A REVIEW ON DOMESTIC INJURIES AMONG HOUSEWIVES

Abstract:

Introduction: Accidents can happen not just outdoors but even inside one's home. The accidents can be minor or major. Domestic injuries are usually sustained while cooking, cutting or cleaning or during household chores. Few of the most common domestic injuries are falling from stairs, beds, chairs, sofas; slipping and hitting heads in bathroom; slamming doors on hands and heads; cut injuries etc. As most of the time, housewives are the person who stay at home, cleaning the rooms, cooking in kitchen; thus they are the one who face the consequences at home more than the other members of family.

Objectives: The review study was done to collect and disseminate information regarding domestic injuries (Physical, Mechanical, Chemical and MSDs) among housewives.

Review Methodology: The review used descriptive research design using secondary sources. The study also used exclusion and inclusion criteria to select the articles. The study referred extensive review of literature on various databases in internet, journals, textbooks and newspapers to have a better understanding on the problem area. Inferential statistics was used to interpret the studies.

Findings: Burn was found as a most prevalent household hazard among housewives that leads to disabilities and death occurs during cooking; aggravates if they wear synthetic clothing, starts fighting with fire in panic and due to absence of emergency exit. Cases of fuel combustion found high in developing countries than developed countries due to use of wood, charcoal, cow dung cake, kerosene as fuel while cooking. Cut and lacerations are common for housewives from knives, mixer grinder, broken utensils. It happens especially when housewives are in hurry to prepare tiffin for their children or preparing lunch pack for her husband. Fall is common due to wet floor. Chemical injuries among housewives was found rare. Housewives were suffering with neck pain, shoulder pain, back pain and carpel turner syndrome due to prolong standing, awkward position while lifting or catching something and due to vibration and repetitive work in kitchen for prolong time.

Conclusion: Study concludes that housewives are suffering from various types of physical, chemical and mechanical hazards as well MSDs while working at home. Most common physical injuries are caused by fire burn. Cut and lacerations while working in kitchen and fall due to slippery floor were found common mechanical injuries. Chemical injury is not very prominent among housewives. MSDs are quiet prevalent due to repetitive work and prolonged standing in kitchen.

Key Words: Housewives; Domestic injuries; Physical Hazards; Chemical Hazard; Mechanical Hazards; Musculo Skeletal Disorders (MSDs).
Introduction

An accident is an unfortunate event resulting from carelessness, unawareness, ignorance or a combination of such causes.¹

Accidents can happen not just outdoors but even inside one's home. The accidents can be minor or major. Domestic injuries are usually sustained while cooking, cutting or cleaning or during household chores.² The majority of home accidents can be attributed to personal causes and due to either physical weakness or frailty, especially with advancing age or to such factors as ignorance, lack of judgment, carelessness or physiological disorders. Different accidents led by different causes or the same cause can lead to different accidents.³

The most common domestic injuries are: 1. Falling from stairs and ramps or on floor; 2. Falling from beds, wrong mattresses and pillow resulting in neck and back problems; 3. Falling from chairs, sofas and sofa beds; 4. Slipping, falling and hitting heads and back on bathroom structures and fixtures; 5. Slamming doors on hands and heads. 6. Falling from table and table breaking 7. Falling over, cabinets knocked over and racks dropping on people. 8. Sharp cans, knives and shattering containers. 9. Children tangling and choking in their own cloths and 10. Falling and tripping from ladders and stools.⁴

Numbers of hazards are significantly higher in the kitchen than in the other high-risk rooms like dining, toilet etc.⁵ Domestic cooking is one of the major occupations of an average Indian housewife who spends around 6 hours in the kitchen everyday.⁶

Thus, various studies pointing that there are many factors at home, which can cause health injuries and housewives are at most risk as they are spending more time in home and doing maximum household works. However, their work and their health have been always neglected as it is a 24 hours job but with no payment. On that basis the present review study was conducted to collect and disseminate information regarding domestic

Review Methodology

The review used descriptive research design using secondary sources. The study also used exclusion and inclusion criteria to select the articles. The study referred extensive review of literature on various databases in internet, journals, textbooks and newspapers to have a better understanding on the problem area. Extensive review of literature was done to identify journals-articles on health sector its availability and attrition in rural as well as urban areas. Electronic searches were conducted in Search Database engine like Go PubMed, World Health Statistics, Google, CINHAL, Google Scholar and in Index Copernicus. Various journals were searched for further information. The search used keywords like housewives, home maker, injuries, hazards, mechanical hazards, physical hazards, chemical hazards, kitchen, toilet, floor, sleep, fall, cut injury, musculoskeletal disorders etc. Only English language was considered for the search of articles. All titles and abstracts found in the search were screened by the reviewer and articles were selected based on inclusion and exclusion criteria for the search. The review included any type of health hazards among housewives occurring at home. The review excluded studies on injuries outside the home and home injuries among child or other members of family rather than housewives. All the articles obtained from search database that were not as per inclusion criteria were deemed as not eligible and discarded. The findings of these articles highlighted the link between shortage of health workforce and attrition and emigration, talent management and retention. Studies were categorized under various sections. Inferential statistics was used to interpret the studies.

Findings and Discussion

Domestic injuries were categorized under physical injuries, mechanical injuries, chemical injuries and musculoskeletal injuries among housewives with a future vision to make them aware how to keep self-protected at home.
disorders.

**Physical injuries**

Physical injuries were defined as the injuries due to physical agents, heat and fuel among housewives which may cause burn, fuel combustion.

**Burn**

Every year a substantial proportion of deaths in India occur due to burn injuries. Burn deaths are a major public health problem in our country. Prolonged morbidity and disability due to burns results in economic loss to the individual’s family, the society and the state. The present retrospective study was carried out in the Department of Forensic Medicine & Toxicology, Government Medical College & Hospital, Chandigarh during the period from 1st January 2011 to 31st July 2013 and includes a total of 381 cases of death due to burn injuries, brought to the mortuary of the hospital for medico-legal postmortem examination. The objective of the study was to understand various demographic aspects of deaths due to burns so as to suggest some remedial measures. About half (189 cases, 49.6%) of the deaths due to burns were accounted for by married females, while married males comprised only 25% (97cases). On the whole, married victims accounted for 286 (75%) deaths, while in females, 78% victims (189) were married. Seventy percent of male victims and 64% of the female victims of death due to burns were from the rural background. Kitchen was the most common place of occurrence, accounting for overall 76% (256) deaths, which was the same in the “female” victims, 186 cases. In the case of females, burns outside home was just 05% (11), the rest occurring inside the homes. Kerosene/ kerosene stove was the cause of fire in 245 (64%) cases, while gas stove/ cylinder was involved in 47 (12%) cases and anghiti/ chullha in 24 (06%). All in all, the universal source of fire in the household for cooking purposes was responsible for 316 (83%) instances of the victims catching fires. Fire due to electricity was responsible for 4% cases.8

A hospital based descriptive study was carried out in surgery ward of Shri Chhatrapati Shivaji Maharaj, General Hospital Solapur, to know socio – demographic profile, duration of stay and outcome of burn. All cases of burns admitted in Hospital during study period (September 2000 to August 2001) were the study subjects. More than half were in the age group between 21 and 40 years. More than two third were females. Rural patients outnumbered urban patients. Majority of patients were unemployed and among unemployed majority of patients were housewives. Maximum number of burns occurred between 5pm and 11 pm. Majority of burns (97.56%) took place at home. 79.33% of burns were accidental. 36% patients had hospital stay less than one day. Among 450 cases, 65.78% died, 16.44% were discharged against medical advice.9

Stratified by age of burn patients, more females were found in most age groups. Most burns were domestic, with cooking being the most prevalent activity. The maximum incidence of burn injuries in males were noted in the age group of 21-30 years. 56% cases who suffered burns were housewives.26% females had 91-100% burns. Smell of kerosene was present in 4% cases. Maximum burns were of 3rd degree with 28% males and 54% females. Head & neck were involved in 94% cases Extremities were involved in all cases.10

Not only in India, burns are a global public health problem, accounting for an estimated 265 000 deaths annually. The majority of these occur in low- and middle-income countries and almost half occur in the WHO South-East Asia Region. The higher risk for females is associated with open fire cooking, or inherently unsafe cook stoves, which can ignite loose clothing.11

In 2009-2013, U.S. fire departments responded to an average of 162,400 home structure fires that involved cooking equipment.
per year. This represents 45% of home structure fires, and 33% of all structure fires.\textsuperscript{12}

Above studies on burn summarizes that burn is a severe household hazard that leads to disabilities and death. Household burn is more prevalent among housewives and frequently occurs during cooking. Effect of burn aggravates if they wear synthetic clothing, starts fighting with fire in panic and due to absence of emergency exit.

\textbf{Fuel Combustion}

Kerosene has been an important household fuel since the mid-19th century. A review focuses on household kerosene uses, mainly in developing countries, their associated emissions, and their hazards. Globally, an estimated 500 million households still use fuels, particularly kerosene, for lighting. However, there are few studies, study designs and quality are varied, and results are inconsistent. Well-documented kerosene hazards are poisonings, fires, and explosions. Less investigated are exposures to and risks from kerosene’s combustion products. Some kerosene-using devices emit substantial amounts of fine particulates, carbon monoxide (CO), nitric oxides (NO\textsubscript{2}), and sulfur dioxide (SO\textsubscript{2}). Studies of kerosene used for cooking or lighting provide some evidence that emissions may impair lung function and increase infectious illness (including tuberculosis), asthma, and cancer risks.\textsuperscript{13}

A large part of the world’s population uses fuel wood for household cooking and space heating, mostly in developing countries. Energy from traditional biomass fuel is thought to account for nearly one-tenth of all human energy demand today (more than hydro and nuclear power together), and wood-based fuels probably make up some two-thirds of household use. In poor developing-country households, wood, charcoal and other solid fuels (mainly agricultural residues and coal) are often burned in open fires or poorly functioning stoves. Incomplete combustion leads to the release of small particles and other constituents that have been shown to be damaging to human health in the household environment.\textsuperscript{14}

In a study 600 households from six urban neighborhoods in Bangalore, India were investigated. Each household's primary cook, usually the woman of the house, was interviewed to collect information on current domestic fuel use and whether there was any presence of respiratory symptoms or illness in her or in the children in the household. Total 547 adult females (ages 18-85) and 845 children (ages 0-17) in households exclusively cooking with either kerosene or LPG were investigated. Among adult women, cooking with kerosene was associated with cough (OR=1.88; 95% CI 1.19 to 2.99), bronchitis (OR=1.54; 95% CI 1.00 to 2.37), phlegm (OR=1.51; 95% CI 0.98 to 2.33) and chest illness (OR=1.61; 95% CI 1.02 to 2.53), relative to cooking with LPG in the multivariate models. It was also found associations between kerosene use and wheezing, difficulty breathing and asthma in adults.\textsuperscript{15}

Cases of fuel combustion found high in developing countries than developed countries. As there are still use of wood, charcoal, cow dung cake, kerosene as fuel while cooking. Sometimes they are burnt inside poorly ventilated rooms which causes suffocation and prolonged use like this causes various respiratory problems.

\textbf{Mechanical Injuries}

Mechanical injuries were explained as the injuries occurring among housewives due to mechanical agents\textsuperscript{7} like unsafe kitchen articles and floors as cut, lacerations and fall.

\textbf{Cut and lacerations}

Cut & lacerations are common hazards occurring generally in kitchen. Knives and other cutting & slicing tools are essential in kitchen, which are potentially hazardous and injury factors. While peeling, mincing or slicing people are at risk of cut or injury.
Approximately 45% of kitchen injuries were from non-powered cutting hand tools, mostly knives. About 15% are from power tools like slicers, grinders or mixers. Sometimes cut can be caused from broken glass, sharp edge of metal also. Major incidences related to cut at kitchen are affecting finger & hands. Cut and lacerations are common for housewives from knives, mixer grinder, broken utensils. It happens specially when housewives are in hurry to prepare tiffin for their children before going to school or preparing lunch pack for her husband while he is running late to go to office. Another cause may be watching TV serial also. Watching TV and cutting vegetables is a common practice among housewives which may lead to more incidence of cut and lacerations.

Fall
Slippery floors are the root of fall injury. Floor surface contamination is frequently reported when slips occur. A woman died after she slipped in her kitchen and landed on knives lying upright in a dishwasher, police said. The freak accident happened in the 31-year-old's home in Dunrobin Road, Airdrie, Lanarkshire. The woman was taken to Monklands General Hospital in Airdrie, North Lanarkshire, but she died shortly after admission. Various studies denotes that even the floor is wet during and after mopping, can also present a slipping hazard. Most floors only become slippery once they become contaminated. Contamination can be classed as anything that ends up on a floor e.g. oil, water split, food items (e.g., jam, sauce), dust etc. the list is endless. Fall due to home accident even may cause fracture and death too.

Chemical Injuries
Chemical injuries denotes to hazards occurring among housewives while using chemical agents like phenyl, detergents, acid to clean toilets etc. While reviewing, incidence of chemical injuries among housewives found rare. Causes of chemical burn may be due to spillage of chemicals/ acids while mopping or cleaning toilet but effect are local and not so sever like fire burn. Inhalation of fumes causes respiratory suffocation during cleaning toilet with acids; but now a days so many non-corrosive toilet products are available which are less irritant.

Musculoskeletal Disorders (MSDs)
Musculoskeletal disorders (MSDs) are problems affecting the muscles, tendons, ligaments, nerves or other soft tissues and joints. The back, neck and upper limbs are particularly at risk. In the present study MSDs refers to the repetitive strain injury, back pain, shoulder pain, leg pain due to prolong and repetitive activities among housewives like chopping, pealing, prolong standing etc.

Women were consistently found to spend more time on household activities than did men, and women were more likely than men to have musculoskeletal disorders that resulted in disability. Many simple but repetitive kitchen activities can also aggravate pain in the hand, wrist, elbow, shoulder and neck. Peeling potatoes, chopping, and picking up heavy pots and kettles were determined to be some of the most stressful kitchen tasks. Traumatic and repetitive injuries related to kitchen tasks include lacerations, cut, wrist fractures from slips and falls due to spills, tendonitis, carpal tunnel syndrome, thermal strains and burn caused by poor work practices, poor quality equipment, and poorly maintained equipment.

A study showed musculoskeletal pain during the past 3 months in the neck, shoulders, forearms/hands, low back, hips, knees and ankles/feet among 495 female working (mean age 45 years)
in kitchens. The 3-month prevalence of any musculoskeletal pain was 87%, the most common sites being the neck (71%), low back (50%) and forearms/hands (49%). About 73% of the subjects had pain in at least two, 36% in four or more, and 10% in 6–7 sites.

Another study was conducted in the Himalayan State of Himachal Pradesh in India among 4296 individuals, 729 households, 84 villages and 9 districts where biomass fuels meet 70% of household fuel needs. On an average, women walk 30 km each month taking 2.7 h per trip for fuel wood collection over hilly terrain, often at high altitudes and undergo stress like stiff-neck, backache, headache and loss of work days.

As in occupational exposures involving highly repetitive jobs with grasping of the hands, repetitive bending of the wrist, vibration and localized mechanical pressure are considered to be the contributing factors towards the occurrence of this disorder. These types of activities are also quite prevalent in kitchen; as among 8801 eligible cases of surgical carpal tunnel syndrome (CTS) were identified. A study on housewives in Tuscany, Italy found Age-standardized rates of surgical CTS were 3.8-fold excess (p<0.001) in housewives. The high rates for full-time housewives suggest that domestic chores should be investigated as a possible risk factor for CTS.

Above studies on MSDs indicated that housewives are suffering with neck pain, shoulder pain, back pain; even they are getting affected with CTS. Causes of MSDc were found as due to prolong standing, awkward position while lifting or catching something and due to vibration and repetitive work in kitchen for prolong time.

**Conclusion**

The so-called housewife is already doing a single shift. If a woman also works outside home, she is consistently working a double shift. When children or family members are ill, she does three shifts day after day. On an average, women work much longer hours than men. According to International Labour Organization (ILO), 2/3rd of the working hours around the world are worked by women because of the combination of various roles in the workplace, in the family and in the society. Most often, the women’s work remains invisible but it contributes a major portion to the world economy.

The present review indicates that housewives are suffering from various types of physical, chemical and mechanical hazards as well MSDs while working at home. Most common physical injuries are caused by fire burn. Cut and lacerations while working in kitchen and fall due to slippery floor were found common mechanical injuries. Chemical injury is not very prominent among housewives. MSDs are quiet prevalent due to repetitive work and prolonged standing in kitchen.

**Recommendation**

As very few studies were found on domestic injuries among housewives; thus it is recommended that there is need to conduct various studies in this field.

- More detailed study on chemical hazards among housewives.
- Comparative study can be done on domestic injuries in rural and urban area.
- Intervention study can be done to assess use of some tool, which can make kitchen work easy as some height adjustment tools or some tools to protect cut in fingers.
- Ergonomical studies with postural correction use of appropriate protective device while using chemicals.

**References**

1. Webster, A.M. 1986. Webster’s Medical Desk Dictionary. (P. 5). U.S.A.: Merriam Webster Inc.
2. Mehta S. TNN, Jun 2, 2016, 09:08 AM IST. [Internet] 2016 [Cited on: 25/8/2016]. Available from: http://limesofindia.indiatimes.com/city/visakhapatnam/Dealing-with-domestic-injuries/articleshow/52547812.cms Dealing with domestic injuries
3. Churchill, H.S. and C. F. Roester. 1966. Construction and Equipment of the Home - A Contribution of the Subcommittee on Construction and Equipment. (pp. 60-66). New York: McGraw Hill Company Ltd. (1966).
4. Most Common Domestic Injuries. Top 10 Injuries Tips to prevent, treat and cure the most common injuries. [Internet] 2014 [cited: 25/8/2016]. Available from: http://top10injuries.com/most-common-injuries-at-home/.
5. Phelan K J, Khoury J, Xu Y, Lanphear B. Validation of a HOME Injury Survey. Injury Prevention 2009, 15: 300–306
6. Dewan A. Occupational and Environmental Health of Women.[Cited 4/6/2016] Internet [Retrieved from: file://D:/NIMS/2016%20project%20proposals/Kitchen/att=dewan_doc+2.html]
7. Park K. Preventive and social medicine. 20th ed. Jabalpur: m/s Banarasidas Bhanot; 2009.
8. Harish D, Kaur C, Singh A, Kumar A. A comprehensive analysis of deaths due to burns in a tertiary care centre. J Punjab Acad Forensic Med Toxicol 2013;13(2).
9. Haralkar S.J., Vinay ST, Madhavi R. Study of socio-demographic profile of burn cases admitted in shri chhatrapati shivaji maharaj general hospital, solapur. National journal of community medicine 2011. 2 (1).
10. Chawla R, Chanana A, Rai H, Aggarwal AD, Singh H, Sharma G. Original research paper A Two-year Burns Fatality Study. J Indian Acad Forensic Med 2005. 32(4): 292-297.
11. WHO. Burn [Updated April 2014] Cited 5/6/2016 [Retrieved from: http://www.who.int/mediacentre/factsheets/fs365/en/]
12. Ahren M. Home fires involving cooking equipment. NFPA's latest estimates of home cooking fires. November 2015. http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fire-causes/appliances-and-equipment/cooking-equipment
13. Lam NL, Smith KR, Gauthier E, Bates MN. Kerosene: a review of household uses and their hazards in low- and middle-income countries. J Toxicol Environ Health B Crit Rev. 2012; 15(6): 396–432. doi: 10.1080/10937404.2012.710134; PMCID: PMC3664014.
14. Smith KR. Health impacts of household fuels in developing countries. FAO corporate document repository. Cited on 6/8/2016. [Retrieved from: http://www.fao.org/docrep/009/a0789e/a0789e09.htm]
15. Choi JY, Baumgartner J, Harnden S, Alexander BH, Town RJ, D'Souza G, Ramachandran G. Increased risk of respiratory illness associated with kerosene fuel use among women and children in urban Bangalore, India. Occup Environ Med. 2015.72(2):114-22.
16. Webster T. Occupational hazards in eating & drinking place. Compensation & working conditions, 2001. (Retrieved from: http://www.bls.gov/opub/cwc/archive/summer2001art4.pdf)
17. Fillaggi AJ, Courtney TK. Restaurant hazards practice based approaches to disabling occupational injuries in restaurants. Prof Saf 2003, 48:18-23.
18. Mail Online. Monday, Feb 20 2012 (Retrieved from: http://www.dailymail.co.uk/news/article-182547/Woman-dies-freak-dishwasher-accident.html)