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## Epidemiology of hospitalized burn patients in China: A systematic review

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### ABSTRACT

**Background:** Burn injury is one of the most destructive injuries around the world. The past several decades have witnessed a rapid development of burn surgery, but burn prevention still remains a weak point in China. Although lots of papers had published on burn epidemiology, a comprehensive national study about epidemiology of burns in China remains scarce. The present study aims to identify certain epidemiological characteristics of burns in China through a systematic review of available previous literatures. **Methods:** A systemic Pubmed, Embase, China Biology Medicine disc Database (CBM) and Chinese Journal Full-text Database (CJFD) search was conducted for retrospective studies published in English or Chinese between 1978 and 2016 that focus on epidemiology of burns of all age groups in China. Data on demographic characteristics, seasonal variation, agents causing burns, severity, mortality and main causes of death in the selected studies were extracted for analysis.

**Results:** Thirty-one retrospective articles were identified. Burns are particularly prevalent in summer and males are more vulnerable to burns in most regions of China. The age distribution of burn patients showed peaks at the age groups of 0–5 and 20–30 yr. Thermal burns, especially scalds are the most common type of burns. Minor burn patients with 10% total body surface area (TBSA) burn or less make up the majority of hospital admissions. Mortality ranges widely from 0.3% to 7.5% in different areas and periods. Sepsis, multiple organ dysfunction syndrome (MODS) and inhalation injuries are the main causes of death.

**Conclusions:** Male, children under 5 and young workers aged between 20 and 30 are two high-risk population for burns. Future research should focus on the early diagnosis and treatment of sepsis, MODS and inhalation injury so as to decrease the mortality of burns. In addition, it is necessary to improve education on the prevention and relevant prehospital emergency care of burns, so as to reduce the morbidity and mortality of the injury.

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### 1. Introduction

Burn injury is one of the most destructive injuries around the world. An estimated 265,000 deaths every year are caused by burns globally. Fire-related burns alone caused over 300,000 deaths per year, with more deaths from scalds, electricity, chemical burns and other forms of burns [1,2]. However, death is not the

only part of the problem, as many survivors are left with lifelong disabilities and disfigurements, which brings the family and society far-reaching negative impacts.

Various factors influence the epidemiology of burns, such as socioeconomic conditions, the national culture, social welfare, lifestyle and so on, among which the socioeconomic condition makes a significant difference. In the world nearly 90% of burn deaths occur in lower middle or low income countries (LMICs), while only 3% of burn deaths happen in high income countries (HIC) [3]. As the world's largest developing country and also a lower middle income country, China bears a worrying number of burns. Since 1978, numerous articles on burn epidemiology have been published in both national and international journals. However, few multi-center and large samples investigations have been carried

*Abbreviations:* CBM, China Biology Medicine disc Database; CJFD, Chinese Journal Full-text Database; TBSA, total body surface area; LOS, length of stay; MODS, multiple organ dysfunction.

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out and comprehensive national studies about epidemiological features of burns remain scarce.

Instead of just focusing on improving burn care and decreasing the mortality, more attention should be paid to preventing burns and reducing morbidity, as Dr. M. H. Keswain says: “The challenge of burns lies not in the successful treatment of a 100% burn, but in the 100% prevention of all burns” [4]. Though evidence shows that some preventive measures are indeed quite effective in reducing burns, most of the evidence comes from HIC. It should be noted that patterns and risks of burns can be quite different in LMICs, and few of the interventions can be directly applied in LMICs [5]. In addition, the evidence-based medicine requires sufficient evidence to support and guide the clinical decisions. The approach to burn prevention, to be effective in a particular area, should be based on sound knowledge of etiological patterns of burns. Moreover, the geographical variations and socioeconomic differences in burn epidemiology must be taken into account [6].

This study aims to explore some epidemiological characteristics of burns in China by a systematic review of available literatures. This review also intends to provide evidence and to shed light on the establishment of effective interventions so as to decrease the burns in China.

## 2. Methods

### 2.1. Data source and searches

This review was conducted and reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The literatures presented and reviewed in this study came from two main sources. First, the

Pubmed and Embase database were searched with the MeSH term ‘burns’ and keywords such as burns, thermal injury, scalds and flame injury for published retrospective studies that focus on the epidemiology of burns in China.

The second and the largest source of information was the China Biology Medicine disc Database (CBM), the biomedical science database aims to promote the exchange of scientific information and index papers published in more than 1600 biomedical journals and Chinese Journal Full-text Database (CJFD). The same terminology and keywords were used when searching the CBM and CJFD. In 1978, the development of burn surgery in China entered a new period and the CBM was established at this year. Papers published from January 1, 1978, to December 31, 2016, excluding gray literature, were searched which helps to identify the possible transition patterns of the epidemiological features of burns in China. A comprehensive search strategy was developed with the assistance of the medical information specialist from General Hospital of PLA, Beijing (Complete search strategy is provided in Supplement 1). The collected articles were imported into the Endnote software package and checked to avoid duplication. Moreover, the references of the retrieved articles were reviewed for further relevant studies and thus contribute as a source of the additional records. The selection of articles for this review is shown in Fig. 1.

### 2.2. Selection criteria

The selection and assessment of each study retrieved was conducted by two investigators assessed study titles and abstracts for inclusion independently. If any of the article potentially relevant, the full text of the article was retrieved. When there were any ambiguities, the point would be reviewed by a third author and a

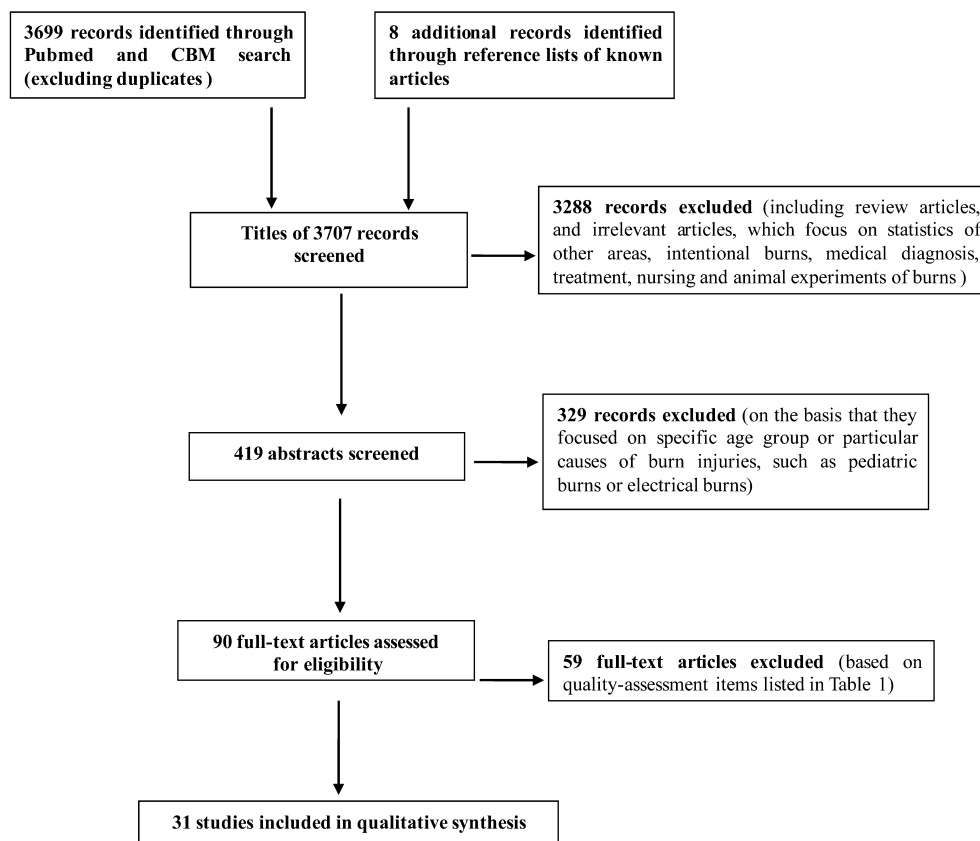


Fig. 1. The search strategy and selection of articles for this review.

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