



**ORIGINAL RESEARCH PAPER**

**Nursing**

**OCCUPATIONAL HEALTH HAZARDS AND SAFETY IN INDIA AND CHINA: A COMPARATIVE SYSTEMATIC REVIEW ON SANITATION WORKERS**

**KEY WORDS:** Sanitation workers, Health hazards, China, Occupational health safety, India.

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**ABSTRACT**

A Comparative Systematic Review on sanitation workers occupational health and safety in India and China was conducted with data from PubMed, Google Scholar and Shodhganga from 2012 onwards in English language. The articles were evaluated for comparable methodology and results. This review included 11 studies of which 5 studies from China and 6 is of Indian origin. In China, the sanitation workers were exposed to many occupational health hazards like dermatological problems, high UV rays' exposures, RTI and road traffic collisions. In India, sanitation workers were exposed to a high incidence of fungal infections and the cases like facial melanosis, melasma and polymorphous light eruption stresses. Sanitation work is associated with significant occupational hazards.

**INTRODUCTION**

Occupational health remains ignored in most of the developing countries because of the social, economic and political challenges that they face in the society. The competing way of development in all the societal settings pave path for it. The development all over the world needs active, dynamic and healthier employees in all the formal and informal job settings. Maintaining a clean, safe working environment is reflected on a healthy worker.

The working condition of sanitation workers has remained unchanged for many years. Apart from the social savagery that these groups face, they are exposed to many health problems by the nature of their occupation. These hazards include not only physical but also psychological and social aspects of health. Decades after Mahatma Gandhi first called for the abolition of manual scavenging, the practice still continues.

The working conditions of the sanitation workers have remained unchanged for decades. Using only a broom stick and a tin plate, they clear feces from latrines onto containers and then carry it on their heads to the disposal sites. Only a few is willing to use proper safety measures and many are depended to drugs to work in these kinds of situations.

On the other hand, the sanitation workers in our neighbor country China are not different than us, they often denied proper employment contracts and social insurance benefits.

Instead, they are considered as service providers, not protected by labour law.

Hence this study is done to explore the facts hidden behind the literatures published in behalf of occupational health hazards and Safety on Sanitation Workers in two different countries, China and India. Especially to see the struggles of sanitation workers in these two countries and about the safety measures they follows.

**MATERIALS AND METHODS**

**Research design:**

Systematic review design

**Study participants:**

Sanitation workers in India and China

**Inclusion criteria:**

- **Duration:** article published from 2012
- **Data collection:** PubMed, Google Scholar and Shodhganga
- **Study design:** Original articles, Review articles
- **Language:** English
- Only the primary research articles

**Exclusion criteria:**

- Article published before 2012
- Non-English language articles

**Brief description of studies (2012 to 2022) regarding Occupational Health Hazards and Safety among Sanitation Workers.**

S. No:	Authors/ Study (Year)	Title	Population	Evaluation Method	Assessments	Findings
- China						
1.	Yuehua Yan et al 2015	Occupational skin diseases and prevention among sanitation workers in China.	273 sanitation workers and 113 administrative staffs from 11 streets of Wuhan, China	Comparative Cross-sectional study	Assessed by questionnaires.	Compared with administrative staffs, sanitation workers had much more occupational dermatological problems and a high rate of ultraviolet rays' exposure.
2.	Yanhong Gong, Jincong Yu et al 2015	Occupational safety and Health status of sanitation workers in urban areas: A Pilot study from Wuhan, China	385 sanitation workers from 54 streets in Wuhan city, in the year July and August 2009.	Pilot survey Executed with face-to-face interviews	Assessed by questionnaires.	The health status of sanitation workers was poor. The prevalence of illness 22.86% was higher than China's general population in 2008 (18.90%). The prevalence of self-reported doctor-diagnosed arthritis in sanitation workers (18.96%) was higher than the estimated population in 2008 (15%). The findings showed that both sanitation workers and their supervisors neglected the role

						of low-cost protection measures. Regarding the health status, high-intensity work load was an important risk factor for ill health.
3.	Yuan WJ, Hu L, Wang Z, Ye Y 2018	The Occupational and Procreation Health of Road Sweeping Female Sanitation Workers in a District of a City	303 Road sweeping female sanitation workers in a city district China.	Cross-sectional survey methods	Face to face Interview with questionnaires.	The total prevalence of reproduction tract infection was 21.47%. The prevalence of uterine fibroids was 6.38%, and menstruation abnormal rate was 25.17%. The sanitation workers of menstruation abnormal rate were 31.03%, which were exposed low temperature, automobile exhaust and air contaminant at the same time, or else it will be 19.61%. Female sanitation workers in the city district were exposed to many occupational hazards. The status of procreation health among road sweeping female sanitation workers in the city district is not optimistic.
4.	L Wang et al 2020	Investigation and analysis of reproductive health status of female street cleaners in a district	613 female road sweepers in Chaoyang district of Beijing China	Cross-sectional study	Assessed by questionnaires.	23.49% women workers did not have regular gynecological examination, 19.41% had reproductive tract infections, 28.87% had abnormal menstruation in recent 6 months. Drinking, outside marriage sexual behavior, night shift and job satisfaction were all influencing factors (P < 0.05). The increasing age, working years, drinking, household registration in other places and decreasing satisfaction of women workers rights and interests' protection were all influencing factors (P < 0.05). All these can be concluded by stating that the health status of female road sweepers is not optimistic.
5.	Wei L, Sha Z et al 2021	Defending the city's cleanliness with their lives? A study of road traffic collisions involving sanitation workers in China over five years.	Sanitation workers road traffic Collision cases in China between 2013 and 2017.	Online news survey	Online news data collection and analysis of time, location, victim characteristics & causes of collision.	511 road traffic collisions were reported, in China between 2013 and 2017 with the fewest in February and July. Most occurred around 5:00 a.m. in Eastern regions and in urban areas. Victims were mainly over 50 years old, with more females than males. Collisions usually resulted in death at the site.
- India						
1.	Sudhir Nayak, Shrutakirithi Shenoi et al 2013	Dermatological evaluation of street sanitation workers.	87 sanitation workers (44 male, 43 females)	Cross-sectional survey	Face to face Interview with questionnaires	A high incidence of fungal infections was noted, usually because of high humidity and temperature. Detection of facial melanosis, melasma and polymorphous light eruption stresses because of the increase outdoor works. The low socio-economic status of these workers may also be due to their poor nutrition status, which makes them more prone to various diseases.
2.	Mohammad Shadab, Dhirendra Kumar Agrawal et al	Occupational Health Hazards among Sewage Workers: Oxidative Stress and	62 sewage workers who had been working for more	Quantitative approach	Cross-sectional Experimental study	Occupational exposure of the sewage workers to harmful dust, fumes, gases and bioaerosols contributed to

	2014	Deranged Lung Functions.	than five years (32 non-smokers and 30 smokers) and 60 control subjects (30 smokers and 30 non-smokers)	Quantitative approach	Cross-sectional Experimental study	oxidative stress among them. This oxidative stress was one of the mechanisms which led to the development of obstructive impairment of lung functions in these sewage workers.
3.	Ravindra K, Kaur K, Mor S 2016	Occupational exposure to the municipal solid waste workers in Chandigarh, India.	Municipal solid wasteworkers, Chandigarh, India	Interview schedule	Questionnaire	The major occupational health issues reported by various categories of waste workers were respiratory disorders, injuries and allergies having prevalence of 12.3%-17.6%, 4.9%-44.4% and 35.3%-48.9%, respectively. Waste workers are vulnerable to occupational health hazards and hence there is a need to safeguard them through formulation of new laws and policies.
4.	Priyanka V. Patil and R.K. Kamble 2017	Occupational health hazards in sanitaryworkersof Chandrapur city, Central India	20 male sanitary workersfrom Chandrapur Municipal Corporation, (10% of the sanitary worker population)	Cross-sectional Survey	questionnaire survey and Peak Expiratory Flow Rate (PEFR) analysis.	Sanitary workers were suffering from number of health ailments such as musculoskeletal, exposure to harmful gases, respiratory, headache, dermatologicaland gastrointestinal during work and cough and cold, skin problems, allergies, malaria, typhoid, bronchitis lungs, asthma, and hearing disorder after completion of work. Sanitary workers will face more amounts of exposure and risk on their health during their work compare to other workers. Sanitary workers exposed to high concentration of airborne gram-negative bacteria since waste handling may cause dust full of microorganisms and bacterial endotoxin to become aerosolized.
5.	Thakur P, Ganguly R et al 2018	Occupational Health Hazard Exposure among municipal solid waste workers in Himachal Pradesh, India.	street sweepers, waste collectors, waste processors and rag picking	Interview scheduling technique	Questionnaire survey	The lack of provisions of protective equipment along with the ignorance of the workers results in occupational health hazards due to different types of external injuries. The major occupational health issues reported by various categories of waste workers were muscle and ligament sprain, cuts and lacerations and different allergies. From this study, it was observed that such workers are ill-protected against such occupational health hazards new laws and policies are needed to be introduced for their protection.
6.	Chandra K, Arora VK 2019	Tuberculosis and other chronic morbidity profile of sewage workers of Delhi.	104 sewage workers with more than five years of occupational experience and employed in three contiguous districts of NCT of Delhi.	Cross-sectional Observational study	Observe and record	21.15%sewage workers had Tuberculosis and 92.31% had at least one of the chronic respiratory diseases (COPD, Asthma or ACOS). 85.6% of participants were smokers. The most common NCD was Hypertension (67.3%) followed by Dyslipidaemia (50%) and Diabetes Mellitus (43.3%). There was clustering of NCDs with 53.85% subjects having three or more chronic disorders. Less than 5% of study participants were free from all the investigated chronic diseases. The sewage workers have an adverse chronic morbidity profile for both Tuberculosis and NCDs.

**DISCUSSION**

From the 11 papers referred, in China, the sanitation workers were exposed to many occupational health hazards like dermatological problems, high UV rays' exposures, RTI and road traffic collisions are common, the victims were mainly over 50 years old, with more females than males. In India, sanitation workers were exposed to a high incidence of fungal infections and the cases likefacial melanosis, melasma and polymorphous light eruption stresses because of the increase outdoor works is also getting common now a days. Occupational exposure to harmful gases contributes to

oxidative stress which led to the development of obstructive impairment of lung functions in these sewage workers. Sanitary workers exposed to high concentration of airborne gram-negative bacteria since waste handling may cause dust full of microorganisms and bacterial endotoxin to become aerosolized. The lack of provisions of protective equipment along with the ignorance of the workers results in occupational health hazards due to different types of external injuries. The major occupational health issues reported by various categories of waste workers were muscle and ligament sprain, cuts and lacerations.

Also, the sewage workers have an adverse chronic morbidity profile for both Tuberculosis and NCDs. Sanitation workers are ill-protected against such occupational health hazards new laws and policies are needed to be introduced for their protection.

The available scientific literature fails to assess the national securities provided to the sanitation workers and what is in lack of existing laws and policies. Many researchers studied in detail about the morbidities affecting the sanitation workers, but a few only searched the exact reason behind these occupational hazards and there is lack in studies related to the psychological and social health issues of sanitation workers.

### CONCLUSION

With rapid urbanization there is an increase in the need of sanitation works in our societies, and so the sanitation workers are an inevitable worker that we have to depend on them to maintain hygiene in the community. But unfortunately, we ignore them, not valuing their hard works, not focusing their job securities and as a result these poor workers always face high occupational health risks. This can be prevented through engineering, medical, legislative measures and also by empowering the workers. Also, timely awareness programs regarding common health hazards, safer work protocols and use of personal protective devices may help us to reduce the chances of accidents among sanitation workers.

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