywords: Diabetes mellitus, Hypertension, Glycemic control, Blood pressure control.

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INTRODUCTION

Chronic diseases such as hypertension (HTN) and diabetes mellitus (DM) are two major issues confronting by many countries in the world due to continuous lifestyle changes and which may further contribute to the high mortality rates [1,2]. Unfailingly, the prevalence rate for both these ailments is found to be escalated tremendously [3,4]. As per the current scenario, the predominance of diabetes and HTN reached approximately 20–30% in urban and 10–20% in rural subjects in India [5]. Even if HTN and diabetes are not considered to be the top leading cause of death in the world such as cancer and stroke, these two diseases have been drawn attention from the public due to their increasing trends [6]. The uncontrolled eminence of these diseases implies poor health outcome and has been involved with micro- and macro-vascular complications [7,8].

To forbid these complications, pointing out the risk factors is of great importance; well-defined risk factors include obesity, family history, hypercholesterolemia, and sedentary lifestyle [9]. The sociodemographic as well as economic factors are equally important and presumed to be associated with better glycemic and blood pressure (BP) control[10]. Hence, to curtail the risk of early mortality, we need to modify the lifestyle behavior. Evidence has shown that sociodemographic factors such as age, gender, occupation, educational, and economic status create a huge impact on glycemic and BP control in diabetes and hypertensive patients [11]. In general, both diseases were typical in males, aged and those who were uneducated and economically poor people. Several studies showed that rural and minority populations are more liable to the consequences of lower ingress to health care [5,12] so that this study focused on the rural populations.

The purpose of this study was to analyze the impact of demographic variables such as age, gender, occupation, income, and education on BP and glycemic levels.

MATERIALS AND METHODS

Study design

This study was a community-based prospective observational study, conducted for a span of 6 months from November 2016 to April 2017.

Study population

This study was conducted in the five rural villages of Nagamangala Taluk, Mandya Dist., Karnataka, namely Javaranahalli, Govinaghatta, Agachahalli, Kannaghatta, Dadaga, over a time of 6 months. A sample size of 285 dwelling individual belongs to the age group of 18–85 years of either sex who were diagnosed with DM, HTN, and with their comorbidities. All pediatric and psychiatric patients were excluded from the study.

Ethical consideration

This study was approved by the Ethical Committee of Adichunchanagiri Institute of Medical Sciences, B.G Nagara (AIMS/IEC/1491), and a letter was issued from the Panchayath office of five rural villages regarding consent for conducting the study in community.

Study procedure

Considering the inclusion and exclusion criteria, patients were enrolled after taking their written consent. A suitably designed data collection form was used to collect all the necessary demographic details. Patients BP readings were recorded using sphygmomanometer and blood glucose levels were obtained using a glucometer. Statistical analysis was performed using SPSS version 17.0 with a confidence interval of 95% and a significant level of 0.01. Descriptive statistics were utilized for evaluating the demographic characteristics of the subjects. Spearman rank correlation was used to assess the relationship between demographic variables, glycemic, and BP levels.

Table 1: Distribution pattern of respondents based on gender

Gender	Number of respondents (%)
Male	135 (47.7)
Female	150 (52.6)
Total	285 (100)

Table 2: Distribution of patients based on age

Age	Number of respondents (%)
18–30	4 (1.4)
31–45	24 (8.4)
46–65	139 (48.8)
66–75	74 (26.06)
Above 75	44 (15.4)
Total	285 (100)

Table 3: Number of respondents based on education

Education	Number of respondents (%)
Illiterate	119 (41.8)
Below SSLC	61 (21.4)
SSLC	72 (25.3)
Graduates	29 (10.2)
Postgraduates	4 (1.4)
Total	285 (100)

Table 4: Distribution of respondents based on income

Income	Number of respondents (%)
Below 10,000	124 (43.5)
10,000–50,000	120 (42.1)
50,000–100,000	24 (8.4)
Above 100,000	17 (5.9)
Total	285 (100.0)

Table 5: Distribution of respondents based on smoking habits

Smoking	Number of respondents (%)
Yes	120 (42)
No	165 (57)

RESULTS

Demographic variables of the respondents

A total of 285 patients were screened, of which 135 were male and 150 were female (Table 1). Table 2 summarizes the age category of the respondents where the majority comes under middle-aged group. Regarding the education, 119 (41.8%) were illiterate, 61 (21.4%) had incomplete primary education, 72 (25.3%) were SSLC, 29 (10.2%) were graduates, and rest of 4 people (1.4%) were well educated as they completed their postgraduation (Table 3). Most of the respondents had a yearly salary beneath rupees 10,000 as described in Table 4. Smoking habits of the individual screened to be analyzed as 120 (42%) were smokers and 165 (57%) were non-smokers (Table 5). In case of alcoholic drinking habits, 114 (40%) of patients were non-alcoholic (Table 6).

Glycemic control

Of the total 140 diabetic patients, majority had poor glycemic control and their random blood sugar (RBS) level was found to be >350. About 6 patients (4.2%) had a better glycemic control. Table 7 summarizes the proportion of patients with their glycemic control.

Table 6: Distribution of respondents based on alcoholic habits

Alcoholic	Number of respondents (%)
Yes	114 (40)
No	171 (60)

Table 7: Distribution of respondents based on glycemic control

RBS level	Number of respondents (%)
<200	6 (4.2)
200–249	11 (7.9)
250–299	24 (17.2)
300–349	44 (31.5)
>350	55 (39.2)

RBS: Random blood sugar

Table 8: Distribution of respondents based on BP level

BP level	Number of respondents (%)
<120	7 (4)
120–139	15 (8.6)
140–169	119 (68.3)
>170	33 (18)

BP: Blood pressure

Table 9: Correlation analysis between demographic variables and RBS level

Demographic variable	RBS
Age	0.180**
Gender	0.143**
Education	0.475**
Occupation	0.043
Income	0.047

RBS: Random blood sugar. **Correlation is significant at the 0.01 level

Table 10: Correlation analysis between demographic variables and BP level

Demographic variable	BP level
Age	0.144**
Gender	0.086
Education	0.162**
Occupation	0.056
Income	0.081

**Correlation is significant at the 0.01 level. BP: Blood pressure

Table 11: Correlation between random blood sugar and blood pressure level

Demographic variable	BP
RBS	0.534**

**Correlation is significant at the 0.01 level. BP: Blood pressure

BP control

Among the total 174 hypertensive patients, majority of patients had poor BP control. Table 8 summarizes the proportion of patients based on their BP level.

The demographic variables like age, gender, education, occupation and income are directly or indirectly correlated with RBS and BP level as demonstrated in Table 9 and 10.

Table 11 reveals that correlation exists between RBS and BP level. Thus the demographic variables exhibited a huge influence on glycaemic

and blood pressure control, resulted in an overall health outcome improvement.

DISCUSSION

Uncontrolled diabetes and HTN can bring about poor health status and have been involved with micro- and macro-vascular complications. Several epidemiological studies found out that risk of mortality and morbidity is higher in patients with coexistence of Increased BP and blood glucose levels due to the cardiovascular complications [13]. To prevent this complication and minimizing the risk of early mortality, modification of lifestyle behavior is essential [14,15]. Evidence has shown that glycemic and BP level is likely to differ according to the sociodemographic variables such as age, gender, occupation, education, and economic status [11].

The study focused to analyze the impact of demographic variables on glycemic and BP level. A total of 285 patients were screened, of which 135 were male and 150 were female. The impact of gender on glycemic and BP level varies with researchers [14]. Some researchers demonstrated that women were more feasible to have better glycemic control as compared with men, whereas other studies depicted negative effect. However, this study manifest gender was significantly correlated with RBS and negatively correlated with BP level.

As per the study conducted by Houle *et al.*, the effect of age on blood sugar and pressure level differed remarkably based on whether the age group may or may not be able to control HTN and DM [7,16]; normally, the young- and middle-aged group can control HTN better than geriatrics [11]. In this study, the age was positively correlated with BP and RBS level. Diabetes and HTN have been reported to be predominant in developing countries as estimated with developed countries. These contrasts in health outcome between nations are due to their variations in educational and economic status [17,18]. Few studies have shown that low economic status of the respondents leads to poor glycemic and BP control. The low-income status is not always associated with these controls; this study implies income is non-significant to both glycemic and BP level [19]. Among all the above demographic variables, educational status had a great impact on the glycemic and BP control [20,21]. Higher education was associated with better glycemic control as well as advanced survival rates, and this study emphasized that education had an influence on RBS and BP level.

The present study reveals that sociodemographic factor had a great impact on better BP and glycemic control.

CONCLUSION

Unrestricted diabetes and HTN may lead to major cardiovascular and other serious micro- and macro-vascular complications. Sociodemographic variables have a less but precise impact on these factors, and the present study analyses the effect of these risk factors including age, gender, economic, and educational status on glycemic and BP control. From this study, it has been identified that apart from other demographic variables, the educational status could create a huge impact on glycemic and BP control. Hence, this study confers an insight that strategies for educating patients, especially in rural areas, bring out an improvement in an overall health outcome by providing awareness on long-term complications.

AUTHOR'S CONTRIBUTIONS

The corresponding author (Dr. Rajesh Venkataraman) is the principal author and guided the project. The authors (Jeethu M. Mathai, Linu Thomas, and Mathew James) had equally contributed in designing of protocol as well as data collection forms, along with carrying out the data collection process, editing, and further analysis.

CONFLICTS OF INTEREST

No conflicts of interest were declared by the authors.

REFERENCES

1. Jhawat V, Gupta S, Agarwal BK, Roy P, Saini V. Prevalence and risk factors of essential hypertension and new onset of diabetes in essential hypertension in rural population of Haryana. Int J Pharm Pharm Sci 2018;10:142-8.
2. Liang X, Chen J, Liu Y, He C, Li T. The effect of hypertension and diabetes management in southwest china: A before- and after-intervention study. PLoS One 2014;9:e91801.
3. Min H, Chang J, Balkrishnan R. Sociodemographic risk factors for diabetes and hypertension prevalence in the republic of Korea. Int J Hypertens 2010;2010:15-7.
4. Khattab M, Khader YS, Al-Khawaldeh A, Ajlouni K. Factors associated with poor glycemic control among patients with type 2 diabetes. J Diabetes Complications 2010;24:84-9.
5. Asekun-Olarinmoye E, Akinwusi P, Adebimpe W, Isawumi M, Hassan M, Olowe O, *et al.* Prevalence of hypertension in the rural adult population of Osun state, southwestern Nigeria. Int J Gen Med 2013;6:317-22.
6. Sushilkumar PL, Mahendrakumar BJ, Suman B, Gloria SK, Chaitanya KT. Implementation and evaluation of health screening services to diabetic and hypertensive patients in a selected community pharmacy at Belgaum city. Asian J Pharm Clin Res 2015;8:305-15.
7. Houle J, Lauzier-Jobin F, Beaulieu MD, Meunier S, Coulombe S, Côté J, *et al.* Socioeconomic status and glycemic control in adult patients with type 2 diabetes: A mediation analysis. BMJ Open Diabetes Res Care 2016;4:e000184.
8. Benoit SR, Fleming R, Philis-Tsimikas A, Ji M. Predictors of glycemic control among patients with type 2 diabetes: A longitudinal study. BMC Public Health 2005;5:36.
9. Elis A, Rosenmann L, Chodick G, Heymann AD, Kokia E, Shalev V. The association between glycemic, lipids and blood pressure control among Israeli diabetic patients. Qjm 2008;101:275-80.
10. Walker RJ, Gebregziabher M, Martin-Harris B, Egede LE. Independent effects of socioeconomic and psychological social determinants of health on self-care and outcomes in type 2 diabetes. Gen Hosp Psychiatry 2014;36:662-8.
11. Huang OS. Glycemic and blood pressure control in an Asian Malay population with diabetes and diabetic retinopathy. Arch Ophthalmol 2010;128:1185.
12. Mainous AG 3rd, King DE, Garr DR, Pearson WS. Race, rural residence, and control of diabetes and hypertension. Ann Fam Med 2004;2:563-8.
13. Soubra L, Nureddin H, Omar AG, Saleh M. Factors associated with hypertension prevalence and control among lebanese type 2 diabetic patients. Int J Pharm Pharm Sci 2016;8:153-9.
14. Mondesir FL, White K, Liese AD, McLain AC. Gender, illness-related diabetes social support, and glycemic control among middle-aged and older adults. J Gerontol Ser B Psychol Sci Soc Sci 2016;71:1081-8.
15. Lipscombe C, Smith KJ, Gariepy G, Schmitz N. Gender differences in the association between lifestyle behaviors and diabetes distress in a community sample of adults with type 2 diabetes. J Diabetes 2016;8:269-78.
16. Seow LS, Subramaniam M, Abdin E, Vaingankar JA, Chong SA. Hypertension and its associated risks among Singapore elderly residential population. J Clin Gerontol Geriatr 2015;6:125-32.
17. Nazir SU, Hassali MA, Saleem F, Bashir S, Aljadhey H. Disease related knowledge, medication adherence and glycaemic control among patients with type 2 diabetes mellitus in Pakistan. Prim Care Diabetes 2016;10:136-41.
18. Dagenais GR, Gerstein HC, Zhang X, McQueen M, Lear S, Lopez-Jaramillo P, *et al.* Variations in diabetes prevalence in low-, middle-, and high-income countries: Results from the prospective urban and rural epidemiological study. Diabetes Care 2016;39:780-7.
19. Roy S, Sherman A, Monari-Sparks MJ, Schweiker O, Jain N, Sims E, *et al.* Association of comorbid and metabolic factors with optimal control of type 2 diabetes mellitus. N Am J Med Sci 2016;8:31-9.
20. Aliarzadeh B, Greiver M, Moineddin R, Meaney C, White D, Moazzam A, *et al.* Association between socioeconomic status and haemoglobin A1c levels in a Canadian primary care adult population without diabetes. BMC Fam Pract 2014;15:1-9.
21. Dupre ME, Silberberg M, Willis JM, Feinglos MN. Education, glucose control, and mortality risks among U.S. Older adults with diabetes. Diabetes Res Clin Pract 2015;107:392-9.