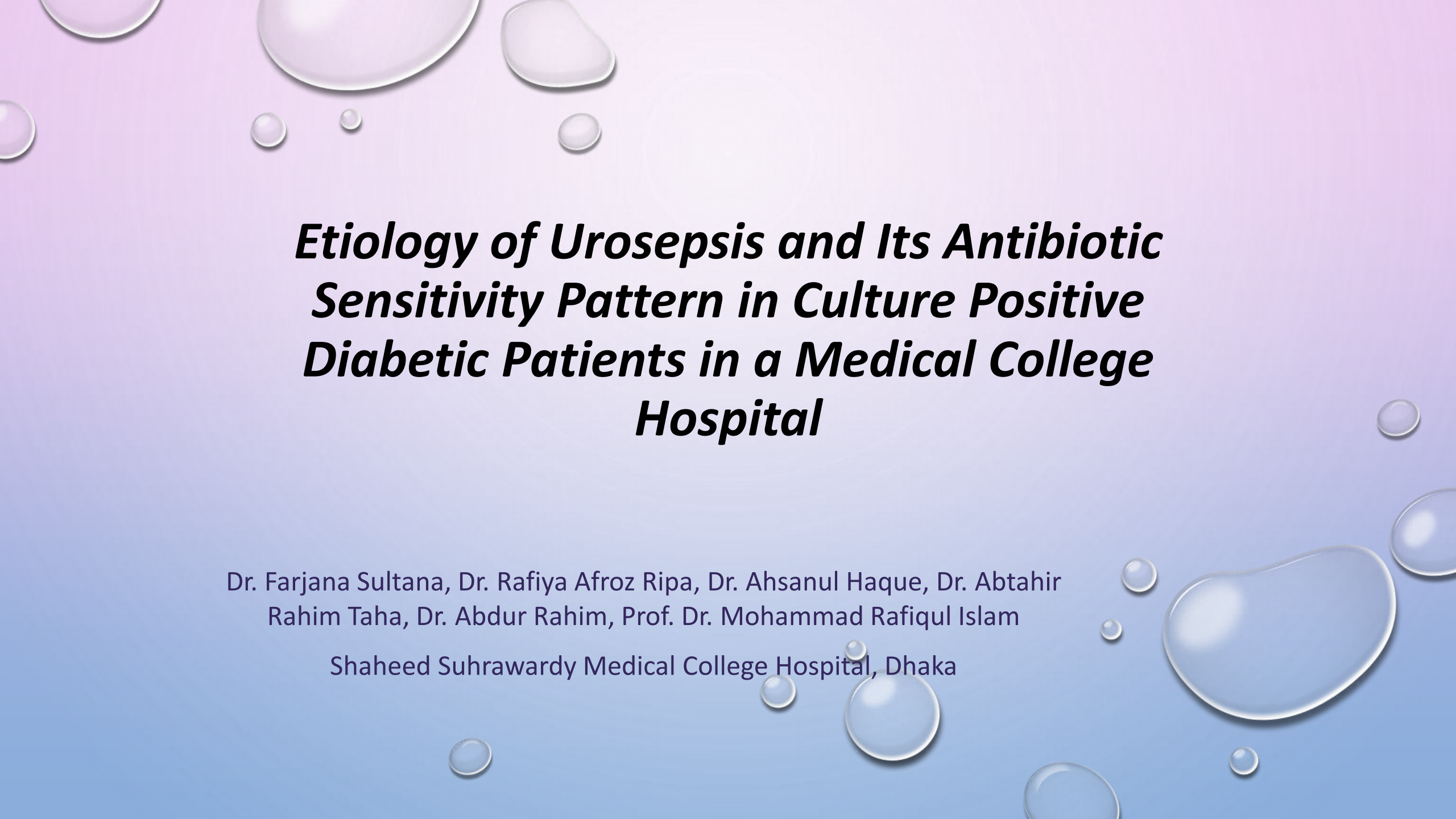




Etiology of Urosepsis and Its Antibiotic Sensitivity Pattern in Culture Positive Diabetic Patients in a Medical College Hospital

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Introduction

- Urosepsis, a severe and potentially life threatening condition which accounts for about 25% of total sepsis cases among adults¹. It is associated with high mortality rate of 20-40% cases².
- Urosepsis particularly in diabetic patients, poses significant challenges due to its complex etiology and the growing concern of antibiotic resistance³.
- Understanding the causative agents and their antibiotic sensitivity patterns is crucial for effective management and treatment.

- ¹WAGENLEHNER, F. M. E., LICHTENSTERN, C., ROLFES, C., MAYER, K., UHLE, F., WEIDNER, W., & WEIGAND, M. A. (2013). DIAGNOSIS AND MANAGEMENT FOR UROSEPSIS: ITEMS IN UROSEPSIS. INTERNATIONAL JOURNAL OF UROLOGY: OFFICIAL JOURNAL OF THE JAPANESE UROLOGICAL ASSOCIATION, 20(10), 963-970. [HTTPS://DOI.ORG/10.1111/iju.12200](https://doi.org/10.1111/iju.12200)
- ²GOOGLE SCHOLAR. (N.D.). GOOGLE.COM. RETRIEVED FEBRUARY 28, 2024, FROM [HTTPS://SCHOLAR.GOOGLE.COM/SCHOLAR?HL=EN&AS_SDT=0%2C5&Q=EMPIRIC+ANTIBIOTIC+AND+IN+VITRO+SUSCEPTIVITY+OF+UROSEPSIS+PATHOGEN&](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=empiric+antibiotic+and+in+vivo+susceptibility+of+urosepsis+pathogen&)
- ³WAGENLEHNER, F. M. E., PILATZ, A., WEIDNER, W., & NABER, K. G. (2016). UROSEPSIS: OVERVIEW OF THE DIAGNOSTIC AND TREATMENT CHALLENGES. IN URINARY TRACT INFECTIONS (PP. 135-157). ASM PRESS.

Aims & Objectives of Study

General Objectives:

To evaluate the aetiology of urosepsis and its antibiotic sensitivity pattern in culture positive diabetic patients in a medical college hospital

Specific Objectives:

- To evaluate the pathogen of urosepsis in diabetic patients
- To evaluate the antibiotic sensitivity pattern of urosepsis in diabetic patients
- To assess the socio-demographic condition of the participants

Materials & Methods

Study design:

Cross sectional observational study

Place of study:

Inpatient department of medicine of Shaheed Suhrawardy Medical College & Hospital

Study period:

Six months

Materials & Methods

Study Population:

All adult diabetic patients diagnosed with urosepsis, attended in medicine ward of Shaheed Suhrawardy Medical College & Hospital

Sample Size:

- Estimated sample size was 72 , but for convenience 50 sample size was taken in this study
- The following standard formula was used to determine sample size

$$n = \frac{z^2 pq}{d^2}$$

Sample Technique:

Sample was selected by convenient purposive sampling technique

Materials & Methods

Inclusion Criteria:

- Age: ≥ 18 years of age
- Both gender
- Patients diagnosed with DM
- Patients diagnosed with urosepsis
- Informed written consent of participants

Materials & Methods

Exclusion Criteria:

- Pregnant women
- Patients with history of use of antimicrobial therapy at time of hospital admission

- A pretested questionnaire was set to collect data
- Ethical clearance was taken from ethical review board of Shaheed Suhrawardy Medical College & Hospital

Materials & Methods

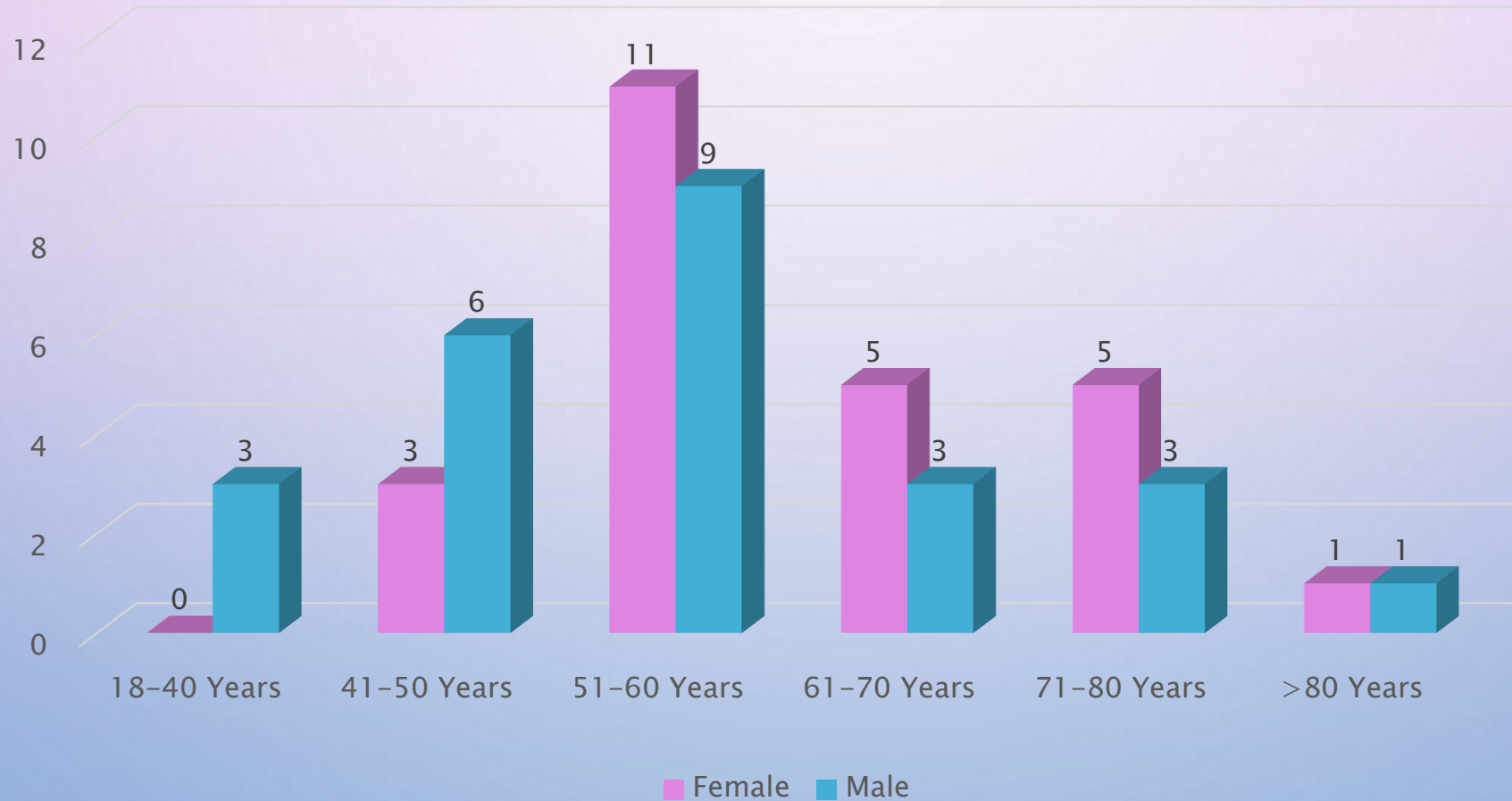
Variables to Analysis:

- Socio-demographic variables-(age, sex, occupation, income)
- Clinical variables-
 1. Co-morbidities
 2. Sign-symptoms of urosepsis
- Biochemical variables- CBC, Urine R\E, Urine C\S

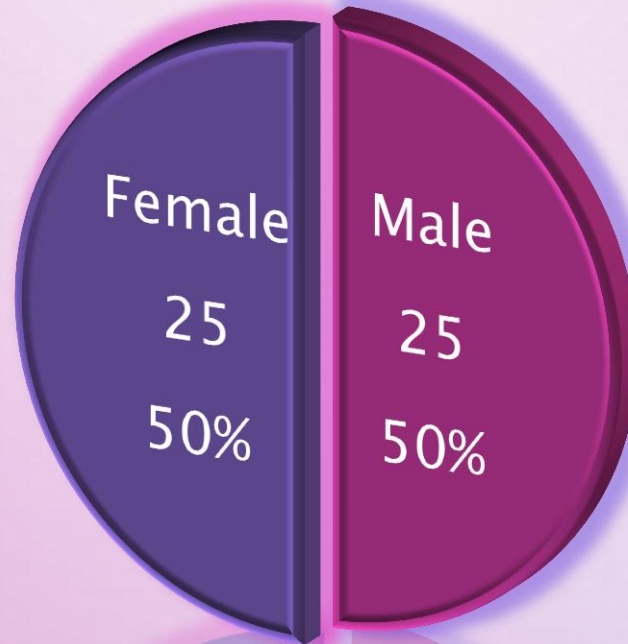


RESULTS

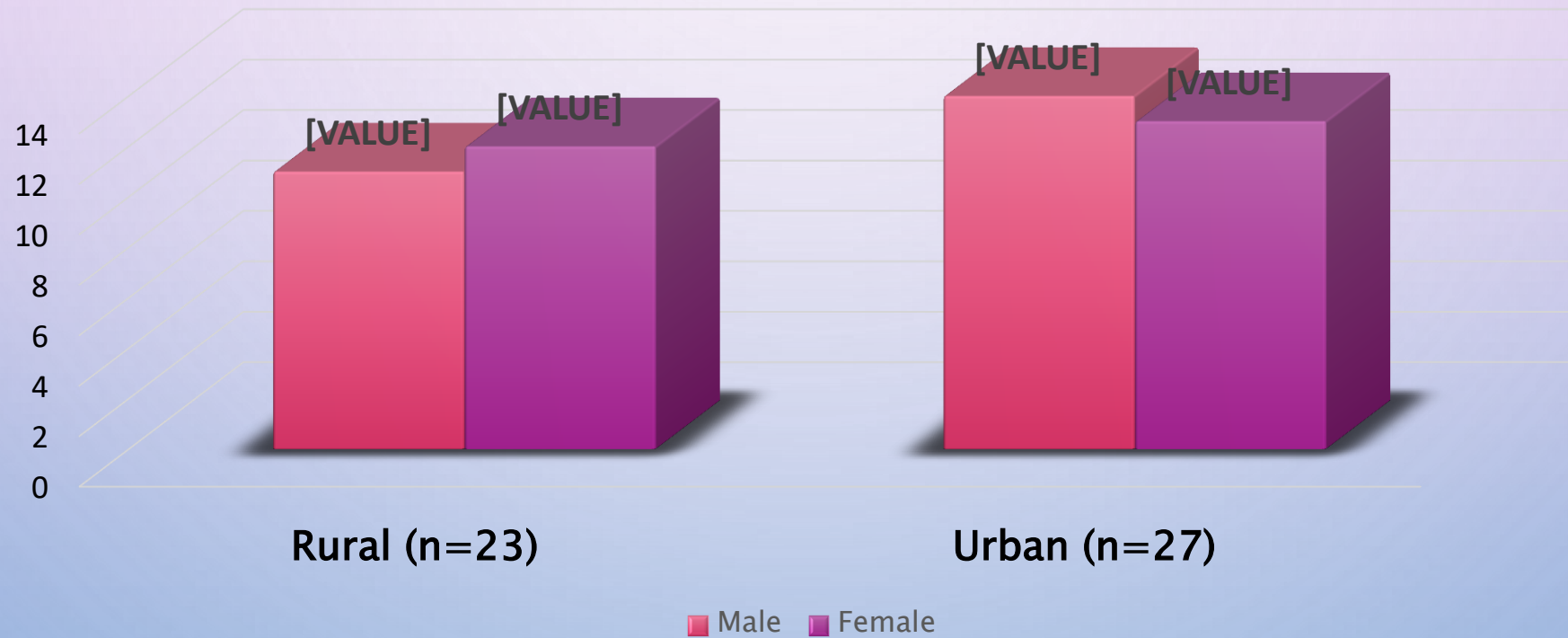
Age Distribution Of The Patients (n=50)



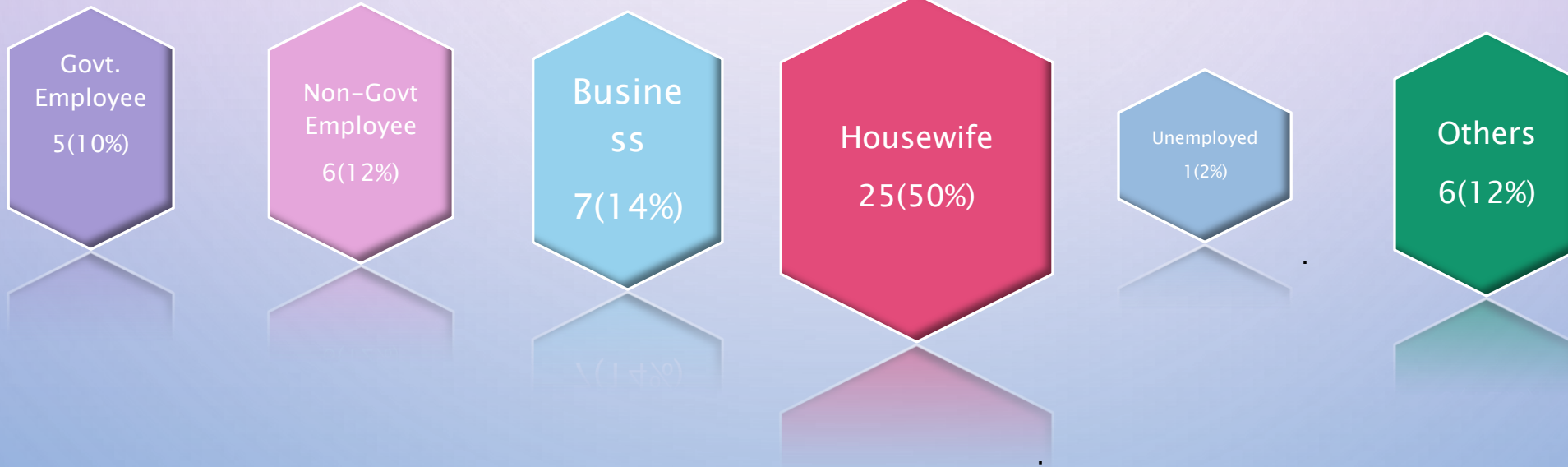
Gender Distribution



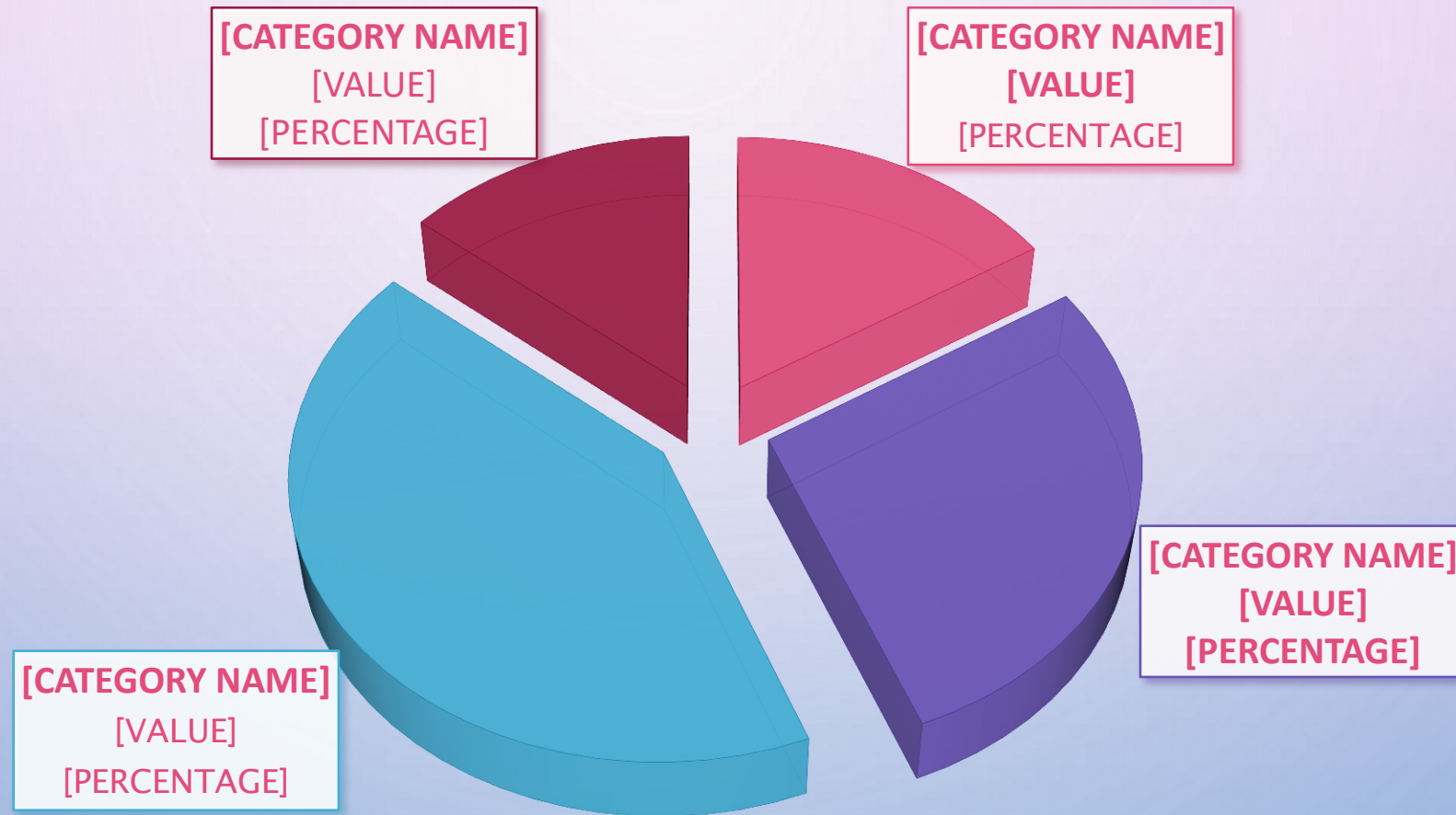
Residence Distribution



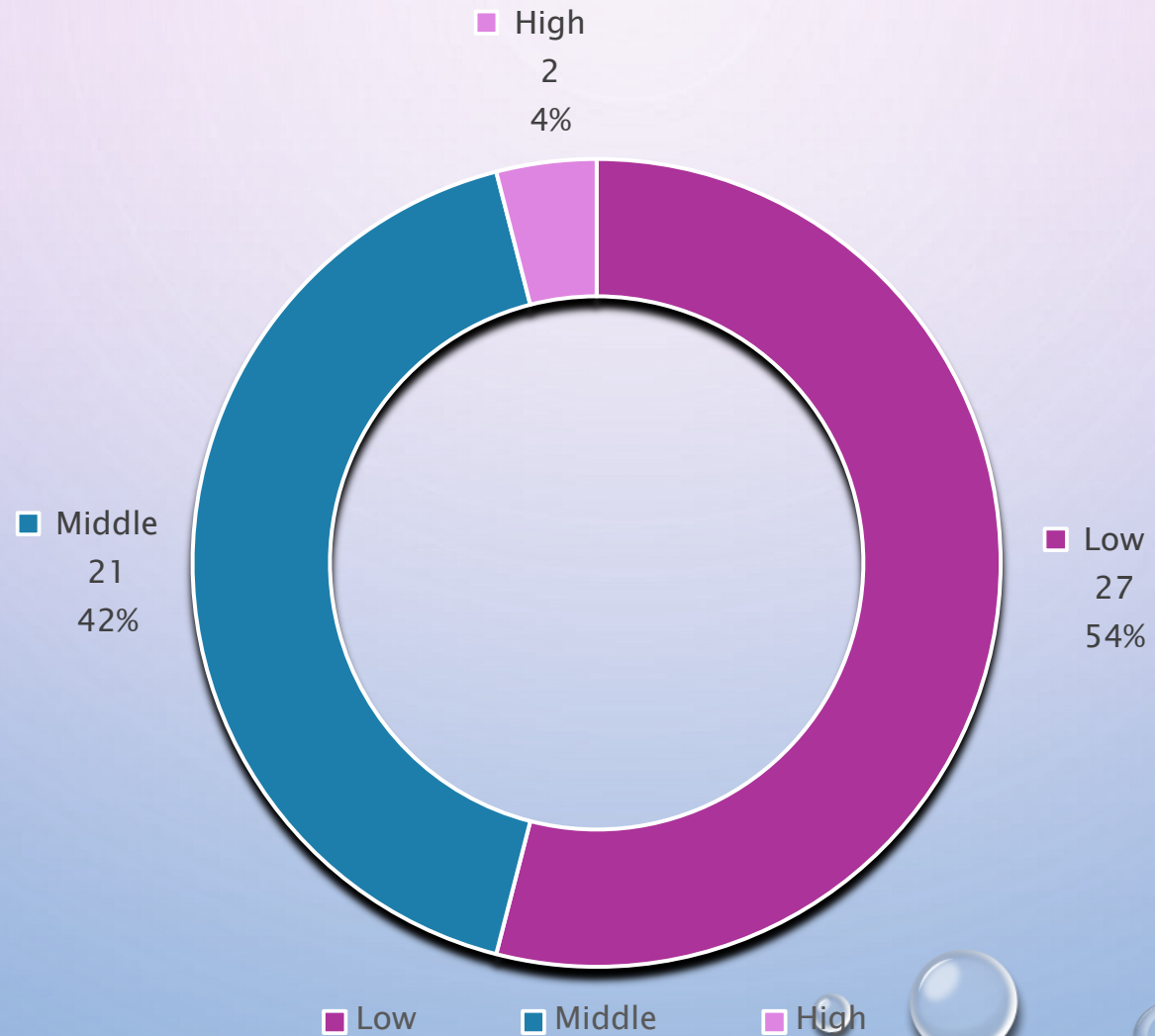
Occupation



Education

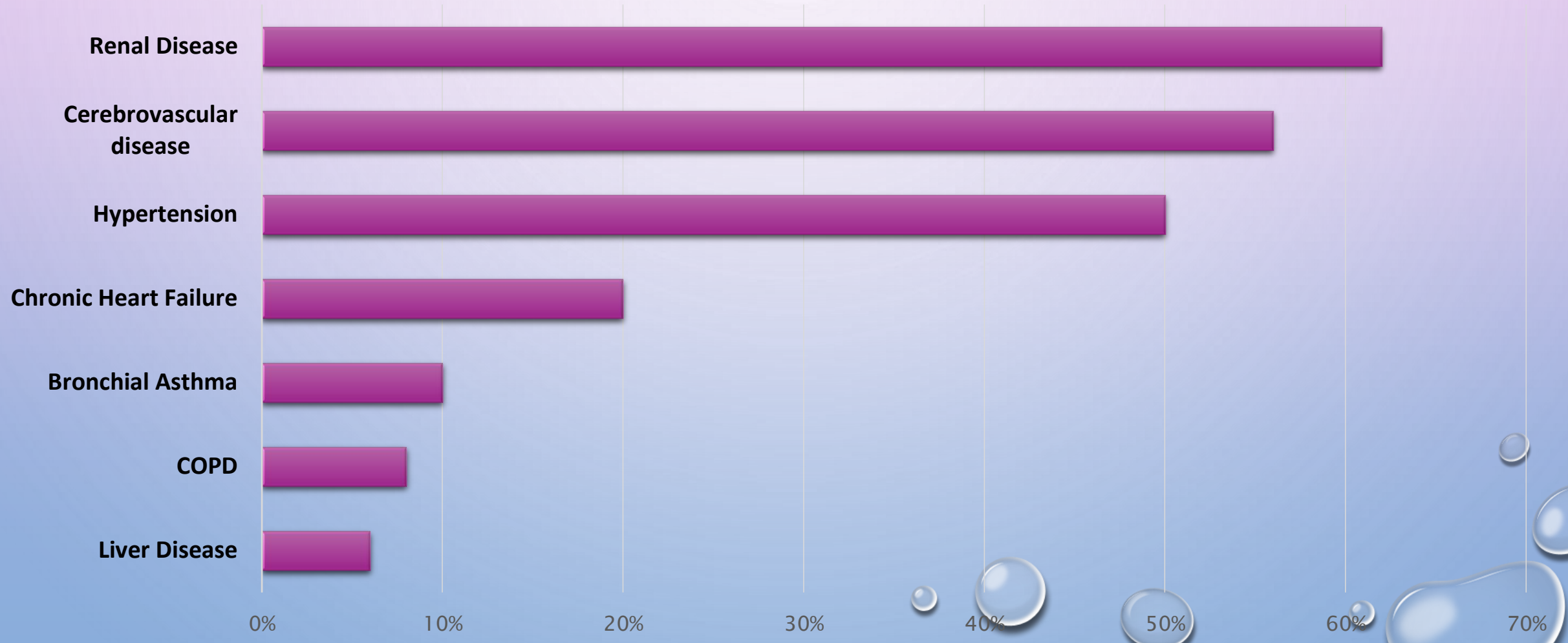


Socioeconomic Status



Comorbidities

Distribution of comorbidities among the Participants (n=50)



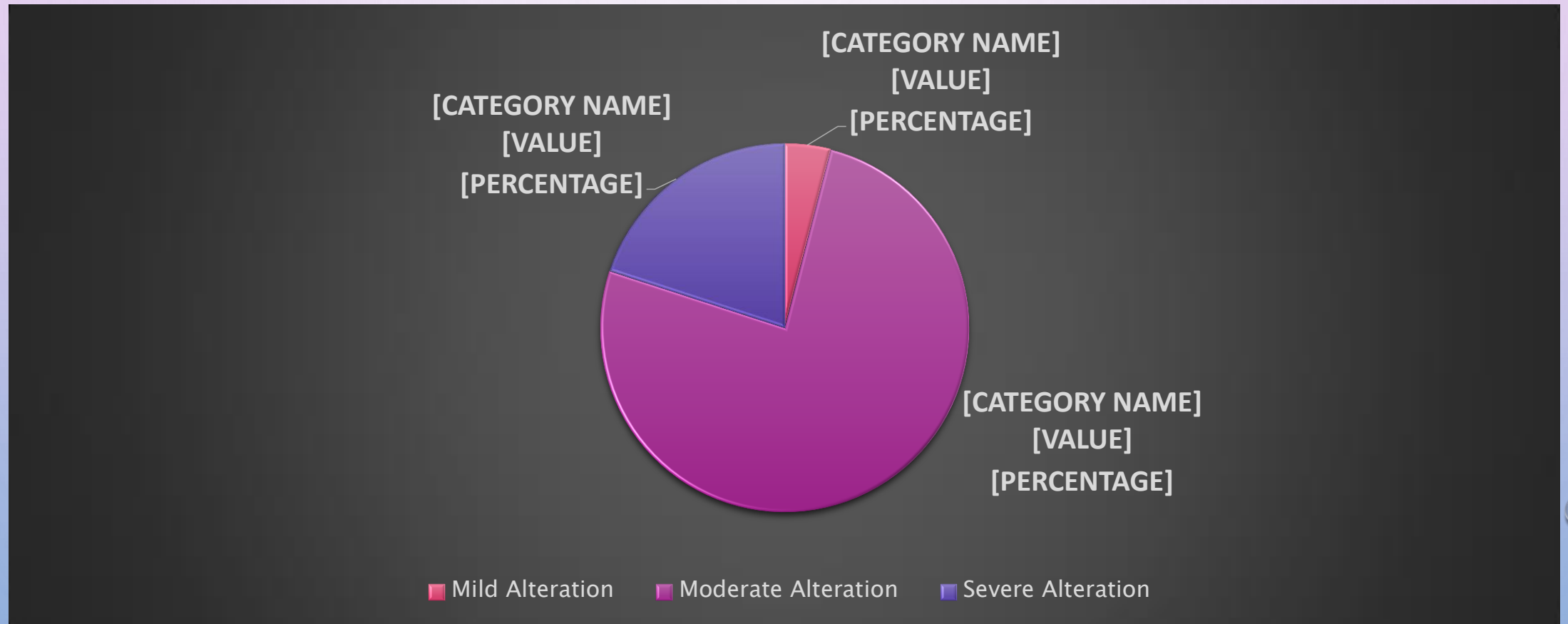
Clinical Symptoms

Distribution of Clinical Symptoms among the participants (n=50)

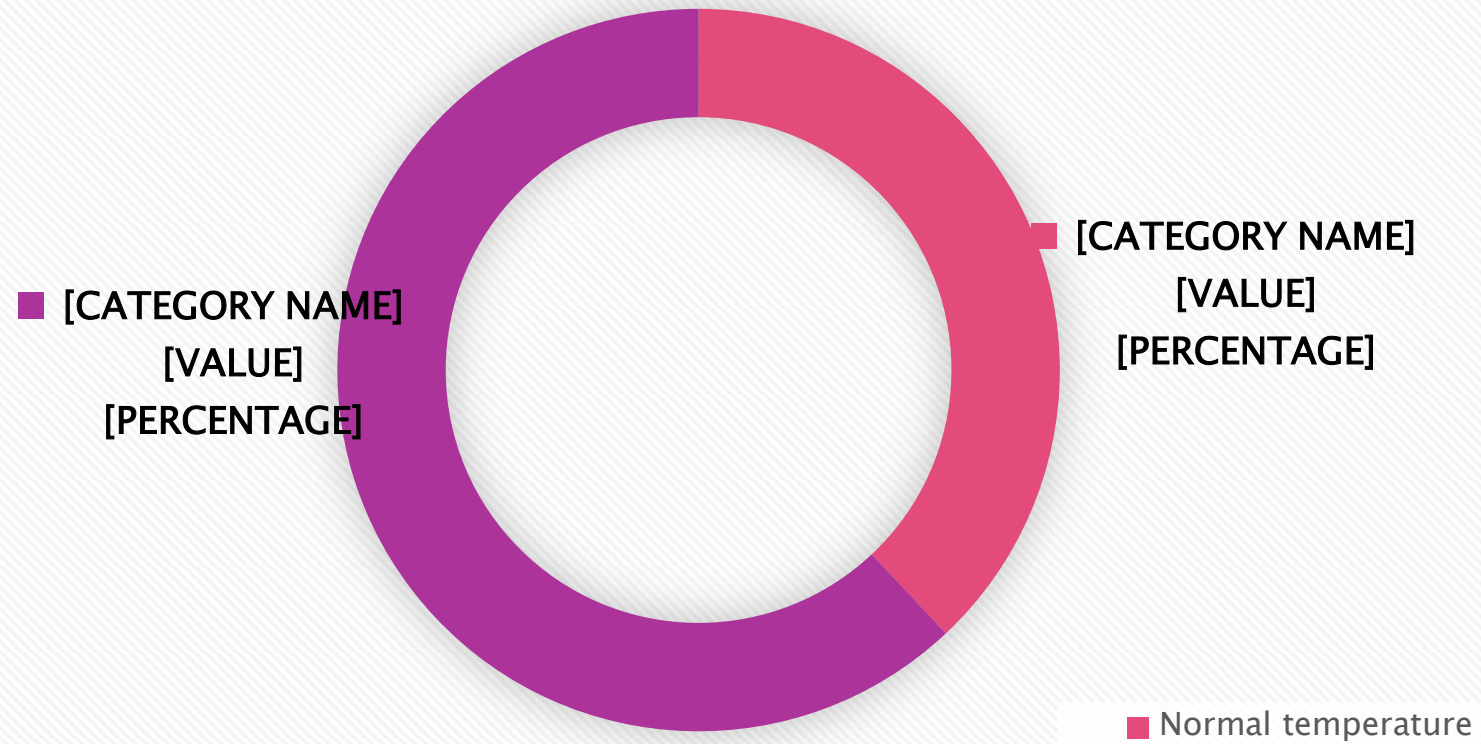


Distribution of Clinical Signs Among Participants (n=50)

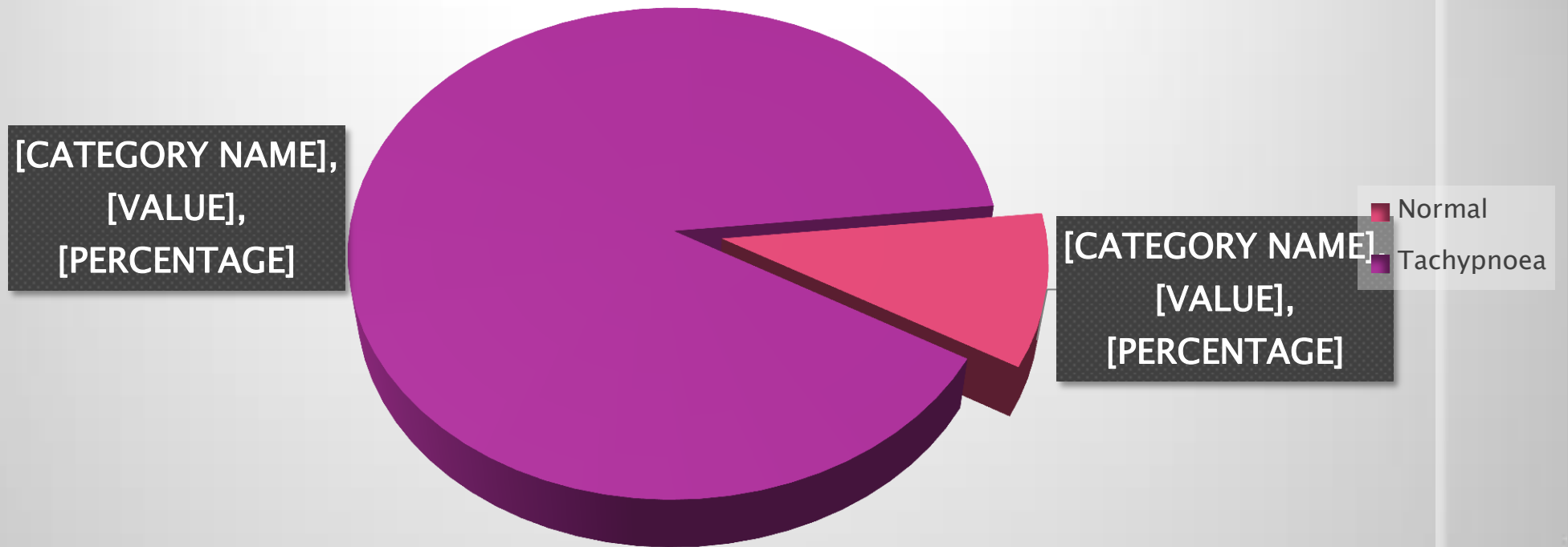
GCS Score



Body Temperature



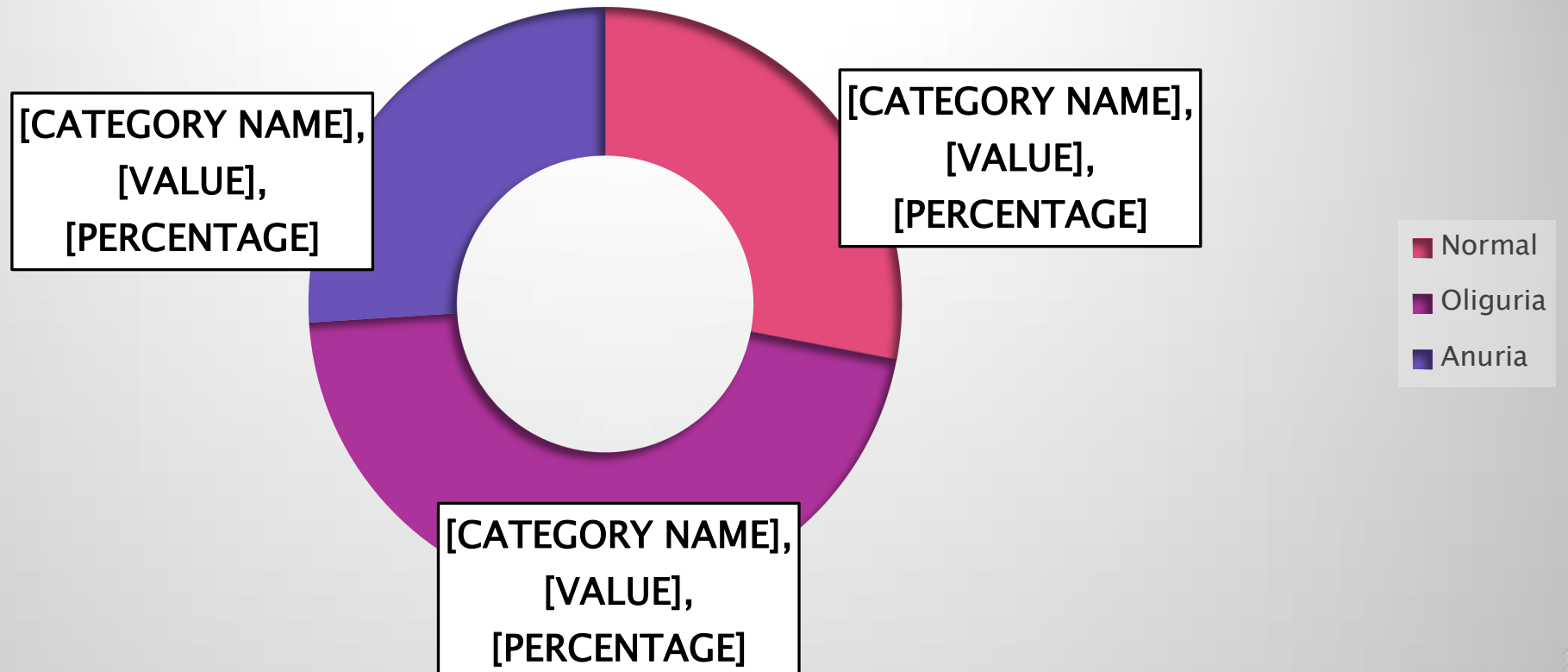
Respiratory Rate



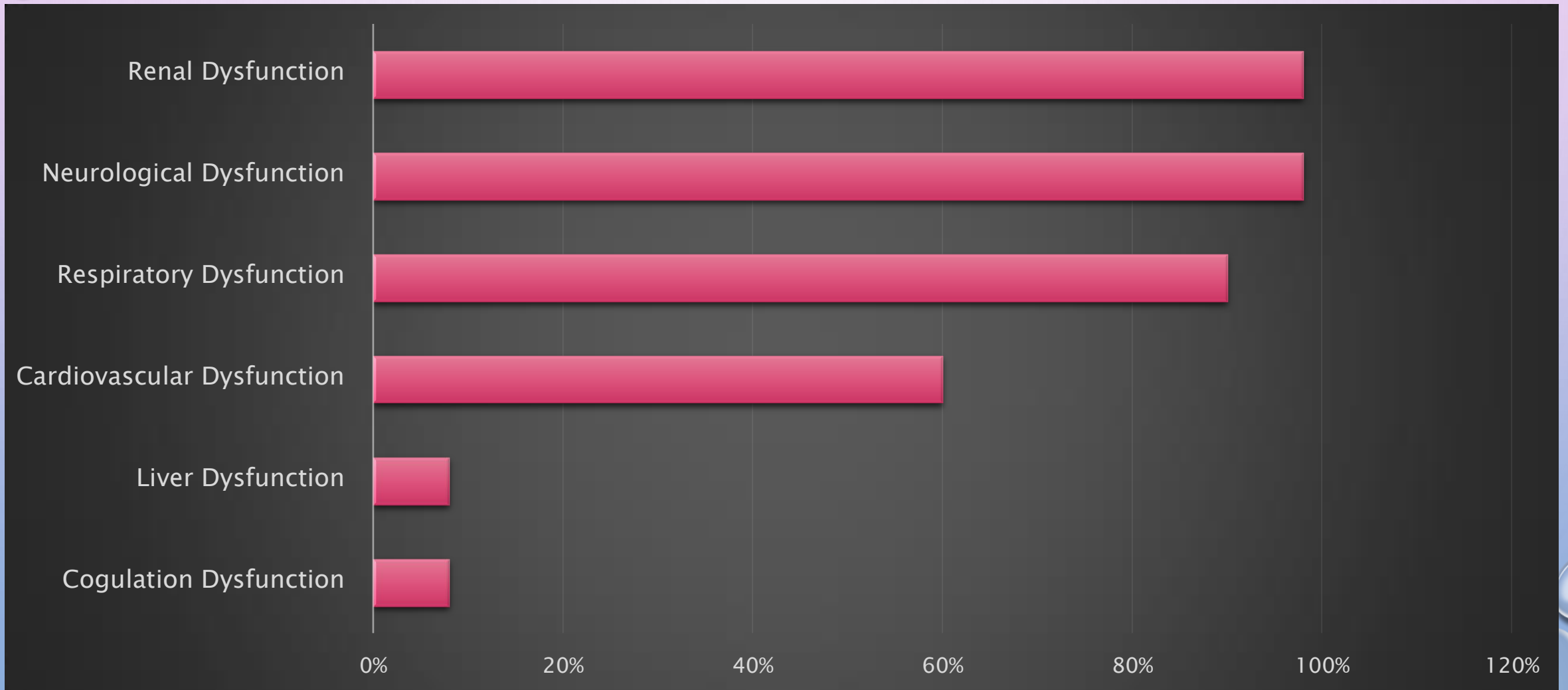
Distribution of Clinical Signs Among Participants (n=50)

Clinical Signs	n (%)
Systolic Blood Pressure	
Mildly Low (101-110)	2 (4%)
Moderately Low (91-100)	18 (36%)
Severely Low (<=90)	30 (60%)
Pulse (beats/minute)	
Tachycardia (>90 beats/minute)	45 (90%)
Bradycardia (<60 beats/minute)	5 (10%)

Urine Output

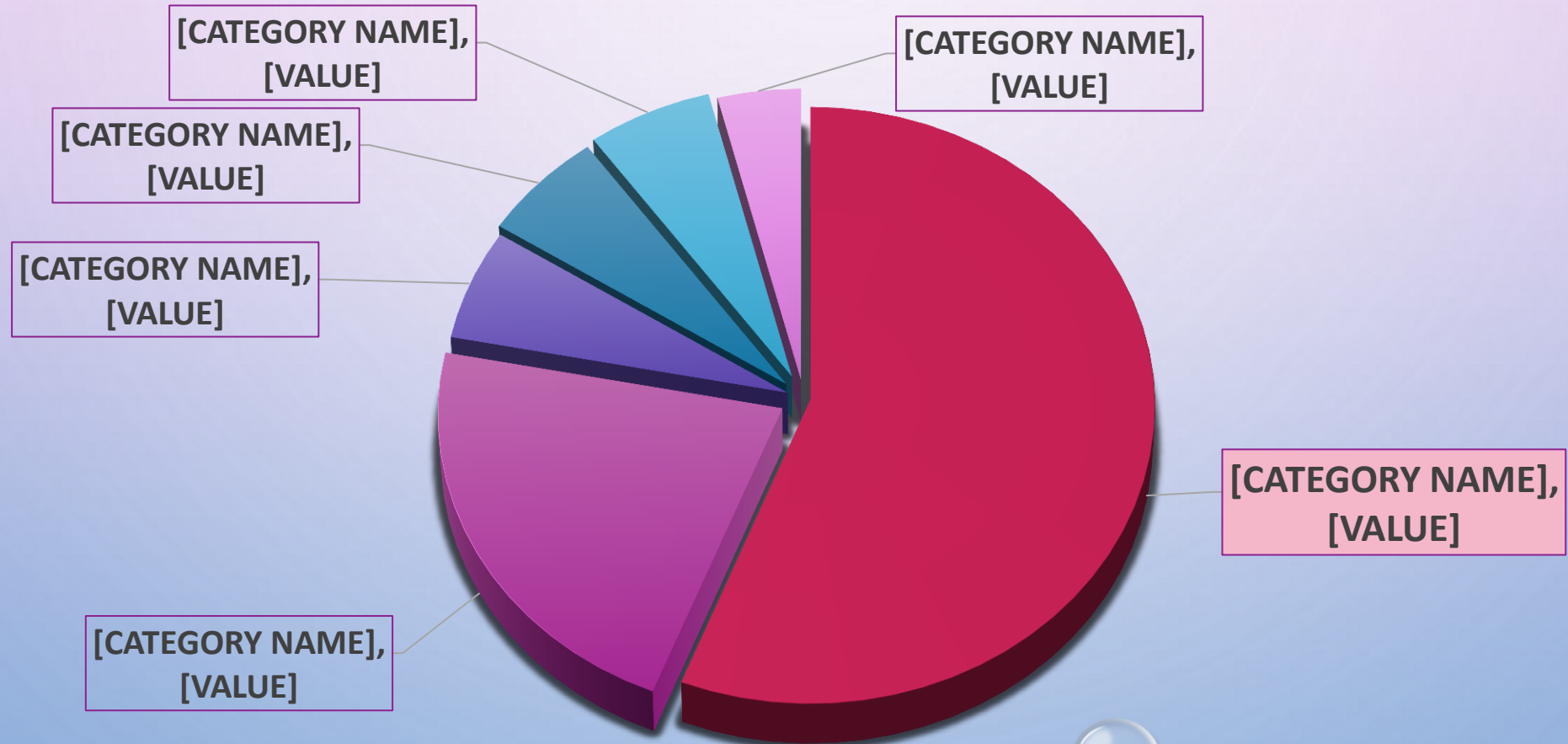


Type of Organ Dysfunction



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Distribution of urine culture growth among the participants (n=50)



Distribution of Sensitivity and Resistance Pattern of Different Antibiotics among The Participants (n=50)

TABLE:02

Escherichia coli culture sensitivity pattern (n=28)		
Drug Name	Sensitive	Resistant
Amoxyclav	8 (28.57%)	20(71.42%)
Cefixime	8 (28.57%)	20 (71.42%)
Ceftazidime	8 (28.57%)	20 (71.42%)
Ceftriaxone	5 (17.85%)	23 (82.14%)
Meropenem	17 (60.71%)	11 (39.28%)
Ciprofloxacin	12 (42.85%)	16 (57.14%)
Nitrofurantoin	3 (10.71%)	25 (89.28%)
Gentamicin	28 (100%)	–
Amikacin	20 (71.4%)	8 (28.57%)

Distribution of Sensitivity and Resistance Pattern of Different Antibiotics Among The Participants Enterococcus (n=11)

Drug Name	Sensitive	Resistant
Gentamicin	9 (81.82%)	2 (18.18%)
Amikacin	8 (72.72%)	3 (27.27%)
Cefuroxime	4 (36.36%)	7 (63.63%)
Meropenem	7 (63.63%)	4 (36.36%)
Ampicillin	4 (36.36%)	7 (63.63%)
Cefixime	3 (27.27%)	8 (72.72%)
Ceftriaxone	2 (18.18%)	9 (81.82%)
Ciprofloxacin	4 (36.36%)	7 (63.63%)
Nitrofurantoin	2 (18.18%)	9 (81.82%)

Discussion

- In this study, regarding age of patients, maximum number of patients 20 (40%) were between 51-60 years of age, followed by 41-50 and 71-80 years, is comprising 16% of the sample. This finding is consistent with a study conducted in Eastern India¹ (51-70 years, 57.1%)
- Regarding Gender of these patients out of 50 cases 25 patients (50%) were Female and 25 Patients (50%) were Male. Majority of the Patients in predominant age group (51-60 years) were female. Female-Male ratio were 1.2:1 which is compatible with the previous study¹ and a study² conducted on South India at 2022.

- ¹PANIGRAHI, A., KANDE, S., PATRO, S., KHORA, P., & PATTNAIK, D. (2021). PREVALENCE OF UROPATHOGENS AND THEIR ANTIMICROBIAL RESISTANCE PATTERN AMONG ADULT DIABETIC PATIENTS. INDIAN JOURNAL OF PUBLIC HEALTH, 65(3), 280. [HTTPS://DOI.ORG/10.4103/IJPH.IJPH_1413_20](https://doi.org/10.4103/IJPH.IJPH_1413_20)
- ²GOSWAMI, T., KRISHNAMURTHY, M., & VARGHESE, S. (2022). A STUDY ON THE PATHOGENIC MICROBES AND ANTIBIOTIC-SENSITIVITY PATTERNS IN URINARY TRACT INFECTION AMONG DIABETES PATIENTS AT A TERTIARY CARE HOSPITAL IN CENTRAL KERALA. JOURNAL OF CURRENT RESEARCH IN SCIENTIFIC MEDICINE, 8(2), 140. [HTTPS://DOI.ORG/10.4103/JCRSM.JCRSM_15_22](https://doi.org/10.4103/JCRSM.JCRSM_15_22)

Discussion

- In the urine cultures of 50 diabetic patients with urosepsis, *Escherichia coli* was the most common pathogen (56%) of cases. *Enterococcus* was present in 22%, while *Klebsiella*, *Pseudomonas*, and *Staphylococcus aureus* were each identified in 6% of the patients. *Staphylococcus epidermidis* were less common, detected in 4% of the cases.
- This study results correspond with the previous study^{1,2} results (*E.coli* 37% & 40%, *Enterococcus* 18% & 20%) conducted in a tertiary medical hospital of India at 2019, 2022 respectively.

- ¹PANIGRAHI, A., KANDE, S., PATRO, S., KHORA, P., & PATTNAIK, D. (2021). PREVALENCE OF UROPATHOGENS AND THEIR ANTIMICROBIAL RESISTANCE PATTERN AMONG ADULT DIABETIC PATIENTS. INDIAN JOURNAL OF PUBLIC HEALTH, 65(3), 280. [HTTPS://DOI.ORG/10.4103/IJPH.IJPH_1413_20](https://doi.org/10.4103/IJPH.IJPH_1413_20)
- ²GOSWAMI, T., KRISHNAMURTHY, M., & VARGHESE, S. (2022). A STUDY ON THE PATHOGENIC MICROBES AND ANTIBIOTIC-SENSITIVITY PATTERNS IN URINARY TRACT INFECTION AMONG DIABETES PATIENTS AT A TERTIARY CARE HOSPITAL IN CENTRAL KERALA. JOURNAL OF CURRENT RESEARCH IN SCIENTIFIC MEDICINE, 8(2), 140. [HTTPS://DOI.ORG/10.4103/JCRSM.JCRSM_15_22](https://doi.org/10.4103/JCRSM.JCRSM_15_22)

Discussion

- Gentamicin and amikacin were the most effective, with 100% E. Coli, 81.82% Enterococcus and 71.4% E.Coli , 72.72% Enterococcus being sensitive to them, respectively.
- Notably, ceftriaxone and nitrofurantoin exhibited a 82.14% E.Coli, 72.72% Enterococcus and 89.28% E.Coli, 81.82% Enterococcus resistance rate, respectively. Resistance to cefixime was observed in 71.42% of E.Coli positive cases.
- The study results compatible with the previous study^{1,2} results where Gentamicin(76.8%), Amikacin (72%) were highly sensitive and Ceftriaxone, Cefixime, were most resistant.

- ¹ANIGRAHI, A., KANDE, S., PATRO, S., KHORA, P., & PATTNAIK, D. (2021). PREVALENCE OF UROPATHOGENS AND THEIR ANTIMICROBIAL RESISTANCE PATTERN AMONG ADULT DIABETIC PATIENTS. INDIAN JOURNAL OF PUBLIC HEALTH, 65(3), 280. [HTTPS://DOI.ORG/10.4103/IJPH.IJPH_1413_20](https://doi.org/10.4103/IJPH.IJPH_1413_20)
- ²GOSWAMI, T., KRISHNAMURTHY, M., & VARGHESE, S. (2022). A STUDY ON THE PATHOGENIC MICROBES AND ANTIBIOTIC-SENSITIVITY PATTERNS IN URINARY TRACT INFECTION AMONG DIABETES PATIENTS AT A TERTIARY CARE HOSPITAL IN CENTRAL KERALA. JOURNAL OF CURRENT RESEARCH IN SCIENTIFIC MEDICINE, 8(2), 140. [HTTPS://DOI.ORG/10.4103/JCRSM.JCRSM_15_22](https://doi.org/10.4103/JCRSM.JCRSM_15_22)

Conclusion

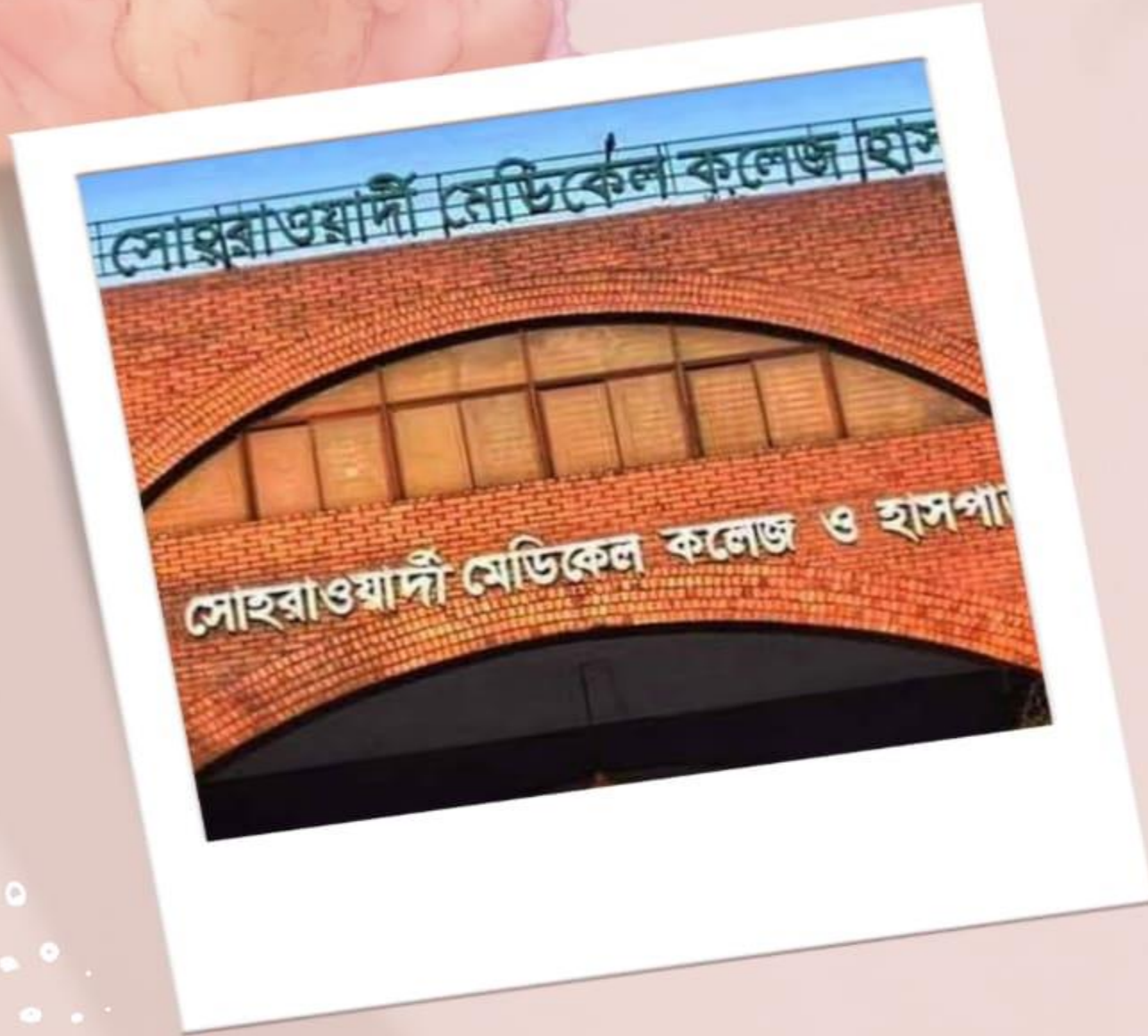
- The study conclusively demonstrates that diabetic patients with Urosepsis are predominantly affected by *Escherichia coli* & *Enterococcus*, necessitating careful consideration in antibiotic selection.
- The high prevalence of antibiotic resistance, particularly to ceftriaxone and nitrofurantoin, calls for an urgent review of current empirical treatment protocols.

Limitation of Study

- The study done on 50 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 cross- sectional nature of this study, patients were assessed only at presentation.



"In the quest to save lives, the judicious use of antibiotics emerges as a dual hero – rescuing patients in critical conditions while fortifying the defenses against the silent adversary of antibiotic resistance."



Thank you

Shaheed Suhrawardy Medical
College Hospital