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Comparative Assessment Of Antibiotic Usage Pattern And Resistance Awareness Among General Population.

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Abstract- Antibiotics play a crucial role in the prevention and treatment of bacterial infections. However, the inappropriate use of these medicines has become a major public health concern due to the increasing prevalence of antibiotic resistance. The present study was conducted to evaluate antibiotic usage patterns and assess awareness regarding antibiotic resistance among the general population of Chhatrapati Sambhajinagar district. A questionnaire-based cross-sectional survey was carried out among 1000 participants from both rural and urban areas. A structured questionnaire was used to collect information related to demographic characteristics, antibiotic consumption practices, self-medication behaviour, treatment adherence, and awareness regarding antibiotic resistance. The collected data were analysed using descriptive statistical methods and represented in the form of frequencies and percentages. The study findings indicated that a considerable proportion of respondents reported using antibiotics without professional medical consultation. Self-medication practices were also frequently observed among the participants. Although awareness regarding antibiotic resistance was reported by a majority of respondents, variations were identified between rural and urban populations. Pharmacists and healthcare professionals were found to be important sources of information regarding antibiotic use.

Index Terms— Antibiotic Resistance, Antibiotic Use, Self-Medication, Public Awareness, Antimicrobial Resistance.

I. INTRODUCTION

Antibiotics have significantly contributed to the successful treatment of bacterial infections and have become an essential component of modern healthcare. Their widespread availability and effectiveness have improved patient outcomes and reduced mortality associated with infectious diseases. Despite these benefits, the inappropriate use of antibiotics has emerged as a major challenge worldwide. Antibiotic resistance develops when microorganisms acquire the ability to survive exposure to antimicrobial agents that were previously effective. This phenomenon has become one of the most serious public health threats due to its impact on treatment outcomes,

healthcare expenditure, and disease burden. The excessive use, misuse, and irrational consumption of antibiotics are recognized as major contributors to the development of resistant bacterial strains. In developing countries, self-medication and the purchase of antibiotics without prescription remain common practices. Inadequate awareness regarding antibiotic resistance further contributes to inappropriate antibiotic use. Therefore, assessing public knowledge and behaviour related to antibiotic use is essential for developing effective interventions and awareness strategies. The present study was designed to evaluate antibiotic usage patterns and determine the level of awareness regarding antibiotic resistance among the general population residing in rural and urban regions of Chhatrapati Sambhajinagar district.

II.MATERIALS AND METHODS

Study Design

A cross-sectional, questionnaire-based survey was conducted to assess antibiotic usage patterns and awareness regarding antibiotic resistance among the general population. The study design was selected to obtain information regarding current antibiotic use practices, self-medication behaviour, and awareness levels within the community.

Study Area

The study was carried out in selected rural and urban regions of Chhatrapati Sambhajinagar district, Maharashtra, India. Urban participants were recruited from community pharmacies and public locations, whereas rural participants were enrolled from villages and community settings to ensure representation of diverse population groups.

Study Population

The study population consisted of adults from the general population who voluntarily agreed to participate in the survey. Participants from different age groups, genders, educational backgrounds, and residential areas were included to obtain comprehensive information regarding antibiotic use and resistance awareness.

Inclusion Criteria

- Individuals aged 18 years and above.
- Individuals willing to participate in the study.
- Individuals capable of understanding and responding to the questionnaire.
- Members of the general population residing in the selected study areas.

Exclusion Criteria

- Individuals below 18 years of age.
- Individuals unwilling to participate in the survey.
- Participants providing incomplete responses.
- Individuals unable to understand the questionnaire.

Sample Size

A total of 1000 participants were included in the study. The large sample size was selected to improve the reliability, validity, and representativeness of the findings and to obtain a broader understanding of antibiotic usage practices and awareness regarding antibiotic resistance among the general population.

Data Collection Tool

Data were collected using a structured questionnaire specifically designed according to the objectives of the study. The questionnaire consisted of demographic information and questions related to antibiotic usage patterns, self-medication practices, sources of antibiotic-related information, completion of prescribed antibiotic courses, occurrence of side effects, and awareness regarding antibiotic resistance.

Data Collection Procedure

Participants were approached at selected study locations and informed about the objectives of the survey. After obtaining verbal consent, questionnaires were distributed and completed responses were collected. Adequate guidance was provided whenever required to ensure accurate understanding of questionnaire items.

Statistical Analysis

The collected data were compiled, organized, and analysed using descriptive statistical methods.

Study findings were expressed as frequencies and percentages. Results were presented using tables, charts, and graphical representations to facilitate interpretation and comparison of participant responses.

Ethical Considerations

Participation in the study was voluntary. Participants were informed about the purpose of the research prior to data collection. Confidentiality and privacy of all respondents were maintained throughout the study, and the collected information was used solely for academic and research purposes.

III. RESULTS

A total of 1000 participants were included in the present study to evaluate antibiotic usage patterns and awareness regarding antibiotic resistance among the general population. The findings revealed considerable variation in antibiotic-related practices and awareness levels among respondents. Regarding self-medication practices, 37.2% of participants reported that they sometimes used antibiotics without professional medical advice, while 23.8% reported rarely practicing self-medication. Approximately 15.1% of respondents frequently used antibiotics without consultation, whereas 23.9% reported never engaging in self-medication. These findings indicate that self-medication remains a common practice among a significant proportion of the population. Analysis of the reasons for self-medication demonstrated that minor illnesses were the most frequently reported cause (31.6%), followed by previous treatment experience (29.7%). Additionally, 21.4% of participants reported self-medication to save time, while 17.3% considered cost reduction as an important factor influencing their decision. The study further evaluated the sources of information influencing antibiotic use. Pharmacists were identified as the primary source of information by 34.1% of participants. Old prescriptions accounted for 23.5% of responses, while internet-based information sources contributed 22.6%. Family members and friends were reported as a source of information by 19.8% of respondents. Assessment of treatment adherence revealed that 64.8% of participants completed the full prescribed course of antibiotics, whereas 35.2% discontinued treatment before completion. This finding suggests that although the majority followed recommended treatment guidelines, a considerable proportion still demonstrated poor adherence to antibiotic therapy. With respect to adverse effects associated with antibiotic use, 38.6% of respondents reported experiencing side effects during treatment, while 61.4% indicated that they had not experienced any noticeable adverse reactions. Awareness regarding antibiotic resistance was observed among 68.9% of participants, whereas 31.1% reported no awareness of the concept. Comparative analysis between residential areas demonstrated higher awareness levels among urban participants compared to rural participants. Among rural respondents, 62.6% were aware of antibiotic resistance, while 37.4% were unaware. In contrast, awareness among urban participants reached 74.3%, with only 25.7% reporting a lack of awareness.

Overall, the findings suggest that although awareness regarding antibiotic resistance is relatively high, inappropriate antibiotic use and self-medication practices continue to be prevalent among the general population.

• Demographic Characteristics Of Participants

Table 1: Frequency of Self-Medication Practice of Antibiotics

Response	Frequency	Percentage %
Rarely	238	23.8
Sometimes	372	37.2
Often	151	15.1
Never	239	23.9
Total	1000	100

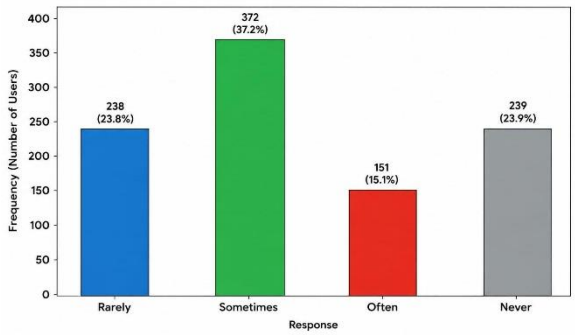


Fig 1: Frequency of Self-Medication Practice of Antibiotics

Interpretation: The majority of participants (37.2%) reported sometimes practicing self-medication with antibiotics. A smaller proportion (15.1%) frequently practiced self-medication.

Table 2: Reasons For self-Medication

Response	Frequency	Percentage
Minor illness	316	31.6
Save Time	214	21.4
Cost Saving	173	17.3
Previous Experience	297	29.7
Total	1000	100

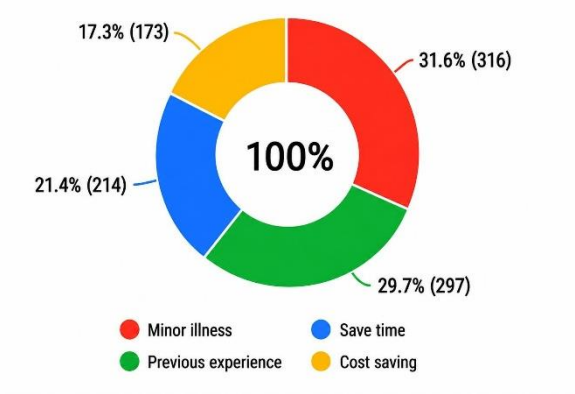


Fig 2: Reasons for self-Medication

Interpretation: Minor illness (31.6%) was the most common reason for self-medication, followed by previous experience (29.7%). These findings suggest that convenience and prior treatment experiences influence antibiotic use behaviour.

Table 3: Completion Of Antibiotic Course

Response	Frequency	Percentage
Yes	648	64.8
No	352	35.2
Total	1000	100

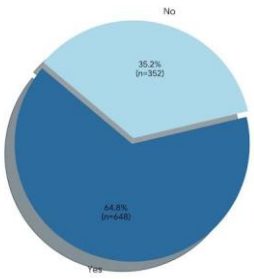


Fig 3: Completion of Antibiotic Course .

Interpretation: The above table represents completion of antibiotic courses among study participants. The findings showed that 64.8% of participants completed their full antibiotic course, while 35.2% did not complete the prescribed treatment course.

Table 4: Age Wise Distribution Of Participants

Age Group	Frequency	Percentage (%)
18-25	240	24
26-35	134	13.4
36-45	136	13.6
46-55	134	13.4
Above 55	356	35.6
Total	1000	100

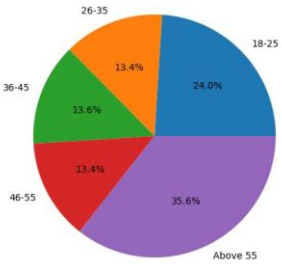
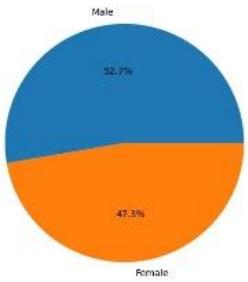


Fig 4: Age Wise Distribution Of Participants

Interpretation: The above table represents the age-wise distribution of participants included in the study. The findings showed that the highest number of participants belonged to the Above 55 years age group (35.6%), followed by the 18–25 years age group (24.0%). Participants from the 36–45 years age group accounted for 13.6%, while 26–35 years and 46–55 years age groups each represented 13.4% of the total study population.

Table 5: Gender Wise Distribution

Gender	Frequency	Percentage
Male	534	53.4



Female	466	46.6
Total	1000	100

Fig 5: Gender Wise Distribution

Interpretation: The study findings indicate that both male and female participants were included in the study. Male participants were slightly higher than female participants. Inclusion of both genders provided balanced information regarding antibiotic usage behaviour and awareness.

Table 6: Residential Area Distribution

Area	Frequency	Percentage
Urban	538	53.8
Rural	462	46.2
Total	1000	100

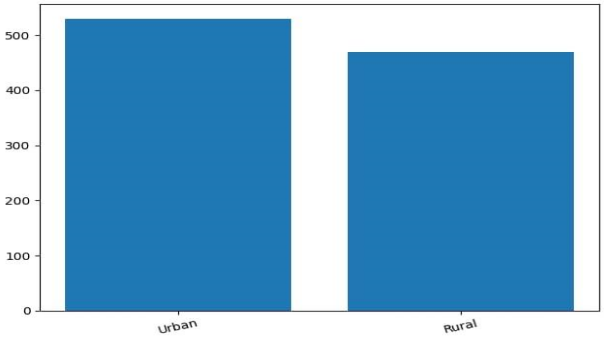


Fig 6: Residential Area Distribution

Interpretation: The above table represents the residential area distribution of participants included in the study. The findings showed that 53.8% of participants belonged to urban areas, while 46.2% belonged to rural areas. The results indicate that participants from both rural and urban populations were included in the study.

Table 7: Participants Take Antibiotics without Prescription

Response	Frequency	Percentage
Yes	541	54.1
No	459	45.9
Total	1000	100

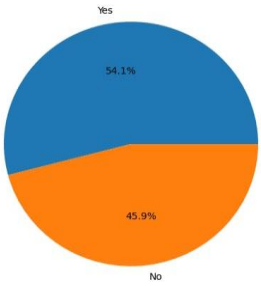


Fig 7: Participants Take Antibiotics Without Prescription

Interpretation: The above table represents participants taking antibiotics without doctor consultation. The findings showed that 54.1% of participants reported taking antibiotics without doctor consultation, while 45.9% reported that they did not use antibiotics without medical advice. The results indicate that more than half of the participants practiced self-medication or used antibiotics without professional guidance.

Table 8: Source of Information Regarding Antibiotic Use:

Source	Frequency	Percentage
Pharmacist	341	34.1
Family or Friend	198	19.8
Internet	226	22.6
Old Prescription	235	23.5
Total	1000	100

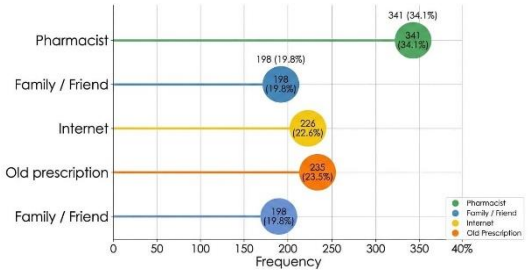
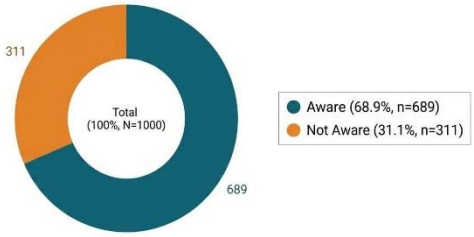


Fig 8: Source Of Information Regarding Antibiotic Use

Interpretation: The above table represents the sources of information regarding antibiotic use among study participants. The findings showed that 34.1% of participants obtained information from pharmacists, which was the highest observed source. 23.5% of participants reported using old prescriptions, while 22.6% relied on internet

sources. Around 19.8% of participants reported family members or friends as a source of information. The results indicate that pharmacists play an important role in influencing antibiotic use behaviour, while other informal sources also contribute to medication-related decisions among participants.

Table 9: Awareness Regarding Antibiotic Resistance



Response	Frequency	Percentage
Aware	689	68.9
Not Aware	311	31.1
Total	1000	100

Fig 9: Awareness Regarding Antibiotic Resistance

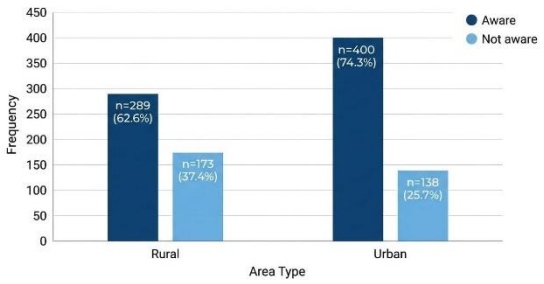
Interpretation: The above table represents awareness regarding antibiotic resistance among study participants. The findings showed that 68.9% of participants were aware of antibiotic resistance, while 31.1% of participants were not aware of the concept of antibiotic resistance. The results indicate that the majority of participants had some level of understanding regarding antibiotic resistance.

Table 10:Rural Vs Urban Awareness Comparison

Area	Aware	Not Aware
Rural	289 (62.6%)	173 (37.4%)
Urban	400 (74.3%)	138 (25.7%)
Total	689	311

Fig 10: Rural Vs Urban Awareness Comparison

Interpretation: The above table represents the comparison of awareness regarding antibiotic resistance between rural and urban participants. The findings showed that urban participants demonstrated a higher level of awareness



regarding antibiotic resistance compared to rural participants. Among rural participants, 62.6% were aware and 37.4% were not aware, while among urban participants 74.3% were aware and 25.7% were not aware. The results indicate variation in awareness levels between different residential areas.

IV. DISCUSSION

The present study assessed antibiotic usage patterns and awareness regarding antibiotic resistance among the general population. The findings indicate that inappropriate antibiotic use remains prevalent despite growing awareness regarding antimicrobial resistance. A significant proportion of respondents reported obtaining antibiotics without professional medical advice. Such practices may contribute to inappropriate antibiotic consumption and accelerate the emergence of resistant bacterial strains. Similar findings have been reported in previous studies conducted in various developing regions. Self-medication was identified as a frequently observed behaviour among participants. Easy access to antibiotics, previous treatment experiences, and perceived convenience were among the possible factors contributing to this practice. These observations highlight the importance of implementing educational interventions aimed at promoting responsible medication use. The study also demonstrated that pharmacists play a significant role in guiding antibiotic-related decisions. Therefore, community pharmacists can serve as valuable contributors to awareness campaigns focused on rational antibiotic use and resistance prevention. Although awareness regarding antibiotic resistance was relatively high, important knowledge gaps still existed. Enhanced

educational initiatives, public health campaigns, and improved patient counselling.

V. CONCLUSION

The present study highlights important aspects of antibiotic usage patterns and awareness regarding antibiotic resistance among the general population. The findings indicate that self-medication and antibiotic consumption without professional consultation continue to occur despite increasing awareness regarding antimicrobial resistance. Although a substantial proportion of participants demonstrated knowledge regarding antibiotic resistance, variations in awareness levels were observed between different population groups. These findings emphasize the need for sustained public health education, stricter antibiotic dispensing practices, and community-based awareness programs. Promoting rational antibiotic use and improving public understanding regarding antimicrobial resistance can contribute significantly toward reducing antibiotic misuse and limiting the spread of resistant microorganisms.

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