Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 3, pp: (106-116), Month: September - December 2018, Available at: www.noveltyjournals.com

Assessment of Ergonomic Health Hazards among Sanitary Workers at Health Insurance Organizations Hospitals in kefir EL sheikh

[1]MOUSTAFA, LAMIAA ABDEFATAH, [2]AHMED, AMEL I.,
[3]ABD EL-MOUTY, SAMIA M.

Community Health Nursing Department, Faculty of Nursing, Mansoura University, Egypt

Abstract: **Healthcare workers (HCWs) especially sanitary workers are potentially exposed to ergonomic health hazards during their workday and are thus at greater risk of Musculoskeletal disorders. Applying the fundamental body mechanic principals related to ergonomic process, use proper equipments, training program among ergonomic hazards, proper and safe environment and safe tools and equipment, all that precautions can help in preventing the ergonomic health hazards and controlling in risk factors.**

Aim: To assess ergonomic health hazards among sanitary workers.

Design: Cross- sectional design was conducted among (168) sanitary workers within Health Insurance Organizations Hospitals in Kefir EL-Sheikh branch, Egypt , from Jan to March 2016.

Tools: five tools were used for assessment hospitals policy, non-structure environment of hospitals, demographic data, knowledge, and practice of sanitary workers were obtained their exposure to ergonomic hazards.

Results: There's no policy specific for the ergonomic hazards, the non-structure of hospitals such as supportive materials, equipments, transferring and lifting devices some were not available and need maintenance and not suitable to use. The studied sanitary workers age up to 35 years with mean age of 36.8 ± 7.8 years ., the most qualification were educated and about their years of experience it was 10 years at workplace. Concerning their knowledge were poor knowledge regarding ergonomic health hazards. However, unsatisfactory practice about ergonomic standard. Workload, inadequate equipment and supplies, resources, not continue training courses were identified as barriers or factors that lead to ergonomic health hazards.

Conclusion: The study concluded that sanitary workers showed poor level of knowledge, unsatisfactory level of practice regarding ergonomic health and safety. Workload, inadequate equipment and supplies, no training courses regarding ergonomic health hazards.

Recommendations: The study was recommended to continuous assessment of sanitary workers practice regarding ergonomic hazards.

***Keywords*: Ergonomic health hazards, Sanitary workers, Musculoskeletal disorders (MSDs).**

1. INTRODUCTION

In hospital departments are highly variable of occupational hazards**.** More than 11 million healthcare human resources are employed in the United States, constituting about eight percent of the entire workforce. Occupational hazards refer to workplace factors with a potential for harm in terms of injury or illness. However, ergonomic injuries from patient lifting and handling, lifting heavy equipment, and static postures (**Dropkin, 2013; Gorman 2013**).

Ergonomics is the discipline and art of fitting the job to the workers. Ergonomic studies evaluate a full range of tasks such as lifting, pushing, walking, and reaching. Without ergonomic considerations in the design of work, workstation, and equipment, the demands of the work may be excessive and result in worker injuries **(Alberta, 2011).**

Assessment of the ergonomic health hazards among sanitary workers to put process for reducing the risk of developing Musculoskeletal disorders (MSDs) to the workers such as provide management support, as workers to participate in ergonomic approach, provide training to insures that workers are aware of ergonomic hazards. Additionally, It is important to classify and assess ergonomic problems and encourage early reporting of MSDs symptoms that helping to prevent or reduce the progression of symptoms, control the hazards, and finally evaluate the progress of the hazards **(OSHA 2011).**

Ergonomic health and safety are very important in health care setting to support of sanitary workers body mechanics principals to avoid complaining of musculoskeletal disorders and injury. Therefore, the main objective of this study was to assess ergonomic health hazards among sanitary workers at Health Insurance Organizations Hospitals (**OSHA, 2013**).

2. MATERIAL AND METHODS

Research design:

Cross- sectional design was used in this study

Setting:

This study was carried out at health Insurance Organization's hospitals in Kefir El sheikh..

Subject and sampling:

Total number of 168 sanitary workers, who were sample size in two hospitals first one sample size (112), second one (56).

Study tools:

Data had collected by using four tools that were used in this study for data collection and strategy development as followed:-

Tool I: Structured interview questions was used to assess preventive measures policy.

Tool II: Structured interview questionnaire to assess personal demographic, occupational characteristics of sanitary workers and health status.

Tool III: Structured interview questionnaire to assess knowledge of sanitary workers about ergonomic health hazards.

Tool V: Observation checklist to observe sanitary workers practice during cleaning tasks

Methods:

An official letter will be issue to director of health insurance organization, Kefir-El-sheikh branch, from Faculty of Nursing, Mansoura University to obtain permission to accomplish this study. Ethical approval on the study was obtained from the research ethics committee of the faculty of nursing, Mansoura University.

- Oral consent obtained from participants at the being of the study
- Data generated was analyzed using Stand for Statistical Product and Service Solutions (SPSS version 20). Statistical techniques employed include descriptive statistics.

3. RESULTS

Table 1: Shows that both health insurance hospitals had general policies and plan for the safety and health of workers. However this policy wasn´t specific for the ergonomic hazards. They did not have policy regarding ergonomic safety. The occupational health team and safety have training courses in fire protection and infection control that is partially implemented, and didn´t have any role regarding injuries of sanitary workers or ergonomic process. There is a clear incident reporting system, but workers don´t use it and not applied.

Table 2: Reflects that 63.7% of sanitary workers were males and their mean was 36.8 ± 7.8 years old. Concerning their level of education 74.4 % were educated. Regarding their experience years was (67.3 %) for less than 10 years. All of them (100%) were responsible for cleaning floor and transferring the items and equipment. More than half (58.6%) of sanitary workers were spending 8 hours shifts, and 88.00% of them had one day weekend.

Table 3: Indicates that more than three fourth (89.0%) workers did not take medications before the employment. The prevalence of musculoskeletal problems was increased among sanitary during their employment period compared to the prevalence of these problems before becoming sanitary workers. The reported musculoskeletal problems that markedly increased during their employment period were neck pain (41.7%), knee pain (29.8%), shoulders pain (35.7%), back pain (63.7%), injuries (20.0%), twisting (29.0%), and fracture (11.9%).

Table 4: Reveals that all sanitary workers (100 %) poor of knowledge regarding of ergonomic safety and health standards. Most of them (91.7%) showed poor level of knowledge regarding the factors of ergonomic health hazards. Moreover they showed poor knowledge regarding types, sources, and effects of ergonomic health hazards, 76.2%, 64.1%, 66.4%; respectively.

Table 5: Clarifies sanitary workers' practice for body mechanics. In general the practicing of body mechanics was not satisfactory for most of body mechanic items. Using pads when kneeling or use folded towel, rotation of foot with the body as a whole, and not only with the back and keeping their trunks in an awkward posture were done by only 1.8% of workers. Carrying weights not more 25kg closeting the items with body was done by 11.9% of workers. Also 20% of workers were keeping their knees flexed during placing loads, and 25% of them were keeping their shoulder and trunks in straight position..

Table 6: Describes the sanitary workers during using the facilities and equipment. The majority of sanitary workers (89.3%) used personal protective measures and 88.1% of them used elevator to transfer wastes bags. However, the observation of sanitary workers revealed that less percentage of them used lightweight mop (1.8%), and hosting devices for lifting items (12.5%).

Table 1: Description of the policy of health insurance hospitals related to ergonomic health hazards

Items	H (1)	H (2)
-Presence of Occupational safety and health team	Yes	Yes
-has a qualified team	No	No
-Members of team are well-trained on safety health goals and standards	No	No
-Do the team members apply the planned policy?	No	No
-There is a policy for incident reporting	No	No
-There is a policy for clarifying the team responsibility included in the written safety plan	Yes	Yes
-There is a policy for sanitary workers participate on the written safety plan and its improvements	No	No
-The team have up to date hazards control plan.	No	No
-there is a policy determining the average time between incidences and reporting	No	No
-There is a plan tracking standards of (OSHA)	No	No
-There is policy to perform continues training on the new devices , supplies, and plans	No	No
-presence of clear written instructions on using fire extinguisher	Yes	Yes
-Occupational Safety and Health Committee is held once a month	Yes	Yes
-There is policy for action taken to correct errors or deficiencies that causes of the hazards.	No	No
-Presence of a visible, suitable and effective waste disposal plan for hazardous materials.	Yes	Yes
-Presence of policy and Precautions for electric fires	Yes	Yes

H 1= AL Opour hospital

H 2= Foua hospital

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 3, pp: (106-116), Month: September - December 2018, Available at: www.noveltyjournals.com

Table 2: Distribution of sanitary workers according to their demographic characteristics (N = 168)

Demographic and occupational characteristics	N	%
Sex		
Female	61	36.3
Male	107	63.7
Age		
25 – 35	78	46.4
35 – 49	64	33.5
≥ 50	30	17.9
Mean ± SD	36.8 ± 7.8	
Level of education		
-Educated	121	74.4
-Non-educated	47	25.6
Experience years		
≤ 10	**113**	**67.3**
20 and more	**75**	**32.7**
Mean ± SD	**6.0** ± 0.9	
Type of assigned tasks:- Cleaning the floor and porters	168	100
Duration of shifts :- *- 8 hour* *- 6 hours*	98 70	58.3 41.7
Weakly vacation ***- one day*** ***- more than one days***	148 20	88.00 11.9
Duration of break - ***One hour*** - ***More than one hour***	16 121	9.5 72.4

Table 3: Distribution of sanitary workers accords to their health status before and during employment. N= 168

Items	Before		During	
	No	%	No	%
-Not taking medication related to musculoskeletal problems	156	89.0	80	47.2
-Taking medication before attendant of the work related to musculoskeletal problems	12	11.0	88	52.8
-Musculoskeletal problems	61	46.3	107	63.7
- back pain	30	17.9	60	35.7
-shoulders pain	20	11.9	34	20.0
- neck pain	11	6.5	50	29.0
-Injuries	6	4.0	20	11.9
-twisting	0	0	70	41.7
-knee pain	0	0	50	29.8
-fracture				

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 3, pp: (106-116), Month: September - December 2018, Available at: www.noveltyjournals.com

Table 4: Distribution of sanitary workers according to their knowledge level about ergonomic health hazards (N = 168)

Items	(Poor<50%)		(Fair 50-80%)		Good>80%)	
	N	%	N	%	N	%
-Definition of ergonomic health hazards	114	67.9	54	32.1	0	0
-Types of ergonomic health hazards	128	76.2	30	17.8	10	6.0
-Sources of ergonomic health hazards	108	64.1	60	35.9	0	0
-Factors of ergonomic health hazards	154	91.7	12	7.0	2	1.3
-Effects of ergonomic health hazards	112	66.4	54	32.3	2	1.3
- Manner of proceeding ergonomic health hazards	128	76.2	40	23.8	0	0
- Hazards materials and waste management plan	114	67.9	39	23.2	15	8.9
- There is review of relevant policies and procedures and skills needed	128	76.2	40	23.8	0	0
- Standards of safe methods regarding ergonomic hazards	168	100	0	0	0	0

Table 5: Observation checklist of sanitary workers body mechanics practice (N = 168)

Items	Done		Not done	
	N	%	N	%
-Taking rest between tasks	109	64.9	59	35.1
-During doing everyday jobs, exchange between the left and right hands	104	62.0	64	38.0
-During lowering heavy weights let the leg muscles lift and laying them, be sure fingers and toes are clear	90	53.6	78	46.4
-Shoulder and trunk in straight position	43	25.6	125	74.4
-During carry things, keep the back straight and the arms and also make the elbow close with the body	40	23.8	128	76.2
-The knees is flexed when placing loads	34	20	134	80.0
-Maintain the integrity of the body with the arms in the drawing and pulling of waste and washing cars	30	17.9	138	82.1
-Avoid stretching the hands	26	15.5	142	84.5
-The body is smooth when bending and twisting	20	12.0	148	88.0
-Carrying weights not more than 25kg to men and 15kg to women.	20	12.0	148	88.0
-Planning during lifting and getting help when possible	15	8.9	173	91.9
-Keep the loads close to the trunk for as long as possible during lifting and placing them	13	7.7	175	93.3
-Keep the arms within the load formed by the legs	10	6.0	158	94.0
The body is straight on changing the posture from stand to sit and vice versa.	5	3.0	163	97.0
Using knee pads when kneel or use fold towel	3	1.8	165	98.2
-The foot is rotated with the body as a whole, and not only with the back	3	1.8	165	98.2
-The trunk of the body is in an awkward posture.	3	1.8	165	98.2

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 3, pp: (106-116), Month: September - December 2018, Available at: www.noveltyjournals.com

Table 6: Observation checklist of sanitary workers practice for using facilities and equipment regarding ergonomic health hazards. (N =168)

Items	Done		Not done	
	N	%	N	%
-Using near water source	160	95.2	8	4.8
-Using Personal protective measures	150	89.3	18	10.7
-Using elevator to transfer the wastes bags to the storage	148	88.1	20	11.9
-Devices are daily tested	104	61.9	64	39.1
-Keep of cleaning tools always clean and tidy and maintenance periodically	62	36.9	106	63.1
-Recheck the equipment and items before using	54	32.1	114	67.9
-Use the equipment 1with proper ergonomic designing (shape – size- adjustment and angle)	54	32.1	114	67.9
-The main power of devices are disconnected during cleaning	43	25.6	125	74.4
-Using pad the mop handle and bucket handle	34	20.2	134	79.8
-Use dust collections machine	24	14.8	144	85.2
-Using all tools control device handles provided with a means for locking –out	23	13.7	145	86.3
-Use hosting devices for lifting items	21	12.5	147	87.5
-Using wheels are visually inspected and tested	12	7.1	156	92.9
-Using lightweight mops that pivot easily and with tale 90cm	3	1.8	165	98.2
-Application of high force principals during (scrubbing, squeezing, moving) of the equipment.	2	1.2	166	99.8

4. DISCUSSION

Globally world health organization (WHO) estimates that every year unsafe environment and musculoskeletal disorders for healthcare workers which represents 12% of the working population. A advanced annual prevalence of back pain (77%) among healthcare workers compared to other occupational groups has been reported. Healthcare workers encounter diverse hazards due to their work activities especially of sanitary workers. Sanitary workers are exposed to a combination of risk factors of different nature such as high work intensity, high workload, working under time pressure, difficulties in keeping up with work, poor work organization, awkward working postures, application of high forces, repetitive movements , lifting and carrying loads, poor ergonomic design, which are all factors associated with the development of musculoskeletal disorders (**OSHA, 2013**)

According to sanitary workers in hospitals, meet unique risks that uncommon in other health sectors. These risks as lifting, reposition transfer patients and equipment, and cleaning tasks that lead to ergonomic hazards. Ergonomic hazard is the science of studies and evaluates a full range of tasks including, but not limited as lifting, pushing, and walking. Many ergonomic problems result from technological changes such as assembly line speeds, adding specialized tasks, increased repetition and poor tasks **(OSHA , 2013)**

Moreover, heavy lifting, improperly designed tools or work areas. In addition to over prolonged periods of time as in jobs involving sorting, assembling, an often cause irritation and inflammation of the tendon sheath of the hands and arms, While injuries can be caused by performing the same motion, over and over again (such as vacuuming), using physical force (lifting heavy objects), or being in an awkward position (twisting the body to reach a light bulb) (**Washington, 2010; OSHA, 2015).**

In the present study, both health insurance hospitals hadn´t policies regarding ergonomic health hazards or preventive plan. There was occupational safety and health team, but the team wasn´t qualified regarding to ergonomic health hazards because they didn´t trained or aware about ergonomic health hazards, but they only know information about fire protection and infection control policy. Additionally, it had no clarifying the team responsibility regarding to ergonomic health hazards as reporting, recording and analyzing the incident reports. Otherwise no action taking to correct any errors or taking action toward any incident that happen, no standard or Guideline in the studied hospitals for ergonomic.

These results disagree with (**OSHA, 2010)** standards , which recommended that, an ergonomic process should be use the policy, standard, or guidelines to address musculoskeletal disorders (MSDs), injury and illness, such as use qualified occupational health team, define clear goals and objectives, assign responsibilities to improve the sanitary workers health and put good ergonomic control program and increase awareness of the team and sanitary workers.

As regards to the non- structure environment in both hospitals regarding to ergonomic health hazards. The present study showed that the supportive materials, equipment, transferring and lifting devices weren´t available and, while the operation tray, patient trolley, wheel chairs waste disposal containers were n´t properly maintained and not enough in all departments. Sanitary workers carry the items and equipments on the shoulders, trailing cables in dialyses and Operating room (OR) were not arranged because during procedures many of devices around the field, poor lightening , unsuitable floor cover all that factors increase exposure of sanitary workers to ergonomic hazards which lead to musculoskeletal disorders.

The present study agree with (**OSHA, 2013 ; NIOSH Guidelines, 2013**) which revealed that, work related injuries have greatly outnumbered illnesses in hospitals throughout the past 20 years. The causes of musculoskeletal disease or injury can extend beyond the workplace, unsuitable environment or devices for patient transfers from one surface to another, include a variety of mechanical lifting devices, including total lifts, sit stand lifts, stand aids, and adjustable height bed and baths should be automatically. These depends on the patient ´s weight and medical condition, so that (OSHA) recommended that, lifting may be portable or permanent electrically powered, ceiling lifts are preferable to electric portable, floor-based lifts and they avoid problems with storing and accessing portable lifting equipment. Storage locations should be identified near the point of use, properly labeled and accessible at all times, unlocked during all shifts.

Moreover, the cleaning equipment wasn´t suitable to sanitary workers and need more efforts in use and not enough quantities. Portable machines for lifting and positioning of heavy objects or tools not available and transportation devices to transfer bulky packages wasn't available. These results come in disagree with **(OSHA standards, 2015)** which recommended that all handling devices are automatic and using suitable equipments during practice of cleaning tasks such as using personal protective equipment, use lightweight mops that move easily, provide microfiber mops and long-handled scrubbers, drill holes into the bottom of garbage barrels. This makes it easier to lift garbage bags out of the barrel and provide a dolly or rolling cart for moving heavy objects to illuminate ergonomic hazards.

The socio-demographic and occupational characteristics of studied sanitary workers in the current study revealed that, more than half of sanitary workers were males and their mean was 36.8 ± 7.8 years old. Concerning their level of education two thirds of them were educated, their experience years was more than10 years. All of them were responsible for cleaning floor and transferring the items and equipment. More than half of the sanitary workers shift duration had (8) hours and make rotation every week to all workers area except in critical area. These results agreement with (**Shafiezadeh, 2014**) which showed that, age group ≤ 30 years and work in 3 shifts of sanitary workers had 1.8 time a greater chance of developing (WMSDs) than work in single shift and job rotation (28.2%) may protect from the risk of development (WMSDs).

Moreover, these results come in agreement with (**Devereux, 2002; Compo**, **2008**) which reported a female predominance in the prevalence of musculoskeletal disorders (MSDs) and injury, it was found that sanitary workers special female in health sitting have (1.9) times higher risk for developing (MSDs) than male in same place, but the age group distribution and work experience reveals that younger age group of ≤ 30 years with ≤ 5 years of sanitary workers experience and who work in 3 shifts have a greater chance of developing (WMSDs). Moreover, sanitary workers who are involved actively in other physical activities such as lifting ,caring ,transferring the items and equipments have 1.8 times greater chance of developing (WMSDs) than those who are not involved in other physical activity.

Concerning to health status, current study showed that more than three fourth workers did n´t take medications before the employment. The occurrence of musculoskeletal problems was increased among sanitary during their employment period compared to the occurrence of these problems before becoming sanitary worker. The reported musculoskeletal problems that markedly increased during their employment period were neck pain, knee pain, shoulders pain, back pain especially female related to natural of their body. In addition to, injuries, twisting, and fracture.

These results come in agreement with **(Shafiezadeh, 2014)** study that revealed job rotation (28.2%) may protect from the risk of developing WMSDs. The sanitary workers who are involved actively in other physical activities such as lifting, caring, transferring the items and equipments have 1.85 times greater chance of developing WMSDs than those who are n´t involved in other physical activity In another hands according to (**William Basely, 2015**) which found that higher annual prevalence of back pain (77%) among sanitary workers compared to other occupational groups has been reported. back injury are associated with a high cost to organization. In fact ergonomic related injuries is a significant health risk to sanitary workers, it is the most prevalent occupational injury in healthcare site.

As regards to the knowledge level, the current study showed that, studied sanitary workers had poor of knowledge regarding of ergonomic safety and health standards. Most of them showed poor level of knowledge regarding the factors of ergonomic health hazards, poor knowledge regarding types, sources, effects of ergonomic health hazards on masscult skeletal system. This finding may be due to no training programs or awareness to sanitary workers for ergonomic health hazards.

These study was contrast with (**General health and safety legislation, (2013); Karwowski, (2003); OSHA, (2015**) which recommend that awareness, education, and training programs on prevention and coping strategies for musculoskeletal disorders (MSDs) be made mandatory for health care professionals especially for the high-risk groups such as sanitary workers not only to reduce the occurrence of WMSDs among them, but also to promote efficiency in patient care. An integrated health promotion model should be planned for sanitary workers in workplace. Sanitary workers are exposed to the possibility risks must be trained in specific measures to eliminate or reduce that possibility. the training must include the factors that could lead to the signs and symptoms of (WMSDs) as well as potential health effects and preventative measures.

Concerning to body mechanic issue regarding ergonomic health hazards, The present study showed, sanitary workers were unsatisfactory toward following body mechanic correctly regarding to ergonomic health hazards . such as , using knee pads lifting posture caring the weight, body flexibility, using awkward posture, the shoulder with trunk in straight position close the using knee pads, lifting posture caring the weights, close the body with load, rotated the body mechanics correctly, lowering the heavy weights during doing tasks, avoid stretching the hands, taking rest period between tasks and the body is smooth when bending and twisting.

In general that findings lead to the sanitary workers more exposed to ergonomic hazards such as, injuries include strains, sprains, and other problems, additionally, patient handling, stock and material moving and highest number of overexertion injuries, this injuries often involve strains and sprains to the lower back, shoulders, and upper limbs. These injuries can be caused by performing the same motion, over and over again (such as vacuuming), using physical force (lifting heavy objects), or being in an awkward position (twisting the body to reach a light bulb) leading to (MSDs).

The present study agree with the (**National institute for occupational safety and health (NIOSH), 2011 ; Washington, 2015)** which highlights how workers in items stores can increase strains and sprains when moving materials from the delivery truck to the using area and manage job tasks that can lead to musculoskeletal injuries, so the sanitary workers would use mechanical assist devices to lift, posh or poll heavy materials or items. lifting equipment and manual material handling risks associated with lifting and lowering tasks in the workplace and job task were variables, so sanitary workers should be use body mechanic and body posture correctly during forceful exertion, type of movement or action, repetition and coupling, for each of the following body regions, wrists, for arms, elbows, shoulders, neck, trunk, back, legs and knees.

According to, **(the Bureau of Labor, 2015**) statistics, musculoskeletal injuries or called overexertion injuries accounted for approximately 30% of occupational injuries that resulted in time away from work, that lead to ergonomic hazards so that agree with present study sanitary worker did not applied the health and safety standards regarding using body mechanic correctly.

Moreover, (**Gilbert, 2007**) Study highlights that half of respondents had experienced an occupational health hazard, mostly sharp related injuries and stress. The likely predictors for both ergonomic and environment hazards were n´t wearing all the necessary personal protective equipment, were working overtime, and were job related pressures of the work. In addition, ergonomic hazards were predicted by working in multiple health facilities. The mitigation measures to control the hazards were mainly availing waste disposal facilities for the medical waste and provision of safety tools and equipment.

As regards using the facilities and equipment, the most of sanitary workers used personal protective measures and used elevator to transfer wastes bags. However, the observation of sanitary workers revealed that less percentage of them used lightweight mop, and hosting devices for lifting items not available, because of there is no suitable equipment for working tasks to decrease efforts, This study was contrast with (**OSHA**, **2014**) standard which recommended that , application of high forces such as scrubbing, squeezing, moving and controlling were need power equipments, lifting and carrying loads, working with arms over shoulder level over longer period of time to clean dust need suitable equipments and tools (shape, size, adjustment and angle) and equipment handles should be available and use proper ways. In addition cleaning work often bent forward and with twisted backs. Sanitary workers daily perform high numbers of repetitive movements of the arms and a high static and dynamic output of force should be regular during mopping. muscular activities contribute to muscle fatigue and may lead to musculoskeletal disorders.

According to**, (Aickin, 2010**; **OSHA, 2013**) the weight handled by cleaners ranged from 2Kg to 42 kg. However, in the current study the heaviest lifting and handling activities were more than 42kg, moving furniture and handling floor polishers, that lifting was combination with awkward postures adopted to handle the load, twisted bent and duration repetition of handling the load, so that all was the main ergonomic risk factors leading to MSDs**.**

Globally, in the present study, sanitary workers were exposed to a combination of risk factors and character sets of cleaning work such as high work intensity, workload, working under time pressure, difficulties in keeping up with work, poor work organization, and unsatisfactory of using body mechanic correctly, all that factors associated with the development of musculoskeletal disorders, and also sanitary workers were poor knowledge regarding to ergonomic health hazards may be due to no training courses or awareness regarding that.

Regarding to **Healthcare and Social Assistance** (**HCSA, 2013)** which establish national standards to guide the reduction in musculoskeletal disorders in sanitary workers. These include guidance and templates that equipment selection, policy development, program coordination, management training, and program assessment. They also include algorithms that can be used to maximize safety during handling and mobilizing all patients with extra guidance for patient size, easy access to the suitable tools.

5. CONCLUSION

Based on the findings of the presents study, it can be concluded that, both studied hospitals hadn´t policies regarding ergonomic health hazards. Concerning to non-structure environment the cleaning equipments wasn´t suitable for working tasks to decrease efforts, portable machines and mechanical transportation devices wasn´t available and manual tools need maintenance. However, sanitary workers had poor knowledge regarding define ergonomic health hazards, sources, factors and precautions. Moreover, unsatisfactory about using body mechanic correctly regarding ergonomic health and safety.

6. RECOMMENDATION

Based on the findings and conclusion drawn from the study, the following recommendations are:-

- Periodic and continuous education program for sanitary workers about ergonomic health hazards.
- A written policy of ergonomic health hazards should be available for some work in their work place and easily to access by each workers.
- Availability of all facilities and equipment for sanitary workers tasks to reduce the exposure to ergonomic hazards.
- Further study needed to continuous evaluation for ergonomic health hazards.

REFERENCES

[1] Brun, E. (Ed.). (2009). *The occupational safety and health of cleaning workers*. Publications Office. imer, B. K., & Glanz, K. (2005). Theory at a glance: a guide for health promotion practice .

[2] Marck, P. B., Kwan, J. A., Preville, B., Reynes, M., Morgan-Eckley, W., Versluys, R., & Majumdar, S. R. (2006). Building safer systems by ecological design: using restoration science to develop a medication safety intervention. *BMJ Quality & Safety*, *15*(2), 92-97.

[3] Gorman, T., Dropkin, J., Kamen, J., Nimbalkar, S., Zuckerman, N., Lowe, T. & Freund, A. (2014). Controlling health hazards to hospital workers: A reference guide. *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy*, *23*(1_suppl), 1-169.

[4] Tavakoli, S. J., Hardesty, J. O., & Held, W. F. (2011). *INH Risk Mitigation Workshop* (No. SAND2011-0083C). Sandia National Lab.(SNL-NM), Albuquerque, NM (Unit ed States).

[5] Rom, W. N., & Markowitz, S. B. (Eds.). (2007). *Environmental and occupational medicine*. Lippincott Williams & Wilkins.

[6] Bell, D., & Heitmueller, A. (2009). The Disability Discrimination Act in the UK: Helping or hindering employment among the disabled?. *Journal of health economics*, *28*(2), 465-480.

[7] Runciman, B., Merry, A., & Walton, M. (2017). *Safety and ethics in healthcare: a guide to getting it right*. CRC Press.

[8] Prielipp, R. C., Magro, M., Morell, R. C., & Brull, S. J. (2010). The normalization of deviance: do we (un) knowingly accept doing the wrong thing?. *Anesthesia & Analgesia*, *110*(5), 1499-1502.

[9] Chu, C., Breucker, G., Harris, N., Stitzel, A., Gan, X., Gu, X., & Dwyer, S. (2000). Health-promoting workplaces—international settings development. *Health promotion international*, *15*(2), 155-167.

[10] Rogers, A. E., Hwang, W. T., Scott, L. D., Aiken, L. H., & Dinges, D. F. (2004). The working hours of hospital staff nurses and patient safety. *Health affairs*, *23*(4), 202-212.

[11] Punnett, L., & Wegman, D. H. (2004). Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. Journal of electromyography and kinesiology, 14(1), 13-23.

[12] BoyerPunnett, L., & Wegman, D. H. (2004). Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. Journal of electromyography and kinesiology, 14(1), 13-23.

[13] Galizzi, M., Cifuentes, M., d'Errico, A., Gore, R., Punnett, L., & Slatin, C. (2009). Ergonomic and socioeconomic risk factors for hospital workers' compensation injury claims. *American journal of industrial medicine*, *52*(7), 551-562.

[14] Mbaisi, E. M., Wanzala, P., & Omolo, J. (2013). Prevalence and factors associated with percutaneous injuries and splash exposures among health-care workers in a provincial hospital, Kenya, 2010. Pan African Medical Journal, 14(1).

[15] Vaughn, T. E., McCoy, K. D., Beekmann, S. E., Woolson, R. F., Torner, J. C., & Doebbeling, B. N. (2004). Factors promoting consistent adherence to safe needle precautions among hospital workers. *Infection Control & Hospital Epidemiology*, *25*(7), 548-555.

[16] Dement, J. M., Epling, C., Østbye, T., Pompeii, L. A., & Hunt, D. L. (2004). Blood and body fluid exposure risks among health care workers: results from the Duke Health and Safety Surveillance System. *American journal of industrial medicine*, *46*(6), 637-648.

[17] Gaba, D. M., Singer, S. J., Sinaiko, A. D., Bowen, J. D., & Ciavarelli, A. P. (2003). Differences in safety climate between hospital personnel and naval aviators. *Human Factors*, *45*(2), 173-185.

[18] Flin, R., Burns, C., Mearns, K., Yule, S., & Robertson, E. M. (2006). Measuring safety climate in health care. *BMJ Quality & Safety*, *15*(2), 109-115.

[19] Breslin, F. C., Polzer, J., MacEachen, E., Morrongiello, B., & Shannon, H. (2007). Workplace injury or "part of the job"?: Towards a gendered understanding of injuries and complaints among young workers. *Social Science & Medicine*, *64*(4), 782-793.

[20] Kirst, M. W., & Bracco, K. R. (2004). Bridging the great divide: How the K-12 and postsecondary split hurts students, and what can be done about it. *From high school to college: Improving opportunities for success in postsecondary education*, 1-30.

[21] Lyubomirsky, S. (2008). *The how of happiness: A scientific approach to getting the life you want*. Penguin.

[22] Heywood, J. S., Jirjahn, U., & Tsertsvadze, G. (2005). Getting along with colleagues–does profit sharing help or hurt?. *Kyklos*, *58*(4), 557-573.

[23] Fullilove, M. T. (2016). *Root shock: How tearing up city neighborhoods hurts America, and what we can do about it*. NYU Press.

[24] Sanderson, K., & Andrews, G. (2006). Common mental disorders in the workforce: recent findings from descriptive and social epidemiology. *The Canadian Journal of Psychiatry*, *51*(2), 63-75.

[25] Van Praag, C. M., & Cramer, J. S. (2001). The roots of entrepreneurship and labour demand: Individual ability and low risk aversion. *Economica*, *68*(269), 45-62.

[26] Foster, H. D. (2012). *Disaster planning: The preservation of life and property*. Springer Science & Business Media.

[27] Lewis, D. W., & McConchie, D. (2012). *Analytical sedimentology*. Springer Science & Bus Luc de Haro, M. D., & Pommier, P. Envenomation: A Real Risk of Keeping Exotic House Pets.

[28] Sawyer, A., & Bright, K. (2014). *The access manual: Designing, auditing and managing managing inclusive built environments*. John Wiley & Sons.

[29] Bowen, R. E., Depledge, M. H., Carlarne, C. P., & Fleming, L. E. (Eds.). (2014). *Oceans and human health: implications for society and well-being*. John Wiley & Sons.