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Neurological Disorders and Its Awareness Among Cardiovascular Disease (CVD) Patients

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Abstract

Introduction: *Cardiovascular system is the one which supply blood and oxygen to brain so, cardiovascular disease (CVD) is associated with neurological disorders. Heart diseases frequently have neurological side effects. As many people may not recognize early neurological symptoms. Thus, they may lose important time in presenting for emergency medical treatment. Thus, the objective of present study is to assess the neurological disorders and its awareness among CVD patients.* ***Methods:*** *A descriptive cross-sectional study on neurological disorders and its awareness among 150 CVD patients admitted in Hero DMC Heart Institute, Ludhiana, Punjab, India, were selected by total enumerative sampling technique. Data was collected from CVD patients by calculating sample size with formula $4PQ/D^2$. The data was collected through checklist to assess the prevalence of neurological disorders and structured questionnaire on awareness of CVD patients regarding neurological disorders through self-report method.* ***Results:*** *Among 150 CVD patients, 36 patients (24%) were diagnosed with neurological disorders and maximum (62%) were diagnosed with CVA. Among them, 4 CVD patients were with neurological deficit. Among remaining 146 CVD patients, maximum (90.00%) had perceived neurological symptoms, such as stiffmuscles (56.29%), restlessness at nighttime (54.07%), forgetfulness (50.37%), etc. More than half of CVD patients (52.8%) had high level of awareness regardingneurological disorder in terms of prevention, warning signs and timely consultation. It was found that the mean % of awareness regarding timely consultation (3.67 ± 1.08; 73.4%) of neurological disorders was more among CVD patients. But the presence of neurological disorders was not associated with their awareness ($p > 0.05$).* ***Conclusion:*** *It is concluded that, about $1/4^{th}$ of CVD patients was with neurological disorder and CVA was most common among them. More than half of patients were having high level of awareness regarding neurological disorder in terms of prevention, warning signs and timely consultation. The awareness regarding neurological disorders was found to be nonsignificant with presence of neurological disorders ($p > 0.005$).*

Keywords: Knowledge, neurological disorders, CVD patient, cardiovascular system, heart diseases

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INTRODUCTION

The cardiovascular system includes both the cardiac and vascular systems. The primary function of the circulatory system is to pump blood and distribute it to all parts of the body [1]. Cardiovascular problems are illnesses where blood arteries become constrained or clogged, which can result in heart related problems [2]. According to WHO report 17.9 million people die every year due to cardiovascular disease (CVD) which includes cerebrovascular and coronary heart disease. Neurological side effects of heart disease are common. The most frequent and well-known cardiac cause of these problems is emboli in heart [3]. It is linked to cardiovascular disorders

because of atherosclerosis and rising or uncontrolled blood pressure are potential causes. Some of the warning signs in CVD patients with neurological disorders [4–10] that can be controlled at an early stage to prevent health deterioration include sudden unilateral weakness, sudden trouble speaking, sudden difficulty walking, etc. Because of ignorance, fear of being admitted to the hospital, or other factors, many people fail to detect the early neurological symptoms in themselves or others, and occasionally they choose to ignore them. Thus, they may lose important time in presenting for emergency medical treatment [8, 9]. There is a pressing need to improve the early identification of these neurological disorders and address the treatment seeking delays to prevent mortality and this can only be done if you evaluate and check person's behavior and physical activities on the daily basis [11, 12]. Given that older people are most vulnerable demographic group, who are at greater risk for developing neurological disorders [11–13].

METHODS

"Quantitative research" approach was used to assess the neurological disorders and its awareness among CVD patients. A descriptive research design was adopted to assess neurological disorders and its awareness among CVD patients. The study was conducted among CVD patients admitted in HDHI, Ludhiana, Punjab. Total enumerative sampling technique was used for selection of 150 CVD patients as per inclusion and exclusion criteria. The tool was developed based on review of literature and opinions and suggestions of experts from the field of nursing and research. Part A of tool is divided into 2 sections, Section 1 include sociodemographic profile and section 2 include clinical profile, part B includes structured neurological disorders checklist, it consists of two components those diagnosed with neurological disorder and those who perceive neurological symptoms, part C of tool involves structured questionnaire on awareness of neurological disorders in terms of prevention, warning signs and timely consultation based on high, average and low level of awareness. In the present study, the reliability of questionnaire to assess neurological disorder awareness was checked by split half method (r = 0.70) and reliability of checklist was checked by test-retest method (r = 0.72). The tool was found to be reliable. Pilot study was conducted on $1/10^{th}$, i.e., 15 total samples (150).

RESULTS

Sociodemographic Profile

Most of the CVD patients (45.30%) were with 51–65 years of age with meanage of 59.3 ± 13.7 years. More than half of CVD patients (58.6%) were male, urban residents (55%)and belongs to Sikh religion (52.8%). Most of CVD patients were educated till elementary level (36.6%) and belongs to joint family (50%). Maximum CVD patients were married (80.70%), nonworking (69.3%) and belongs to lower middleclass family. Majority of the patients prefer vegetarian diet (62.7%), were non-alcoholic (85.33%) and nonsmoker (96%) (Table 1) (Figures 1–5).

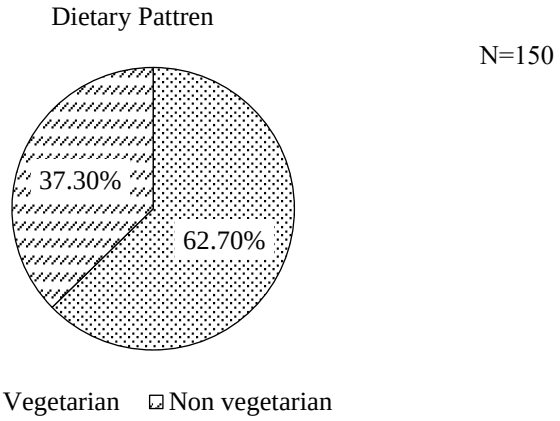

Figure 1. Percentage distribution of CVD patients as per dietary pattern.

Table 1. Frequency and percentage distribution of CVD patients as per the sociodemographic profile.

Sociodemographic Variables	**f (%)**
Age (in years) *	
21–35	09 (06.00)
36–50	23 (15.30)
51–65	68 (45.30)
≥ 66	50 (33.40)
Gender	
Male	88 (58.60)
Female	62 (41.40)
Educational status	
Illiterate	18 (12.00)
Elementary education	55 (36.60)
Secondary education	29 (19.40)
Graduate and above	48 (32.00)
Habitat	
Urban	83 (55.00)
Rural	67 (45.00)
Marital status	
Married	121 (80.70)
Unmarried	03 (02.00)
Divorced/separated	02 (01.30)
Widow/widower	24 (16.00)
Occupation	
Non- working	104 (69.30)
Working	46 (30.70)
Working status (n = 46)	
Private job	07 (15.20)
Government job	01 (02.10)
Business	38 (82.60)
Type of family	
Joint	75 (50.00)
Nuclear	67 (44.70)
Extended	08 (05.30)
Religion	
Hindu	69 (46.00)
Sikh	79 (52.80)
Muslim	01 (00.60)
Jain	01 (00.60)

Note: N=150. Mean age (in years) = 59.3 ± 13.7.

Clinical Profile

Most of the patients (34.67%) were diagnosed with coronary artery disease. Among 150 CVD patients, most of patients were overweight (42.7%), hypertensive (49.3%), without any family history of cardiac (71.33%) and neurological disorder (87.33%) (Table 2).

Neurological Disorders Among CVD Patients

Among 150 CVD patients, 36 patients (24%) were diagnosed with neurological disorders and maximum (62%) were diagnosed with CVA. Among them, 4 CVD patients were with neurological deficit. Among remaining 146 CVD patients, maximum (90.00%) reported perceived neurological

symptoms, such as stiff muscles (56.29%), restlessness at nighttime (54.07%), forgetfulness (50.37%), etc. (Tables 3 and 4).

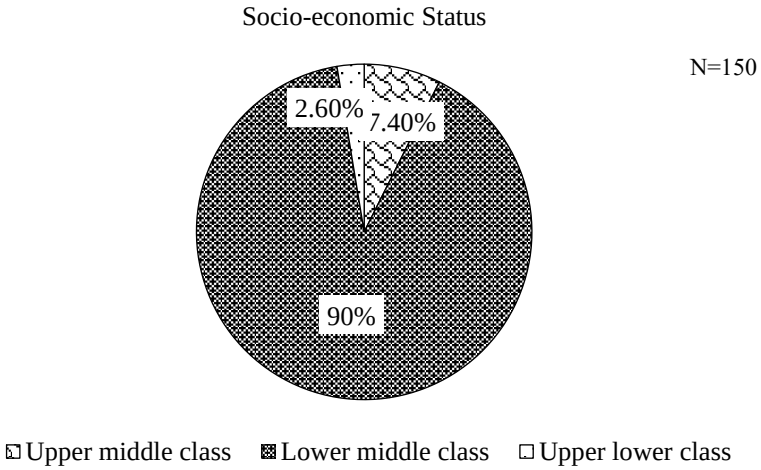

Figure 2. Percentage distribution of CVD patients as per socioeconomic status.

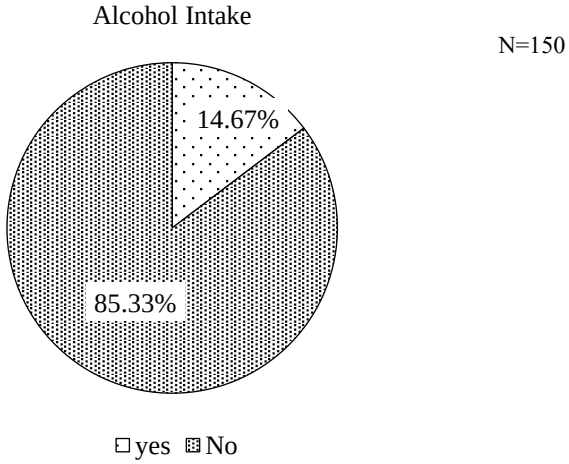

Figure 3. Percentage distribution of CVD patients based on alcohol intake.

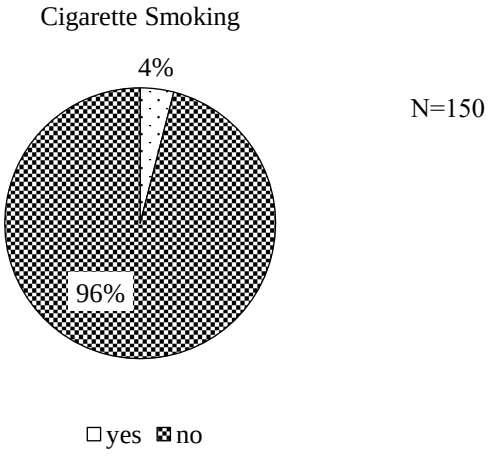

Figure 4. Percentage distribution of CVD patients based on cigarette smoking.

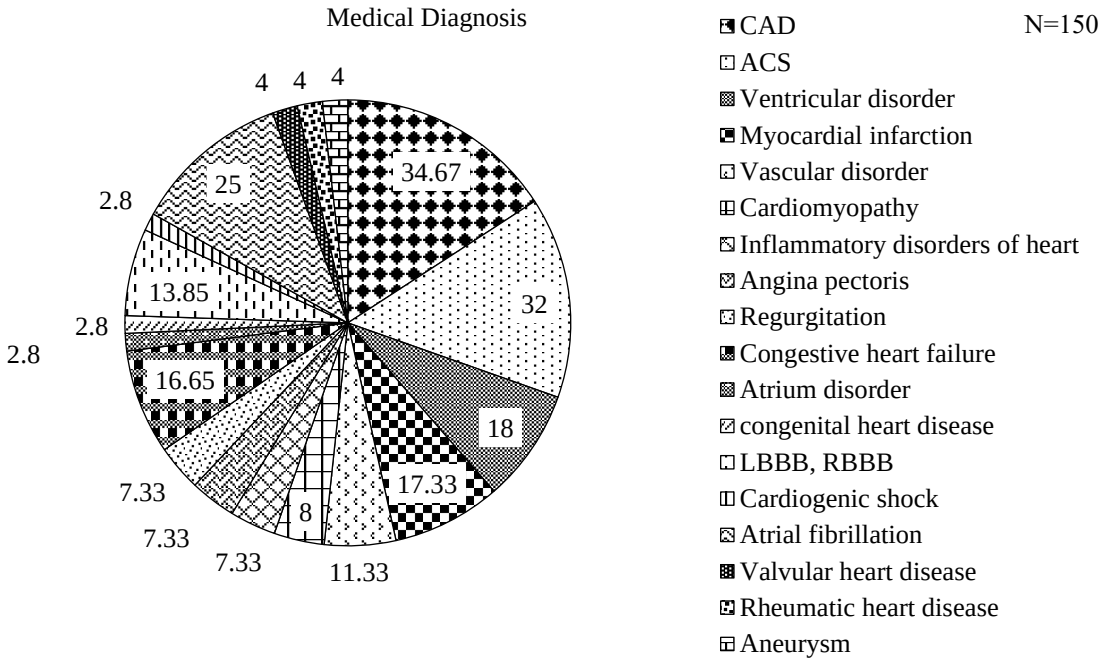

Figure 5. Percentage distribution of CVD patients based on medical diagnosis.

Table 2. Frequency and percentage distribution of cardiovascular disease patients as per the clinical profile.

Clinical Profile	**f (%)**
BMI	
Underweight (<18.5)	08 (05.3)
Normal (18.5–24.9)	57 (38.0)
Overweight (25–29.9)	64 (42.7)
Obese (≥ 30)	21 (14.0)
*Comorbidity***	
Gastrointestinal disorder	13 (08.67)
Endocrine disorder	67 (44.60)
Urinary disorder	18 (12.00)
Hypertension	74 (49.30)
Others	24 (16.00)
Family history of cardiac disorder	
Yes	043 (28.67)
No	07 (71.33)
Family history of neurological disorder	
Yes	019 (12.67)
No	131 (87.33)
*Medications administered***	
Antibiotics	033 (22.00)
Cardiac drugs	150 (100.0)
Respiratory drugs	009 (06.00)
Gastrointestinal+ endocrine drugs	075 (50.00)
Tranquilizers	034 (22.70)
Hypoglycemic agents	013 (08.70)

*Note: N=150. **Multiple response.*

Table 3. Frequency and percentage distribution of CVD patients as per presence of perceived neurological symptoms.

S.N.	Perceived Neurological Symptoms	f (%)	Rank Order
I.	*Presence of perceived neurological symptoms*		
	PresentAbsent Not responded	135 (90.00%) 011 (07.33%) 004 (02.67%)	}146
II.	*Type of perceived neurological symptoms** (n = 135)*		
1.	loss of sight in half visual field	14 (10.37%)	13
2.	seeing two images of an object	13 (09.62%)	14
3.	fear of light	08 (05.92%)	16
4.	Drooping of eyes/ eyelids	14 (10.37%)	13
5.	Confusion	56 (41.48%)	5
6.	Suddenly severe headache	59 (43.70%)	4
7.	feeling of sleepy or lethargy	33 (24.44%)	8
8.	Forgetfulness	68 (50.37%)	3
9.	Rapid mood changes	47 (34.81%)	6
10.	Restlessness at nighttime	73 (54.07%)	2
11.	Trouble speaking/slurred speech	21 (14.00%)	12
12.	Trouble swallowing	11 (15.55%)	15
13.	A tremor or shaking	32 (23.70%)	9
14.	Slowed movement	34 (25.18%)	7
15.	Stiff muscles	76 (56.29%)	1
16.	Impaired posture and balance	32 (23.70%)	9
17.	Problems in urination/ defecation	32 (23.70%)	9
18.	Drooling from mouth	08 (05.92%)	16
19.	Drop in blood pressure quickly when stand up from Sitting	26 (19.25%)	11
20.	Numbness or weakness of the face/ arm/ leg in one side of body	27 (20.00%)	10

*Note: N = 150. **Multiple response.*

Table 4. Frequency and percentage distribution of CVD patients as per level of awareness regarding neurological disorders.

Level of Awareness	Score	f (%)	Mean ± SD	Mean%
High	10–14	77 (52.8%)	11.2 ± 0.98	80.0%
Average	5–9	67 (45.8%)	08.0 ± 1.19	57.1%
Low	0–4	02(1.4%)	04.0 ± 0	28.5%

Note: n = 146. Mean awareness score = 9.6 ± 2.0. Maximum Score = 14. Minimum Score = 0.*

Awareness Regarding Neurological Disorders Among CVD Patients

More than half of CVD patients (52.8%) had high level of awareness, regarding neurological disorder (11.2 ± 0.98), 45.8% had average (8 ±1.19) and only 1.4% had low level of awareness in terms of prevention, warning signs and timely consultation. It was found that the mean % of awareness regarding timely consultation (3.67 ± 1.08; 73.4%) of neurological disorders was more among CVD patients as compared to risk factors (4.02 ± 1.71; 67%) and warning signs (1.06 ± 0.73; 53%) (Table 5).

Association Between Neurological Disorder and Its Awareness Among CVD Patients

The association between neurological disorder and its awareness was found to be statistically nonsignificant ($p > 0.05$) (Table 6).

Table 5. Mean score of awareness of neurological disorders as per its component among CVD patients.

Components	Max Score	Mean ± SD	Mean%
General	1	0.76 ± 0.42	76%
Risk factors	6	4.02 ± 1.71	67%
Warning signs	2	1.06 ± 0.73	53%
Timely consultation	5	3.67 ± 1.08	73.4%

Note: n = 146.*

Table 6. Association between the presence of neurological disorder and level of awareness regarding neurological disorders among CVD patients.

Neurological Disorder	n	Level of awareness						χ^2
		High		*Average*		*Low*		
		F	*Mean ± SD*	*f*	*Mean ± SD*	*f*	*Mean ± SD*	
Present Absent	32 114	14 63	11.07 ± 1.14 12.06 ± 6.53	16 51	8.07 ± 1.16 8.00 ± 1.31	20	4 ± 0.000	3.779 p = 0.151^{NS} (Yates' correction)

Note: n = 146. NS = non-significant. Minimum score = 0. Maximum score = 14.*

DISCUSSION

Among 150 CVD patients, 45.30% were in age group of 51–65 years with mean age 59.3 ± 13.7 years. Most of CVD patients were male (58.6%), elementary educated (36.6%), urban residents (55%) and married (80.70%).

Most of CVD patients were non-working (69.30%), Half of them, were from joint family, most of CVD patients were from Sikh religion (52.80%), prefer vegetarian diet (62.70%), belongs to lower middle class family (90%), nonalcoholic (85.33%), and nonsmoker (96%).

Clinical profile reveals that most of CVD patients were overweighed (42.7%), diagnosed with coronary artery disease (34.67%), hypertensive (49.30%), with a family history of cardiac disorder (28.67%), and neurological disorder (12.67%).

Similar findings was found in a study by Cordero A, Martínez BV, Mazon P, Facila L, Cosín J, Gonzalez BV, et al. on profile of patients with the CVD which revealed that coronary heart disease was the most prevalent CVD, but heart failure (41.5%) and atrial fibrillation (33.7%) increased significantly [4]. Among 150 CVD patients, 36 (24%) were diagnosed with neurological disorders. Among them maximum were diagnosed with CVA. Four CVD patients with neurological deficit, could not respond to perceived neurological symptom checklist and awareness questionnaire (n = 146*) (Figures 6 and 7).

This finding was supported by another study conducted by Andreua P, Parrilla BG, Arribas JM, Villalba BG, Lucas JJ, Garcia M, et al. Murcia, Spain (2013) [5] on neurological manifestations in patients treated with cardiac myxoma. Among 36 patients, half were women and mean age of patients was 52.4 ± 11.6 years. The study revealed that established ischemic stroke was the most common clinical manifestation (75%), followed by transient ischemic attack. It was concluded that cardiac myxomas frequently present with neurological symptoms, especially ischemic events (established stroke or transient ischemic attack). The result of study revealed that most of CVD patients (52.8%) had high level of awareness followed by average level of awareness (45.8%) and low level of awareness (1.4%) in terms of prevention, warning signs and timely consultation of neurological disorders.

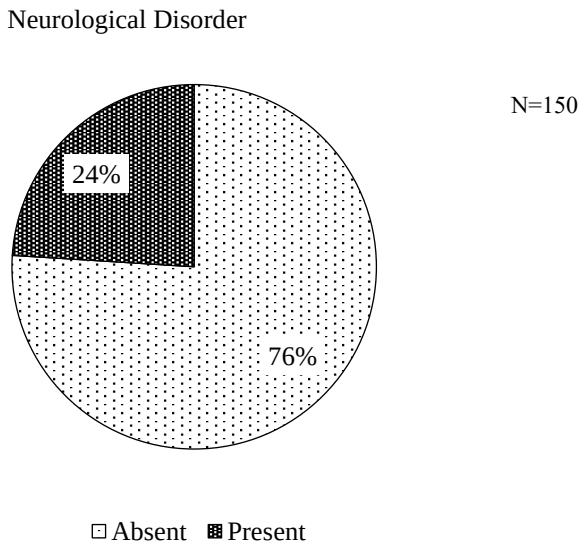

Figure 6. Percentage distribution of CVD patients as per neurological disorders.

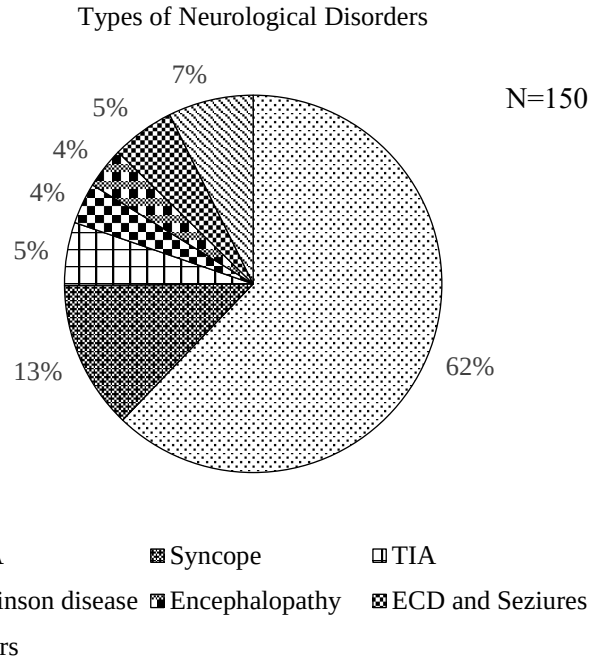

Figure 7. Percentage distribution of CVD patients as per type of neurological disorders.

Similar results were reported by Rossnagel K, Reich A, Jungehulsing G, Roll S, Villringer A (2006) [6] in a study conducted to assess knowledge of stroke risk factors and to determine factors associated with knowledge. The study revealed that increased knowledge of stroke risk factors was significantly associated with younger age, a higher educational level, not living alone, a German nationality, and having received any information about stroke during the last year. The association between neurological disorder and its awareness among CVD patients revealed that there was no statistical association found between presence of neurological disorder and its awareness ($p > 0.05$). Similar results were reported by Chaturvedi S, Femino L (1997) [7] conducted a study on knowledge of stroke risk factors in an urban community. It revealed that knowledge of stroke is deficient among high-risk individuals who developed cerebral or retinal ischemia ($p = 0.15$).

Limitation

In the present study, four CVD patients could not respond to checklist on neurological disorder and questionnaire on awareness due to neurological deficit. Due to strict inclusion and exclusion criteria and restricted duration of data collection, sample size was small for the study. Hence, it was difficult to makea broad generalization.

CONCLUSION

It is concluded that, about 1/4th of CVD patients were with neurologicaldisorder and CVA was most common disease among them. Maximum patients were experiencing perceived neurological symptoms, such as stiff muscles, restlessness at nighttime, forgetfulness, etc. More than half of patients were having high level of awareness regarding neurological disorder in terms of prevention, warning signs and timely consultation. The awareness regarding neurological disorders was found to be nonsignificant with presence of neurological disorders ($p > 0.005$).

Limitation

Due to strict inclusion and exclusion criteria and restricted duration of data collection, sample size was small for the study. Hence, it was difficult to make a broad generalization.

Recommendations

- Community awareness programs regarding neurological disorders can be planned and implemented.
- CVD patients should be assessed frequently for neurological disorders. While discharge planning, nurses can provide counseling to CVD patients regarding neurological disorders in terms of prevention, warning signs and timely consultation.
- A similar study may be conducted on a large sample for wider generalization.
- An experimental study can be carried out to assess the effectiveness of structured teaching program on neurological disorders.
- A similar study can be undertaken among the public.

CONCLUSIONS

It is concluded that about 1/4 of CVD patients was with neurological disorder and CVA was the most common disease among them. More than half of patients were having a high level of awareness regarding neurological disorder in terms of prevention, warning signs and timely consultation. The awareness regarding neurological disorders was found to be nonsignificant with the presence of neurological disorders ($p > 0.005$).

Acknowledgment

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Authors Contribution

Ms. Chetna

- Substantial contributions to the conceptions or design of the work; or the acquisition, analysis, or interpretation of data for the work.
- Drafting the work or revising it critically for important intellectual content.
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
- Final Approval of the version to be published.

Ms. Bindu K.

- Substantial contributions to the conceptions or design of the work; or the acquisition, analysis, or interpretation of data for the work.
- Drafting the work or revising it critically for important intellectual content.

- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
- Final Approval of the version to be published.

Competing Interest

All authors have nothing to declare and disclose.

Ethical Approval

Permission from Institutional Ethical Committee, DMC & Hospital had been taken to conduct the study. A Written Permission was taken from Head of department of Cardiovascular & Thoracic.

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