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A STUDY OF ERGONOMICS AND ITS EFFECT ON THE HOUSEKEEPING EMPLOYEES

***Chingromawi[1], Dr. Shweta Misra[2] and Sakshi Sharma[3]**

[1]Global Development Trainee (Voyager-Rooms Operations) Aloft, Aerocity, New Delhi, [2]Senior Lecturer and [3]Lecturer, Institute of Hotel Management, Catering and Nutrition, Pusa, New Delhi

*chingromawi02@gmail.com

ABSTRACT

Background: *Ergonomics is the science of designing work as per the human body, it is used by the management to make the work processes safe for their workers. Housekeeping involves lots of physical work, therefore it is necessary that such research should be done on housekeeping department employees.* **Objectives:** *The objectives of this study were: to understand the application of ergonomics in the housekeeping department, to study the effects and challenges of ergonomics on the members of the housekeeping team, and to explore the awareness of ergonomics amongst the housekeeping employees.* **Methodology:** *The research design was a combination of experimental & descriptive. 100 housekeepers from 4 & 5 star hotels in Delhi-NCR were participants of the work. A questionnaire consisting of close-ended and few open-ended questions was circulated among the respondents on one to one basis. To study the fatigue rate while working, oxygen and pulse rate of the respondents was also recorded. Data analysis was done on the basis of gender.* **Results:** *The findings state that 98% of the housekeeping department employees were aware about the concept of ergonomics and its application in housekeeping. Unfortunately, due to constraint of time and tight work schedule, a housekeeper cannot always follow the practices of ergonomic. Oxygen level decreased (98.15±0.08) after doing the task and the pulse rate increased (95.54±1.52) after completing their task.* **Conclusion:** *Housekeepers are exposed to a range of ergonomic risk factors and are prone to posture related injuries. It has also been seen that there is a substantial difference in level of energy lost when the housekeepers are working in a hurry.*

Key Words: *Ergonomics, Musculoskeletal Disorder (MSD), Hotel Industry, Health and Safety.*

INTRODUCTION

Ergonomics is the science of designing the process, product or equipment that suits the human body. Health issues related to ergonomics have been found scribed in the Egyptian, Greek and Roman civilization. However, the development of precautionary actions based on an ergonomic viewpoint and ergonomic approaches, such as the measurement of work-related exhaustion and the establishing of principles in scientific management of labor, were not introduced until early 20th century (Ashizawa, 2000).

Housekeeping department looks after the cleanliness and upkeep of the establishment. In hotels it also looks into aesthetics like flower arrangement, indoor plant etc. (Joshi, 2016). Housekeeping department in hotels not only looks in to the cleanliness & upkeep but is also considered as the ear & eye of the security department. The responsibility of the department is also to prevent accidents. Housekeeping department helps in the infection control and prevention of the microorganism. With this kind of job profile the employees of the housekeeping department, the work of the department is highly labour intensive, for example cleaning processes, bed making etc. Due to the exposure to the labour intensive work, the employees are exposed to risk and accidents. The occupational risks are majorly because of lifting heavy

weights, bending, wrong postures and shift weights. The routine activities of the department are not reformed to the psycho-physiological needs of employees therefore the chances of occupational risk and work accidents increases (Luz et al., 2021; Weigall et al., 2005).

However, Rahman et al. (2017) established that the work risk of housekeeping employees is moderate and it mainly effects the back, shoulder, arms, wrists and neck. Aina et al. (2020), concluded in their research that the most affected area of the housekeeping employees is lower back, heel and shoulder. Rahman and Jaffar (2017), concluded that the room attendants have risk due to wrong body postures and repetitive movements. Further they pointed out that the housekeeping staff handles vacuum cleaners and the vibration of the vacuums cleaner develops musculo skeleton disorder which ultimately results in the interruption of the sensory receptor of the user. Mansour and Abdelaal (2021) study gave following reasons as the cause of musculo skeleton disorder among the housekeeping employees: monotonous job, use of hazardous material which may lead to respiratory disorders. It was further concluded in this study that majority of the housekeeping staff are not aware of ergonomics. Parmar and Dalal (2017) concluded that almost 60% of the employees have injuries in the lower back which is due to lifting heavy weights and working in same position for a long period of time.

Frumin et al. (2006) and Chebet (2021) concluded that a high percentage of hotel housekeepers face pain related issues at workplace. Chebet (2021) even mentioned in the study that inspite of the awareness of ergonomics, the employees do not practice it. Mattresses which are heavy increase the occurrence of pain in some body parts. Sánchez-Rodríguez et al. (2022) focused their study on 'Chronic pain and work conditions of hotel housekeepers' highlighted that pain was related with age, experience, pushing of the trolley and bed making. Joshi (2016) focused in their research on the 'Study of Relationship Between Ergonomics & Efficiency of the Housekeeping Employees at Workplace' that housekeeping work involves routine and repetitive work which easily leads to occupational injuries which have direct impact on the productivity of the staff.

In a study done by Anderson et al. (2017), it was acknowledged that choice of footwear is another important factor to reduce occupational inquiries. While selecting the footwear at workplace one should consider the standing nature of the job, purpose and environment in which shoes will be worn and the comfort of the wearer.

There are number of advantages of ergonomics which includes improvement of health, leading happy life; increase in output, and better service quality (Luz et al., 2021). Overall, it provides a means for regulating the work environment & work practices to avert injuries on a pre-emptive basis. Therefore, it suggested some methods for reducing the occupation risk i.e. maintaining correct body posture, handling equipment properly and physical fitness. Chijioke and Alozie (2019) carried out their research which suggested that training should be done of the housekeeping staff to make them aware about the ergonomics practices. The authors also suggested that the training should be done of the appropriate use of equipment which may reduce the pressure on the body. They also suggested that by job rotation the occupational risk may be reduced in the housekeeping department. There is need of modifying the daily tasks performed by housekeeping employees (Aina et al., 2020). In a study done by Sianoja et al. (2016), it was established that lunch breaks are an important part of the work schedule as it helps in internal recovery and also energizes the employee. To reduce work related injuries Seifert and Messing (2006) suggested that the quota of rooms to be prepared should be defined. They also concluded that standards and directive on a governmental level are essential.

Yung (2016) focused their study on 'Fatigue at the workplace: measurement and temporal development'. The combined assessments of fatigue development and temporal responsiveness suggested that evaluation of perceived fatigue and action tremor were greatly repeatable and responsive in multiple task environments on an average. As suggested by various authors, the study of ergonomics is every important in the housekeeping department. There is lots of work which has been done on work breaks, fatigue, musculoskeletal injuries and various other human resource related problem. However, not much work has been done on housekeeping specify task like dusting, sweeping, mopping, scrubbing, bed making, bathroom cleaning, etc. Therefore, this study focuses on a specific task of bed making. Bed making is the integral part of room making procedure in any accommodation providing facility. It is reported that bed making is a task which is highly labour intensive, the housekeeping staff really get tired after making beds especially in a 5-star and 4-star hotel facility.

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Thus the objectives of the study were:

- To understand the application of ergonomics in housekeeping department.
- To study the effects and challenges of ergonomics on housekeeping staffs.
- To explore the awareness of ergonomics amongst the housekeeping employees.

METHODOLOGY

Research Design: For assessing the ergonomics and its impact in housekeeping department a descriptive and experimental approach was adopted.

Locale: Five Four-Star and Five-Star Hotels respectively in Delhi-NCR were selected.

Sampling Design: Convenience sampling was done wherein 100 housekeeping associates were approached who were working in four and five 5 star hotels of Delhi/NCR. The subjects age ranged from 18 years to 45 years. There were 88 male and 12 female housekeeping associates.

Tools and Technique: For attaining information on health issues faced by the housekeepers like muscle pain and to check their awareness level about ergonomics, a well-structured questionnaire was designed consisting majorly of close-ended and a few open-ended questions, for data collection a personal interview was conducted to get a better insight. To check the biochemical parameters like pulse rate and oxygen level a well calibrated pulse oximeter was used. Task of bed-making was assigned to each housekeeper. Their pulse rate and oxygen levels were assessed before and after they performed their task for studying the effect of ergonomics and level of fatigue/loss of energy in them. Their movements were observed in order to analyse the application of ergonomics in their task.

Data Analysis and Statistical Analysis: The data was analyzed on the basis of before & after doing the bed making task. For statistical analysis frequency, percentage, mean & mean difference was calculated.

RESULTS AND DISCUSSIONS

Sociodemographic details: The subjects age ranged from 18-45 years. Majority (62%) of the subjects were from age range of 18-25 years followed by 35% in age group 26-32 years, and remaining were from the age group of 33-45 years. Of this majority were (88%) were male while 12% were female. Majority (60%) of the subjects worked for 10-12 hours a day, 34% worked for 8-10 hours on an average, , and 6% subjects worked more than 12 hours daily on an average which may be cause of work related injuries. Supporting this study Siaw (2018) reported that as high as (55.5%) housekeepers strongly agreed that working for long hours is a threat to the safety of the housekeepers. For number of rooms being cleaned during the shift majority (46%) of the subjects cleaned 13-15, 39% cleaned 16-18 rooms, and 15% cleaned more than 18 rooms during their work hours.

Table 1: Sociodemographic detail of subjects

Age (years)	**N=100** **Percentage**
18-25	62
26-32	35
33-45	3
Gender	
Male	88
Female	12

Awareness for ergonomics at workplace: Majority (92%) of the subjects were aware about ergonomics and its application in the housekeeping department. Similar results were reported by Chijioke and Alozie (2019) where 96% of the staffs were aware about ergonomics, and a very few 4% were not aware about this concept. On asking about injuries faced while doing task majority (93%) of the subjects reported that they have never injured themselves while on shift, 3% scratched their fingers on bed edges, 1% slipped on wet floor and hurt their feet, 1% hurt their shoulder from broken glass cubicle, 1% had a mild cut on their finger from a sharp object found on the HK trolley and 1% bumped their head on the wall while working in a hurry.

Experiencing muscle pain: The subjects were asked about their experience in relation to muscle pain at the time of joining as a housekeeper and current time at the time study. The difference in situations as analysed is presented in table 2 below. It was found that initially only 33% of the subjects experienced muscle pain issues while

67% did not, 20% respondents experienced back pain, 7% experienced leg pain, 1% experienced both back and leg pain, 3% respondents experienced body pain and 2% of the respondents experienced knee pain. On the other hand, at the time of conduction of study in the present situation only 18% reported to experience muscle pains, while 82% were not facing any muscle pain issues. A difference of 30% was observed between initial and present situations, and the number of subjects who had experienced muscle pain at early stage was reported to decrease in the present situation. The results are contrary to the results of Frumin et al. (2006) and Chebet (2021) as their study concluded that a high percentage of hotel housekeepers face pain related issues at workplace. Mansour and Abdelaal (2021) found that room attendants face MSD due to repetitive work, hazardous material (cleaning supplies & chemicals), exposure to broken glassware in the guest room. Their findings showed that there is a co-relation between ergonomics and occurrence of pain among the staff. Siaw (2018) stated in the study that due to time pressure and accident prone work conditions, the housekeeping employees face stress, injuries and pain.

Table 2: Respondents' initial and present experience in relation to muscle pain

	Initial Experience		**Total**	**Difference**
	Had Muscle Pain	**No Muscle Pain**		
Percentage	33%	67%	100%	34%
	Present Experience		**Total**	**Difference**
	Experiencing Muscle Pain	**No Muscle Pain**		
Percentage	18%	82%	100%	64%

Biochemical assessment: The oxygen rate and pulse rate of the subjects was recorded before and after the task (bed-making) to measure the fatigue level. The following table 3 includes the analysis of the collected data. It was observed that for majority of the subjects the oxygen level decreased (98.15±0.08) after doing the task and the pulse rate increased (95.54±1.52) after completing their task.

Table 3: Analysis of fatigue, t-Test: paired two sample for means for oxygen level and pulse level before and after task

t-Test: Paired Two Sample for Means				
	Oxygen Level		**Pulse Level**	
	Before	*After*	*After*	*Before*
Mean	98.39	98.15	95.54	86.62
S.D.	0.72	0.83	15.24	11.36
S.E.	0.07	0.08	1.52	1.13
Variance	0.52	0.69	232.39	129.20
Observations	100	100	100	100
Pearson Correlation	0.40		0.84	
Hypothesized Mean Difference	0		0	
df	99		99	
t Stat	2.80		10.66	
P(T<=t) one-tail	0.00		1.96	
t Critical one-tail	1.66		1.66	
P(T<=t) two-tail	0.00		3.92	
t Critical two-tail	1.98		1.98	

While the subjects were making the bed the observations made in order to analyse the application of ergonomics are presented in table 4. Majority (88%) were kneeling down while making the bed. Therefore, it was observed that majority of the housekeepers applied the principles of ergonomics in their task in order to reduce injury, and only a few (12%) did not follow the practice of ergonomics. Similar results were found in work done by Chijioke and Alozie (2019), where they concluded that 96% of the housekeeping staffs followed the practice of ergonomics, while 4% did not follow.

Table 4: Observations Recorded During Bed Making

Action	**Percentage**
Kneeling down	88%
Not kneeling down	12%

CONCLUSION

The current study concludes that a majority of the hotel housekeepers are cognizant of the concept of ergonomics and its use in the housekeeping department. But due to the constraints of time and busy work schedule, only a few number of housekeepers follow the practices of ergonomics, hence putting the majority of the housekeepers at the risk of getting musculoskeletal disorders. The study has established

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that the housekeeper service workers are vulnerable to multiple ergonomic risk factors and have a high risk of injury. In order to cut down on their injuries, both physical and psychosocial risk factors must be deliberated when developing system-wide policies. Though hotel housekeepers are aware about the physical injuries caused for not following the ergonomics principles, less thought is given to the root cause. One of the major findings of this research is that there is a relationship between ergonomics and level of energy loss/fatigue in a housekeeper when they are working. It has been found that when working in a hurry, the pulse rate of the majority of the housekeepers increase by 20-30% above their normal heart rate. And the oxygen level decreases by 1-2% in most of the housekeepers. This may cause shortness of breath and exhaustion for some. There is a high chance of injury as well, since the housekeeper is working in a hurry. The recommended daily work hours is said to be between 8-9 hours. When a person starts working more than his scheduled work hours, there is a high chance of getting muscle pain, their heart may be at risk, and may experience more stress and even lower the productivity at work. This eventually causes issues such as absenteeism, high attrition of the housekeeping staff, fatigue and low output. This way the inefficiency of the staff to perform as per the standards of the hotels decreases which may lead to further loss for an organization.

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