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***Research Article** (Open Access)*

AWARENESS, KNOWLEDGE AND PERCEPTION OF CHRONIC KIDNEY DISEASE (CKD) AND CO-MORBID RISK FACTORS AMONG AGENCY, RURAL AND URBAN RESIDENTS OF VISAKHAPATNAM DISTRICT, ANDHRA PRADESH, INDIA: A CROSS-SECTIONAL STUDY

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ABSTRACT
Chronic Kidney Disease (CKD) is growing as one of the foremost public health problem worldwide. It is a chronic condition inclined by lifestyle and behavior of the people in low-income to middle-income countries where recognition rates remain low. Chronic Kidney Disease is habitually asymptomatic until later stages and the precise prevalence data is lacking. All the stages of CKD are connected with increased risks of cardiovascular morbidity, premature mortality and decreased quality of life. Although population based screening studies have been performed in developed countries, there are very few studies reported particularly in developing countries like India where the true incidence and frequency of CKD remains yet unknown. Public responsiveness is a key determinant factor to overcome the burden of CKD and perception of people to various causes, symptoms and signs of CKD are necessary for its prevention and early diagnosis. The present investigation has been designed to study the people's awareness and perception of CKD including lifestyle habits and co-morbid conditions leading to kidney damage among the three domiciles, i.e. agency, rural and urban areas of Visakhapatnam District, Andhra Pradesh, India during the period 2016-2018. In the present study, a cross-sectional population based survey was conducted among 1340 respondents residing in the three domiciles using a pre-structured and validated questionnaire. The questionnaire included the information on the socio-demographic and economic characteristics, awareness of CKD risk factors, its symptoms and the effect of drinking alcohol, inadequate sleep, high salt intake, co-morbid and inherited conditions on kidney damage. The results revealed that the awareness regarding the signs and symptoms of CKD and co-morbid conditions among the respondents was found to be inadequate. Hence, programs and health camps need to be carried out in order to create awareness among the respondents to prevent and identify CKD at the earliest.

Keywords: *Chronic kidney disease, cardiovascular morbidity, co-morbid conditions, questionnaire, kidney damage*

INTRODUCTION
Chronic kidney disease (CKD) is a worldwide health burden with an elevated economic cost to health systems and is an independent risk factor for cardiovascular and other diseases. The danger of developing CKD is increasing worldwide and its complications comprise

cardiovascular mortality, kidney disease development, anemia, mineral and bone disorders and fractures. The major reported causes of CKD worldwide are diabetes mellitus and hypertension coupled with advancing age, obesity and behavioral risk factors (Meguid *et al.,* 2005). The risk factors for CKD are highly widespread among the Indian residents and the number of Indians at risk is ever increasing. In a country such as India where the per capita income is low, only 1% of the population can afford renal replacement therapy. The global response to this challenge is prevention, early detection and treatment. Suitable screening, diagnosis and management are required to prevent unfavorable CKD-associated outcomes including end-stage kidney disease and death.

Chronic kidney disease refers to abnormalities of kidney structure or function with decreased kidney function and a glomerular filtration rate (GFR) of less than 60 mL/min per 1.73m^2 or markers of kidney damage or both of at least 3 months period (KDIGO, 2013). With the onset of CKD, kidneys become spoiled and over time may not clean the blood as well as healthy kidneys do, as a result toxic waste and extra fluid buildup in the body and possibly lead to high blood pressure, heart disease, stroke and early death. Poverty, poor sanitation facilities, water contamination, pollutants and known and unknown nephrotoxins along with heavy metals and plant toxins in native remedies may lead to glomerular and interstitial kidney diseases. Growing burden of hypertension and diabetes mellitus are the major root cause for kidney damage. India is anticipated to have the world's largest population of patients with diabetes by the end of 2030 (Varughese and Georgi, 2018). Early identification and treatment of CKD will reduce the associated morbidity, mortality and the significant economic and public health burden.

The etiology of CKD varies significantly throughout India and parts of the states of Andhra Pradesh, Odisha and Goa have been reported to have high levels of CKD of unknown etiology (CKDu), which is a chronic interstitial nephropathy with dangerous onset and slow progression (Jayasekara *et al.,* 2015). The lifestyle of people and environmental factors are the major risk factors of CKD and the best approach method is population-based prevention programs such as a survey (Prochaska and DiClemente, 1983). Awareness of CKD and risk factors increase risk perception and availability for screening to make an early diagnosis. Creating attentiveness about health risk improves health behaviour, drives the determinants of health and impacts positively on efficient management of kidney diseases. There have been reports of rising incidence of CKD in rural and coastal areas especially in Andhra Pradesh, India (Ganguli, 2016).

Only a few studies have been reported about the prevalence of CKD in urban populations of Andhra Pradesh and there is lack of such studies in the rural populations. The present epidemiological survey has been conducted to highlight the degree of awareness among the three domiciles of Visakhapatnam with respect to chronic kidney disease and co-morbid risk factors.

MATERIALS AND METHODS

The present investigation has been taken up with the objective to study the perception and prevalence of CKD and its risk factors among the respondents of three domiciles of Visakhapatnam district-agency, rural and urban respondents in 43 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, Munching Puttu, Paderu and Peda Bayalu.
Rural mandals (22): Achuthapuram, Anakapalli, Bodapalem (Cherlopalem), Butchyyapeta, Cheedikada, Chodavaram, Devarapalli, Dondawaka (Nakkapalli), K. Kotapadu, Kasimkota, Komaravolu (Kothakota), Koruprolu (S. Rayavaram), Lingampeta (Golugunda), Madugula, Makavarapalem, Munagapaka, Narsipatnam, Nathavaram, Payakaraopeta, Rambilli, Ravikamatham and Yalamanchili.
Urban mandals (10): Anandapuram, Bheemunipatnam (Bheemili), Gajuwaka, Padmanabham, Paravada, Pedagantyada, Pendurthi, Sabbavaram, Vizag–Rural and Vizag-Urban.
Inclusion and Exclusion criteria: Respondents among the age group of 10-85 years were included in the survey following their consent. The study excluded participants with a history of CKD which was assessed during the consideration of demographic details.
All the respondents were given a structured pre-tested questionnaire consisting of demographic details and questions related to awareness and knowledge of CKD. All the respondents were asked about the presence or absence of symptoms suggestive of CKD and its co-morbid symptoms. Participants were asked to answer the questions based on their knowledge about the effect of drinking alcohol, inadequate sleep, high salt intake, co-morbid and inherited conditions on kidney damage.

Statistical Analysis

The data collected from the respondents has been analyzed using appropriate statistical methods (SPSS 16.0). Chi square was used to study the association between definite variables and the significant p-value taken into consideration was ≤ 0.05.

RESULTS

The total number of participants in the study was 1340 from three domiciles of Visakhapatnam District which included 52.50% males and 47.50% females (Figure 1). The socio-demographics distribution for the area of living showed a total of 49.30% (N=660) respondents in rural area which is twice that of urban and agency areas 26.1% (N=350) and 24.6% (N=330) respectively. Distribution according to the area of living showed rural participants with a significant p-value < 0.05.

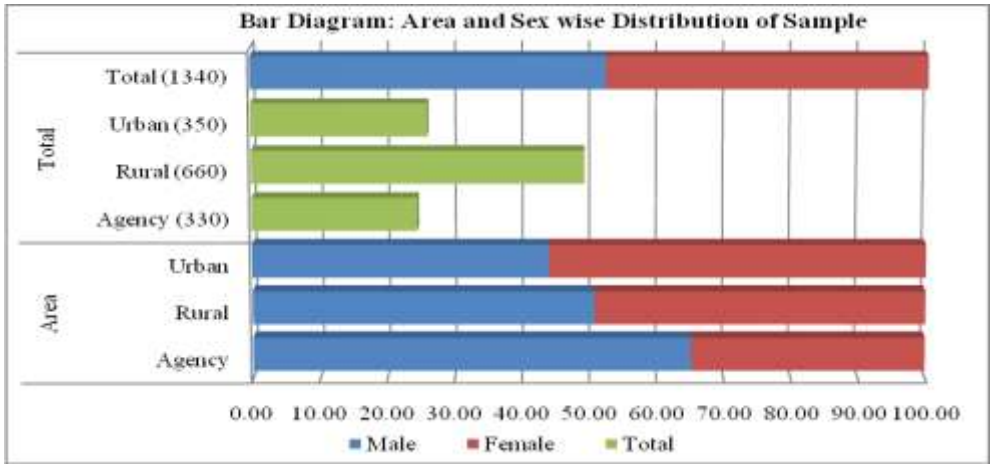

Figure 1: Bar Diagram showing Area and Sex wise distribution of respondents

Prevalence of chronic kidney disease (CKD) among agency, rural and urban respondents

It is evident from the results that among the total respondents, 66% were found to be healthy and 34% diseased (Figure 2). The major diseased conditions were diabetes (2.3%) next to that of hypertension (7.1%) whereas cardiac, cerebrovascular and hyperlipidemia were of small proportion in the present study (Figure 3). The study showed 2.4% (N=32) of the respondents were affected by CKD among all the three domiciles of Visakhapatnam district. However, the study distribution with an area of living depicted that rural respondents (3.3%) are significantly more affected than agency (2.1%) and urban (0.90%) respondents.

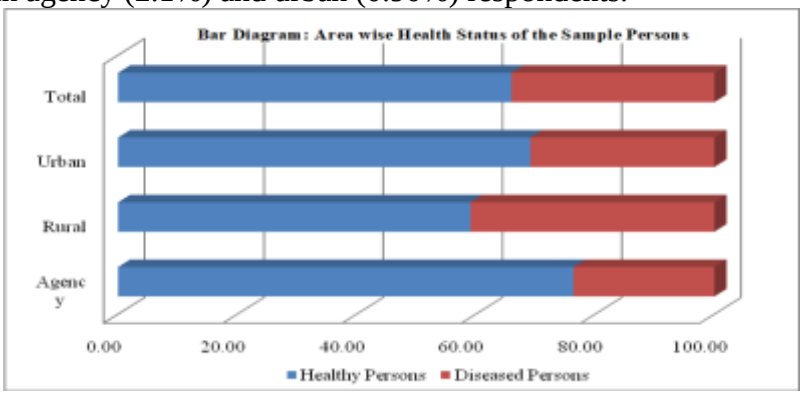

Figure 2: Area wise Health status of the Sample respondents

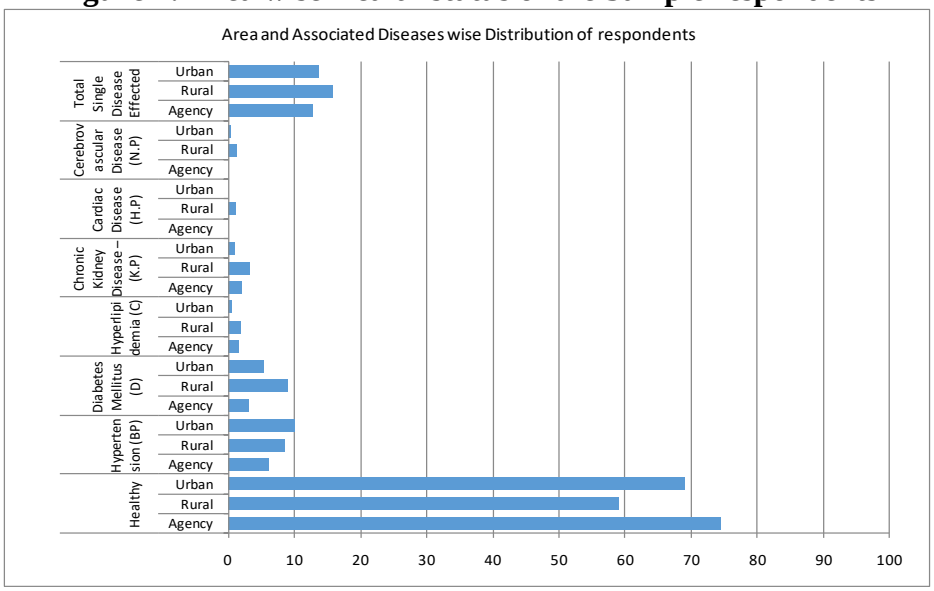

Figure 3: Area and Associated Diseases wise Distribution of respondents

Awareness of respondents regarding the effect of drinking alcohol, inadequate sleep, high salt intake on kidneys damage

The function of the kidney is altered by consumption of alcohol and makes the kidney inefficient to filter the blood. Consumption of alcohol also affects the ability to regulate fluid and electrolyte balance in the body. It is well known that nocturnal patterns can affect chronic kidney disease and that people sleepless usually have faster kidney function decline. More usage of salt

in the diet alters sodium level in the body resulting in electrolyte imbalance, causing the kidneys to have reduced function and remove less water resulting in higher blood pressure.

Area and Sex wise Awareness among the respondents

Respondents awareness regarding alcohol consumption leading to kidney damage in agency area was observed in 9.8% males and 8.7% females. On the other hand, 49.5% males and 50.4% females replied there is no effect on kidney function and 40.7% males and 40.9% females were completely unaware about the effects of alcohol consumption on kidney damage. Among the rural respondents, 21.5% males and 21.7% females positively responded as they were aware of the consequences of alcohol consumption. Awareness concerning alcohol consumption on kidney damage among urban respondents showed 18.3% males and 23.7% females responded positively as they were aware, while 55.6% males and 49% females replied there is no effect and 26.1% males and 27.3% females were totally unaware of the consequence (Figure 4).

When asked about adverse effects of inadequate sleep, 0.15% males and 8.7% female respondents of agency area, 14% male and 14% female respondents of rural area and 18.3% males and 23.7% female respondents of urban area responded positively as they were aware of the consequences.

Awareness regarding high salt consumption and its effect on kidney was exhibited by 3.3% males and 2.6% female respondents of agency area, 20.6% males and 20.4% female respondents of rural area and 0.15% male and 0.25% female respondents of urban area while others did not reply positively.

Area and educational status wise Awareness

Effect of alcohol consumption, inadequate sleep and high salt intake on kidney function

Respondents with primary education i.e. 17.9% in agency area, 37.5% and 52.9% residing in rural and urban areas respectively replied to have knowledge about the consequences caused by alcohol consumption on kidney damage. Likewise, respondents with below secondary and secondary education habitants of agency (14.3% and 1.1%), rural (22.6%, and 18.3%) and urban (26.1 and 9.4%) responded to have awareness about the association of kidney damage and alcohol consumption. Also, graduate and post-graduate subjects of agency (3.6% and 33.3%), rural (12.6% and 23.5%) and urban (15.5% and 7.1%) responded being aware of the ill effects of alcohol. Even some of the uneducated rural subjects (22.5%), 24.1% of urban and 8% agency respondents also had awareness (Figure 5).

Respondents with primary education i.e., 17.9% habitants of agency, 10.7% and 41.2% residing in rural and urban respectively replied to have the knowledge regarding consequences caused by insufficient sleep on kidney injury. Likewise, respondents with below secondary and secondary education of agency (11.4% and 11.1%), rural (14.5%, and 12.2%) and urban (18.8% and 21.9%) replied having awareness about the association of kidney damage and insufficient sleep. Moreover, graduate and post-graduate subjects of agency (3.6% and 33.3%), rural (9.9% and 11.8%) and urban (20.2% and 57.1%) regions too had knowledge of the effect of improper sleep.

Respondents with primary education i.e., 30.4% habitants of rural and 64.7% urban residents replied knowing the consequence caused by excessive salt intake on kidney injury, while respondents in agency revealed to have no awareness. Likewise, respondents with below secondary and secondary education of agency (2.9% and 1.1%), rural (20.2%, and 15.9%) and urban (18.8% and 25%) replied having awareness about the association of kidney damage and

the amount of salt intake. Similarly, graduate and post-graduate subjects of agency (1.8% and 9.1%), rural (10.8% and 17.6%) and urban areas (20.2% and 14.3%) too were aware of the kidney damage caused by high salt intake.

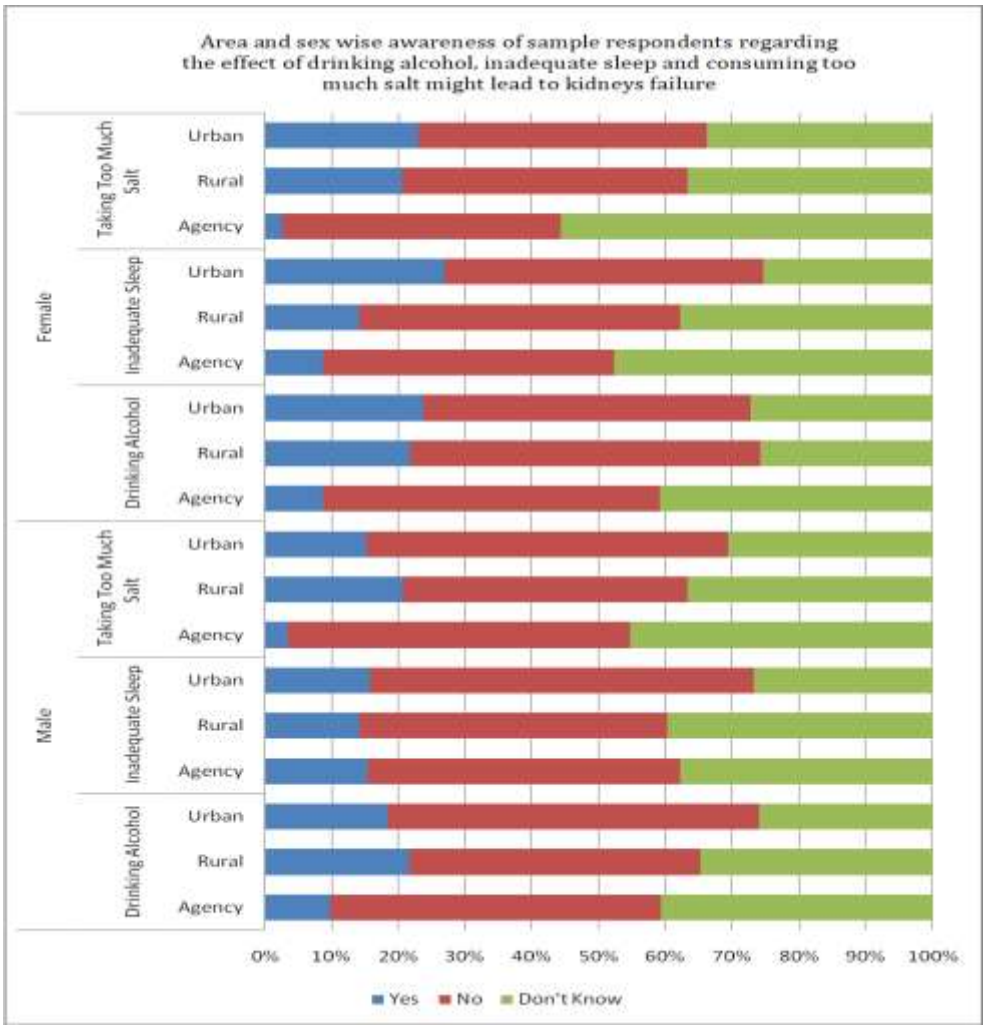

Figure 4: Area and sex wise awareness of sample respondents regarding the effect of drinking alcohol, inadequate sleep and consuming too much salt might lead to kidneys failure

Distribution of respondents with respect to educational status and domicile showed a significant association (p=0.001) about awareness of alcohol consumption, inadequate sleep and high salt intake with regard to kidney damage.

Area and occupational status wise Awareness

Effect of alcohol consumption, inadequate sleep and high salt intake on kidney function

Respondents in administrative services residing in rural (50%) and urban areas (66%) replied to have the knowledge regarding the consequence caused by alcohol consumption on kidney injury, while subjects of the agency revealed they were unaware of the effect. Likewise, professionals in the agency (29.2%) and rural areas (26.9%), students of rural (27.3%) and urban region (12.5%)

replied to have awareness about the association of kidney damage and drinking alcohol. Also, retired and casual labourers of agency (50% and 9.6%), rural (0% and 23.8%) and urban areas (11.1% and 25.6%) too were aware of effects of alcohol (Figure 6).

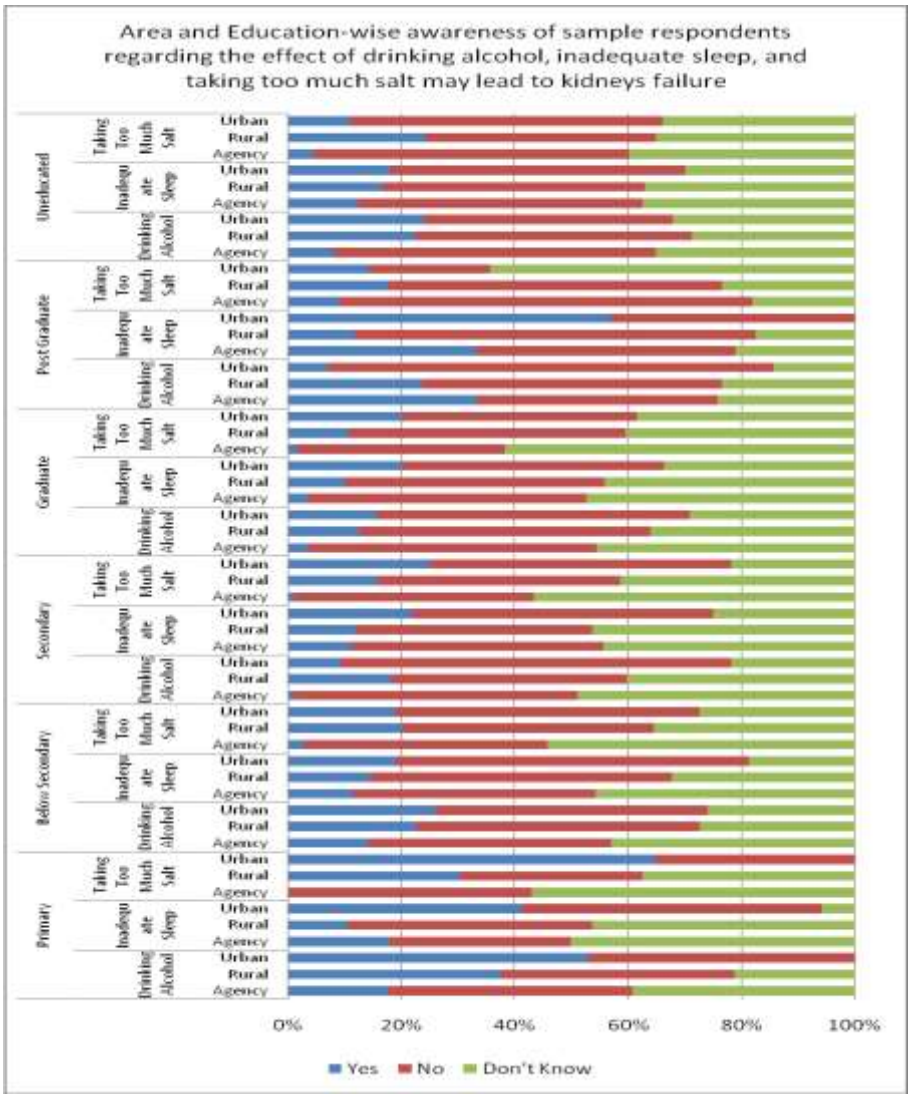

Figure 5. Area and Education-wise awareness of sample respondents regarding the effect of drinking alcohol, inadequate sleep, and taking too much salt may lead to kidneys failure

Respondents in the administrative services of the urban area (16.7%) have admitted to have knowledge of the consequences caused by insufficient sleep on kidney injury. Likewise, respondents in professional field residing in agency (37.5%), urban (43.8%) and rural areas (7.7%), students of rural (22.7%), agency (4.2%) and urban areas (50%) also replied to have awareness about the association of kidney damage and insufficient sleep. Besides, retired a nd casual labourers of the agency (100% and 17.4%), rural (0% and 14.7%) and urban (77.8% and 21.5%) too were aware of the effect of inadequate sleep.

Respondents in administration positions of the urban area (66.7%) replied positively on having

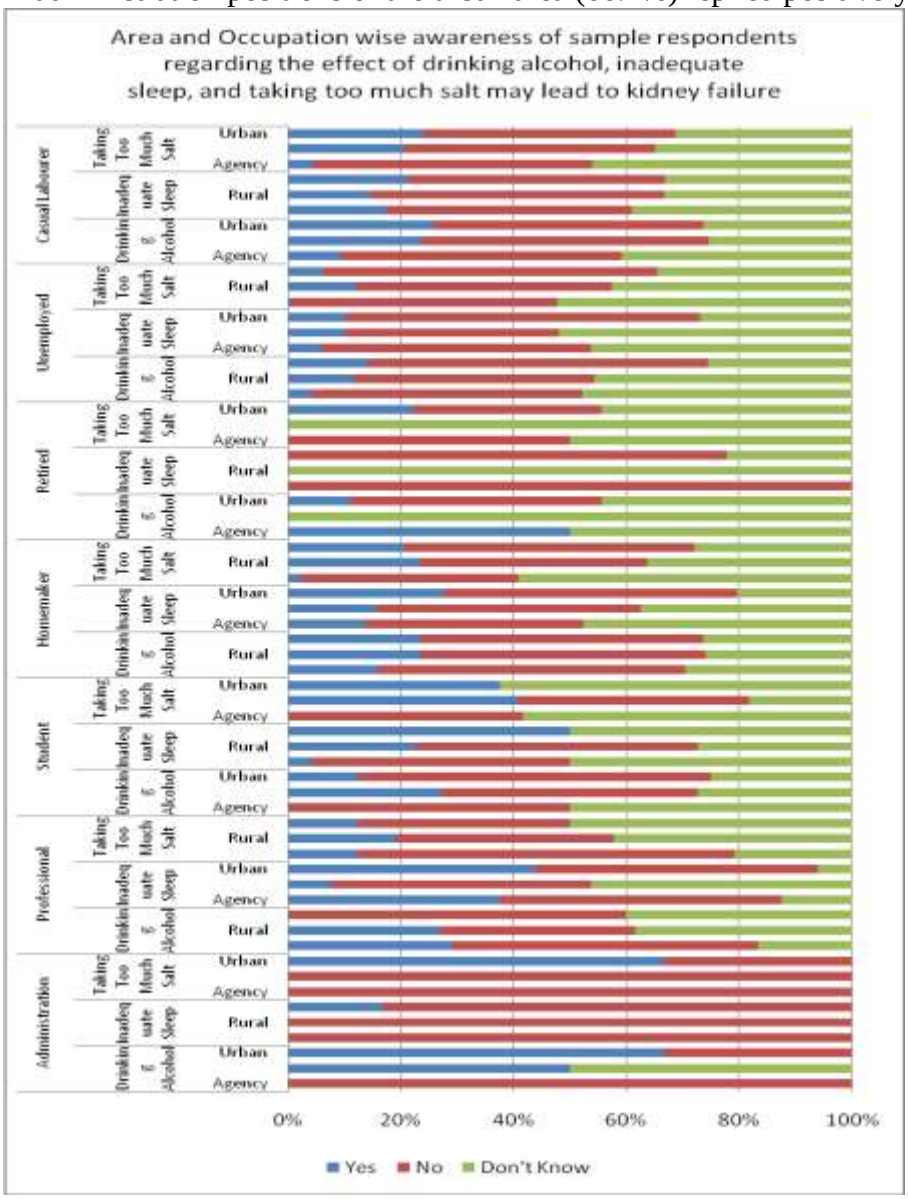

Figure 6. Area and Occupation wise awareness of sample respondents regarding the effect of drinking alcohol, inadequate sleep, and taking too much salt may lead to kidney failure

knowledge about the consequences caused by excessive salt intake leading to kidney injury, while subjects of agency and rural region gave a naive response. Likewise, respondents working in professional field residing in the agency (12.5%), urban (12.5%) and rural regions (19.2%), as well as students of rural (40.9%), agency (Nil) and urban (37.5%) replied to have awareness about the association of kidney damage and the amount of salt intake. In addition, homemakers and casual labourers of agency (2.3% and 4.3%), rural (23.6% and 20.6%) and urban (20.6% and

24%) too knew the ill effects increased salt intake caused. Retired subjects of the only urban area (22.2%) were aware of the salt utilization and its effect on kidneys.

Awareness of respondents regarding co-morbid and inherited conditions and their effect to cause kidney damage

A positive response regarding the effect of high blood pressure (BP) on kidney damage was seen among 10.3% males of agency and also among the rural and urban area subjects shown to be 16.4% and 15% respectively. Respondents who gave naive responses were 46.3%, 42.1% and 48% in agency, rural and urban habitant males respectively. The others (41% in total) were unaware of the consequence (Figure 7). Knowledge about effect of high blood pressure on kidney damage was noticeable among females of agency 9.6% and also among the rural and urban 15.7% and 35.6% respectively. Respondents who gave naive responses include 47.8%, 42.3% and 44.3% of agency, rural and urban habitant males respectively.

Awareness regarding relationship of diabetes and kidney damage among the males of agency area was found to be 10.3%, while in rural and urban areas, it was shown to be as 15.3% and 10.5% respectively, male respondents who have given naive responses were 49.3%, 48.5% and 56.2% in agency, rural and urban habitants respectively. The others (36.9% in total) were unaware of the consequence. Awareness related to the effect of diabetes on kidney damage in females of agency was found to be 12.2%, while in rural and urban recorded as 19.5% and 15.8%.

Knowledge of inheritance of the condition was unknown among 33.9% male respondents, whereas 50.9 replied, as there is no effect inheritably, while, 16.4% of agency subjects, 11.8% and 20.9% of rural and urban subjects were aware of the fact that kidney disease can be heritable. Familiarity about kidney inheritance condition was unknown among 35.6% female respondents, whereas, 48.6% replied as there is no effect inheritably. 18.4% of agency respondents, 14% and 17.4% of rural and urban respondents were aware of the consequence that kidney disease can be heritable.

Area and educational status Awareness among sample respondents

Respondents with primary education 3.6% habitants of agency, 32.1% and 52.9% residing in rural and urban areas respectively responded knowing the consequence caused by high BP regarding to kidney injury. Likewise, respondents with below secondary and secondary education of agency (5.7% and 7.8%), rural (17.7%, and 7.3%) and urban subjects (24.3 and 28.1%) responded having awareness about the association of kidney damage and high BP. Also, post-graduate and graduate subjects of agency (21.2% and 10.9%), rural (11.8% and 9%) and urban (21.4% and 21.2%) too were aware of the effect of blood pressure on kidneys. Even, 17.8% rural, 29.1% urban and 11.4% agency uneducated respondents also had awareness (Figure 8).

Respondents with primary education accounting to 3.6% habitants of agency, 23.2% and 41.2% residing in rural and urban areas replied to have knowledge of the consequence caused by diabetes on kidney injury. Likewise, respondents with below secondary and secondary education of agency (5.7% and 12.4%), rural (19.5%, and 11.1%) and urban (5.7% and 12.5%) replied having awareness about the association of kidney damage and diabetes. Besides, graduate and post-graduate subjects of agency (10.9% and 15.2%), rural (12.6% and 11.8%) and urban (15.4%

and 21.4%) too were aware of the effect of diabetes on kidneys. Even, 19.3% rural subjects, 11.6% urban and 12.5% agency uneducated respondents also had awareness.

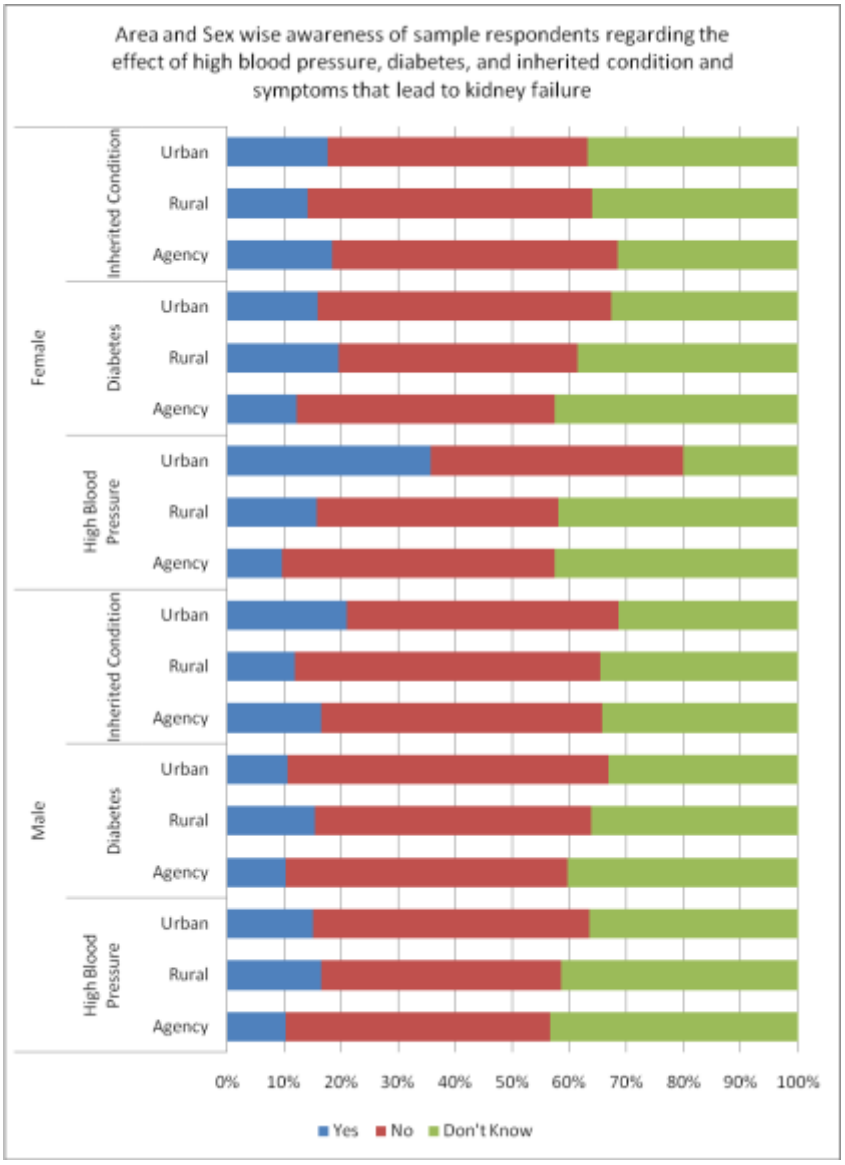

Figure 7. Area and Sex wise awareness of sample respondents regarding the effect of high blood pressure, diabetes, and inherited condition and symptoms that lead to kidney failure

Respondents with primary education i.e., 17.9% habitants of agency, 14.3% of rural and 41.2% urban replied knowing the association of kidney injury and inheritance. Likewise, respondents with below secondary and secondary education of agency (5.9% and 13.5%), rural (15.4%, and 7.4%) and urban (21.4% and 21.9%) replied having awareness about the association of kidney damage and inheritance condition. Besides, graduate and post-graduate subjects of agency (25.5% and 15.2%), rural (8.3% and 17.6%) and urban (11.5% and 7.1%) too were aware of the

kidney damage caused by inheritance. Even, 14.7% rural subjects, 21.6% urban and 20.5% agency uneducated respondents also had awareness.

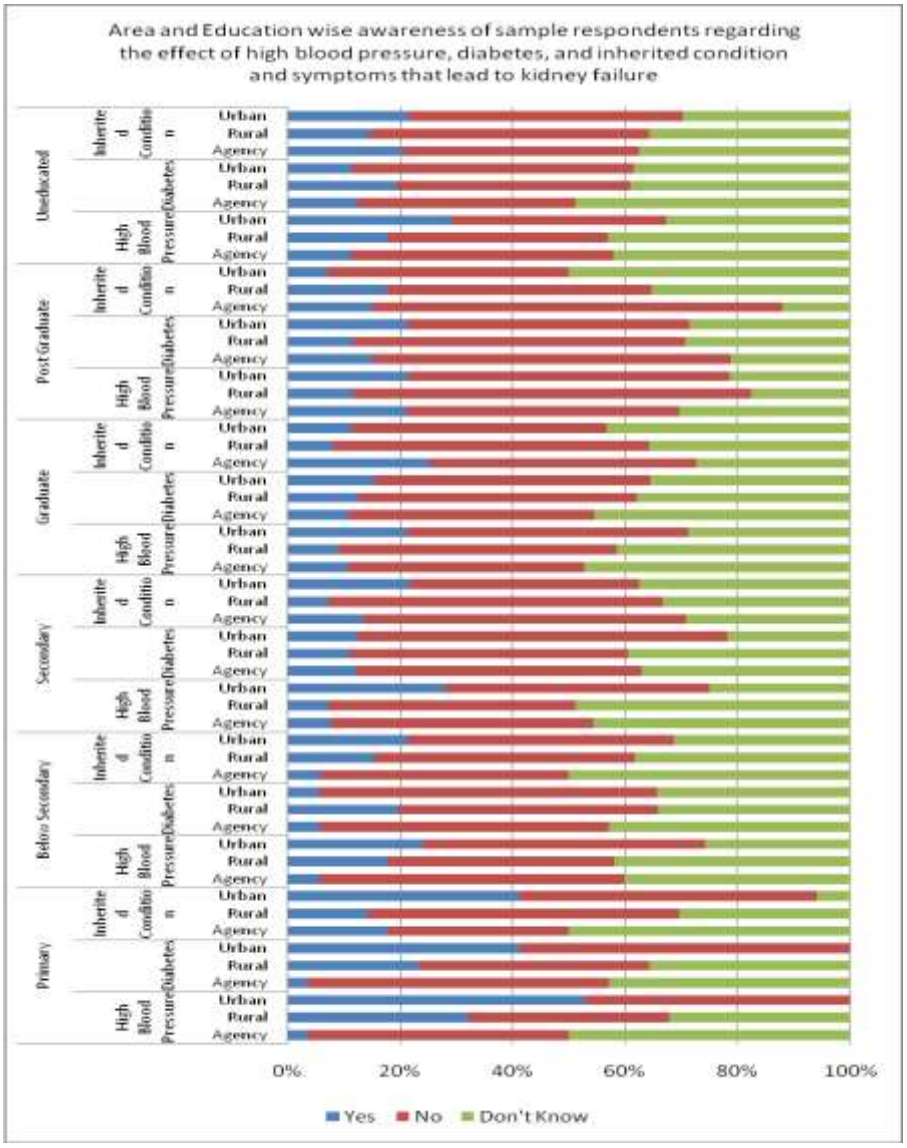

Figure 8. Area and Education wise awareness of sample respondents regarding the effect of high blood pressure, diabetes, and inherited condition and symptoms that lead to kidney failure

Area and occupational status wise Awareness of respondents

Respondents in administration service residing in urban region (66.7%) alone replied knowing the consequence caused by high blood pressure on kidneys, while subjects of the agency and rural revealed that there is no effect. Likewise, respondents in the professional field in the agency (20.8%), rural (7.7%) and urban (31.2%) and also students of rural (18.2%) and urban (25%) replied to have awareness about the association of kidney damage and high BP. Also, retired and

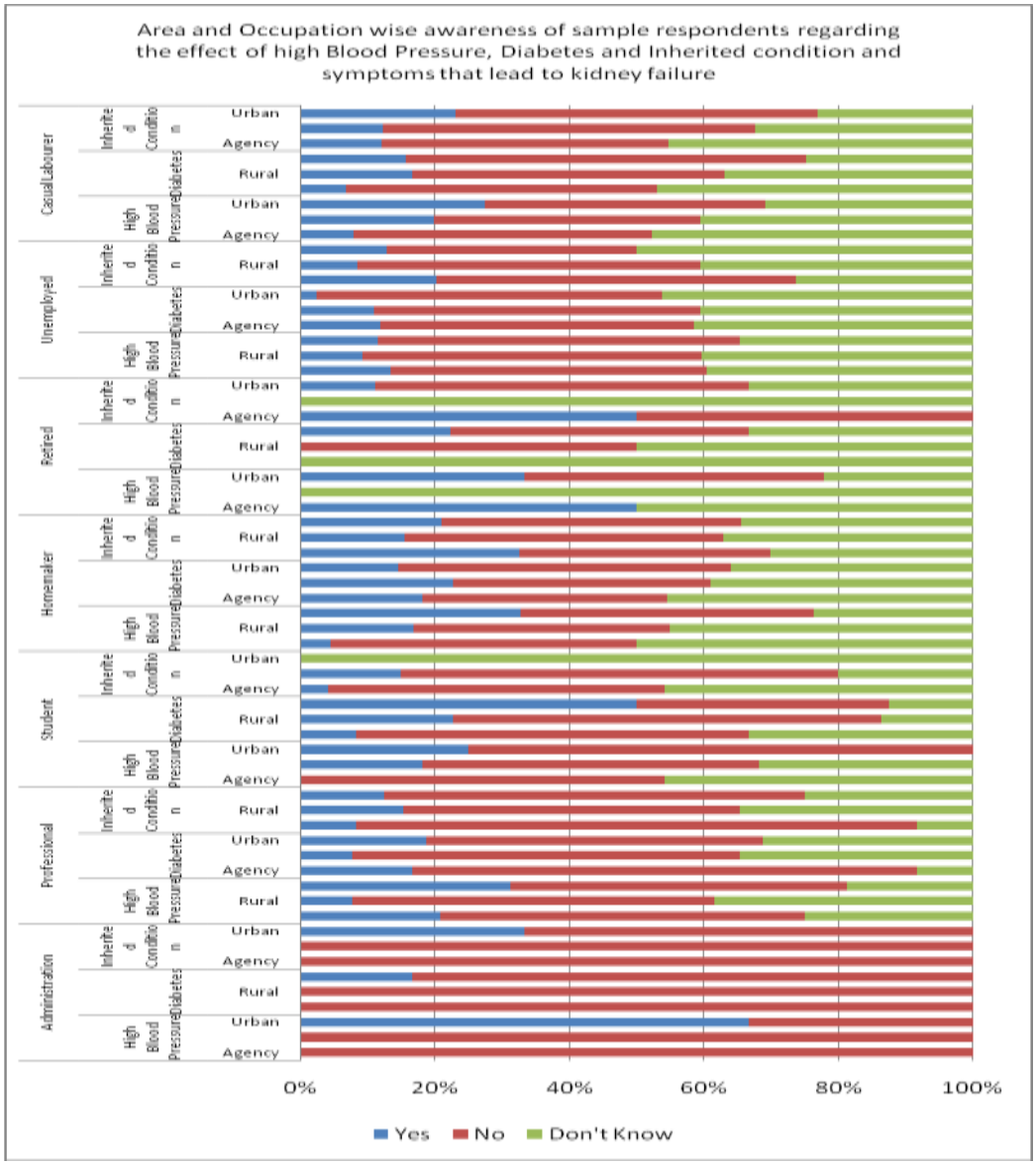

Figure 9. Area and Occupation wise awareness of sample respondents regarding the effect of high Blood Pressure, Diabetes and Inherited condition and symptoms that lead to kidney failure

casual labourers of the agency (50% and 7.8%), rural (0% and 19.8%) and urban (33.3% and 27.5%) too knew the effect of blood pressure. Homemakers of all the three regions i.e., rural (16.8%), agency (4.5%) and urban (32.7%) were aware of the effect of BP on kidneys (Figure 9). Respondents in the administration services residing in urban area (16.7%) replied having knowledge of the consequences caused by diabetes on kidney injury. Likewise, respondents in professional field residing in agency (16.7%), rural (7.7%) and urban regions (18.8%) as well as students of rural (22.7%), agency (8.3%) and urban regions (50%) replied to have awareness about the association of kidney damage and diabetes. Besides, retired and casual

labourers subjects of agency (0% and 7%), rural (0% and 16.7%) and urban (22.2% and 15.7%) too were aware of the effect of diabetes on kidneys. Homemakers of all the three regions i.e., rural (22.7%), agency (18.2%) and urban (14.4%) were aware of the diabetes effect on kidneys.
Respondents in the administration services residing in the urban area (33.3%) replied having knowledge about the consequences of inheritance and kidney injury, while subjects of agency and rural areas gave a naive response. Likewise, respondents in the professional field residing in agency (8.3%), urban (15.4%) and rural regions (12.5%), as well as students of agency (4.2%) and rural (15%) replied to have awareness about the association of kidney damage and inheritance. Besides, homemakers and casual labourers subjects of agency (32.6% and 12.2%), rural (15.6%, and 12.4%) and urban regions (20.9% and 23.1%), too were aware of the effect of same. Retired subjects of the urban area (11.1%), rural (0%) and agency (50%) were aware of the inheritance and its effect on kidneys.

DISCUSSION

Chronic kidney disease (CKD) is increasingly documented as one of the public health problems. The general community lacks adequate awareness that chronic kidney disease (CKD) is a serious and progressive medical condition. In the early stages, CKD is habitually asymptomatic and often remains undiagnosed and untreated. Several reports indicated that CKD is often undiagnosed and complications of later stages of CKD are often untreated. Public knowledge, perception and awareness regarding chronic kidney disease (CKD) is an important factor influencing the booming implementation of CKD prevention and screening programs. Surveys conducted in both developed and developing countries have shown that the public understanding about CKD and its risk factors are relatively poor (Gheewala *et al*, 2018).
The aim of the present study was to analyze the knowledge, perception and awareness among three domiciles of Visakhapatnam district, Andhra Pradesh, India regarding CKD and its risk factors and the adverse effects of drinking alcohol, inadequate sleep and high salt intake, co-morbid and inherited conditions on kidney failure.
The socio-demographic profile of the sample respondents (n=1340) was studied in the three domiciles of Visakhapatnam district 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. 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 more in the rural area. The major disease conditions observed were diabetes, hypertension whereas 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 were affected by CKD and the study distribution with an area of living showed rural people were significantly more affected than the others. Mani (2003) reported a CKD prevalence of 0.16% in rural south India in a population of 25,000. Agarwal *et al.,* (2005) conducted a study in 4,972 individuals in urban New Delhi and found CKD in 0.79%. In contrary to earlier reports, a later study using a population of 6,120 patients in medical centers all over India showed a much higher prevalence of 17% (Singh *et al.,* 2013).
Awareness among the public about CKD is one of the significant determinant of the uptake of screening programs which could help to combat the CKD burden (Glanz and Bishop, 2010).

Knowledge relevant to various causes, symptoms and signs of CKD is necessary for the prevention, early diagnosis and treatment without delay. Respondents with primary education i.e 17.9% in agency area, 37.5% and 52.9% and residing in rural and urban areas respectively replied to have knowledge regarding consequences caused by alcohol consumption on kidney damage. Respondents in administrative services residing in rural (50%) and urban (66%) replied to have the knowledge regarding the consequence caused by alcohol consumption on kidney injury. Respondents with primary education i.e., 30.4% habitants of rural and 64.7% living in urban regions replied knowing the consequence caused by excessive salt intake on kidney injury. Respondents in administration positions of the urban area (66.7%) replied positively on having knowledge about the consequences caused by excessive salt intake leading kidney injury, while subjects of agency and rural gave a naive response. Majority of the respondents of three domiciles have limited knowledge about the effect of drinking alcohol, inadequate sleep and high salt intake, co-morbid and inherited conditions on kidney damage.

A positive response regarding knowledge about high blood pressure (BP) on kidney damage was seen in 10.3% males of agency, while in rural and urban area, it was found to be 16.4% and 15% respectively. Likewise, awareness regarding relationship between diabetes and kidney damage among the males of agency area was found to be 10.3%, while in rural and urban areas, it was shown to be as 15.3% and 10.5% males respectively. In the present survey, less than half of the respondents were aware that hypertension and diabetes are the major risk factors for kidney damage. In a study conducted in India among the diabetics, only one third of the study subjects identified that hypertension and diabetes mellitus are risk factors of CKD (Hussain *et al.,* 2019). Bala *et al.,* (2021) reported that the participants had ample knowledge of the risk factors, signs and symptoms of CKD and insufficient knowledge of the physiological function of the kidney and the diagnosis of CKD in cross sectional study among the general population of Chennai and Salem city of Tamil Nadu. The study revealed that most of the participants had knowledge on diabetes mellitus (76.1%) and hypertension (62.2%) as risk factors for kidney damage.

Venkatachalam *et al.,* (2013) studied the awareness of CKD in a coastal area of Kottakuppam, Tamil Nadu among 1200 respondents and observed that the awareness was inadequate among the selected respondents regarding signs and symptoms of CKD. It has been reported that in a study of 516 adults living in Hong Kong, 43.8% of participants knew that hypertension can cause kidney disease (Chow *et al.,* 2014). In a study conducted by Gheewala *et al.,* (2018) amongst Australian public, majority of the participants were aware of diabetes (60.6%) as a risk factor, but hypertension (38.3%) was less frequently recognized.

CONCLUSION

The present study has been taken up to assess the knowledge, perception and awareness among the respondents of three domiciles of Visakhapatnam district, Andhra Pradesh about CKD and its risk factors and the adverse effects of alcohol consumption, inadequate sleep and high salt intake, co-morbid and inherited conditions on kidney failure. The study findings showed meager understanding about CKD and its risk factors amongst the three domiciles of Visakhapatnam district especially among agency and rural areas. On the whole, the results of this survey showed that the awareness regarding CKD and its risk factors needs to be improved that could prevent the prevalence of the disease. There is also lack of screening programs in the primary health care,

hence efforts are necessary to create awareness and educate people about the early detection and prevention of CKD.

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