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Socio-economic and Health Status of People in Agency, Rural and Urban Domiciles of Visakhapatnam District with Reference to Chronic Kidney Disease (CKD)-An Epidemiological Survey

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ABSTRACT
The health and well-being status of the community is being influenced by socio-economic determinants of the people. India is experiencing a terrifying increase in the burden of non-communicable diseases, but data regarding the incidence of chronic kidney disease (CKD) is meager. Most of the people in India reside in rural areas with limited health care services, so CKD is diagnosed in the advanced stages and the cost of treatment is expensive. The present paper reports socio-economic and health status of inhabitants in agency, rural and urban areas of Visakhapatnam District with reference to Chronic kidney disease. A community based cross sectional survey was carried among 1340 respondents residing in agency, rural and urban areas of Visakhapatnam District, Andhra Pradesh, India during the period 2016-2018 using a pre-structured and validated questionnaire. The questionnaire is having information on the socio-demographic and economic characteristics, awareness of CKD risk factors and its symptoms. The results in the present study reveal scope for creating health awareness with reference to chronic kidney disease among the three domiciles of Visakhapatnam district. Studies on the incidence of diseases aid in keeping the attention on the magnitude of the risk and also in planning preventive measures for the control of diseases.
Keywords: *Chronic kidney disease, non-communicable diseases, cross sectional survey, prevalence.*

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INTRODUCTION

Chronic diseases account for 60% of all deaths worldwide and have turned to be the most important public health problem. In India, the projected number of deaths due to chronic diseases was around 5.21 million in 2008 and is expected to rise to 7.63 million in the coming decades [8]. Chronic kidney disease (CKD) is a term given to a range of disorders characterized by impaired kidney structure and function. Chronic kidney disease is one of the key determinants of the poor health outcomes of major non-communicable diseases and is associated with an 8 to 10-fold increase in cardiovascular mortality and is the risk multiplier in patients with hypertension and diabetes. Chronic conditions such as diabetes, hypertension, obesity or cardiovascular disease can lead to the progression of CKD, nevertheless, it can also be due to aging, exposure to toxins or infection etc[13].

Chronic renal failure is characterized by a steady loss of kidneys' function. Chronic kidneyddisease may be regarded as one of the clinical model of accelerated vascular disease and premature ageing and the risk-factor profile changes during development from mild moderate CKD to End Stage Renal Disease (ESRD). Chronic kidney disease can be defined by a glomerular filtration rate (GFR) of less than 60 mL/min/1.73m^2, albuminuria of at least 30 mg per 24 hours or markers of kidney damage like hematuria or structural abnormalities such as polycystic or dysplastic kidneys persisting for more than 3 months [12].

Epidemiology in its modern form is a relatively new discipline and uses quantitative methods to study diseases in human populations to inform prevention and control efforts. Epidemiology is often used to describe the health status of population groups. Earlier, surveys conducted in epidemiology were mainly related with the causes of communicable diseases. Such work continues to be important since it can lead to the recognition of preventive methods. Epidemiological and sociological surveys will play a major role in identifying the epidemic, identifying risk factors, determining the pattern of its spread and social determinants and also help in evaluating interventions for prevention, treatment and control. Poverty, poor sanitation, pollutants, water contamination, overcrowding and known and unknown nephrotoxins

(including heavy metals and plant toxins in indigenous remedies) may lead to glomerular and interstitial kidney diseases. Population-based studies in tropical/subtropical countries are required to assess the global patterns of burden of disease from CKD. Early detection and educating the people can help to prevent the development of kidney disease to kidney impairment. There have been reports of increasing presence of CKD in rural and coastal areas especially as reported in Srilanka and Andhra Pradesh in India [7].

A few studies have reported the incidence of CKD in urban populations of Andhra Pradesh, but there is a scarcity of those studies in the rural populations. Hence, the present study has been taken up with the objective to study the socio-demographics and health status among the three domiciles of Visakhapatnam district with reference to CKD during the period 2016-2018. The present study also emphasizes prevalence of CKD along with associated disorders like hypertension, diabetes and cardiovascular diseases among the selected subject groups.

MATERIAL AND METHODS

The present investigation has been taken up with the objective to study socio-demographics and health status among the three domiciles of Visakhapatnam district-agency, rural and urban respondents with reference to chronic kidney disease in 43 mandals (agency–11, rural–22, urban–10 mandals) of Visakhapatnam District, Andhra Pradesh during the period 2016-2018 from the collected demographic data.

The following are the list of agency, rural and urban mandals of Visakhapatnam district selected for the present study.

Agency mandals (11): Ananthagiri, Araku Valley, Chinthapalle, Dumbriguda, G. K. Veedhi, G. Madugula, Hukumpet. Koyyuru, Paderu, Munching Puttu, PedaBayalu.

Rural mandals (22): Anakapalli, Butchyyapeta, Cheedikada, Chodavaram, Achuthapuram, Devarapalli, Lingampeta, K.Kotapadu, Kasimkota, Rambilli, Bodapalem, Makavarapalem, Munagapaka, Dondawaka, Narsipatnam, Nathavaram, Madugula, Payakaraopeta, Ravikamatham, Komaravolu, Koruprolu, Yelamanchili.

Urban mandals (10): Anandapuram, Bheemunipatnam (Bheemili), Gajuwaka, Padmanabham, Paravada, Pedagantyada, Pendurthi, Sabbavaram, Vizag-Urban, Vizag –Rural.

A well informed oral consent was taken from all the subjects involved in the study. All the respondents were administered a structured pre-tested questionnaire taking into account the area-wise, age-wise, marital status, employment status, educational status etc. All the subjects were inquired about the presence or absence of symptoms suggestive of CKD and its co-morbid symptoms. Past medical history of hypertension, diabetes mellitus, ischemic heart disease, cerebrovascular disease, hyperlipidemia etc. were recorded. The data collected from the respondents had been analyzed using appropriate statistical methods (SPSS16.0). Descriptive analysis of the epidemiological data collected from the respondents was evaluated by frequency calculation, mean values and calculated probability (p-value hypothesis testing).

RESULTS

A total of 1340 respondents were taken into consideration from three domiciles of Visakhapatnam District. Out of the 1340 respondents, 52.50% are males and 47.50% are females, with men showing a positive significant association (Figure 1). The socio-demographic distribution for the area of living shows a total of 49.30% (N=660) of subjects belong to the rural area which is twice that of urban and agency areas 26.1% (N=350) and 24.6% (N=330) respectively. Individuals from the agency and rural areas show a higher male preponderance (65.2% and 50.8% in total) as compared to females. However, a higher proportion of females are found among urban residents (56% vs 44%). Distribution according to the area of living showed rural participants was high in frequency with a significant association (p-value < 0.05). The interpretation of data showed that the distribution was more rated in younger and middle aged than the older age with a ratio of 866:474 of the total individuals in the study.

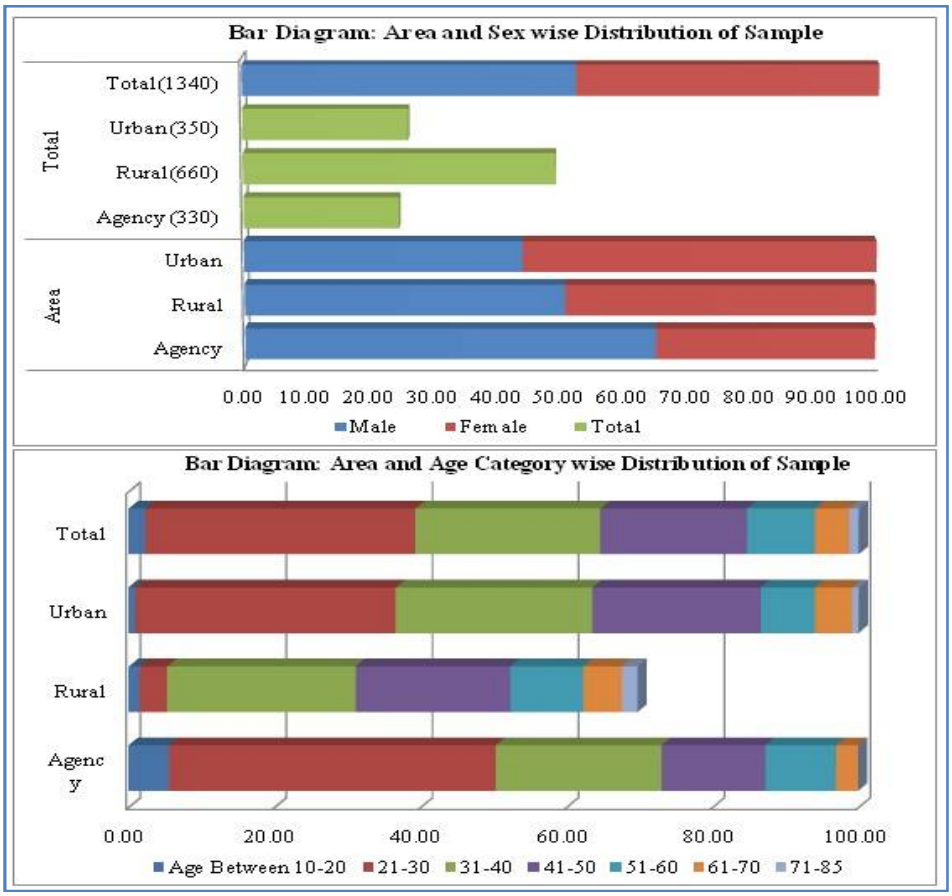

Figure 1. Gender and Age wise distribution of the study population

From the study,it was shown that the majority of the participants belonged to the Hindu religion (92.30%) while few of them belonged to Muslim and Christian communities (0.5% and 7.20%) respectively. The sample selection in terms of both residential and religion is, however, statistically significant ($p<0.001$). In the present study, it was observed that the majority of the participants were married (73.5%) including the widowed and the divorced, while one-fourth of the participants were unmarried (26.5%). The sample selection in terms of both residential and marital status shows statistical significance with a p-value of less than 0.001 (Figure 2).

In the state of Andhra Pradesh, education level is classified as primary, secondary, higher secondary, graduation and further post graduation level of education. From the study statistics, it was evident that significant association ($p<0.05$) was observed with illiteracy (35%) and primary education (7%). Only 17.2% and 15.2% of the study group had received secondary and college-level education respectively with rural preponderance over urban and agency in all the levels. About 20.2% of the total participants were found to be at graduate level and 4.9% at post graduate level. The distribution of residential with occupational level reported the majority of the respondents were unemployed (24.3%) including the homemakers (28.5%), the remaining were students (4%), Governmentemployees and Professional job holders (5.7%) and casual labourers (36.5%).

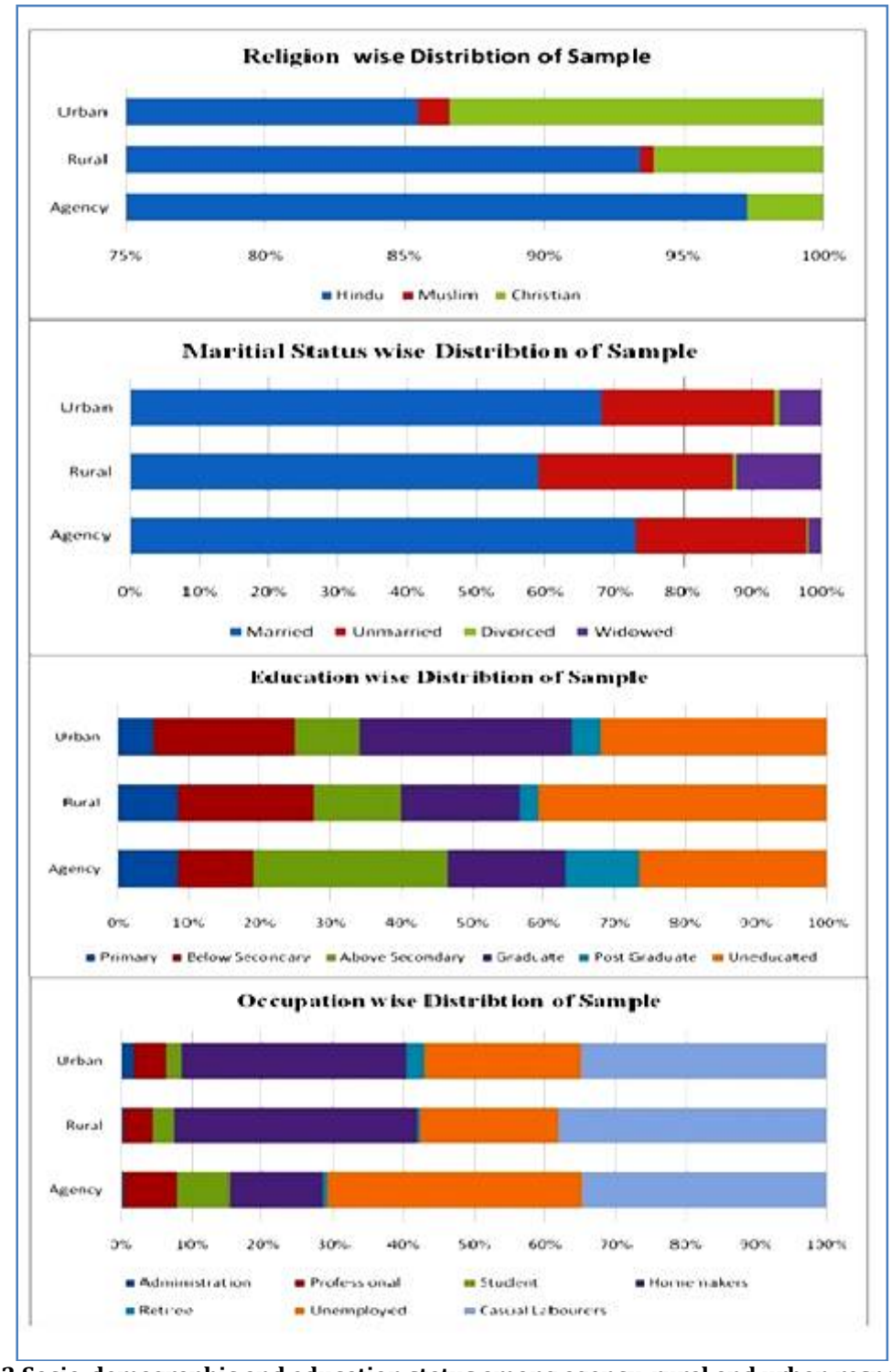

Figure 2.Socio-demographic and education status among agency, rural and urban respondents

Area wise distribution with respect to health status

Health wise status of the sample revealed that the majority of the respondents were healthy (65.97%) and the rest were diseased (34.03%) having one or more ill-health conditions. The distribution was high in the rural area where as the urban and the agency respondents were almost equal in proportion (Figure 3).

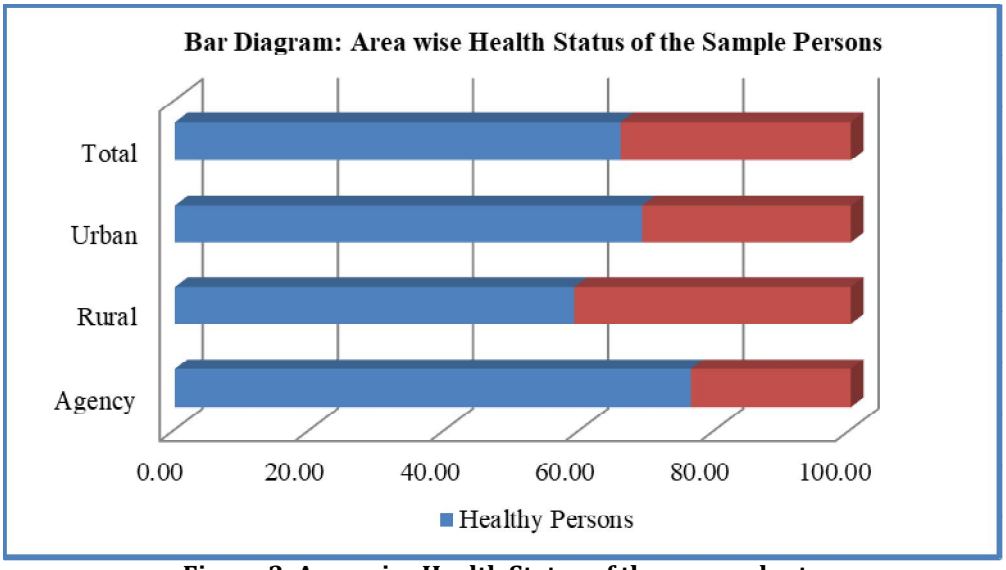

Figure 3. Area wise Health Status of the respondents

Health status of the sample gender wise showed significant association ($p<0.001$). Of the total 1340 individuals, 66.3% of males were found to be healthy while 33.7% of the males were diseased (Figure 4). Likewise in females, 65.6% and 34.4% were recorded to be healthy and diseased respectively.

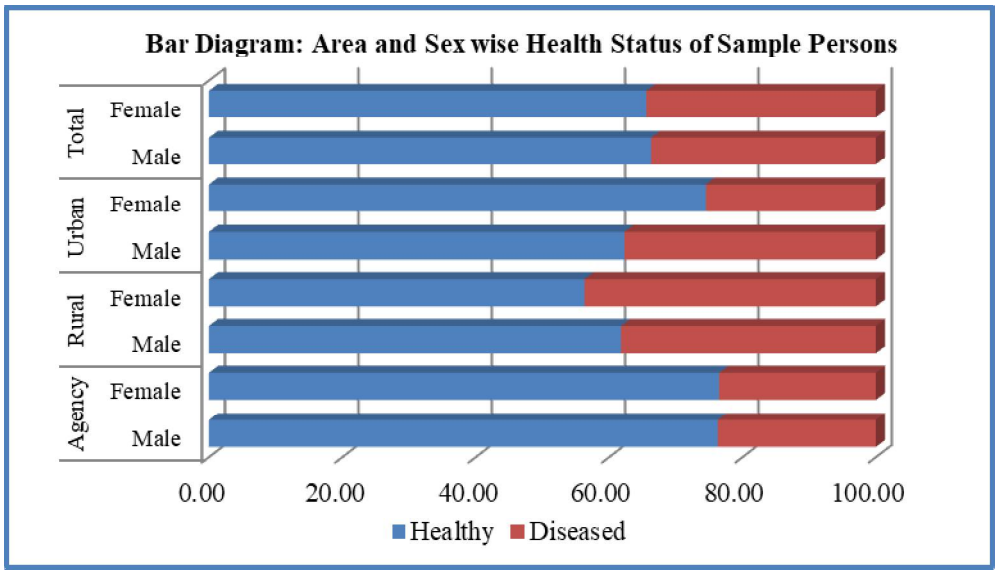

Figure-4. Area and Sex wise Health Status of respondents

It is evident that, out of the 34% of diseased people, 14.48% were single disease affected while the rest (19.55%) hadco-morbid condition i.e. more than one disease state at a time (Figure 5). The major disease conditions were diabetes (2.3%) next to that of hypertension (7.1%) whereas cardiac, cerbrovascular and hyperlipidemia were of small proportion in the present study. The present study was taken up with an interest to analyze the knowledge and awareness of the respondents to chronic kidney disease. The study showed 2.4% (N = 32) of the participants were affected by CKD in all the three domiciles. However, the study distribution with an area of living showed rural people are significantly more affected than the others.

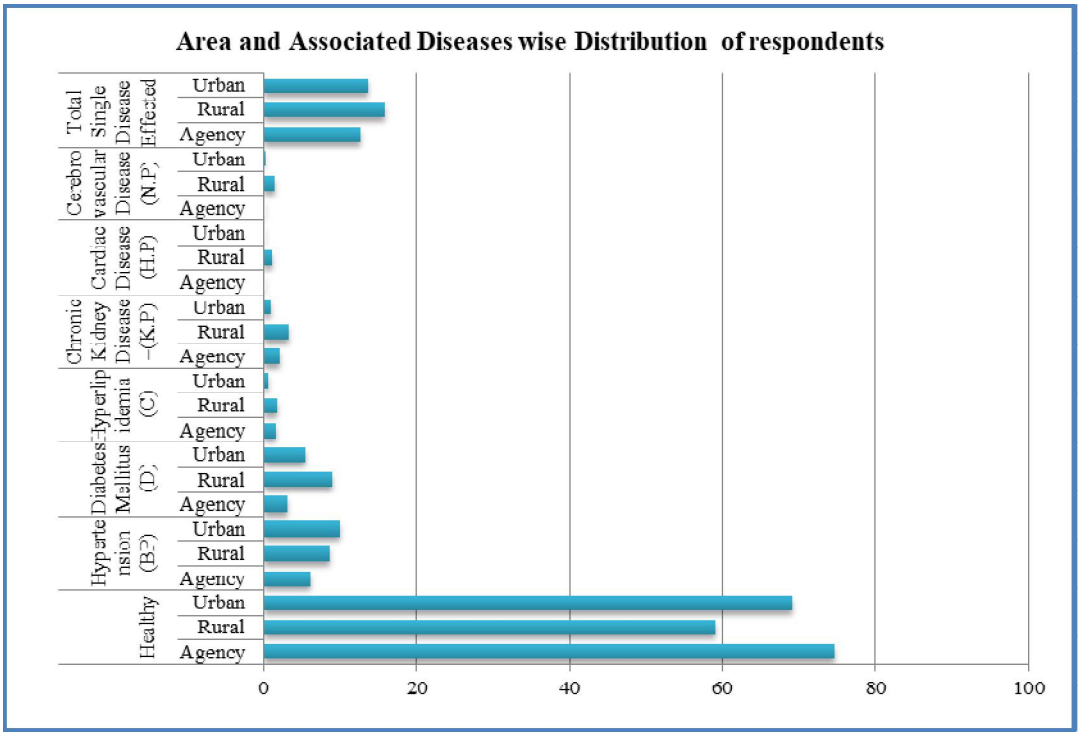

Figure 5. Area and Associated Diseases wise Distribution of respondents

Area wise and multiple diseases status wise distribution of Sample

The interest of the current study was to investigate the knowledge and awareness of selected subjects relating to chronic kidney disease. From the tabulated statistical data, the frequency of CKD along with other diseases was observed to be 7.24% (N=97). However, the study distribution with an area of living showed rural people were significantly more affected with kidney diseases (3.30%) (Figure 6).

Health and educational status wise distribution of subjects

It is evident from the Figure 7, health and educational status wise distribution showed significant association (p=0.001) with the selected subjects for the current study. The subjects with primary education showed 53.5% to be diseased with rural people in major proportion, while secondary education and graduates showed the highest disease condition in the urban area. People of rural and uneducated showed a 44.2% increased proportion of diseased condition.

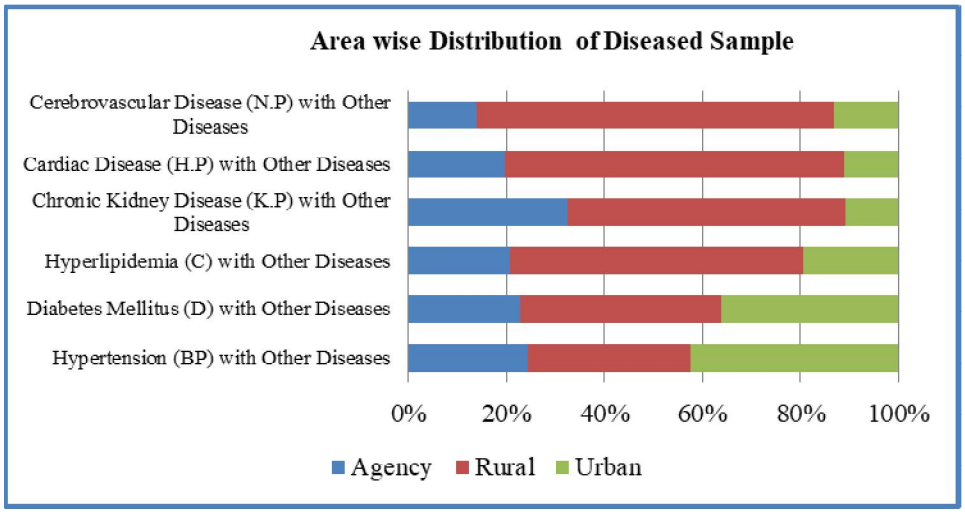

Figure 6. Area and Associated Diseases wise Distribution of Sample

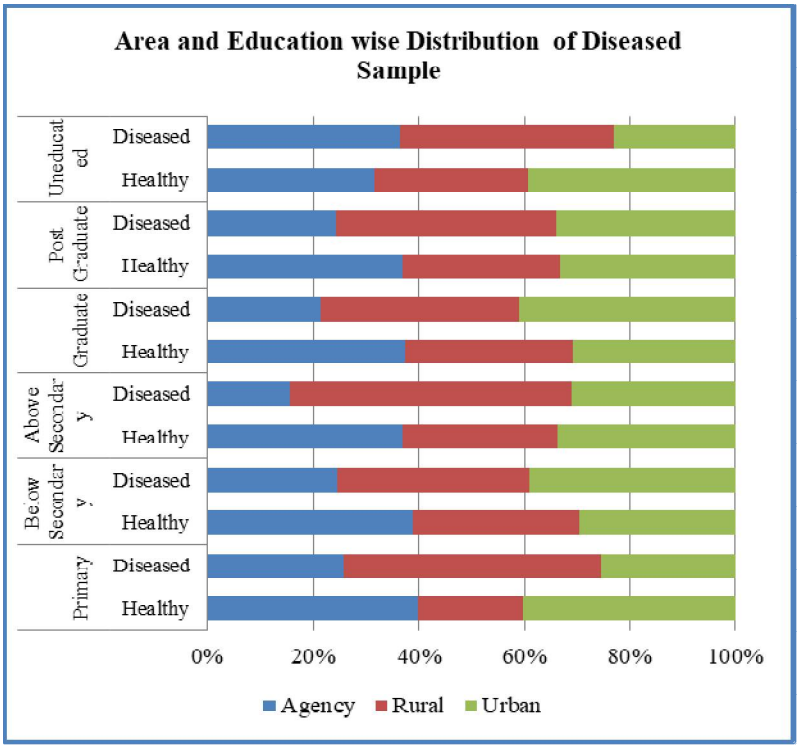

Figure 7. Area and Education wise Health Status of respondents

Area and Occupation wise Health status of sample

From the Figure 8, it is clear that health and occupational status wise distribution showed significant association (p=0.001) with homemakers, retired, unemployed, casual labourers and administrative officers are more at risk for disease with proportions of 50.7, 100%, 29.5% 40.10% and 50% respectively. Professionals (56.2%) showed the highest frequency in urban area.

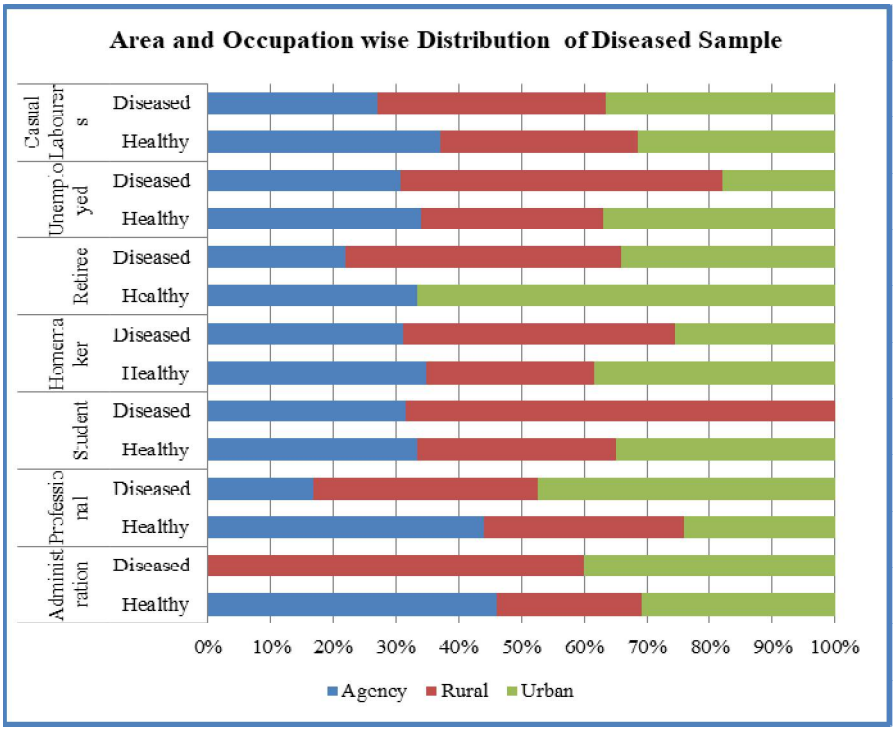

Figure 8. Area and Occupation wise Health Status of respondents

DISCUSSION

CKD has become a major global public health problem affecting 10-15% of the population in Asia, Australia, Europe and USA. India is experiencing a frightening increase in the threat of CKD, but data on the incidence of chronic kidney disease (CKD) is sparse. A community-based epidemiological study has not been done in the agency, rural and urban areas of Visakhapatnam District to determine the prevalence of CKD. Hence, the present study has been taken up to study the pervasiveness of CKD among three domiciles of Visakhapatnam district. The present study also emphasizes the prevalence of CKD along with allied disorders like hypertension, diabetes and cardiovascular diseases among the selected respondents. The socio-demographic, economic and education profile of the sample respondents (n=1340) was studied in the three domiciles and rural males and females were found to be in higher proportion than the other two domiciles which is twice that of urban and agency areas. Few of the respondents had received secondary and college-level education with rural preponderance over urban and agency in all the levels. The distribution of residential with occupational level reported the majority of the respondents were unemployed including the homemakers and the remaining were students, government and professional workers and casual laborers. The distribution of health status of the respondents revealed that half of the respondents were healthy (49.7%) and the rest were diseased having one or more ill-health conditions in the three domiciles and the distribution was high in the rural area. The major disease conditions observed were diabetes next to that of hypertension where cardiac, cerebrovascular and hyperlipidemia were of small proportion and the distribution was found much higher in rural and urban areas.

The study showed 2.4% of the participants are affected by CKD and the study distribution with an area of living showed rural people are significantly more affected than the others. A population-based survey of two major cities Delhi and Chennai revealed that CKD is seen in 8.7% of the adult subjects. One in five participants with CKD was found to be in the upper risk categories for adverse events and nearly a third to half of the participants with CKD has high risk for experiencing a cardiovascular event [2]. In a cross-sectional study carried by Singh *et al.,* (18) among 6120 subjects from 13 academic and private medical centers all over India observed the prevalence of CKD to be 17.2%. Hypertension, anemia and diabetes were the most common risk factors and associated characteristics associated with CKD. The prevalence of CKD was center-dependent and the highest prevalence of CKD was observed in Kanpur, Uttar Pradesh (41.7%), Visakhapatnam, Andhra Pradesh (46.8%) and Delhi (41%) and lowest prevalence was observed in Bangalore and Mysore in Karnataka state.

A community-based study carried by Agarwal*et al.,*[1] in South Delhi reported a prevalence of CKD of 0.79% among the selected subjects. The CKD was comparatively lower than incidence of chronic kidney disease in NHANES and KEEP studies [5, 11]. Rai*et al.,* [17] studied the prevalence of CKD and patterns of known risk factors among the general population at Opal Hospital in Varanasi and observed 29.3% of overall prevalence of CKD in the participants.Rai*et al.,*[16] carried a hospital camp-based screening for detecting patients with chronic kidney disease in Varanasi from 2008-11 and reported the prevalence of CKD of about 46.7% among 645 subjects.

Comparing the health status and disease condition in the present study, findings showed both the genders having significant prevalence with males being predominant over females. Older aged subjects i.e. 50-85 years of age showed highest incidence than other age groups. However, the present statement is contradictory to the findings of Jafar *et al.,*[10] who observed prevalence of CKD in men (9%) and 11% in the case of women aged over 40 years. Nevertheless, in a cohort study carried in Britain, there are considerable remains of evidence of dissimilarities between males and females in a wide range of health outcomes where it was observed that the pattern of sex differences in morbidity is more complicated than the conventional wisdom [15]. Male and female differences in health are highly dependent on historical time and geographic location [6, 9, 14, 20]. Occasionally, these type of studies often fail to take into account factors like gendered distribution of social roles, age and morbidity measures [15, 21, 22]. There are evidences of sex discrimination in the diagnosis of various diseases particularly chronic disease like heart disease [4], hypertension [3] and kidney disease [19].

CONCLUSION

The present study has been undertaken to study the socio-demographics and health profile of the sample respondents in the three domiciles – agency, rural and urban subjects. Rural males and females were found to be in higher proportion than the other two domiciles. Major religion followed by the residents was found to be Hinduism. It was observed that most of the subjects were illiterates (35%) in the three domiciles. Few of the respondents had received secondary and college-level education respectively with rural preponderance over urban and agency in all the levels. The distribution of residential with occupational level reported the majority of the respondents were unemployed including the

homemakers. The distribution of health status of the respondents revealed that half of the respondents were healthy and the rest were diseased having one or more ill-health conditions in the three domiciles and the distribution was high in the rural area. The study showed 2.4% of the participants are affected by CKD and the study distribution with an area of living showed rural people are significantly more affected than the others. The major disease conditions observed were diabetes next to that of hypertension where cardiac, cerebrovascular and hyperlipidemia were of small proportion and the distribution was found much higher in rural and urban areas.

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CITATION OF THIS ARTICLE

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