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**‘ROAD TRAFFIC ACCIDENTS AND HEALTH COMPLICATIONS
DURING THE KEDARNATH YATRA:
A RETROSPECTIVE STUDY’**

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TITLE OF STUDY

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INTRODUCTION

The Kedarnath pilgrimage in Uttarakhand, India, stands as one of the largest religious gatherings globally, attracting millions of devotees annually. This spiritual journey not only holds immense religious significance but also presents unique challenges to public health due to the convergence of large crowds in remote areas with limited healthcare infrastructure. Understanding the health implications of the Kedarnath Temple pilgrimage is crucial for devising effective preventive and management strategies. This study aims to investigate prevalent diseases or incidents during the pilgrimage season and explore the multifaceted factors contributing to their occurrence.

RESEARCH QUESTION

1. What is the incidence and nature of health complications during the Kedarnath Yatra?
2. What is the occurrence and demographic distribution of road traffic accidents during the Kedarnath Yatra?
3. Which age groups, genders, and individuals with pre-existing conditions are most vulnerable to health complications and accidents during the Kedarnath Yatra?
4. How does the incidence of health issues and accidents during the Kedarnath Yatra compare to the non-pilgrimage season?
5. What recommendations can be made to improve medical facilities, emergency response systems, and preventive measures to enhance pilgrim safety during the Kedarnath Yatra?

OBJECTIVES

1. To determine the incidence and types of health complications (e.g., cardiac shock, hemorrhagic shock, pulmonary edema, hypoxia) during the Kedarnath Yatra.
2. To investigate the occurrence and demographic distribution of road traffic accidents among pilgrims.
3. To identify age groups, genders, and individuals with pre-existing conditions who are most vulnerable to health complications and accidents.
4. Compare the incidence of health issues and accidents between pilgrimage and non-pilgrimage seasons.
5. Provide recommendations for improving medical facilities, emergency response systems, and preventive measures to enhance pilgrim safety.

HYPOTHESIS

1. We hypothesize that certain health-related conditions, complaints and road traffic casualties exhibit a higher prevalence during the Kedarnath Pilgrimage season compared to non-pilgrimage months.
2. Also, demographic factors such as age, sex, and co-morbidities play pivotal roles in influencing the occurrence of these health issues during the pilgrimage season.

MATERIAL AND METHODS

STUDY DESIGN: A Retrospective cohort study design will be employed wherein the defined population will be divided into subsets of the medical records of patients presenting during the non-functional months of pilgrimage and those presenting to the hospital during the functional months of the pilgrimage to study for the increased incidence of certain diseases (infectious/non-infectious) and/or RTA during the pilgrimage season and the associated risk factor like age, sex and co-morbidities leading to this increase in the incidence.

SETTING: The study will be conducted at **District Hospital, Rudraprayag, Uttarakhand** which serves as a primary healthcare facility catering to the medical

needs of pilgrims and residents in the region.

STUDY POPULATION:

- **Inclusion criteria:**

- a) Patients seeking medical care at Rudraprayag District Hospital during the Kedarnath Pilgrimage season.
- b) Patients seeking medical care at Rudraprayag District Hospital during the non-pilgrimage months.
- c) Patients reporting to both OPD and Emergency during pilgrimage and non-pilgrimage season.

- **Exclusion criteria:**

- a) Patients with incomplete medical records.
- b) Patients reporting to Maternity OPD or maternity related emergencies.
- c) Patients reporting to Dental OPD.
- d) Patients reporting for routine activities like vaccinations, general examination, routine health check-ups, etc.

DURATION OF STUDY: March 18, 2024- June 17, 2024.

SAMPLE SIZE: The sample size will be determined based on the prevalence of diseases or incidents during both the pilgrimage season and non-pilgrimage months.

SAMPLING TECHNIQUE: Consecutive sampling will be employed to include all eligible patients presenting to Rudraprayag District Hospital during the study period.

DATA COLLECTION PROCEDURE:

- Data collection will involve a comprehensive review of electronic medical records and hospital registers. Information pertaining to demographics, medical history, presenting complaints, and clinical outcomes will be meticulously documented.
- Descriptive Analysis: To analyze demographic data using frequencies, percentages, means, and standard deviations which will

provide a basic profile of the sample population (age, gender, co-morbidities, etc).

- Data will then be compiled using relevant applications and statistics will be applied in the form of Inferential statistical techniques.
- Chi-square tests and logistic regression will be utilized to assess the association between pilgrimage season and disease occurrence, while controlling for confounding variables.
- Discuss the need for future research employing more robust sampling methods (e.g., stratified random sampling) for a more thorough and larger scale analysis.

OPERATIONAL DEFINITIONS:

1. **Health complications:** Specific health issues reported by patients during the study period.
2. **Confounding variables:** Demographic factors such as age, sex, and co-morbidities that may confound the relationship between pilgrimage season and disease occurrence.

DATA ANALYSIS PLAN

- Descriptive statistics will summarize demographic characteristics and disease incidence during both the pilgrimage season and non-pilgrimage months.
- Inferential statistical techniques, including chi-square tests and logistic regression, will be utilized to assess the association between pilgrimage season and disease occurrence, while controlling for confounding variables.

ETHICAL CONSIDERATIONS

A signed declaration will be obtained, ensuring that the identities of all study participants will remain confidential throughout the study period, as well as during and after the publication. This declaration will be duly signed by the Additional CMO as the investigator.

IMPLICATIONS OF RESEARCH

The findings of this research endeavor hold significant implications for public health interventions aimed at enhancing healthcare delivery during the Kedarnath Pilgrimage and analogous mass gatherings. By elucidating disease patterns and discerning associated risk factors, policymakers can formulate targeted strategies to mitigate health risks and safeguard the well-being of pilgrims and local communities alike.

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