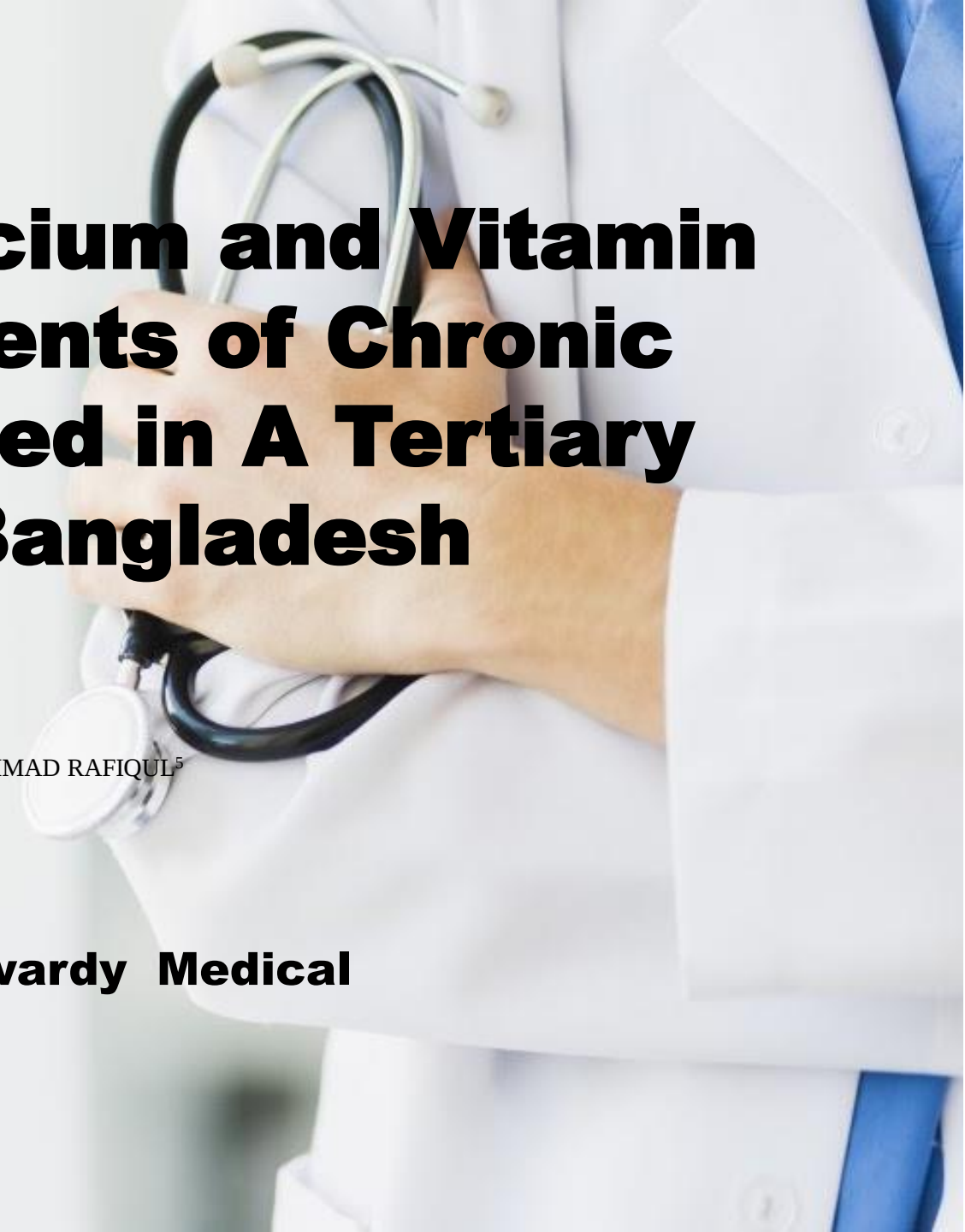




Rationality of Using Calcium and Vitamin D Supplements in Patients of Chronic Kidney Disease Admitted in A Tertiary Care Hospital in Bangladesh

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Introduction

Chronic kidney disease (CKD) is a global public health burden¹ and important contributor to the overall non communicable disease.²

Although the reported prevalence of CKD varies widely across countries and regions, 5-10% of world population are affected with this chronic disease.

Estimated prevalence of CKD in Bangladesh is 13.1%.^{1,3, 4}

¹Baroi B, et al. Level of Serum Parathyroid, Calcium, Phosphate and Vitamin D and their correlation in occurrence of Mineral Bone Disorder in CKD patient Admitted in Adult Medicine Ward of a tertiary hospital in Bangladesh. Bangladesh J Medicine 2022; 33: 145-153.

Aims & Objectives of Study

General objectives :

To assess the rationality of using calcium and vitamin D supplements in Patients of Chronic Kidney Disease Admitted in A Tertiary Care Hospital in Bangladesh

Aims & Objective of Study

Specific objectives :

- To find out the socio-demographic characteristics of the selected patients.
- To assess the status of follow-up in CKD patients.

Materials & Methods

Study Design :

Descriptive type of cross-sectional study

Place of Study :

Dept. of medicine and dept. of Nephrology of Shaheed Suhrawardy Medical College Hospital(ShSMCH).

Study period :

Three months.

Materials & Methods

Study population :

Diagnosed case of chronic Kidney disease admitted in ShSMCH.

Sample size :

53 samples were taken in this study.

Materials & Methods

- Estimated sample size was 173, but for convenience 53 sample size was take in this study.
- The following standard formula was used to determine sample size
- $N = Z^2 \times pq / d^2$

Materials & Methods

Sampling technique :

Sample was selected by convenient purposive sampling technique.

Materials & Methods

Inclusion criteria :

People diagnosed with CKD based on clinical, radiological and biochemical parameters.

Patients who gave consent.

Materials & Methods

Exclusion criteria :

- Patients with AKI
- Newly diagnosed CKD.

PRE-TESTING OF QUESTIONNAIRE

- A pretested questionnaire was set to collect data.
- Ethical clearance was taken from ethical review board of ShSMCH.

Materials & Methods

Variables to analysis :

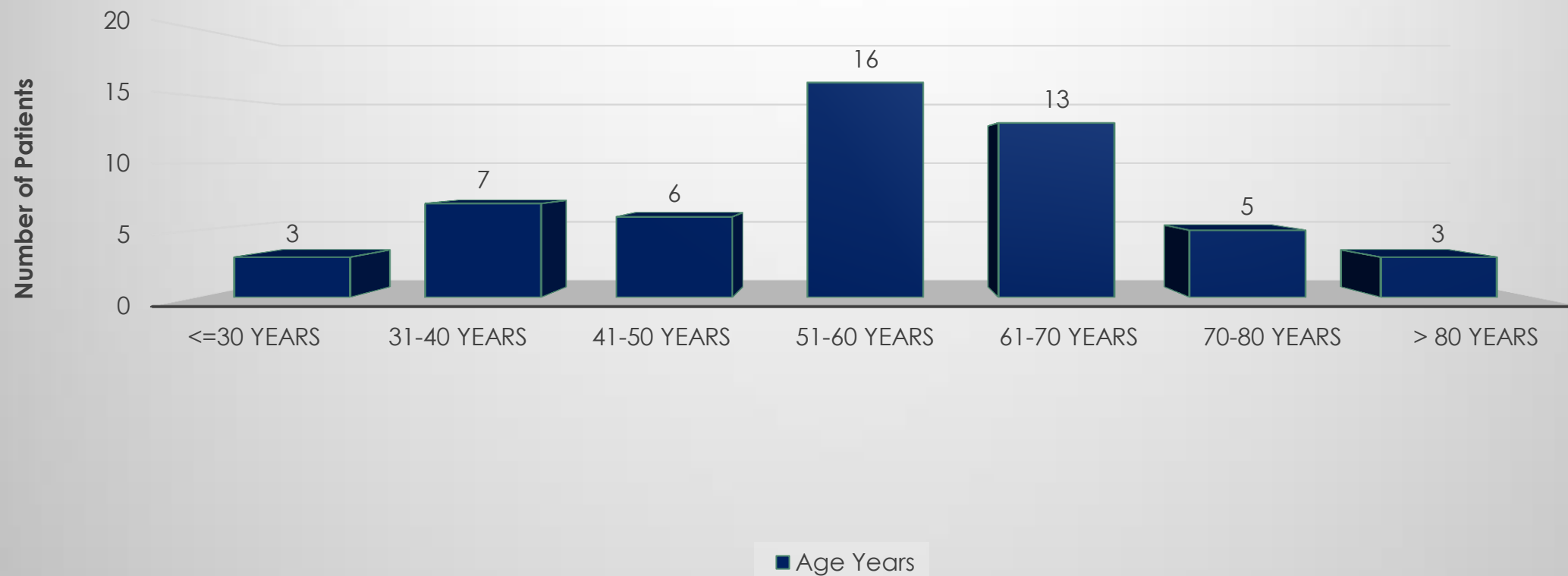
socio- demographic characteristics
comorbidities

Biochemical variable :

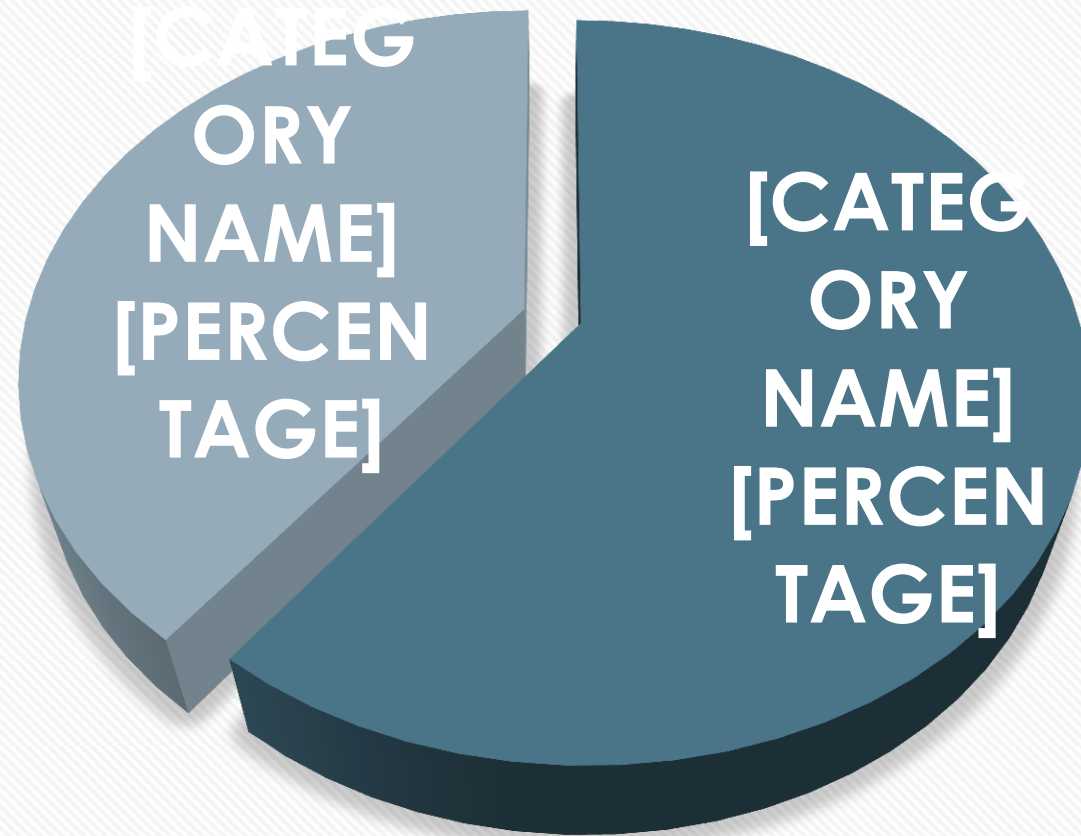
Calcium, Vitamin D, Calcium
containing Phosphate binders.

RESULTS

Age distribution of the patients (N = 53)

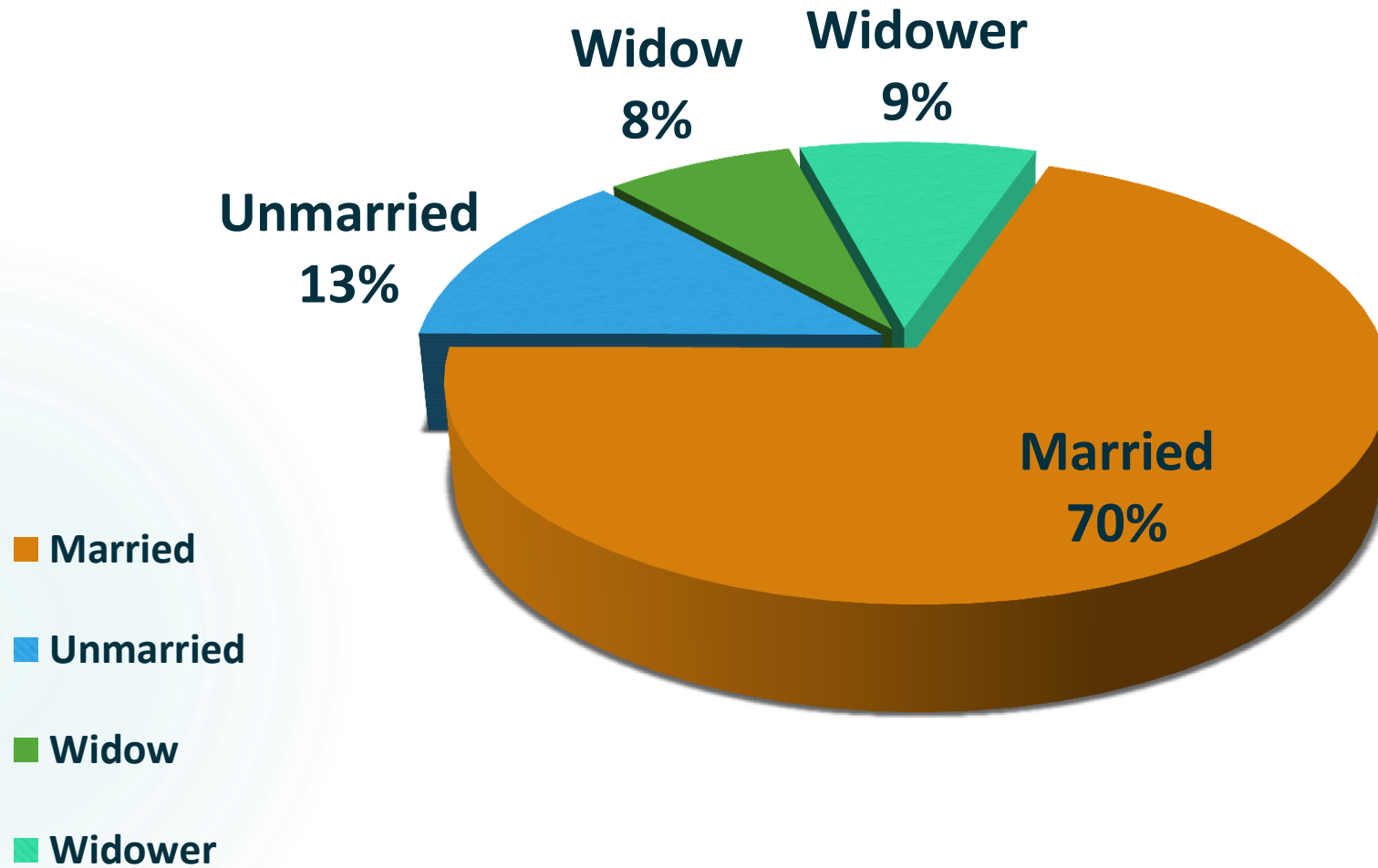


Gender Distribution

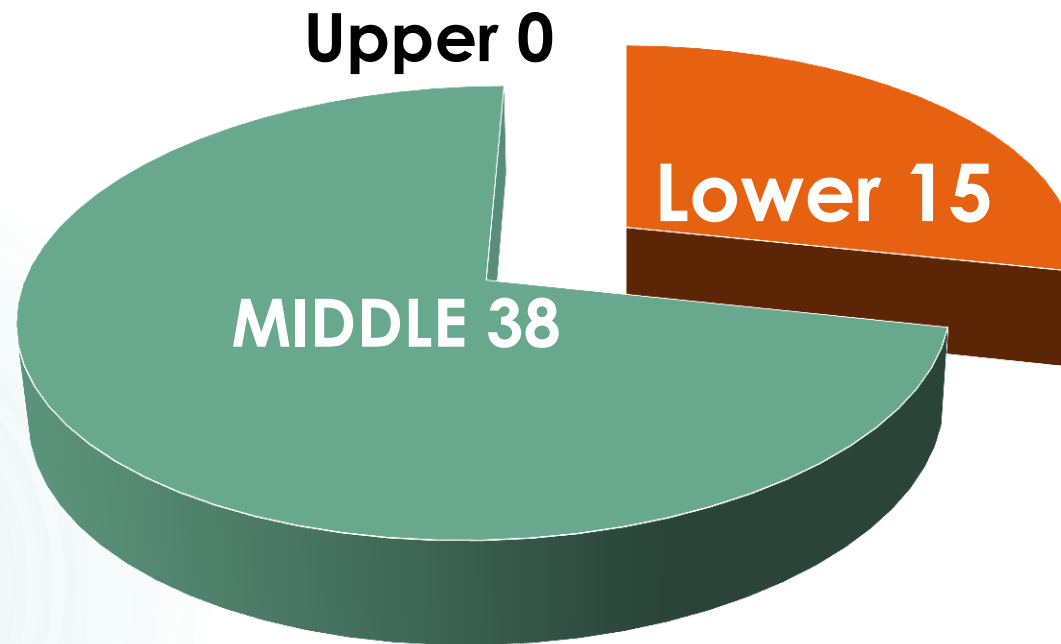


■ Male ■ Female

Martial Status

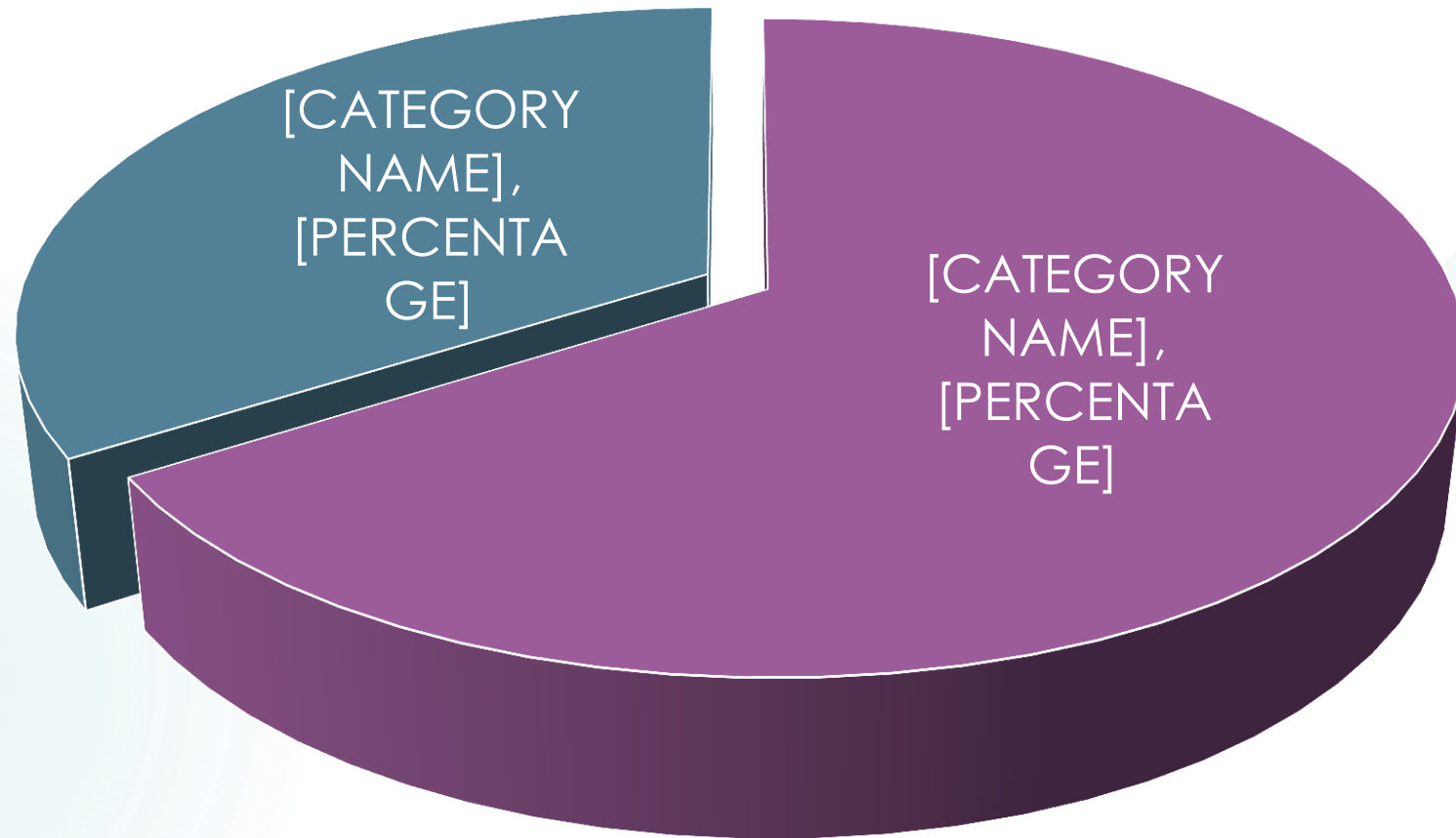


Socioeconomic Status



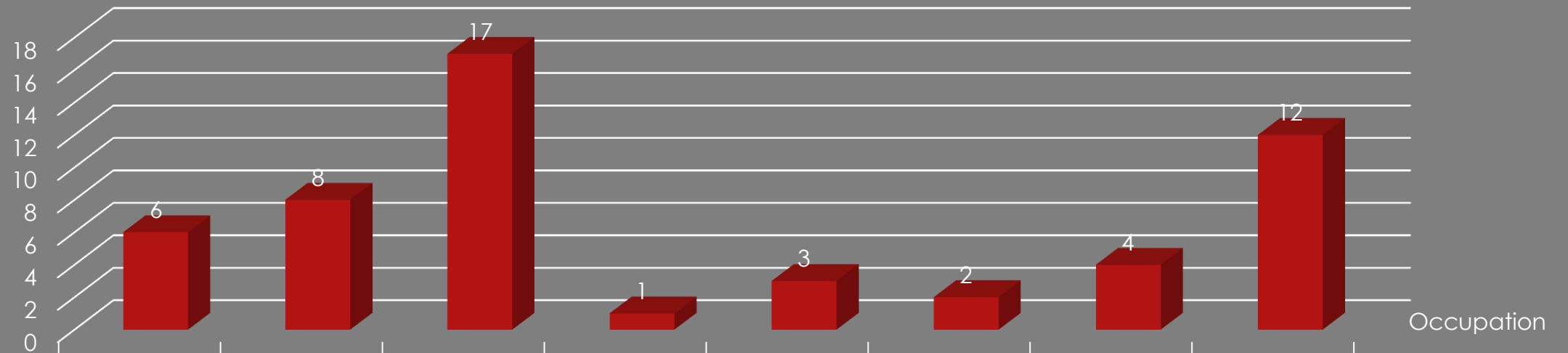
■ Lower ■ Middle ■ Upper

Habitat



■ Urban ■ Rural

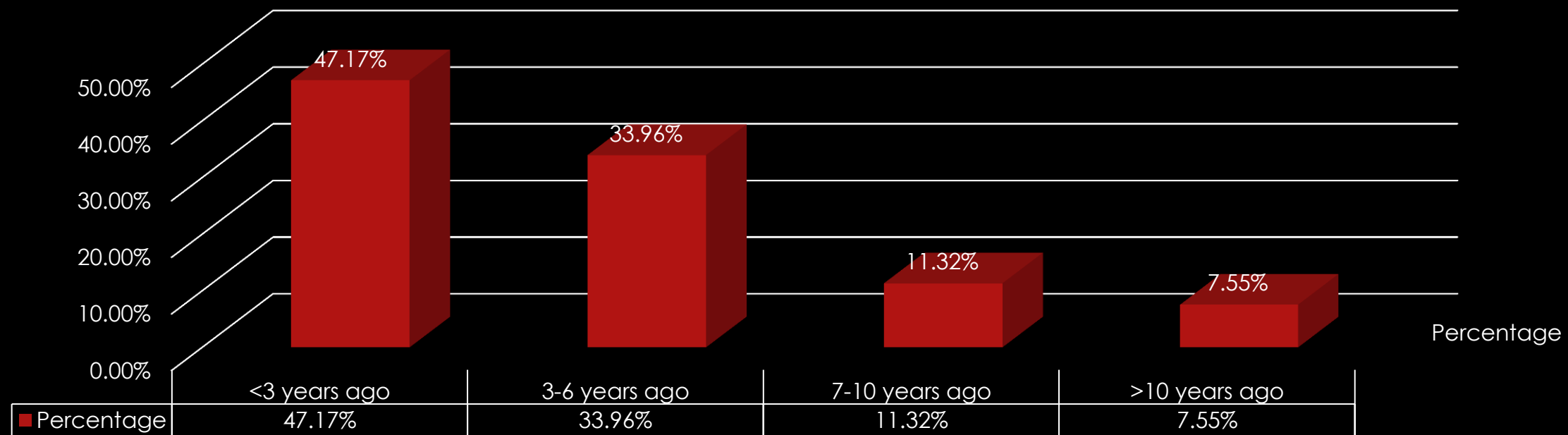
Occupation



■ Occupation	6	8	17	1	3	2	4	12
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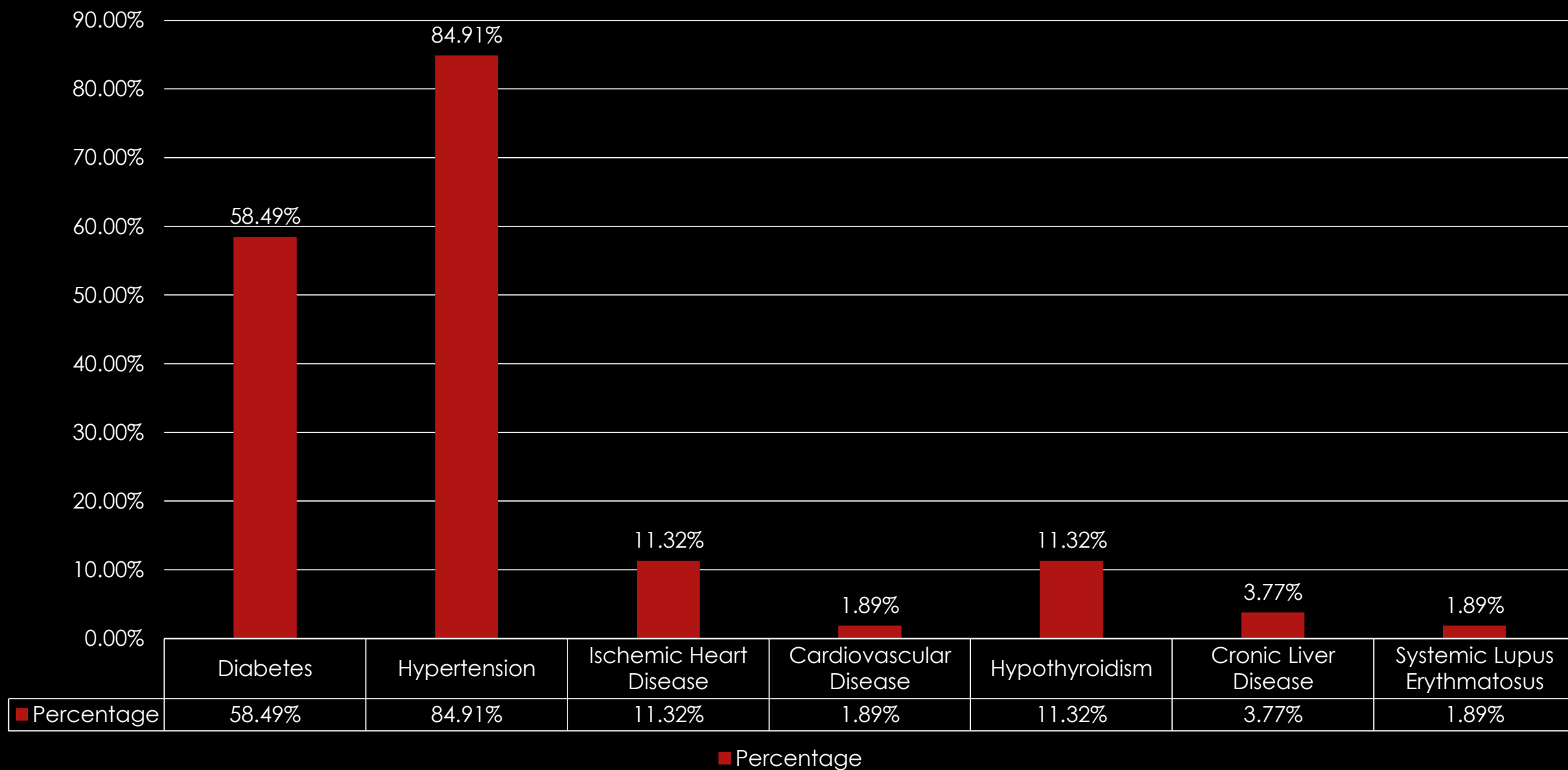
■ Occupation

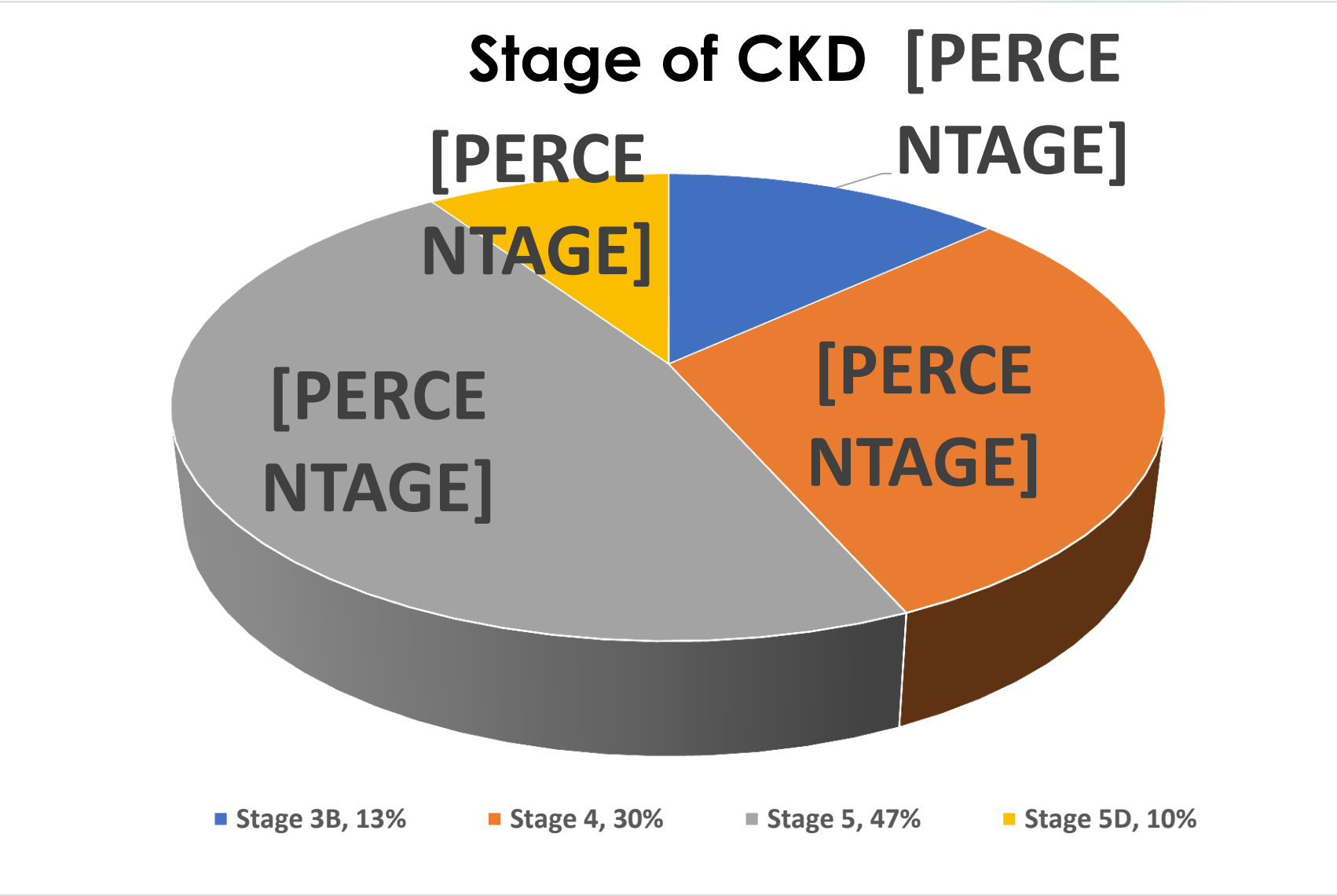
Distribution of participants by CKD diagnosis history (N=53)



■ Percentage

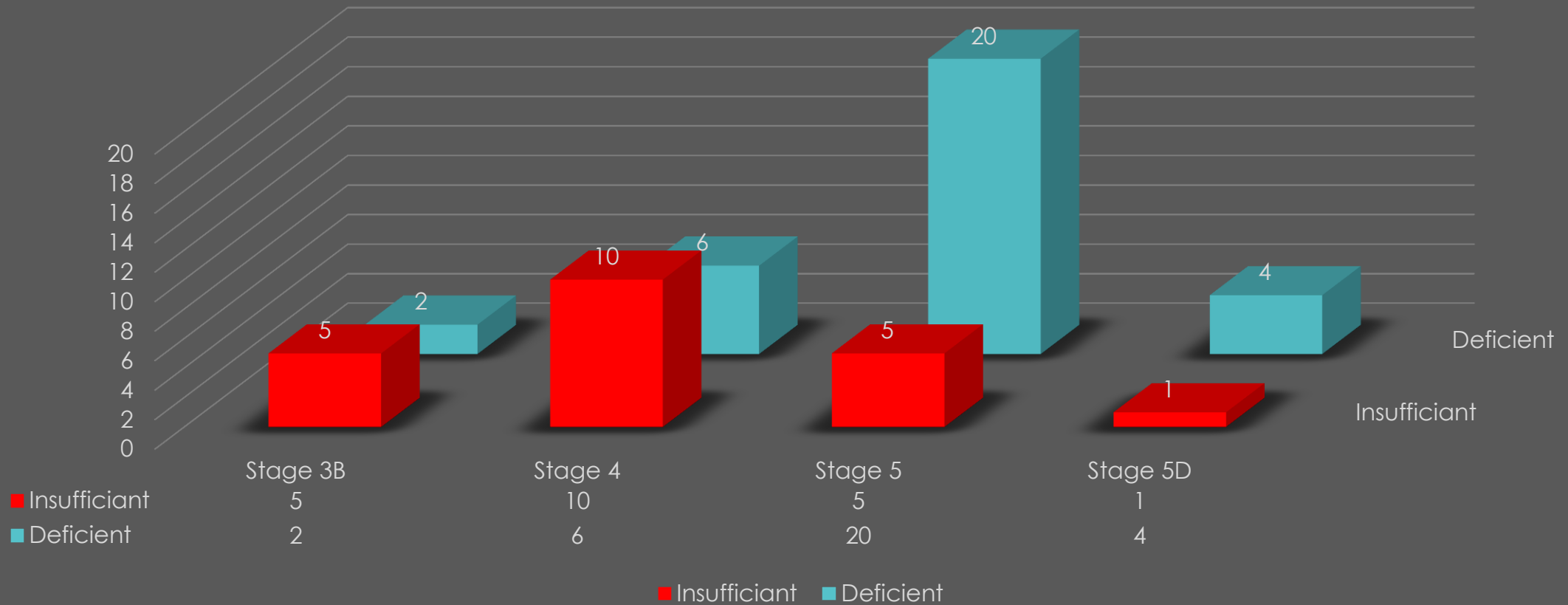
Distribution of participants by presence of comorbidities (N=53)





Distribution of current CKD stage among the participants (N=53)

Correlation between Vitamin D level & Stage of CKD (N=53)



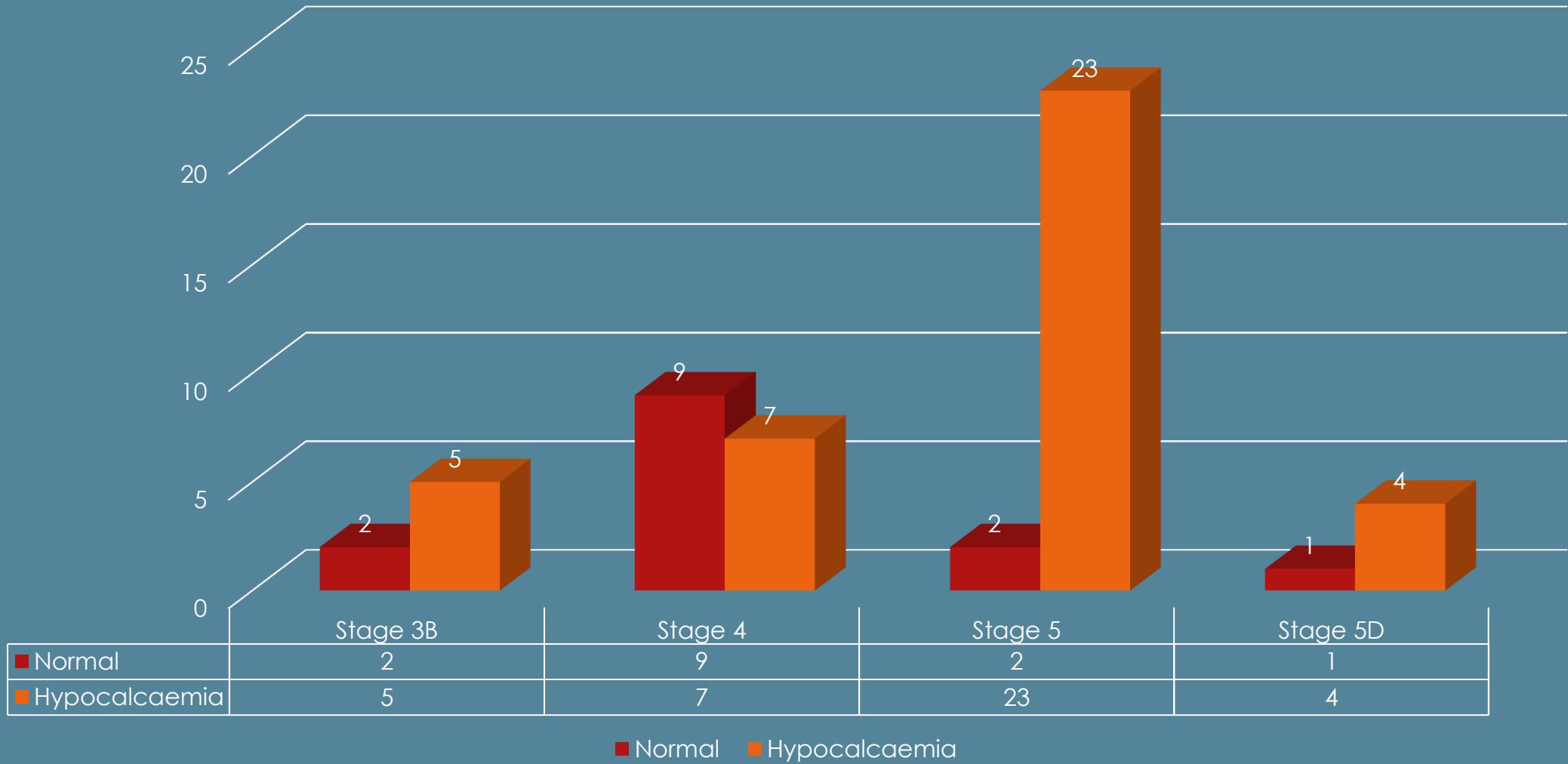
Insufficient

Deficient

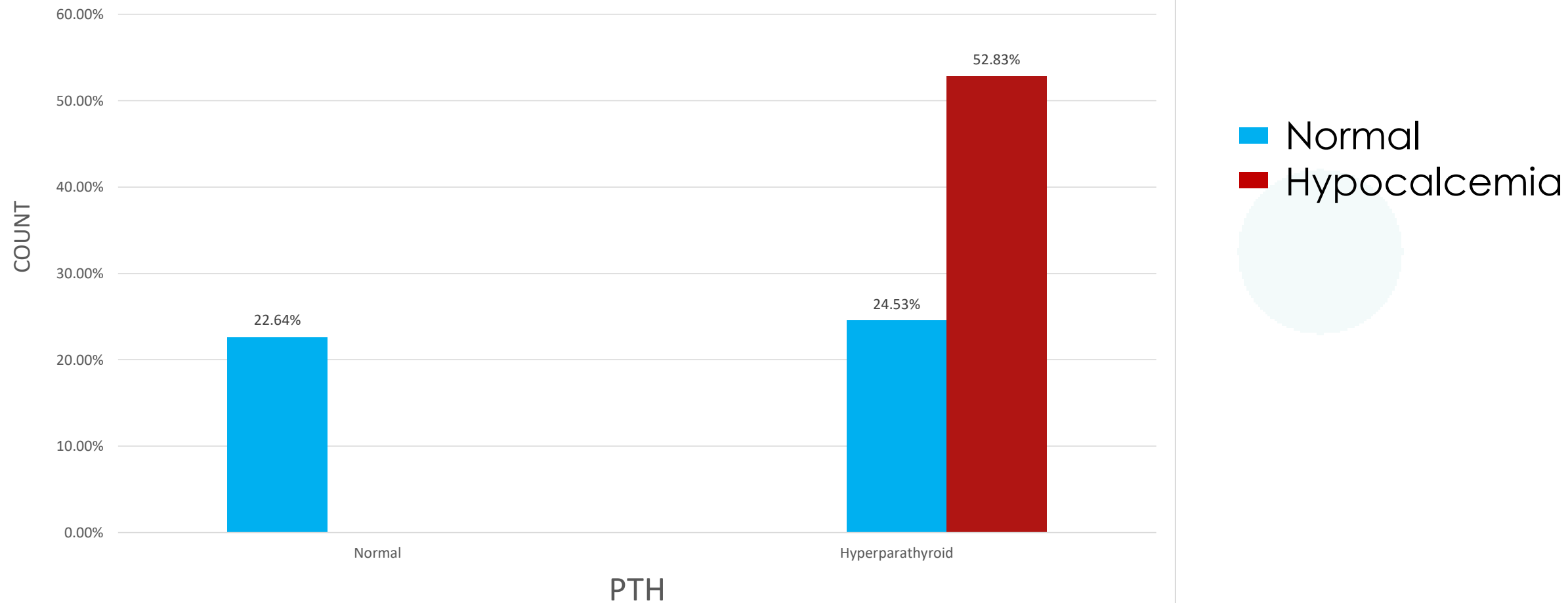
30 to < 50nmol/L

<30nmol/L

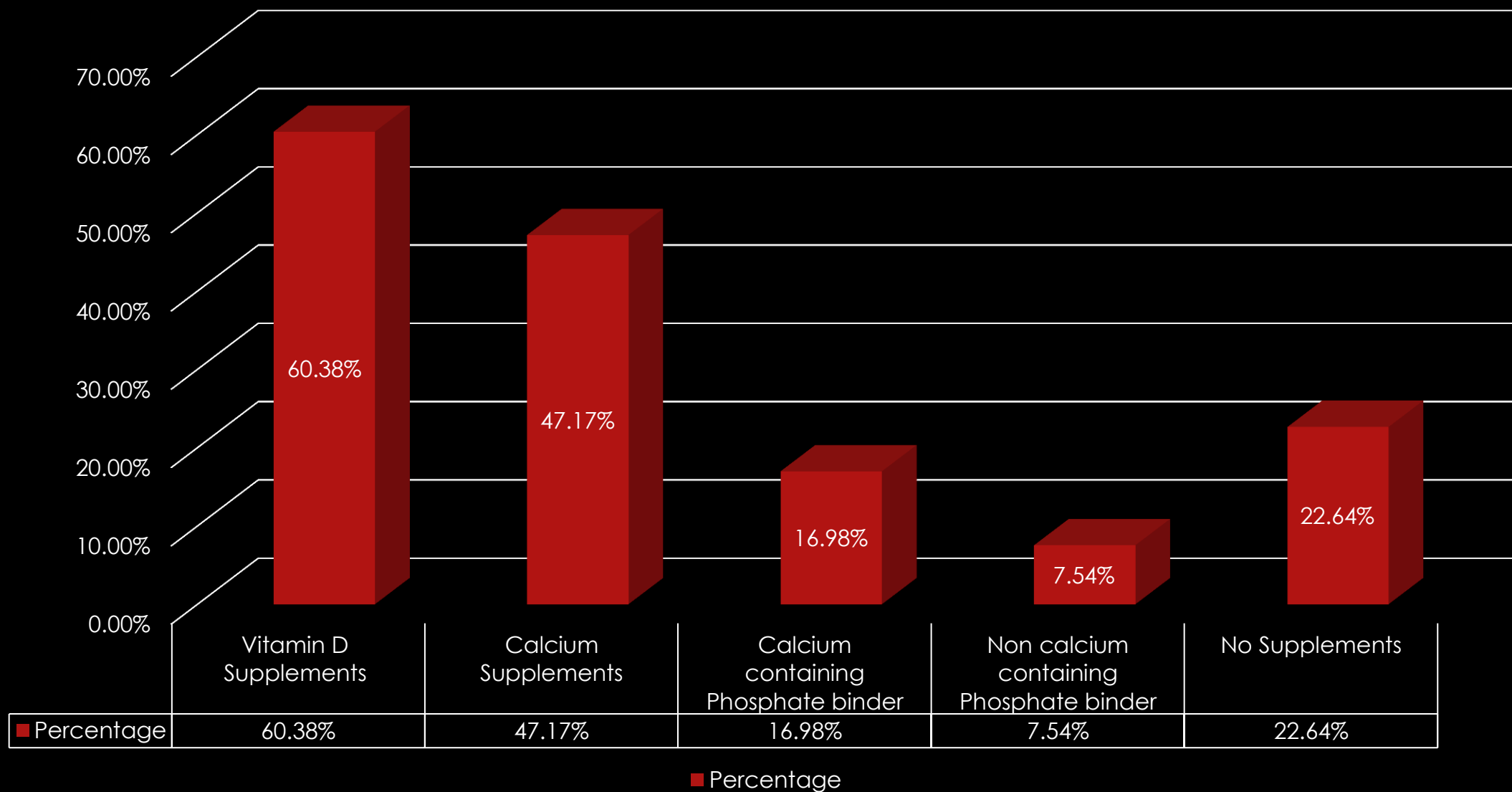
Correlation between Serum calcium level & Stage of CKD (n = 53)



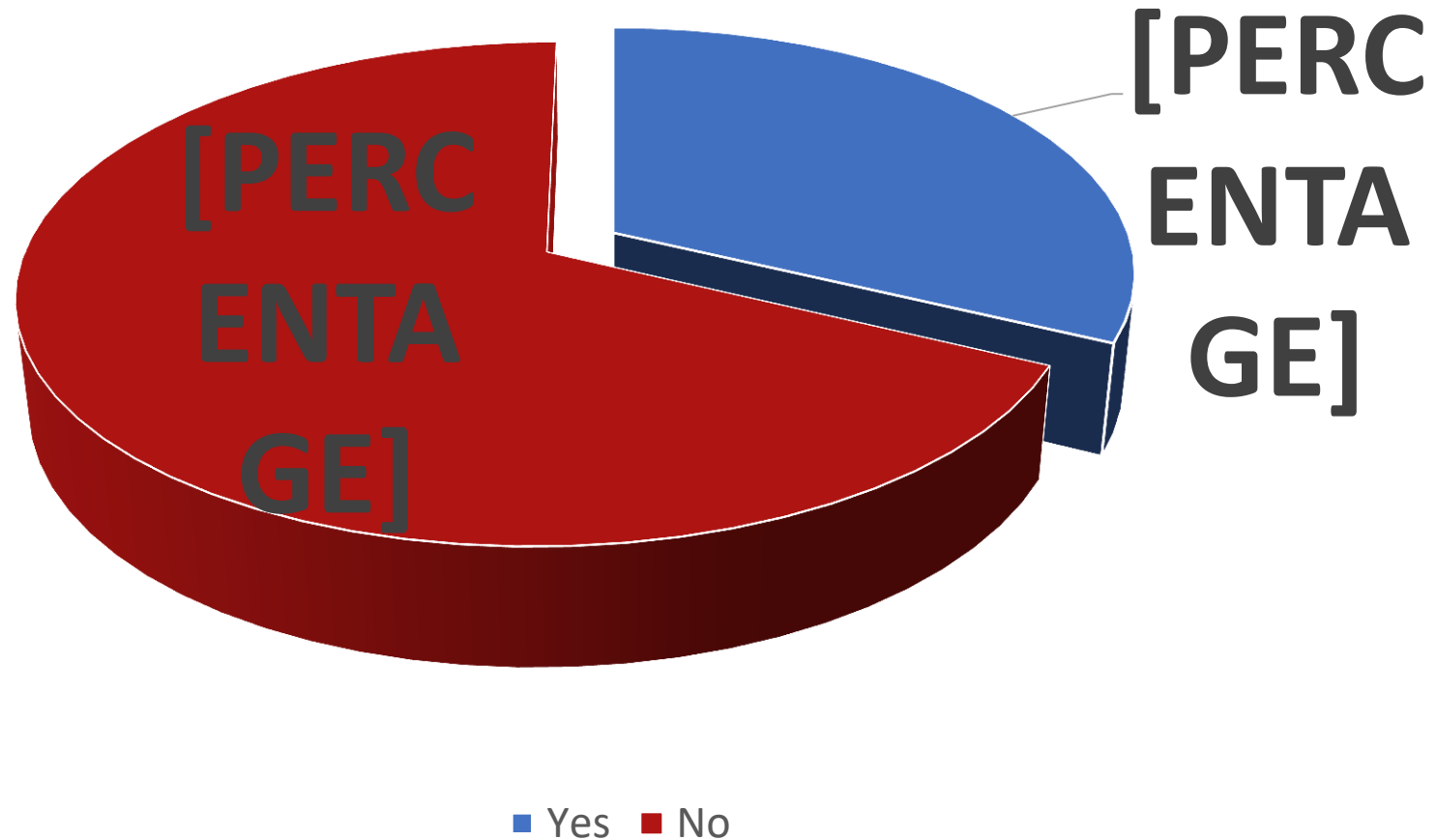
Correlation between Serum PTH & Calcium level (n = 53)



Distribution of types of supplements given among the participants (N=53)

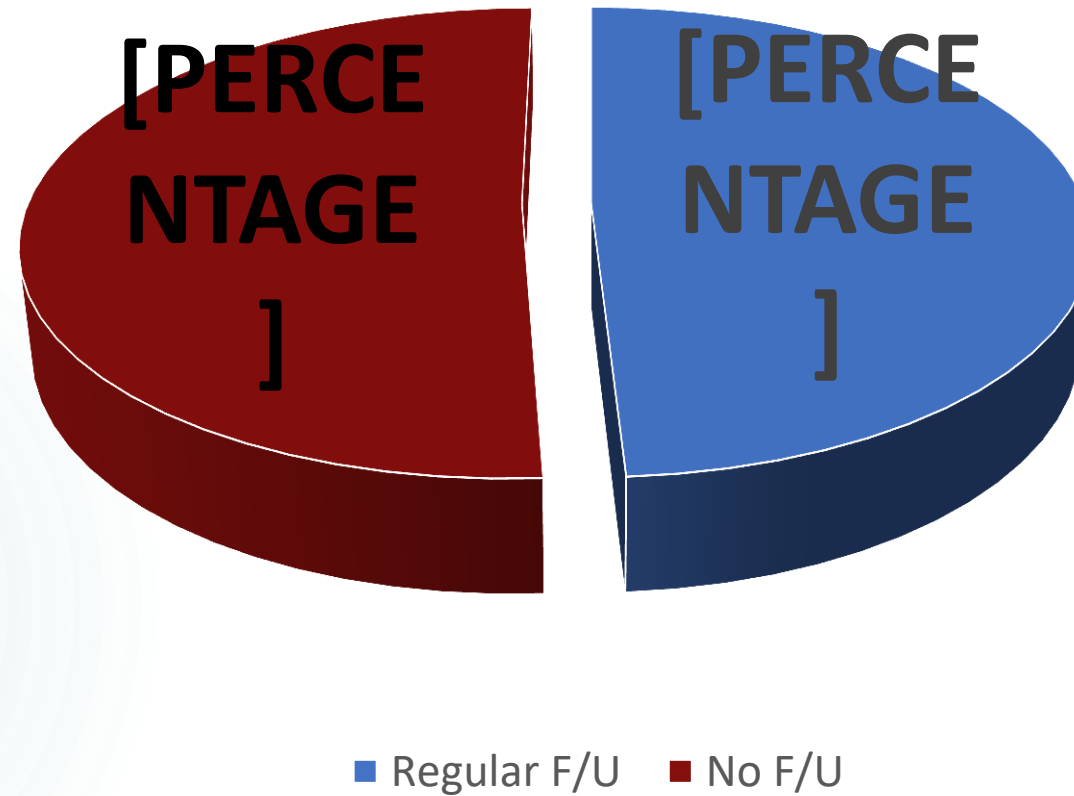


Rationality of Supplements



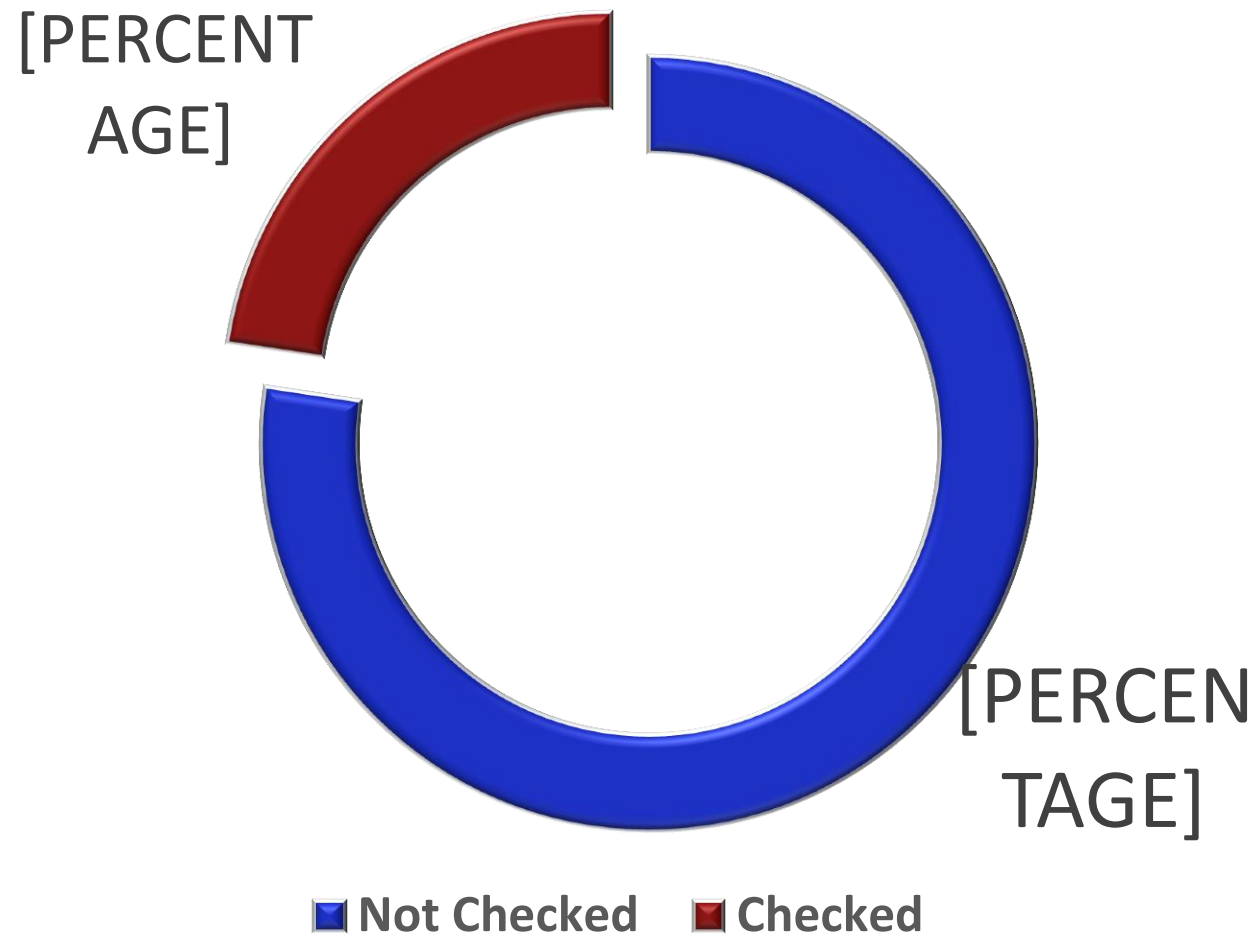
Participants Distribution by rational approach using Vitamin D and Calcium Supplements (N=53).

Stage of Follow Up



Distribution of the participants based on the state of Follow Up (N=53)

Biochemical Parameters



Distribution of the participants based on whether biochemical parameters were checked or not (N=53).

DISCUSSION

- Regarding age of the patients, maximum number 16 (30.19%) were between 51-60 years, 13(24.53%) were between 61-70 years.
- Regarding gender, the study included a higher proportion of male participants (60.38%) compared to females (39.62%).

DISCUSSION

Regarding socio economical data, Baroi B, et al supports our study.

²Baroi B, et al. Level of Serum Parathyroid, Calcium, Phosphate and Vitamin D and their correlation in occurrence of Mineral Bone Disorder in CKD patient Admitted in Adult Medicine Ward of a tertiary hospital in Bangladesh. Bangladesh J Medicine 2022; 33: 145-153.

DISCUSSION

- In our study, hypertension was most common comorbidity 81.91% among all participants, followed by diabetic which was present in 58.49% population.
- The study by Theodosios K, et al supports our own research

▪ ³Theodosios Kaqntas, et al. Relationship between Chronic Kidney Disease Staging and Vitamin D Deficiency. Cureus.2022 March 17; 14(3): r55.

DISCUSSION

- In our study, 68% participants received Vitamin D and Calcium supplements without any specific indication.
- More than half of the patients were not on any follow up.
- The biochemical levels were being followed up regularly only 23% of the participants.

DISCUSSION

Treatment

- In patients with CKD G3a-G5D, treatments of CKD-MBD should be based on serial assessments of phosphate, calcium, and PTH levels, considered together .
- In patients with CKD G5D requiring PTH-lowering therapy, we suggest calcimimetics, calcitriol, or vitamin D analogs, or a combination of calcimimetics with calcitriol or vitamin D analogs (2B).

DISCUSSION

Targets for Management of CKD- MBD:

Test in serum	Frequency	Targets
Calcium and Phosphates	CKD3: 6-12 Months CKD4: 3-6 months CKD5 and 5D:1-3 months	Normal
Calcidiol 25 (OH) D	CKD 3 to 5 and 5D	Baseline (Normal < 50 nmol/l)
ALP	Annually / more frequently in case of elevated PTH	Normal
PTH	CKD3: 6-12 Months CKD4: 3-6 months CKD5 and 5D:1-3 months	Within 2-9 times of upper limits of normal

CONCLUSION

The study highlights the challenge of supplementing calcium and Vitamin D in CKD patients. Many patients showed biochemical imbalances, yet supplement usage was often irrational. Nearly half lacked regular follow-up, emphasizing the need for personalized treatment and monitoring.

LIMITATION

- The study was done on 53 cases only due to time and resource constraint.
- It was done in only one Centre in Dhaka, which may not reflect the wholesome picture of our country.
- Due to the cross-sectional nature of this study, patients were assessed only at presentation.

