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AWARENESS ABOUT THE IMPORTANCE OF ELECTROLYTES AND ITS CONSEQUENCES AMONG COLLEGE STUDENTS

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ABSTRACT:

Electrolytes is the most important constituent of the body. It regulates the body condition by several physiological mechanisms. Maintaining the balance of electrolytes is necessary for maintaining good health. Electrolytes can be balanced by proper diet and regular exercise. The main aim of the study is to create awareness on the importance of electrolytes and its consequences among college students. Self administered questions were designed based on knowledge, attitude, perception and practice about the importance of electrolyte. The questionnaires were distributed through an online platform. The study population included participants belonging to the age group of 18-24 years. The data were collected and statistically analyzed using SPSS software. Results were collected as ordinal data and it was reported that not all of the participants were aware about the importance of electrolytes. More than half the population are aware about required diet and the techniques to be followed when there is an electrolyte imbalance. Most of the college students are aware about electrolytes and it is observed that lifestyle changes, modification in regular life and change in food habits are the major causes of electrolyte imbalance at a very young age. It is important to maintain our health in a proper way.

INTRODUCTION

It is important to learn about electrolytes to know the concept of homeostasis and metabolic disorders (Balci *et al.*, 2013). Electrolytes are the important constituents of body fluids. It is necessary for many physiological mechanisms (Arneson, 2014). Sometimes imbalance in electrolytes may cause mortality or it may lead to hyperchloremic acidosis, renal vasoconstriction, reduced glomerular filtration rate and oedema (Lobo, 2004) (Chaiyabutr and Johnson, 1991). Disorders caused due to electrolyte imbalance is mostly seen in patients who are hospitalised and also most commonly seen in elder population (Slavin, 1985) (Liamis *et al.*, 2013). Electrolytes helps us to know the pathophysiology of diseases and helps us to find the primary diseases (Maday, 2013).

Interference in the electrolyte distribution in the body affects in a cellular level (Weiner and Epstein, 1970). Electrolytes like bicarbonates are increased and chloride is decreased in case of pulmonary disorders. Individuals suffering from Chronic Kidney disease also face electrolyte imbalance (Raju and Madala, 2004).

Age is an important parameter in maintaining electrolyte balance. CKD patients show imbalanced Calcium and Potassium level. Measuring electrolyte balance is necessarily important for diagnosing ED patients. Individuals who are doing regular exercise should be aware of their fluid intake because they have more loss of electrolytes due to excess sweating (Kear, 2017) (Candia, Alvarez and Dartt, 2017). Patients with diabetic Mellitus also have electrolyte balance. Dietary modifications can help to maintain balanced electrolyte level (Jung *et al.*, 2005) (Jung *et al.*, 2004). Not only age, sex also play an important role in determining electrolyte balance (Billah *et al.*, 2018). Patients in the Intensive Care Unit are most probably observed of electrolyte imbalance. To provide optimal therapy to the patients the clinicians should be aware of electrolyte imbalance and electrolyte disorders and the proceeding treatment for particular electrolyte disorders. Sodium is the most abundant electrolyte present in our body. Deficiency in sodium causes Hyponatremia. Hyponatremia divides into Isotonic Hyponatremia, Hypotonic Hyponatremia and Hypertonic Hyponatremia. Some causes are Hyperproteinemia, Hyperglycaemia, renal losses and non renal losses. The next most abundant electrolyte in Body is Potassium. The electrolyte disorders of potassium are Hypokalemia and Hyperkalemia. Hypokalemia is defined as a decreased level of potassium than the normal level in the body. The main cause of Hypokalemia is Metabolic alkalosis. Common causes are caffeine, insulin, aminoglycosides and potassium-wasting- diuretics. Hyperkalemia is defined as an increased potassium level than normal level. It is most commonly seen in renal failure patients. Some common causes are muscular injury and extracellular shifts. The main electrolyte anion present intracellularly is Phosphorus. Imbalance in phosphorus causes Hypophosphatemia and Hyperphosphatemia. Hypophosphatemia can cause severe clinical manifestations like weakness, respiratory failure, death, hypoxia, seizures and paresthesias. Supplementation of adequate phosphorus can cure this disease. Patients with renal disorders are prone to Hyperphosphatemia. It can be cured only when you identify the major cause for this disease. Calcium is one of the

important electrolytes of our body which helps in bone metabolism, maintaining heart muscle, neuromuscular activity and exocrine secretory functions. Disturbances in calcium level causes Hypocalcemia and Hypercalcemia. Major cause for Hypocalcemia is Hypoalbuminemia and Hyperthyroidism. Some of the clinical manifestations are eczema, hair loss, brittle and dermatitis. Administration of Calcium gluconate can cure Hypocalcemia. Some major causes of Hypercalcemia are multiple myeloma, breast cancer, hyperthyroidism, lung cancer, tuberculosis, Paget's disease and vitamin - D toxicity. Magnesium is one of the most abundant electrolytes in our body. Imbalance of Magnesium causes Hypomagnesemia and Hypermagnesemia. Hypomagnesemia is most commonly observed in several critical patients. It may lead to change in ECG level. Causes of this disease may include sepsis, trauma, infection, renal losses, surgeries, alcoholism, starvation, aminoglycosides and malnutrition. Administration of Magnesium through IV route is the best way to cure Hypomagnesemia. At mild level Hypermagnesemia is asymptomatic. At moderate level these patients show symptoms like vomiting, hypotension, nausea, loss of deep tendon reflex, respiratory paralysis, bradycardia and cardiac arrest. Sometimes it may also lead to death. Renal insufficiency is the main cause for this disease. Tablets or antacids with high magnesium content should be avoided (Singhi, 2013)(Mount, Sayegh and Singh, 2012).

The other studies have not mentioned about creating awareness and this study is done in an South Indian population and the survey is done among college students. Most of the studies are done in a random sampling manner.

The aim of the study is to create awareness and knowledge on the importance of electrolytes and its consequences in our body.

MATERIALS AND METHODS:

Self administered questionnaires were designed based on knowledge, attitude, perception and practice. The questions were circulated to the age group of 18 to 25 years and circulated among 100 undergraduate college students. It was circulated using Google forms and a list of output variables were included. Descriptive variables like age, year of study, gender and explanatory variables like personality traits, knowledge, attitude and practice were also included. Each output variable was collected as ordinal data and the collected data were represented as pie charts. Exclusion criteria as of this study are participants who are not willing to participate and medically compromised participants. Some of the inclusion criteria are participants above 18 years of age, college students and participants who can understand and fill the questionnaire. The data was collected and statistically analysed in SPSS

RESULTS AND DISCUSSIONS:

It is important to know about the importance of electrolyte balance and remedies used to maintain the electrolyte balance when there is an electrolyte imbalance. Knowing about dietary changes and modifications is also an important part to maintain electrolyte balance.

Survey on knowledge and awareness on the importance of electrolytes and its consequences consists of a study population containing the age group of 18 - 23 years consisting of 41.18 % of male participants and 58.82% of female participants [figure 1.1]. 75.49 % of the medical college students are aware of the importance of electrolytes and its consequences [Figure 1.2] . 64.71% of the population have a view that fluid is important in maintaining electrolyte balance [Figure 1.3] 70.59% of population intake 3-4 litres per day [Figure 1.4]. 28.43 % of people feel that dysentery is the major consequence when there is an electrolyte imbalance [Figure 1.5]. 26.47 % of the population have a view that fluids like juices and vegetables are the important and rich source of maintaining electrolytes [Figure 1.6]. 32.35 % of them think that calcium is the abundant and widespread electrolyte in our body [Figure 1.7]. 88.24% of them think that electrolyte imbalance is life threatening [Figure 1.8]. 82.35 % of them have a view that not only dehydration; over hydration also causes disturbance in electrolyte balance in our body [Figure 1.9]. 75.49 % of them think intaking electrolyte infused tablets and electrolyte infused water is good for health [figure 1.10]. We have seen association between the gender and the knowledge on importance of electrolytes [figure 1.11], association between gender and electrolyte imbalance is life threatening [figure 1.12], association between the gender and over hydration also causes electrolyte imbalance [figure 1.13], association between the gender and acceptance and knowledge on electrolytes infused tablets [figure 1.14], association between the gender and fluid intake of an individual per day [figure 1.15]. From the comparison it is associated that more than half of the participants are aware about the importance of electrolytes.

In other research, it is found that 39 % think malignancy is the main consequence of electrolyte imbalance. 3.5 % of people thinks that electrolyte imbalance occurs based in sex and age. 69 % of people have a view that exercise causes electrolyte imbalances and the cramps and muscle weakness caused due to over practising exercise causes electrolyte imbalance in our body(Jung *et al.*, 2004). When there is an electrolyte imbalance in the fetus and children some maintenance therapy should be prescribed and followed. Such as intake of water in predicted requirement, intake of electrolytes in predicted volume, considering patients' situation and fluid therapy (Friedman, 2010). Overhydration and dehydration both are major reasons for the change in the balance of electrolytes. Hence, regulation of electrolytes is based on the concepts like tonicity of the body, total body water volume and total effective solute volume (Roumeliotiet *al.*, 2018) Despite the findings introduced here, it is important to note that this survey has some limitations. The sample size chosen was small, the responses were collected in a short duration of time and the population selected was a homogeneous population. Electrolytes regulate muscle and nerve function, balance blood acidity and pressure, and rebuild damaged tissues. So it is important to have some knowledge about the essential electrolyte in our body which is the key to keep our body in a healthy condition.

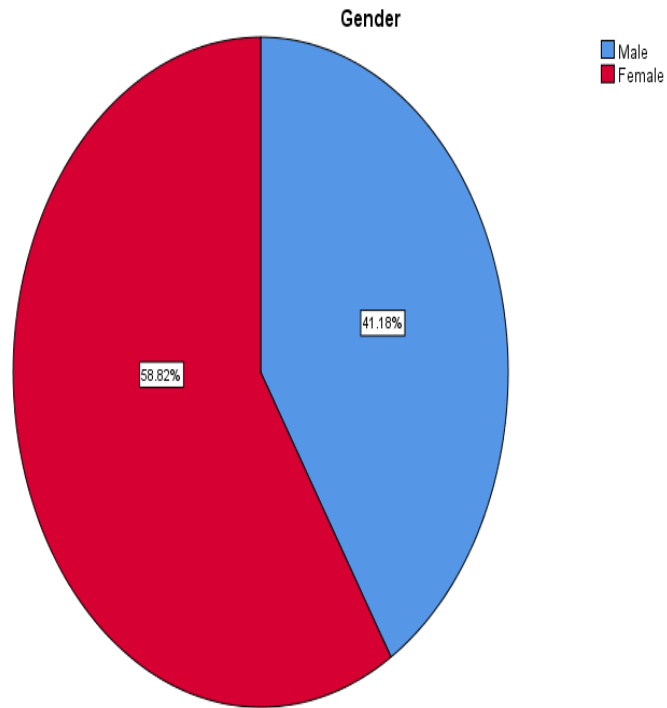


Figure 1: Gender

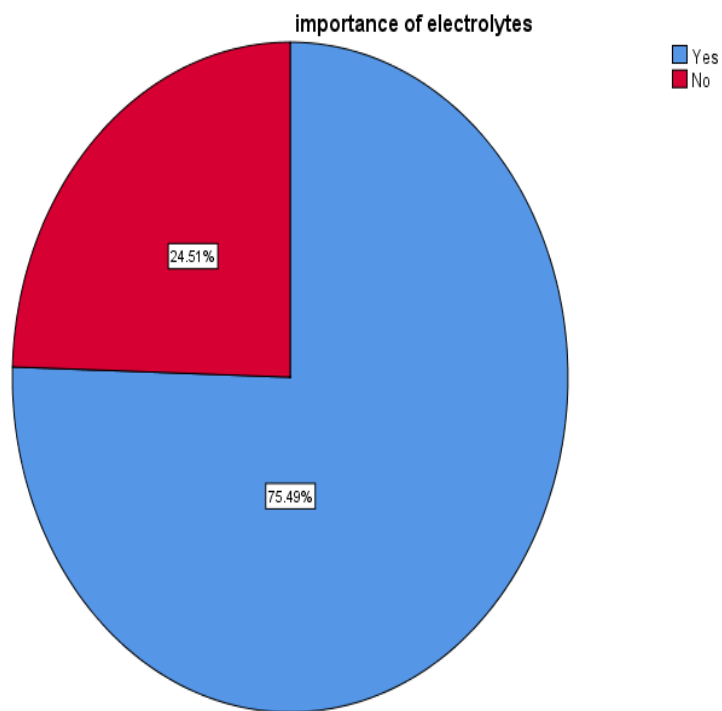


Figure 2: Awareness about importance of electrolytes.

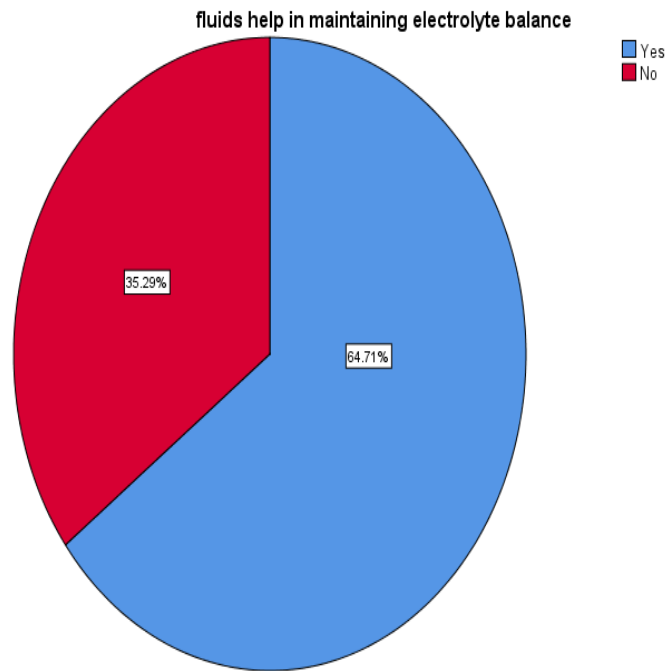


Figure 3: Fluid helps in maintaining electrolyte balance

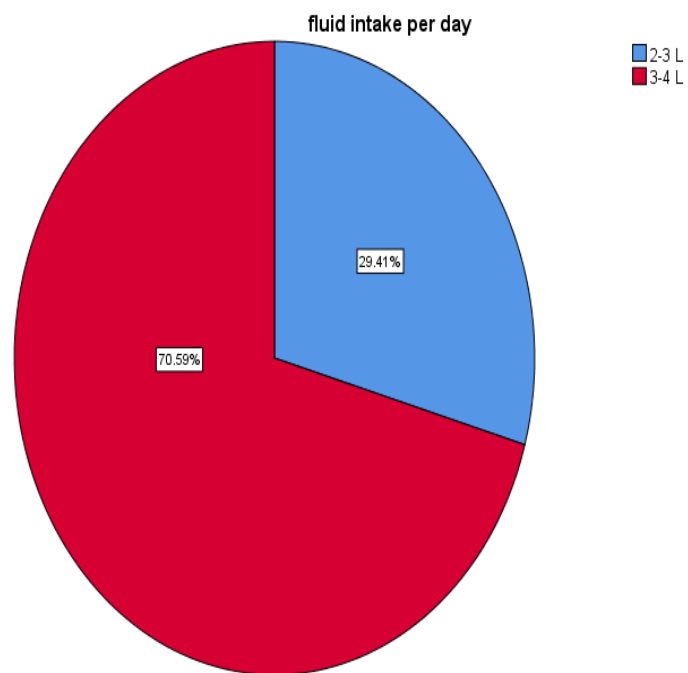


Figure 4: Fluids intake per day by an individual

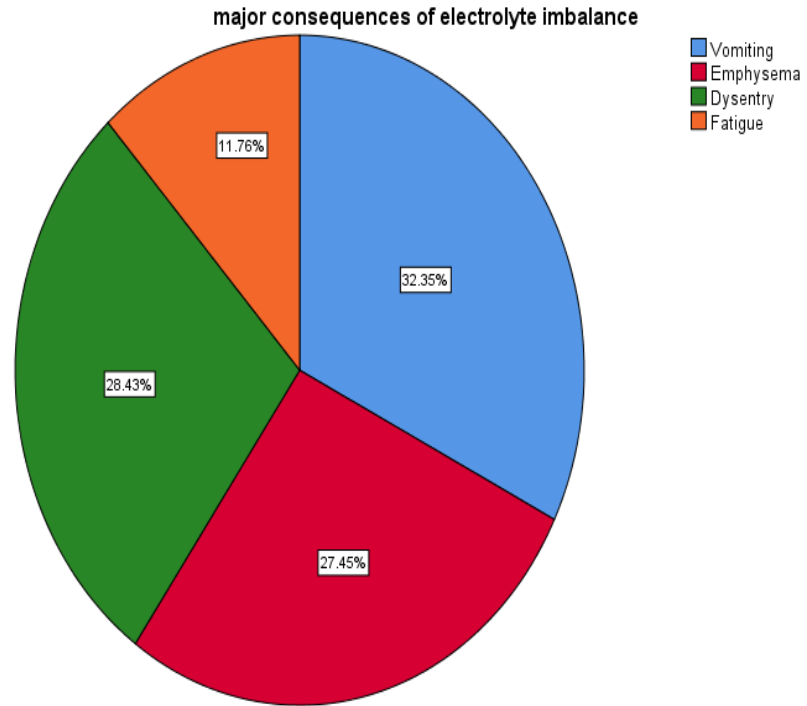


Figure 5: Major consequences of electrolyte imbalance

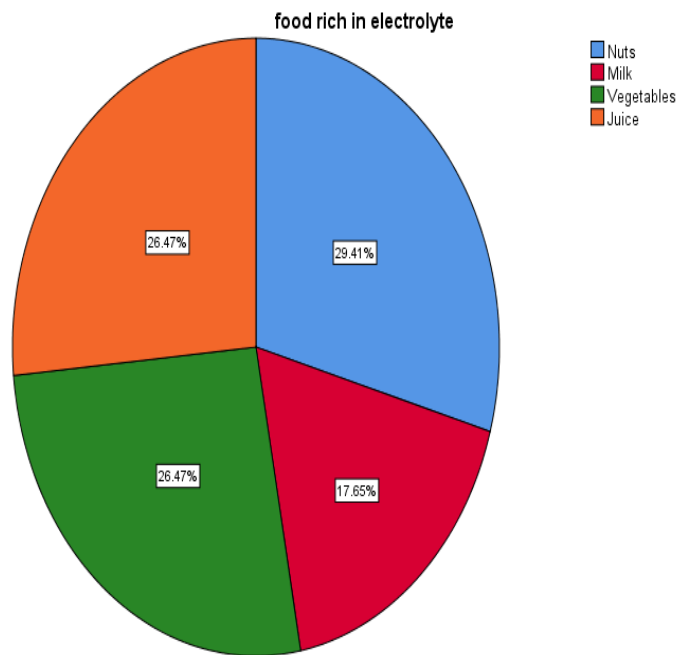


Figure 6: Foods rich in electrolytes

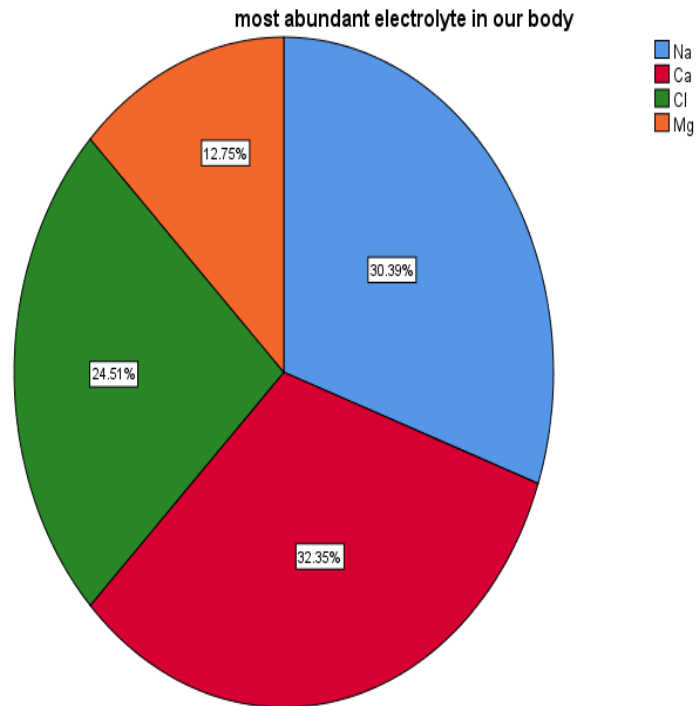


Figure 7: Most abundant electrolyte in our body

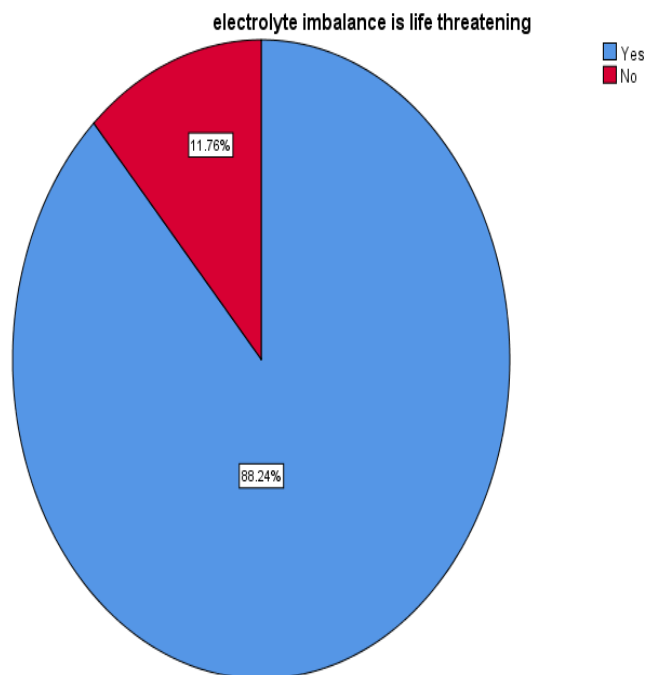


Figure 8: Electrolyte imbalance is life threatening

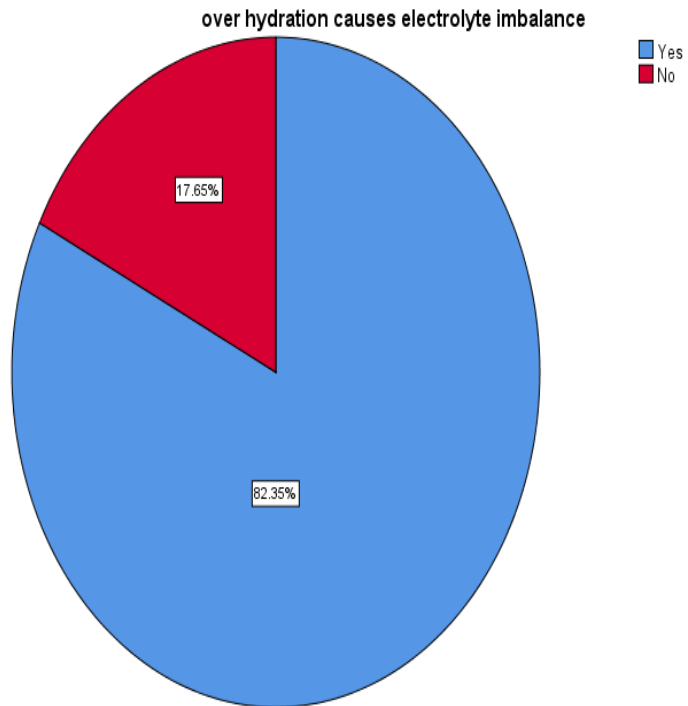


Figure 9: Overhydration causes electrolyte imbalance

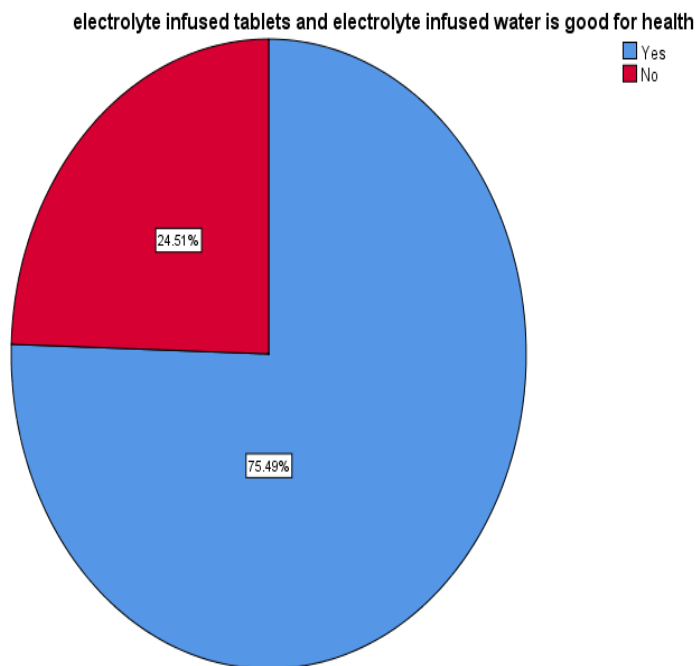


Figure 10: Electrolyte infused and electrolyte infused water is good for health

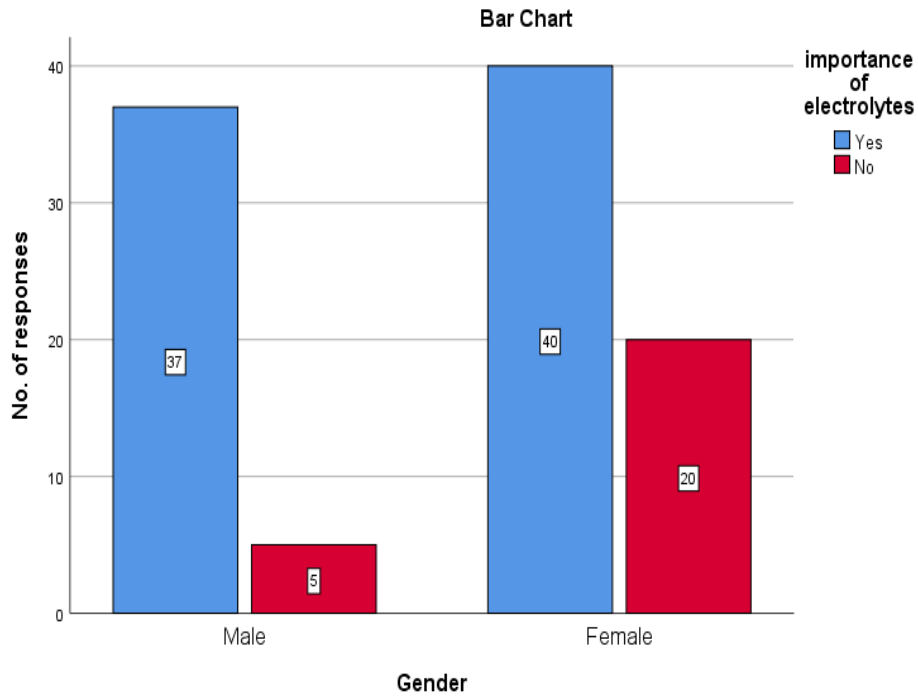


Figure 11: Association between gender and awareness on importance of electrolyte

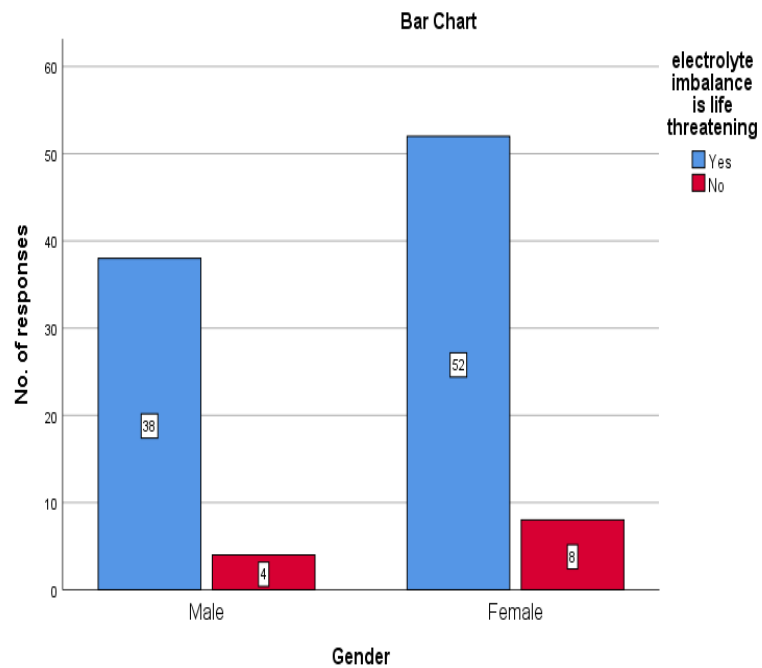


Figure 12: Association between gender and electrolyte imbalance is life threatening

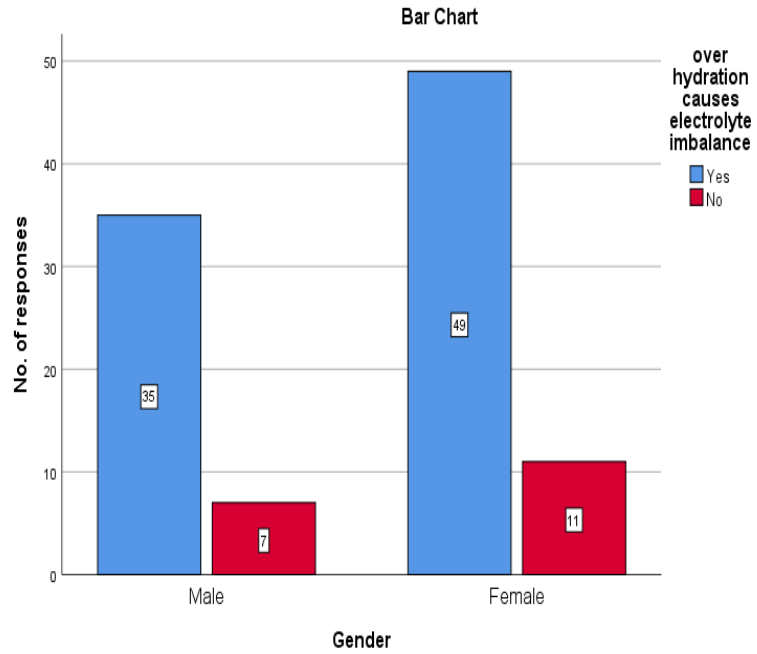


Figure 13: Association between gender and overhydration causes electrolyte imbalance.

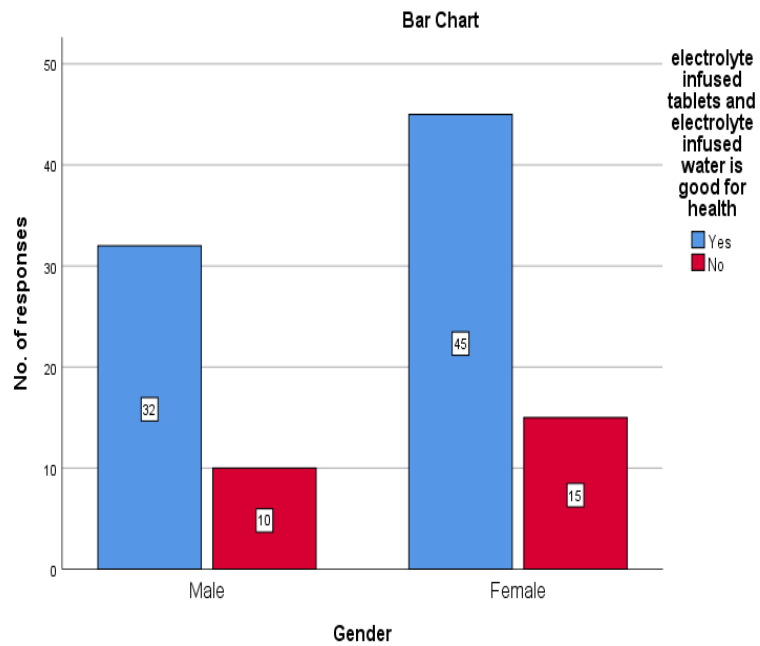


Figure 14: Association between gender and electrolyte infused tablets and water is good for health.

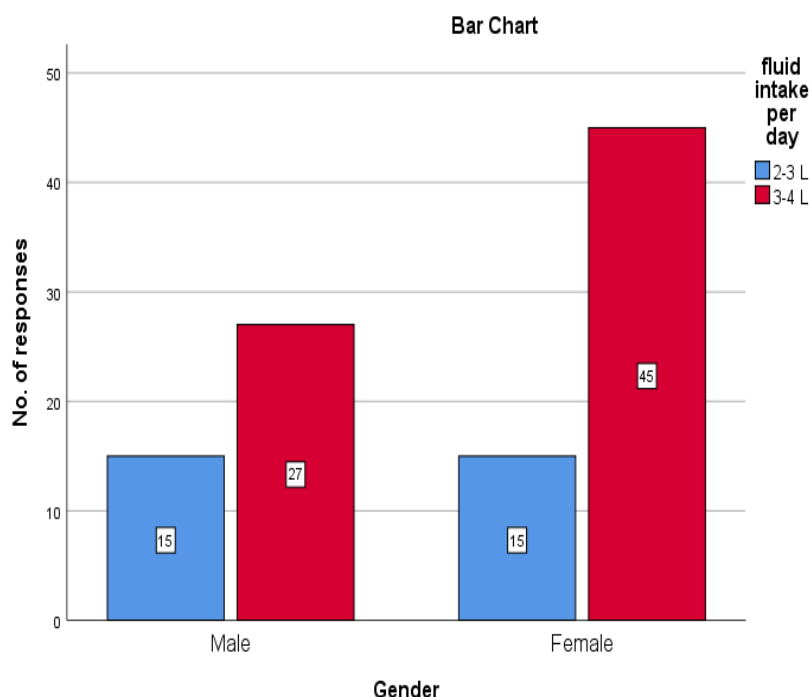


Figure 15: Association between gender and fluid intake per day.

CONCLUSION:

Electrolyte imbalance is a major problem in the present generation as the lifestyle has changed, dietary modifications have occurred and people are more prone to electrolyte imbalance and electrolyte disorders. Less intake of water, more intake of junk food and carbonated drinks and less physical activities causes electrolyte imbalance even in small age. Change in diet and proper intake of food and water in the correct ratio helps to prevent electrolyte imbalance and disorders.

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CONFLICT OF INTEREST

The authors declare no conflict of interest

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