

# Occupational Hazards among Cooks in Commercial Kitchens

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**Abstract:** *The food service industry in India caters to the demands of the consumers by serving a variety of traditional and multi-cuisine foods from across the world. Food service industry is poised for huge growth creating employment for a large section of population. Review of literature reported the incidences of work related problems among the cooks in different food outlets. This study examined the types and causes of work-related injury among 90 cooks working in restaurants, catering centres and fast-food centres. Data revealed the prevalence of occupational hazards in workplace causing injuries and accidents. Burns and scalds, arising from accidents with contact with hot food products accounted for 24 % and majority were the result of contact with hot oil and cooking vessels. Work-related forearm and shoulder injury due to repetitive motion were reported by 19% of sample, while slips and falls and cuts and lacerations were reported by 18% of the sample respectively. Statistical inference from one-way ANOVA proved that there is a significant difference at 5 percent level in occupational injuries among cooks in three different working environments. Cooks working in the commercial kitchens were identified as an occupational group with high risk of occupational injury and illness. Further research would help in identifying workplace risk factors and potential long-term impact of occupational injuries on the lives of cooks to demonstrate the need for intervention strategies viz., personal protective equipment, space design layout, ergonomically designed tools and products aimed at injury prevention.*

**Keywords:** Occupational hazards, Work related accidents and injuries, Commercial Cooks, Commercial kitchens

## 1. Introduction

The commercial food service establishments are an important service sector in the Indian economy and have grown strongly in recent years. The food service industry employs a large number of workers. Eating out has emerged as a trend and has become a routine trend to eat out at least once a month. People are spending more of their time and money in the world of fast foods and restaurants [1]. Many new options have opened to the consumer within the food market where people are enjoying with the onset of fast foods and ready cooked meals available along with the ever increasing choice of world cuisine [2]. Due to the demand of supply of food the workers employed in this industry are as well increasing [3].

Similar to many hazardous works, commercial cooks exposed to harsh work environment are also exposed to many work-related hazards that may cause injuries and illnesses that in succession impact their lives, income, and family members. Usually these occupational injuries are not given due importance and are often ignored. Cooks working in the commercial kitchens were identified as an occupational group with high risk of occupational injury and disease [10]. Occupational injury results from a work-related event or a single impulsive exposure in the workplace [1, 4]. There are many risks and hazards in restaurants although it is a combination of the workplace, job and worker characteristics that contribute to injuries. Typical injuries reported included musculoskeletal injuries, cuts, lacerations, scalds, burns and eye injuries [2].

The leading causes of accidents in commercial kitchens are slips and trips, manual handling of heavy loads, exposure to

hot surfaces and steam, injured while moving articles and hot vessels and hand tools, exposure to direct fire and electrical shock [5]. Health hazards in commercial kitchens include exposure to allergens, irritants, polycyclic aromatic hydrocarbons in temperature extremes, smoke, cooking fumes, noise, overcrowding, stress an unhealthy life style and unsociable working hours [3]. Despite the known high risks from health and safety hazards, health and safety procedures are not always given the priority. Workers of all ages are at risk of being seriously injured on the job in the commercial kitchens. "It is a fundamental human right to return home safe and sound from work" [9]. Occupational hazards can be grouped into safety hazards that can result in burns, cuts, or fractures and secondly ergonomic hazards that cause sprains and strains, while doing repetitive tasks or heavy lifting [11].

The aim of this study was to determine the type and causes of work-related injury among cooks in commercial kitchens. The result of this study will help to predict the health and safety needs of commercial kitchen establishments and thereby aid in the implementation of effective interventions.

## 2. Materials and Methods

Exploratory research design was selected for conducting this study. To assess work related hazards among cooks in commercial kitchens, a sample of 90 main cooks from three different commercial food service centers viz., Restaurants, Catering centre and Fast-food centre situated in and around Hyderabad city, Telangana State were selected through purposive sampling method. The Telangana State Hoteliers Association's was sought to have access to restaurants. The study had the limitation of the population restricted to male

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cooks with minimum 5 years of direct exposure to cooking environment. The questionnaire sought information on the personal background of cooks and job details, working conditions, work-related injury types and causes. In this study, the respondents were asked about the work-related injuries referring to an episodes of injury caused or aggravated by exposure to a hazard in the working environment. Data was statistically analysed with descriptive statistical tools and one-way ANOVA to draw inferences.

### 3. Results and Discussion

#### 3.1 Profile of Cooks and their Work

The study participants were aged 38.03 (S.D=11.51). Majority of the respondents (55.5%) had only primary education, very few respondents (24.4%) qualified till secondary and only 10% of the sample had intermediate education. Years of work experience of the selected cooks ranged from 5-20 years. Comparatively larger proportion (43.33%) of the sample was in the work experience of 6-9 years and another 20% of the sample was in the more years of experience of more than 10 years. Only twenty percent of the sample was under contract service and the rest were temporary staff. The cooks are involved in the cooking activities for duration of 8-15 hours per day especially in Catering center. Often the cooks are required to work in speed due to big demand during peak hours and work in hot environment and also are being exposed to poor indoor air quality due to lack of insufficient ventilation. The cooks were actively involved in activities like pressure cooking, boiling, steaming, frying, roasting, baking, cutting and chopping, preparing masalas and blending ingredients during cooking and turning foods, transferring hot food etc.

#### 3.2. Work- related Health Hazards

Data revealed the prevalence of many health hazards in the working environment of cooks. The common types of accidents and injuries experienced by cooks are reported in Table 1. Majority experienced burns and scalds. by coming in contact with hot substances, heating equipment and tools, while transferring hot food items from cooking pot; wrist and shoulder stiffness due to repetitive motion; Slips and falls due to slippery floor surfaces, spillage of food and improper access to objects; cuts and lacerations accidents where the worker is struck by knives, food containers, furniture and cooking appliances, body ache due to lifting, reaching, pulling, and carrying; direct exposure to heat and electric shock due to bad electrical wiring.

**Table 1:** Distribution of sample by the type of hazard in different cooking environments, N=90

Type of Injury	Restaurant	Catering centre	Fast Food centre	Total
Burns and scalds	8 (25)	7 (19)	6 (27)	21 (24)
Wrist and shoulder stiffness	9 (28)	5(14)	3 (14)	17 (19)
Slips and falls	7 (22)	6(17)	3(14)	16(18)
Cuts and lacerations	7 (22)	3 (8)	6(27)	16(18)
Body ache	3 (9)	8 (22)	2(9)	13(14)
Direct Exposure to heat	1(3)	2 (6)	1(5)	4(4)
Electric shock	1(3)	1(3)	1(5)	3(3)
Total	32 (100)	36 (100)	22 (100)	90 (100)
<b>Mean</b>	<b>4.57</b>	<b>5.14</b>	<b>3.14</b>	
<b>SD</b>	<b>1.26</b>	<b>1.01</b>	<b>0.799</b>	

Statistical Inference: ANOVA - One way Classification for type of injuries among cooks in different cooking environments

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	92.95238	6	15.49206	3.655431*	0.021404	2.847726
Within Groups	59.33333	14	4.238095			
Total	152.2857	20				

\* - Significant difference at 5 percent level

Anova one-way classification was computed between three different cooking environments and types of injuries among cooks which revealed that there was significant difference in the causes of injuries within groups and between groups. The Mean sum of squares is largest for between groups coinciding with the observations made. It was hypothesized that type of cooking environment has no significant difference on occupational injuries among cooks. Since calculated value of F is greater than the table value of F, null hypothesis is rejected. From this analysis, it can be drawn that the type of cooking environment influenced the well-being of the cooks.

#### 3.3. Causes of hazards in commercial kitchens

##### 3.3.1. Burns and scalds

Twenty four percent of all injuries in three different types of commercial kitchens were burns and scalds. Contact with hot cooked food products accounted for 2 % of these burns and scalds and 3 % were the result of spillage of hot oil and fat. Nearly half of all burn injuries involved hot oil. Such injuries can be prevented by providing handles for tools and utensils, providing appropriate gloves, allowing oil to cool before it is moved. Cooks working around heating tools, like fryers, ovens, microwaves etc. are vulnerable for burns [6]. Out of these cases reported, three noteworthy cases were considered severe in the cooking work environment:

- The deep burn in contact with hot plastic chopping board developed a secondary infection and required surgery. The cook was left with a noticeable scar on his right hand.
- A scald in a cook developed aggravation of his underlying skin condition at the site of the scald; this delayed healing and required surgical referral.

- A cook was advised by the doctor to change career as he suffered with contact dermatitis

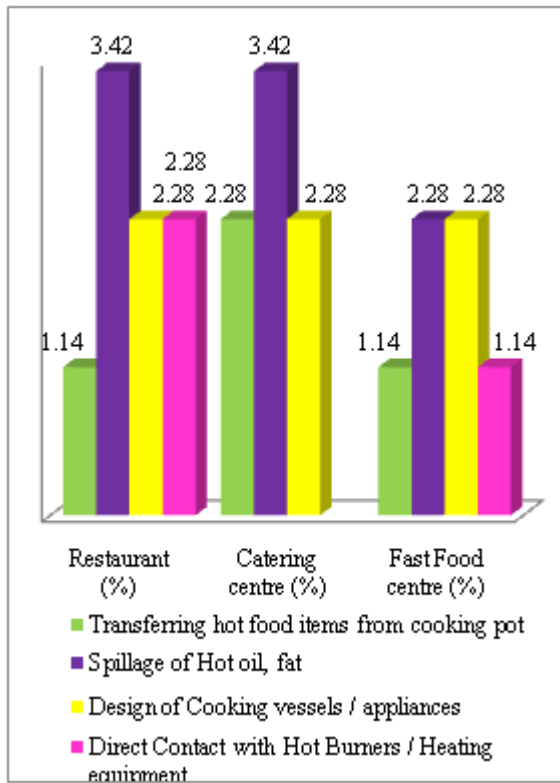
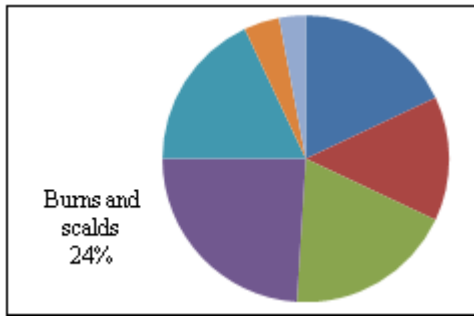


Figure 1: Reasons for suffering from Burns and scalds

### 3.3.2. Wrist and Shoulder stiffness

Repetitive motion injuries accounted for 19% of which 5% complained of wrist stiffness due to improper design of handles, lifting heavy utensils and 4% suffered with shoulder stiffness due to continuous stirring, tossing and turning foods.

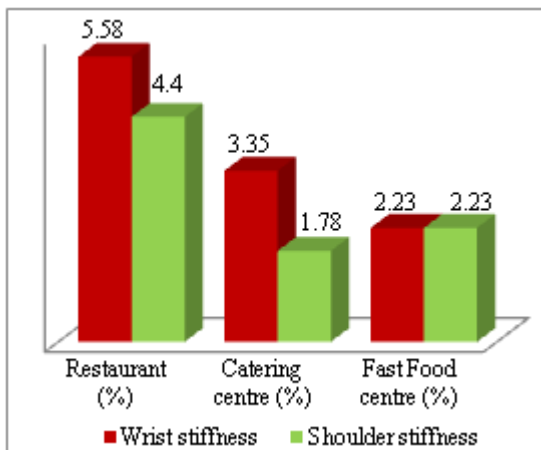


Figure 2: Injuries caused by repetitive motion

Repetition rate is similar motion pattern which is performed in a set time repeatedly [5,11]). Repetitive movements are mainly harmful if they involve the same joints and muscle groups. The more the number of repetitions, the higher is the risk for injury. Recurrence rates of greater than 20 times a minute can expose the wrists and hands to a high level of risk. In this study it is observed that, repetitive work done by arms and hands would be combined with a constrained trunk posture in many tasks including cooking, preparation activities, dish washing and cleaning which could create main ergonomic work load for the cooks together with frequent lifting and handling of objects, and frequent bending of the trunk [10].

### 3.3.3. Slips and falls

Slips, trips and falls in commercial kitchens may source a minor or major injury or even injuries leading to death. Slips take place where there is slight friction or traction amid the footwear and the walking surface. Trips often happen when the foot strikes an object causing loss of balance and, eventually a fall. It was found from this study that contributed to 18% of accidents among cooks. Out of them, 10% of the slips were caused due to slippery flooring surfaces and spillage of greasy food and 6% reported of falls while reaching for scattered objects. These conditions were most often found around wet grinders, work platforms and cooking stations. A high percentage of slips occurred near the sink and food fryer areas and especially during lunch time, when there is heavy demand for quick supply of foods. Preventive measures to mitigate slipping hazards in these two areas could lead to a significant reduction in the slipping incidences [6].

Table 2: Reasons for Slips and falls in cooking environment

Reason for Slips and Falls	Restaurant (n=30)	Catering centre (n=30)	Fast Food centre (n=30)	Total (n=90)
Falls due to slippery flooring surfaces and spillage of greasy food	5 (5.6)	4 (4.5)	1 (1.1)	10 (11.25)
Poor access to reach object due to scattered arrangement	2 (2.25)	2 (2.25)	2 (2.25)	6 (6.75)
Total	7 (7.85)	6 (6.75)	3 (3.35)	16 (18)

Falls are caused by both intrinsic and extrinsic factors as summarized [7]: Intrinsic factors include aging, alcohol, awareness, experience, weariness, pathologies and physical status. Extrinsic factors include environmental parameters such as contamination, illumination, maintenance, shoes, and a change in surface height, and task parameters such as activity type and temporal constraint/urgency.

It is important to use slip-resistant floor materials and to keep floors dry and well maintained [8]. Following an effective floor cleaning protocol and using safe work practices may reduce the floor contaminants in commercial kitchens.

### 3.3.4. Cuts and lacerations

Being hurt by an object or equipment caused 18% of injuries among cooks. Accidents with a knife accounted for 9% and 4% by sharp edged cooking appliances and food containers. Professional cutlery, though essential in the kitchen, pose an increased risk of injury to workers in this cooking environment. The probability for injuries from knives are particularly very high for those who are not properly trained [11]. Knowledge of how to correctly handle kitchen knives and other cutting tools among cooks creates a safer workplace.

Commercial kitchens use many types of equipment like food processors, choppers, slicers, grinders and mixers have moving parts that must be guarded because of their risky motions. It was found that cooks are hurt by the lack of guards, accidental removal of the guards, or inappropriate guarding. Machine guarding related injuries in commercial kitchens include cuts, bruises, burns, amputations and strangulation [9].

**Table 3:** Reasons for cuts and lacerations

Reason for Cuts and lacerations	Restaurant	Catering centre	Fast Food centre	Total
	n=30	n=30	n=30	n=90
Knives	4(4.5)	2 (2.25)	2 (2.25)	8 (9)
Sharp edged Food containers (dishes, bowls, bottles, jars)	1 (1.125)	1 (1.125)	2 (2.125)	4 (4.5)
Sharp edged Cooking appliances	2 (2.25)	0	2 (2.25)	4 (4.5)
Total	7 (7.87)	3 (3.37)	6 (5.57)	16 (18)

### 3.3.5. Body ache

Body ache due to over exertion was stated by 14% of cooks. Among them, 8.8% have developed pain due to stirring large quantities of food. It was also found that lifting and lowering heavy products, holding heavy pots while using awkward body postures, grasping bulky bags, emptying vessels and carrying items are common tasks in this kind of work environment.

**Table 4:** Reasons for Body ache

Reason for body ache	Restaurant	Catering centre	Fast Food centre	Total
	n=30	n=30	n=30	n=90
Stirring big quantities of food	2 (2.5)	5 (5.3)	1 (1.0)	8(8.8)
Manual handling of heavy vessels	1 (1.0)	3 (3.2)	1 (1.0)	5(5.2)
Total	3 (3.5)	8 (8.5)	2 (2.0)	13(14)

Persistent and frequent performing of these tasks can cause exhaustion, uneasiness, back pain, shoulder and neck problems, decreased range of motion in the joints, lessen grip strength, and so on [13]. Employers and employees can help in reducing or eliminating these problems by improving the fit between the worker's capabilities, the task, and the equipment used. Some improvement options include rearranging workstations, providing carts, training employees, limiting the moving of heavy loads, calling a co-worker for help, and using better tools. Good lighting in

work areas also helps in preventing accidents and injuries [15, 12].

### 3.3.5 Exposure to direct heat

Four percent of the respondents suffered injuries due to direct exposure to heat. The respondents complained of heat cramps, heat rashes and heat exhaustion due to the result of exposures to high temperatures. The respondents sometimes experienced dizziness and nausea indicating that they are suffering from heat exhaustion. Research findings reveal that if not treated promptly by lowering the person's body temperature, a person suffering from heat exhaustion could suffer brain damage [16].

### 3.3.6. Electric shock

It was terrifying to note that 3% of the cooks reported to have experienced electric shocks due to electrical cords with loose contact to plugs, faulty wiring for the equipment, damaged outlets and improperly used or damaged extension cords. But none of the accidents were severe but when preventive measures are not taken they can be fatal when working around electrical equipment. With all electrical equipment operations there is the threat of electrocution.

## 4. Summary and Conclusion

Food service industry engages skilled cooks for meeting the demands of consumers in different cooking environment. They were found to perform this work for 8 – 12 hours on an average, on daily basis, throughout the year without any break. This study explored the occupational health hazards among cooks in three different commercial food service centers totaling to 90 units in Hyderabad city. The study proved the prevalence of work related health problems of cooks working in these work centres and unsafe condition under which some of the cooks are exposed to work. Many injuries and work-related pains were found to affect body parts seriously due to long standing hours, awkward working posture, repetitive task, lifting heavy containers, exposure to extreme direct heat, cuts and burns, slips and falls, physical stress due to heavy workload. Accidents from exposure to direct heat and electrical shocks were life-threatening. Workplace risk factors and potential long-term impact of occupational injuries on the lives of cooks demonstrate the need for intervention strategies viz., personal protective equipment, space design layout, ergonomically designed tools and products aimed at injury prevention.

## 5. Acknowledgement

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service centres. She has also participated in national and international conferences and presented her findings.

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