

Occupational Hazards among Hospital Laundry Workers at Ismailia City, Egypt

Sara Mohamed Hesham Abd El-Wahed^{1,*}, Salwa Abbas Ali², Heba Al-kotb Mohamed³, Hanaa Kassem Farg³

¹Demonstrator of Family and Community Health Nursing, Faculty of Nursing, Suez Canal University, Egypt

²Family and Community Health Nursing, Zagazig University, Egypt

³Family and Community Health Nursing, Faculty of Nursing, Suez Canal University, Egypt

*Corresponding author: Saramohamed@nursing.suez.edu.eg

Received May 03, 2020; Revised June 05, 2020; Accepted June 12, 2020

Abstract Background: hospital laundry workers are widely exposed to various occupational hazards due to the unique characteristics of their work environment. **Aim of the study:** this study aimed to assess occupational hazards among hospital laundry workers at Ismailia city. **Design:** Descriptive design was utilized in this study. **Setting:** this study conducted at seven governmental hospitals at Ismailia city. **Sample:** all hospital laundry workers (159) in the previous settings were included in this study. **Tools of data collection:** structured interview questionnaire included questions about socio-demographic characteristics and worker's exposure to different occupational hazards. **Results:** 95%, 95%, 92.5% and 91.2% of the studied sample reported presence of open sanitary system, inadequate ventilation, contact with contaminated linen and standing for prolonged periods respectively. More than four fifth of the studied sample exposed to heat, falls or trips, noise and vibration (85.5%, 85.5%, 83% and 83% respectively), while 67.9% exposed to needles and sharp objects followed by 54.1% and 53.5% exposed to bleaching agent and detergents respectively. **Conclusion:** Most of the studied workers exposed to environmental, physical, biological and ergonomic hazards. **Recommendations:** Develop educational program and training workshops regarding prevention of workplace hazards emphasizing on the use of personal protective equipment and safety practices for body mechanics.

Keywords: occupational hazards, laundry workers, hospital laundry

Cite This Article: Sara Mohamed Hesham Abd El-Wahed, Salwa Abbas Ali, Heba Al-kotb Mohamed, and Hanaa Kassem Farg, "Occupational Hazards among Hospital Laundry Workers at Ismailia City, Egypt." *American Journal of Nursing Research*, vol. 8, no. 4 (2020): 471-476. doi: 10.12691/ajnr-8-4-7.

1. Introduction

Laundry is crucial to the appropriate operation of a hospital, without clean linens, hospitals would not be able to provide the same high quality care environment that patients expect and that is needed by regulations and quality guidelines [1]. Although laundries in hospital settings are necessary to prevent hospital acquired infections and for the hospital activities in general, there is little concern about the workers' health and safety [2].

National Institute for Occupational Safety and Health (NIOSH) estimates that every year approximately 100,000 persons die of occupational diseases and about 400,000 new cases documented annually among the workers. It was not only health care professionals that are at risk but also other employees may sustain injuries specially the auxiliary staff including cleaners, morticians and laundry staff [3].

According to World Health Organization, there are 59.8 million health care workers globally. About two-thirds of them 39.5 million provide health related services; the other one-third 19.8 million are support and

administration workers, including those employed in laundry Departments [4]. Workers in hospital laundry have exhausting duties and are exposed to various environmental and work related hazards [2].

Physical hazards include noise, temperature, electricity, illumination, and radiation [5]. Chemical hazards such as detergent, soaps, cleaning products, bleaching solutions and breathing fumes [6]. Ergonomic hazards such as heavy lifting and carrying, awkward postures, stretching, vibrations and excessive repetitive motions [7].

In addition, hospital laundry workers are exposed to various biological hazards as they get in contact with contaminated and/or used linens that may harbor numbers of microorganisms from the various body substances like blood, urine, stool, skin, sputum, vomitus and other tissues and fluids of the body [8].

These groups of workers however, exposed to numerous hazards, they are often neglected and basic preventive measures including training and education for health and safety are usually overlooked, usually not covered by legislation, and do not have access to basic occupational health services provided to other staff [9].

The role of occupational health nurse is to train individuals who work in laundry to know the location and

proper use of the available personal protective equipment (PPE) and adequately inform them about the physical and other health hazards present in the laundry, the known hazards and what to do in case of an accident. Therefore, provide a harmless environment in the laundry which is crucial to maintain employee's health [10].

Despite the significant role these health personnel perform in the hospital, there are a very small number of studies globally and locally concerned with their health, safety and hazards exposure. Therefore, it was necessary to assess occupational hazards among hospital laundry workers.

2. Aim of the Study

The aim of this study was to assess occupational hazards among hospital laundry workers at Ismailia city.

3. Subjects and Methods

3.1. Research Design

Descriptive design was utilized in the current study.

3.2. Research Setting

The present study was conducted at the laundry department of seven hospitals in Ismailia city, Egypt namely: Suez Canal University Hospitals, Ismailia General Hospital, Fever Hospital, Chest Hospital, Ismailia Oncology Teaching Hospital, Suez Canal University Specialized Hospital and Suez Canal Authority Hospital.

3.3. Sampling

All hospital laundry workers of the previous mentioned settings were involved in the study (177). Hospital laundry workers included in the pilot study (18) were excluded later from the study sample, so the final study sample was (159) hospital laundry workers.

3.4. Tool of Data Collection

Data collected using a structured interview questionnaire which has been developed by the investigator after extensive review of literature and then translated into simple Arabic language. It was divided into two parts:

Part (I): socio-demographic characteristics which include questions about personal data such as age, gender, educational level, etc. In addition to questions about job and work place data such as years of experience, daily working hours, type of work, etc.

Part (II): hospital laundry workers exposure to different occupational hazards such as physical, chemical, ergonomic, biological and environmental hazards.

3.4.1. Validity of the Study Tool

It was ascertained by a jury consisting of five expertise in the field of community health nursing and occupational health medicine to revise the tools for clarity, relevance, applicability, comprehensives and understanding. According to their opinion the necessary modifications were applied.

3.4.2. Reliability of the Study Tool

The reliability was measured by means of Cronbach's alpha (α); it indicates that the tool has a reliability of 0.823.

3.5. Pilot Study

A pilot study was conducted on 10% of the total sample size that equal 18 of the hospital laundry worker to evaluate the clarity and applicability of the study tools. After obtaining the result of the pilot study, simple modifications were done according to the hospital laundry worker's response and the final form was developed. Those hospital laundry workers in the pilot study were excluded later from the study sample.

3.6. Ethical Consideration

Primary approval was obtained from the research ethical committee in the Faculty of Nursing, Suez Canal University, Egypt. Written consent was obtained from hospital laundry workers to participate in the study after full explanation of the nature and the main aim of the study, its expected outcomes, their rights to voluntarily participate and their right to withdraw from the study at any time without any rationale. The topic of this study doesn't touch religious, ethical, moral and cultural issues among participants. Hospital laundry workers were assured that all gathered information will be confidential and will be used only for the purpose of the study.

3.7. Field of Work

An official letter was issued from the Dean of the Faculty of Nursing, Suez Canal University, Ismailia, Egypt to the director of each study setting to seek their approval for carrying out the study. An official permission was obtained from the director of each study setting. The actual field work was carried out from the beginning of December (2017) to the end of May (2018). The investigator was available in the previous mentioned settings 3days/week as follow; Monday by rotation from 9.00 AM to 1.00 PM to collect data from workers in morning shift, Tuesday by rotation from 3.00 PM to 6.00 PM to collect data from workers in afternoon shift and Thursday by rotation from 8.00 PM to 10.00 PM to collect data from workers in the night shift. Written consent was obtained from each subject before data collection. Each interview the investigator starts by introducing self and give brief explanation about the aim of the study. The investigator with the help of each hospital director arranged a suitable room in which the interview with study subjects can be done with complete privacy to reduce their worries. The approximate time spent with each worker to complete the study tool was 15 to 20 minutes.

3.8. Statistical Design

Data were organized, revised, tabulated and analyzed using statistical package of social science (SPSS) program, (SPSS package version 19, Chicago, USA). Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables,

and means and standard deviations for quantitative variables.

4. Results

The present study showed that the mean age of the studied workers was 39.9 ± 9.5 SD, where more than half of them (57.2 %) were females. Concerning their education level, about one third of them (36.5 % and 33.5%) had diploma and basic education respectively. Regarding type of task performed 83.6% of them carried out collection and distribution task, while 36.5% soaking dirty linen and 16.4% carried out washing, drying, ironing and folding tasks. Moreover, daily working hours ranged from 6 to 12 hours with mean score 8.6 ± 2.5 SD and years of experience ranged from 2 to less than 40 years with mean score 11.1 ± 7.9 SD.

Figure 1 shows the distribution of the studied workers according to their exposure to physical hazards. It shows

that 85.5% of the studied workers exposed to heat followed by 83% exposed to noise and vibration, while the minority of them (15.1%) exposed to radiation hazards. Regarding exposure to chemical hazards, it was found that 61% of them exposed to gases and vapors followed by more than half of them (54.1% and 53.5%) exposed to bleaching agents and detergents respectively (Figure 2). Also for exposure to ergonomic hazards, most of them (91.2 % and 87.4 %) reported standing and bending for prolonged periods respectively, while 83.6% reported lifting heavy loads (Figure 3).

Concerning biological hazards, 92.5% of the studied workers were in contact with linen contaminated with blood and body fluids, while 67.9% exposed to needles and sharp objects (Figure 4). Furthermore, 95 % of them reported the presence of open sanitary system and absence of air exhaust, while 87.4 % of them reported that floors were slippery followed by 85.5% experienced falls or trips and an equal percentage of them 76.7% exposed to humidity and leakage of sanitary system (Figure 5).

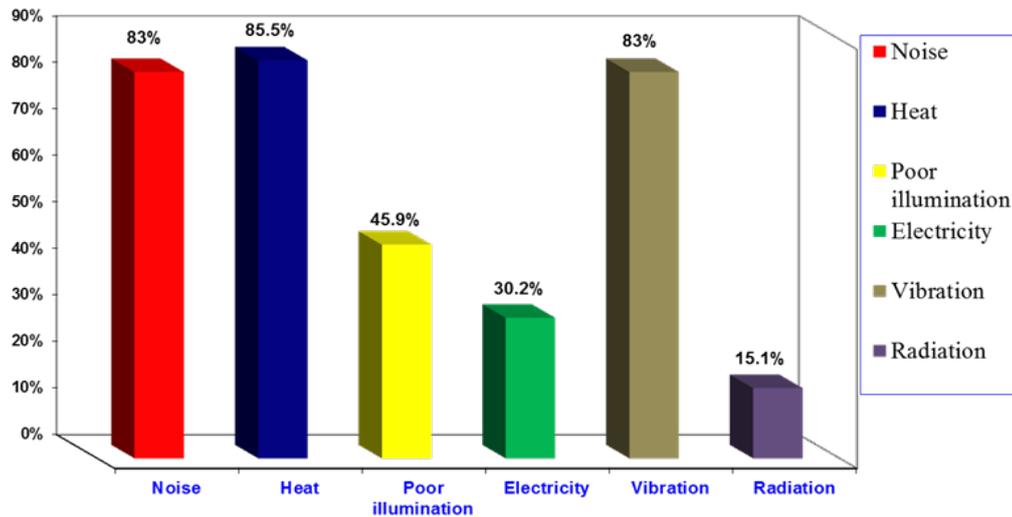


Figure 1. Distribution of the studied sample according to their exposure to physical hazards (n = 159) (# Results are not mutually exclusive)

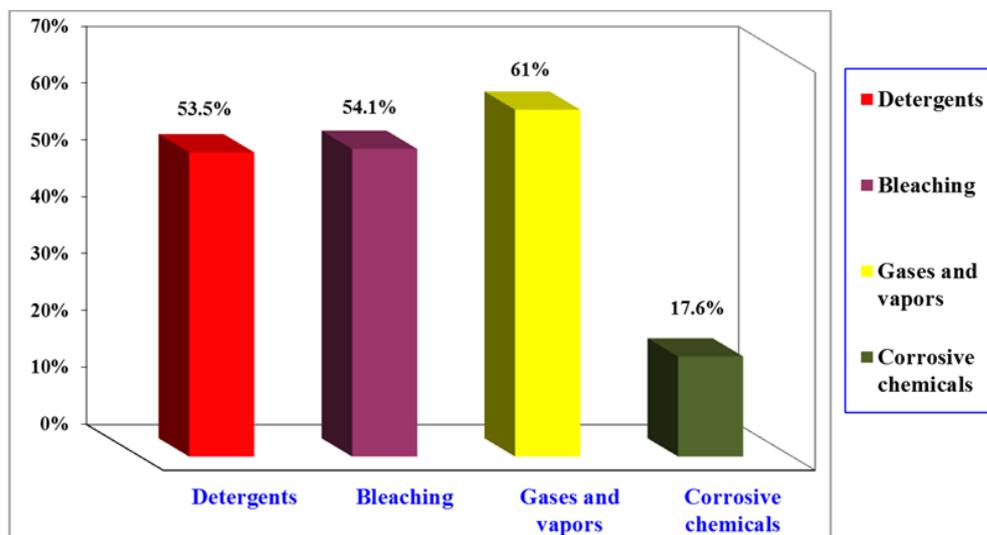


Figure 2. Distribution of the studied sample according to their exposure to chemical hazards (n = 159) (# Results are not mutually exclusive)

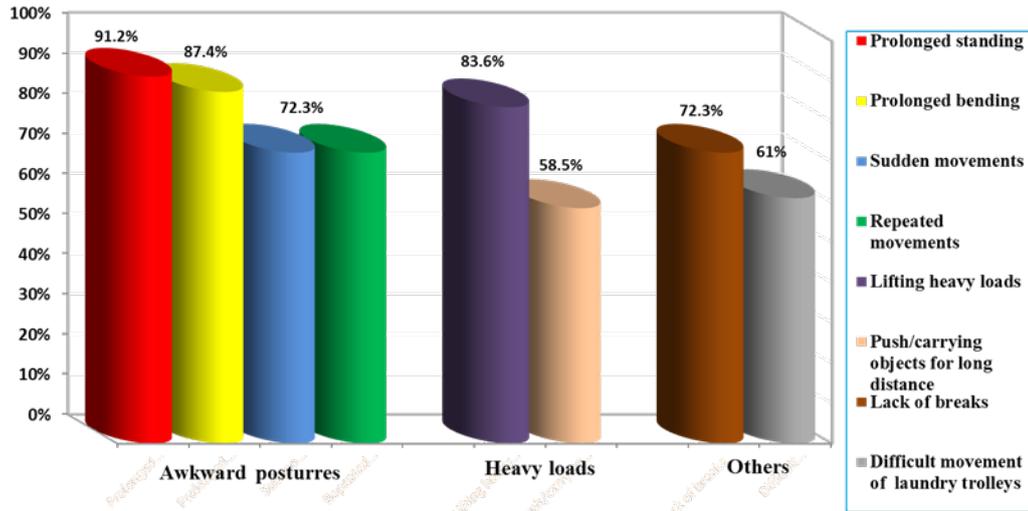


Figure 3. Distribution of the studied sample according to their exposure to ergonomic hazards (n = 159) (# Results are not mutually exclusive)

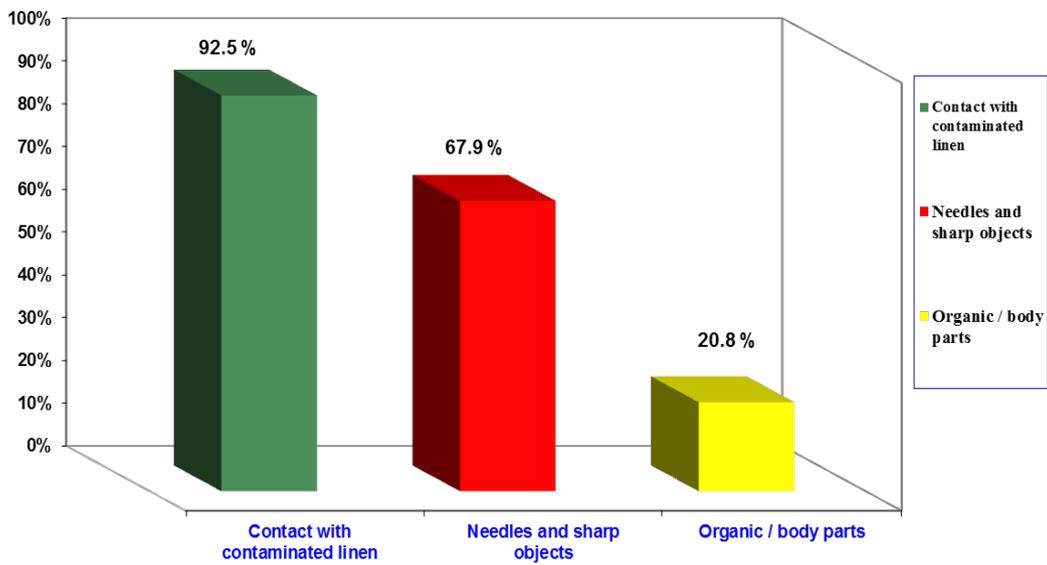


Figure 4. Distribution of studied sample according to their exposure to biological hazards (n = 159) (# Results are not mutually exclusive)

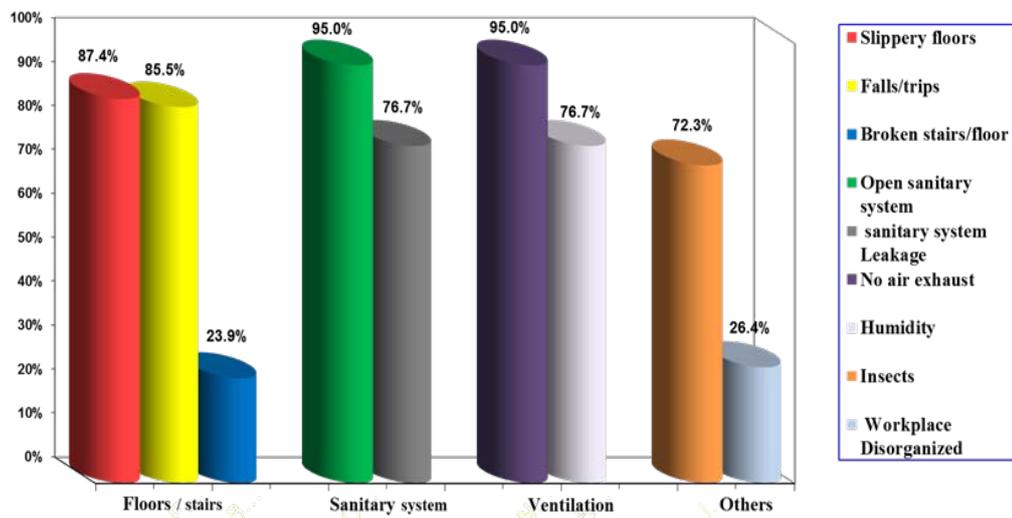


Figure 5. Distribution of the studied sample according to their exposure to environmental hazards (n =159) (# Results are not mutually exclusive)

5. Discussion

The present study found that more than four fifth of the studied sample exposed to heat, noise and vibration, while less than one fifth of them exposed to radiation hazard. Similarly, study conducted by Abdel Wahed et al., [11] titled "risk assessment of physical health hazards in Al-Azhar University Hospital in New Damietta, Egypt" found that noise levels were above the standard of Occupational Safety and Health Administration (OSHA) in the laundry department of a tertiary hospital in New Damietta, Egypt.

Conversely, Fontoura et al., [12] in their study in Brazil titled "noise effects on hospital laundry workers' hearing" found that less than half of the hospital laundry workers had already been exposed to occupational noise.

From the researcher point of view, The high exposure to noise among laundry workers in the current study may be due to use of heavy machinery in the laundering process especially dryers and gas compressor, the small surface area, low ceiling and vibration produced by ill working washing machines in some hospital laundries under the study.

In relation to occupational exposure to heat, Omoijiade [13] in his study titled "an assessment of laundry workers exposure to workplace hazards in secondary and tertiary health facilities in Benin-city, Nigeria" found that more than one third of laundry workers were exposed to heat hazards while carrying out their job tasks in the past year. Furthermore, another study conducted in Iran by Izadi and Piruznia, [14] titled "occupational health hazards among health care workers" had previously mentioned that workers in laundry rooms are among the main groups in a hospital setting that are exposed to heat-related hazard.

From the researcher point of view, the high exposure to heat among laundry workers may be because there were no steam pipes, inadequate ventilation, the major heat-emitting equipment including the pressing iron, driers and other heavy machinery used and the steam released through leaks from the machinery and delivery tubes also would have contributed to the hot environment. Moreover, the presence of these units in the basement makes the thermal condition to be more difficult than in other hospital units.

As regard to exposure to chemical hazards, the current study revealed that less than two thirds of the studied sample exposed to gases and vapors followed by more than half of them exposed to detergents and bleaching agents. Similarly, a study carried out in Nigeria to assess laundry workers exposure to workplace hazards in secondary and tertiary health facilities found that more than two third of respondent reported exposure to chemical hazards while carrying out their job tasks [13].

Also, Sukumar and Karthiga, [15] in their study in India titled "a study on laundry workers attitude towards health care industry in Trichy city" observed that hospital laundry workers were exposed to a wide variety of chemicals depending on the type of chemical products used. Additionally, Lopes et al., [16] in their study in Brazil titled "analysis of sustainability in hospital laundry: the social, environmental, and economic (cost) risks" observed that laundry workers were exposed to chemical hazards mainly from the use of cleaning products used in washing such as detergents, disinfectants, acidifiers, bleaches and fabric softeners for hospital use.

From the researcher point of view, exposure of laundry workers to chemical hazards may be due to using a chemical-based spotting and waterprooagent, handling and storage of hazardous chemicals, removing clothes especially thick items before the dry cycle is finished, transferring solvent-laden clothes to the dryer, pressing freshly dry-cleaned clothes, accidental chemical spillage on the skin, and exposure to chemical emissions from leaks in machines, hoses, valves, or ducts especially when not wearing proper PPEs. In addition, rinsing clothes soaked by stool and other body fluids in the sink of the department by linen collection personnel before being delivered to laundry in some hospitals under the study.

Further occupational health hazards revealed in this study were ergonomic hazards. Most of the studied sample reported standing for prolonged periods, while more than four fifth reported lifting heavy loads and bending for prolonged period. In the same context, Muslim et al., [17] in their study in Indonesia titled "ergonomic analysis of garment industry using posture evaluation index (PEI) in virtual environment" showed that in every single activity of laundry workers, the positions were not ergonomic.

From the researcher's point of view, the high exposure to ergonomic hazards among hospital laundry workers in the present study may be due to heavy work load, shortage of the laundry staff, pulling wet and crumpled clothes, high quantity of clothes processed every day, pace of work, lack of training regarding safety practices for body mechanics and manual handling. In addition, linen collection personnel are involved in other tasks due to shortage of workers in most of hospitals under the study such as housekeeping and manual handling tasks.

In the current study, most of the studied sample reported contact with linen contaminated with blood and body fluids, while two thirds reported exposure to needles and sharp objects. The findings of this study are in contrary with the results of a study conducted to understand the incidence of sharps injury and occupational blood and body fluid exposure of mucous membranes among medical waste handlers in Ethiopia by Shiferaw et al., [18] who found that less than two thirds of the studied hospital laundry workers reported the exposure of their mucus membranes to blood and blood stained body fluid.

From the researcher's point of view, as to the reasons for exposure of laundry workers to sharps during their work that sharps were improperly disposed of by medical personnel, and inattentive hospital laundry workers rushing to complete work. This failure to safely segregate and package wastes contributed to splash and needle stick and sharp injuries (NSSIs) to laundry workers during the handling, transport and sorting of laundry items.

The present study shows that the majority of the studied workers reported the presence of open sanitary system and absence of air exhaust followed by more than four fifth reported falls or trips and floors were slippery, while slightly more than three quarters reported the exposure to humidity and leakage of the sanitary system.

These results were in contrast with Sukumar and Karthiga, [15] who revealed that more than one third of laundry workers reported that floors were slippery. Also, another study conducted by Mogale et al., [19] titled

"occurrence of occupational slips, trips and falls (STFs) amongst health workers in Limpopo Province of South Africa" revealed that more than one half of STFs were reported among non-clinical staff including about one tenth among laundry staff and less than one fifth among cleaning staff.

Moreover, Ribeiro et al., [20] in their study in Brazil titled " risk mapping and prioritization-case study in a Brazilian industrial laundry" found that workers in industrial laundry were exposed to humidity and inappropriate physical arrangement.

From the researcher's point of view, the high incidence of STFs among laundry workers in the present study may be explained by the fact that the floor at this area was slippery due to spillage of soap oil solution and drained water and leakage of sanitary system. In addition, the workers did not clean the spillage immediately and absence of warning signs near the wet floors.

6. Conclusion

Based on the findings of this study, most of the studied workers exposed to environmental, physical, biological and ergonomic hazards, while less than two thirds of them exposed to chemical hazards.

7. Recommendation

Regarding the findings of the present study, the following recommendations are suggested:

1. Developing educational program and training workshops to raise hospital laundry worker's awareness and knowledge about occupational hazards and their effects on health.

2. Providing safety training to workers regarding prevention of workplace hazards emphasizing on the use of personal protective equipment and safety practices for body mechanics. Training must be repeated at least annually.

3. Future research should be conducted to assess occupational hazards among hospital laundry workers to help protect their health by recognizing occupational health hazards in their workplaces and drive authorities to increase attention to health and safety of this category of workers to implement safer management techniques.

References

[1] Langabeer, j. R., & Helton, J. (2016). Health Care Operations Management: A systems perspectives. 2nd edition, United States of America: Jones and Bartlett learning publication LLC, p.p. 311-312.

- [2] Fontoura, F., Gonçalves, C., & Soares, V. (2016). Hospital laundry working and environment conditions: workers' perception. *Brazilian Journal of Occupational Health*, 41, 1-11.
- [3] Nwankwo, C. M., Karanja, S., & Vasanthakalam, H. (2018). The occurrence of occupational health hazards in districts health facilities in Kigali, Rwanda. *International Journal of Community Medicine and Public Health*, 5(1), 21-29.
- [4] Khapre, M., Naik, S., & Mudey, A. (2015). Study on knowledge and attitude regarding the occupational safety in tertiary care hospital. *Int. J. Cur. Res. Rev.*, 7 (5), 30-33.
- [5] Omojiade, E. N., & Okareh, O. T. (2018). A comparative study of the common health and safety complaints among laundry workers in secondary and tertiary health facilities in Nigeria. *Journal of Environmental Science, Toxicology and Food Technology*, 12 (5), 1-12.
- [6] Kumar, M. S., Goud, B. R., & Joseph, B. (2014). A study of occupational health and safety measures in the laundry department of a private tertiary care teaching hospital, Bengaluru. *Indian Journal of Occupational and Environmental Medicine*, 18(1), 13-20.
- [7] Arcangeli, G., Montalti, M., Sderci, F., Giorgi, G., & Mucci, N. (2019). Risk assessment in an industrial hospital laundry. *Proceedings of the 20th Congress of the International Ergonomics Association (IEA 2018)*, 820, 438-445.
- [8] Okareh, O. T. (2018). Bacterial pathogens from bed linen used in secondary and tertiary health facilities in Benin city, Nigeria. *Journal of Microbiology & Experimentation*, 6 (2), 84-87.
- [9] Ilesanmi, O., Omotoso, B., & Falana, D. (2014). Hazards of Hospital cleaners in a tertiary health facility in Southwest Nigeria. *International Journal of Occupational Safety and Health*, 4(1), 5-10.
- [10] Manuel, M., Daphnie, L., D'cunha, S., & Suresh, S. (2015). A study to assess awareness on occupational health hazard among laundry workers. *Muller Journal of Medical Sciences and Research*, 6 (1), 40-44.
- [11] Abdel-Wahed, A., Ghandour, A. A., & Elsaidy, W. H. (2013). Risk assessment of physical health hazards in Al-Azhar University Hospital in New Damietta, Egypt. *The Egyptian Journal of Hospital Medicine*, 31(914), 1-17.
- [12] Fontoura, F. P., Gonçalves, C.G.O., Lacerda, A. B. M., & Coifman, H. (2014). Noise effects on hospital laundry workers' hearing. *Rev. CEFAC*, 16(2), 395-403.
- [13] Omojiade, E. N. (2018). An assessment of laundry workers exposure to workplace hazards in secondary and tertiary health facilities in Benin-city, Nigeria. *MOJ public health*, 7 (5), 252-259.
- [14] Izadi, N., & Piruznia, R. (2018). Occupational health hazards among health care workers. *Public Health*, 2 (1), 1-3.
- [15] Sukumar, S., & Karthiga, V. (2014). A Study on laundry workers attitude towards health care industry in Trichy city. *International Journal of Scientific and Research Publications*, 4 (1), 1-8.
- [16] Lopes, C. M., Scavarda, A. J., de Carvalho, M. N. M., Vaccaro, G., & Korzenowski, A. L. (2019). Analysis of sustainability in hospital laundry: the social, environmental, and economic (Cost) risks. *Resources*, 8 (37), 1-15.
- [17] Muslim, E., Nurtjahyo, B., & Ardi, R. (2011). Ergonomic analysis of garment industry using posture evaluation index (PEI) in virtual environment. *Makara Journal of Technology*, 15(1), 75-78.
- [18] Shiferaw, Y., Abebe, T., & Mihret, A. (2012). Sharps injuries and exposure to blood and bloodstained body fluids involving medical waste handlers. *Waste Management & Research*, 30(12), 1299-1305.
- [19] Mogale, N. M., Malangu, N., & Huma, M. (2015). Occurrence of occupational slips, trips and falls amongst health workers in Limpopo Province of South Africa. *Botswana Journal of African Studies*, 28(1), 72-80.
- [20] Ribeiro, G., Haddad, A., & Galante, E. (2017). Risk mapping and prioritization—case study in a Brazilian industrial laundry. *Occupational Safety and Hygiene*, 4, 41-46.

