**DISCUSSION**

As *Table 1* suggests age group between 51-60(31.8%) has got maximum number of CAD patients because CAD is most common in these age groups as they have a lot of stress and co-morbidities are also more common in these age groups. Similar results are also shown in other studies. The second most common age group being 61-70(24.5%) as the risk of co-morbidities increases, also because of sedentary lifestyle. As mentioned in Sharma et al study [81], the risk of developing CAD is more early in the Asian population than any other population, and the mean age of developing CAD is 53 years, in our study also the most common age group is between 51-60 years.

In gender as in *Table 2*, Males (55.6%) were predominantly affected by CAD than females (44.4%) as males had the high number of risk factors for the development of CAD such as alcoholism, smoking, abnormal cholesterol level, high blood pressure. In our study also, males were commonly affected by CAD than females as mentioned in Jousilahti et al study of CAD [82].

As far as occupation is concerned in *Table 3*, Housewives (43.05%) are the people who are more commonly affected as they are undergoing a lot of stress, sedentary lifestyle, and do not take care of themselves properly. This study also shows there is no connection between long working hours and CAD as mentioned in Virtanen et al study [83].

As per *Table 4*, co-morbidity which is largely associated with CAD is hypertension (19.2%), next is diabetes with hypertension (17.88%), followed by diabetes (8.61%). Multiple co-morbidity which contribute to CAD in this study are Diabetes, Hypertension, Hypothyroidism, and previous history of CAD patients (7.95%). Newly diagnosed CAD with no previously known co-morbidities contributes to 13.91% of 151 patients surveyed. Hypertension is the most common risk factor associated with CAD, which got the highest percentage of comorbidity in these 151 patients also. Diabetes is another common comorbidity when it is present along with hypertension, it’s an added risk factor for CAD. Multiple comorbidities also contribute to CAD. As mentioned in [Marie-Isabel K Murray](https://www.omicsonline.org/author-profile/marieisabel-k-murray-337072/) et al study [84], hypertension, diabetes, and hypothyroidism were the comorbidities likely to be associated with CAD, this study also shows the same results.

According to WHO standard, Average number of drugs per prescription should be within 2 drugs (1.6-1.8). In these 151 prescriptions as per *Table 5*, 7 drugs per prescription was more which accounts for 16.56%, 8 drugs per prescription was the next most prescribed which is 13.91%, 6 and 10 drugs per prescription account for 11.26%, 11 drugs per prescription accounts to 8.61%, 13 drugs per prescription accounts to 5.9%, 4 and 12 drugs per prescription accounts for 4.6%, 14 drugs per prescription accounts for 3.31%, 16 and 18 drugs per prescription accounts for 0.66%. with these 151 prescriptions, the average number of drugs per prescription was 8.5 which is more than the WHO standard of the average number of drugs per prescription. As Antiplatelet, Anti-Coagulant, Hypolipidemic drugs, and drugs for comorbidities are necessary for CAD patients, the number of drugs per prescription is higher than the WHO standard.

As per WHO standard, the percentage of encounters with Antibiotics prescribed should be 20.0 to 26.8%. As illustrated in *Table 6*, prescriptions containing antibiotics were 34 in 151 which accounts for 22.5%. So the value is within WHO standards. Antibiotics were prescribed for cellulitis, URI, and UTI most commonly in these patients.

As depicted in *Tables 7 and 8*, the percentage of drugs prescribed by generic names accounts for 39.31%, only 4 prescriptions are prescribed fully by generic names. According to WHO standards, the percentage of prescriptions prescribed by generic names should be 100%. The percentage is very less in this study.

As per WHO standard, the percentage of encounters with Injections prescribed should be 13.4-24.1%. As shown in *Table 9*, the percentage of patients with injections prescribed was 15.59% which is in the range of WHO standards. Injections most commonly prescribed here were heparin, enoxaparin, antibiotics, and proton pump inhibitors.

As illustrated in *Table 10*, the percentage of drugs prescribed free of cost was 69.72% and the percentage of drugs that patient buys for cost was 30.28%. As cost is also one of the complimentary indicators in drug utilization studies, these factors are also should be considered.

*Table 11* compares the value of drug use indicators from our study against the WHO standards.

In our study, the total consumption of drugs in CAD was analyzed using the WHO ATC/DDD system. PDD/DDD ratio was calculated for each prescription to determine underuse (<1) or overuse (>1). As shown in *Table 12*, Aspirin, Clopidogrel, and Trimetazidine have a PDD/DDD ratio of 1 and so we could infer that the dosage has been administered appropriately for these drugs in CAD. Glimepiride (1.08), Glyceryl trinitrate (1.1), Trimetazidine (1.125), Telmisartan (1.33), Furosemide (Parenteral) (1.35), Heparin (1.5) Amlodipine (1.66), Rosuvastatin (2), Atorvastatin (2.496), Enoxaparin (4) were the drugs having PDD/DDD ratio greater than 1, suggesting that they have been overused in our study. Metoprolol (0.11), Carvedilol (0.13), Nicorandil (0.18), Isosorbide dinitrate (0.395), Isosorbide mononitrate (0.5), Metformin (0.522), Enalapril (0.61), Atenolol (0.611), Ranolazine (0.66), Warfarin (0.66), Fenofibrate (0.725), Spironolactone (0.733), Torsemide (0.733), Digoxin (0.92), Furosemide (Oral) (0.977) were the drugs having PDD/DDD ratio less than 1, suggesting that they have been underused in our study.

The drug type distribution was tabulated in *Table 13*. Anti-Platelet drugs (96.69%) and hypolipidemic drugs (92.72%) were the most commonly prescribed drugs in our study. The next most commonly prescribed drug is antihypertensives (61.59%) followed by antianginal drugs (49.67%), anti-diabetic drugs (47.68%), drugs used in heart failure (45.70%), and anticoagulants (29.14%).

According to *Table 14*, Aspirin and clopidogrel both were prescribed to most of the patients which account for 52.06%, Aspirin alone was given to 37.67%, and Clopidogrel alone was given to 10.27%. This study shows dual antiplatelet therapy with aspirin and clopidogrel in CAD patients but in Degrauwe et al article [85] dual antiplatelet therapy with Aspirin and P2Y12 inhibitors, which is still in debate.

As illustrated in *Table 15*, Enoxaparin was the most commonly used anti-coagulant which accounts for 50%, Heparin was the next most commonly used which accounts for 47.73% when used alone, Heparin when used along with warfarin accounts for 2.27%. In our study also low molecular weight heparins were commonly used as in Lee LV et al study[86].

As per *Table 16*, Atorvastatin was the most commonly used hypolipidemic drug which accounts for 93.57%, Atorvastatin used in combination with Fenofibrate which accounts for 1.43%, Rosuvastatin accounts for 5% among the hypolipidemic drugs prescribed. Statins are safe and very effective drugs regardless of cholesterol levels for the prevention and treating of CAD as in Lim SY et al [87]. In our study also statins were almost prescribed for all CAD patients especially, Atorvastatin.

Isosorbide di nitrate was the most commonly used antianginal drug, accounting for 68%, followed by nitro-glycerine (10.67 %), Nicorandil (8 %), trimetazidine (6.67 %), Ivabradine (4 %), isosorbide mononitrate (1.33 %), and ranolazine (1.33 %) as shown in *Table 17*. In this study, nitrates were most frequently used which was similar to the study conducted by Wei J et al [88]. Nicorandil also exerts substantial benefits if it is used as an additional therapeutic agent as in Zhao et al study [89]. Nowadays, Ivabradine is also being used in Heart failure in patients who are unable to tolerate beta blockers as mentioned in Badu-Boateng et al study [90].

Among the heart failure drugs, as in *Table 18*, Furosemide (60.87%) is the most common diuretic prescribed in this study, tablet form (31.88%) and injection form (28.99 %). Spironolactone in tablet form was the next most prescribed diuretic which accounts for 14.49%. Torsemide was also used which accounts for 4.35%. CAD patients are often associated with heart failure for which most commonly used is loop diuretics, especially furosemide. Even in Casu G et al study [91], loop diuretics are the drug of choice for patients with heart failure.

Among the heart failure drugs, as in *Table 18*, all these three drugs Digoxin, and Carvedilol were prescribed equally with 8.70%. There was a combination of Digoxin with Carvedilol which accounts for 2.90%. As mentioned in Spencer et al article [92], Digoxin helps in improving exercise tolerance and decreasing hospitalization for patients with any level of severity of heart failure. As in Keating et al study [93], Carvedilol is shown to have improved left ventricular ejection fraction and reduced mortality in heart failure patients along with anti-oxidant properties.

As shown in *Table 19*, among the anti-hypertensive drug prescribed, the most common anti-hypertensive drug was ACE Inhibitors (80.6%). The prescribed combination of antihypertensive drugs were ACE inhibitors alone (44.09%), ACE Inhibitors with Beta-blockers (29.03%), ACE Inhibitors with calcium channel blockers (4.30%), ACE Inhibitors + Beta blocker + Calcium channel blocker (3.23%) ARB with calcium channel blockers (5.38%), Calcium channel blockers (4.31%), and Beta blockers (3.23%), and, ARB (2.15%), and ARB + Beta-blockers (2.15%), Calcium channel blockers + ARB + Diuretic and ARB + calcium channel blocker + beta-blocker (1.08%). Among the ACE inhibitors, Enalapril was most commonly prescribed in our study because it helps in reducing mortality in patients with risk of cardiovascular death. The beneficial effect of Enalapril is mentioned in Yusuf et al [94] study also. The next most prescribed here was ACE inhibitors along with Beta blockers in our study, this combination is known to reduce cardiovascular risks as mentioned in Strauss et al study [95].

Among the anti-diabetic drug, as in *table 20*, the most commonly prescribed antidiabetic drug in the study was Metformin (31.94%). Insulin accounts for 30.56%. Among the combination of drugs, Metformin and Glimepiride was the most prescribed which accounts for 16.67%. Glipizide and metformin, Metformin + Glimepiride + Voglibose both accounts for 2.78%. Other combinations among oral antidiabetic drugs and insulin with oral antidiabetic drugs accounts for 1.39%. Metformin was the drug most commonly prescribed in patients having both diabetes and CAD. Metformin shows maximum efficacy in reducing cardiovascular events than sulfonyl urea, also lowers cardiovascular mortality as in Han Y et al [96]. Insulin was also prescribed as equally as metformin in diabetic patients with CAD as there will be insulin resistance in CAD patients as per Bressler et al [97].

As shown in *Table 21*, the most common antibiotic prescribed in this study was Cephalosporins- Injection Ceftriaxone (58.13%), Macrolide antibiotics accounts for 11.62%, Nitroimidazole & Penicillin antibiotics accounts for 9.30%, Fluroquinolones accounts for 7%, Nitrofuran antibiotics accounts for 4.65%. Antibiotics were prescribed for cellulitis, Upper respiratory tract infections, and Urinary tract infections.

As in Table 22, Vitamins (46.36%), H2 blockers (36.42%), and proton pump inhibitors (31.13%) were the most prescribed drugs. Apart from that laxatives(27.15%), Benzodiazepines (23.84%), 5HT3 Antagonist (11.26%), Bronchodilators (9.93%), Thyroxine (9.27%), Antacid (8.61%) and Anti-histamine (5.30%) were also prescribed to the patients. Laxatives are commonly prescribed for CAD patients to avoid them straining. Sedatives are commonly prescribed for good sleep.

According to *Table 23*, Antihypertensives were prescribed for CAD patients even though they did not have hypertension but for cardio-protection. Among the antihypertensives, ACE Inhibitors with Betablockers were most commonly prescribed accounting for 58.82%, ACE Inhibitors accounting for 35.29%, Betablockers account for 5.89%. This practice of giving antihypertensives for persons having CAD without hypertension is mentioned in Thompson AM et al article [98].