



A Study to Assess the Posture of Adults at their Work Place on Body Mechanics at Kurali: A Descriptive Study

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Abstract

Background: Body Mechanics is a term used to describe the ways we move and go about in our lives. It includes how we hold our body while sitting, standing, lifting, bending, and carrying or while moving. Poor body mechanics can often leads to poor body posture, back pain and related discomfort. Workers in industries and offices are exposed to various types of risk factors such as lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures and performing the same or similar tasks repetitively, causing morbidity. Taking care of back is a lifelong project and use of proper body mechanics is an effective way to maintain health and fitness of the back.

Objective: 1. To assess the posture of adults at their work place. 2. To develop health education package on body mechanics.

Material and Method: Non-Experimental Descriptive Design was used for study. The study was conducted among 50 subjects from various organizations at Kurali. Socio-demographic data sheet and Observation Checklist was used to observe the body mechanics practices of the subjects.

Results: The findings of the study revealed that 27 (54.0%) subjects had good body mechanics practices, 17(34.0%) had average practices where as 06(12.0%) subjects had poor body mechanics practices.

Conclusion: Half of the participants had good practices of using body mechanics, one third of the participants had average practices and some of the participants had poor practices of using body mechanics.

Keywords: Body Mechanics; Practices; Body Posture

Introduction

Body mechanics’ is described as a coordinated effort of musculoskeletal and nervous system to maintain correct, posture, and alignment. It is directly related to effective body functions. Uncoordinated body posture increases the risk of damage to the body. It also refers to the method of effective use of the body while making movements, such as bending the body, lifting a heavy object or person, stretching an arm, sitting, standing, or lying. Proper body mechanics allows an individual to carry out his or her daily activities without extra use of energy, and helps in preventing injuries for patients, health care providers and other work professionals [1]. Good body mechanics refers to the use of safest and more systematic method to lift and move patient or heavy items. Most people are aware that when they bend or lift something, they should be bending their knees. Attention must also be paid to the position of spine in order to avoid back injury and care must be taken to maintain the neutral spine. Using good body mechanics minimize the stress and decrease the occurrence of back and neck injuries. Correct posture needs to be used during patient lifting, transfer and even in the activities of daily life [2].

Computer and internet use has been increased recently over the past decades, which also leads to various musculoskeletal disorders and improper body mechanics while using computers is also leading to health problems [3]. Back injuries and other musculoskeletal disorders related to patient handling are the leading cause of workplace disability among nurses and other patient care providers. Each year approximately 40,000 nurses report work-related back pain [4,5].

Employers recognize that body mechanics and ergonomics program can be successfully applied to prevent and reduce the severity of musculoskeletal disorders and lower back pain among the working employees. Posture can be of two types Static and Dynamic. Static is when the body is almost at stationary position, while during Dynamic posture body is in walking, running or lifting position [6,7].

It is recommended that institutions should utilize strategies to promote safety for nurses and patients as patient handling and lifting in awkward positions, to prevent the lifter’s fatigue. The incidence of work-related injuries in hospitals has been evaluated on the basis of educational programs used to train nurses to employ better body mechanics while performing their jobs; and to address the culture of safety within the hospital, by creating awareness and a change in policy and expectations for nurses’ safety [8].

Therefore good body mechanics are important at work site and should be used at all times. Musculoskeletal disorders are one of the most common public health problem. The employees those who have more work on computers, longer duration of sitting jobs, long hour standing job and the workers who have more work related to lifting, shifting and transferring are more prone to have posture related issues. Hence the good body mechanics is very much important to have good posture and healthy life, The present study aims to assess the practices of body mechanics.

Objective

To assess the employees practices towards body mechanics and to develop and implement the health education package.

Material and Method

An observational study was carried out among working employees of different organizations, Kurali, Punjab. The study was conducted in two banks, two schools, one office and one hospital. Both males and females were included in the study, employees who were able to speak, read and write English and those who were present at the time of data collection at their work place were included in the study. Sample size was 50. Structured Tool including a Sociodemographic Performa and an observation checklist was developed by the investigator. Content validity and reliability of the tools was established using split half method ($r = 0.75$). Ethical permission was obtained from the heads of the organizations; informed consent was taken from the subjects before the data collection. The observation checklist consist of 34 items and was divided into two domains i.e. (sitting posture and working on computer), (standing posture, lifting/bending and type of shoes used) at their workplace. Each correct practice observed was given one score and wrong practice observed was given zero score. The investigator categorized the observations as poor practices (0-11 scores), average practices (12-22 scores) and good practices (23-34 scores). Each subject was observed for 30-45 minutes while working in the office by the investigator for two consecutive days.

Table 1 shows the socio-demographic variables of participants. Most of the participants, 41(82.0%) were in the age group of 29-48 years, 6(12.0%) participants were in the age group of 18-28 years and 03(6.0%) were in the age group of 49 years and above. More than half of the participants (56.0%) were female and 22(44.0%) were male. One third of the participants (32.0%) were working in hospital, 15(30.0%) were in banks, 15(30.0) were in schools and only 4(8.0%) were working in the office. Majority of the participants (90.0%) were working for less than 8 hours per day and

Table 1: Socio Demographic Variables of participants (N = 50).

S No.	Sociodemographic Variables	sF (%)
1	AGE	
	18-28 Years	06(12.0%)
	29-48 Years	41(82.0%)
	49 and above	03(6.0%)
2	GENDER	
	Male	22(44.0%)
	Female	28(56.0%)
3	WORKING AREA	
	Banks	15(30.0%)
	Schools	15(30.0%)
	Hospital	16(32.0%)
	Office	04(8.0%)
4	WORKING HOURS PER DAY	
	< 8 Hours	45(90.0%)
	>8Hours	05(10.0%)
5	FOOTWEAR USED	
	Flat Sole	26(52.0%)
	Medium heeled	20(40.0%)
	High Heeled	04(08.0%)
6	Type of Chair used	
	Movable	18(36.0%)
	Fixed	32(64.0%)

05(10.0%) participants were working for more than 8 hours. More than half of the participants (52.0%) were using flat heel shoes, 20(40.0%) participants were using medium heeled shoes and only 04(8.0%) participants were using high heeled shoes. More than half (64.0%) participants were using fixed chair and 18(36.0%) were using movable chair at their work place for sitting.

Table 2(a) Depicts the body mechanics practices as per Sitting posture. According to sitting domain 31(62%) participants were keeping their back straight while sitting. Most of the participants (76%) were not having the chairs which were not comfortable to sit in the right posture. Most of the participants 40(80%) were using the slouching posture while sitting. More than half of participants (58%) were not keeping thighs parallel to floor while sitting and 30(60%) participants were sitting directly at about an arm’s distance in front of computer. More than half of the participants (62%) were avoiding the excessive reaching and 41(82%) had head tilted in downward posture while working on the desk.

More than half of participants (54%) were not repositioning after every 20-30 minutes and 48(96%) were having comfortable devices while sitting. More than half (52%) of the participants were using the phones frequently while working and 33 (66%) participants had shown the unpleasant body gestures. Most of the study participants (78%) were always facing the direction of movement while working and 26(52%) were not keeping the frequently used items within easy reach from their chair. Two third of participants (66%S) were not having the messy and overcrowded working place and 28(56%) were not having the poorly designed work space. More than half of the participants (52%) were having the elbow bent at 90 degree while working on computer and 27(54%) were having the height of elbow and the table at same level while working on computer. Most of the study subjects 38(76%) were having the screen of the computer at an eye level and 31(62%) were having the keyboard, mouse and work surface at the elbow height.

Table 2(a): Body Mechanics Practices of the participants (N = 50).

Statements of sitting posture and working on computer	Yes f(%)	No f(%)
1. The employee keeps the back straight while sitting	31(62.0)	19(38.0)
2. Chair supports the right posture	12(24.0)	38(76.0)
3. Employee uses slouching posture while sitting	40(80.0)	10(20.0)
4. The employee keep thighs parallel to floor while sitting.	21(42.0)	29(58.0)
5. The employee sits directly in front of monitors about an arms distance away.	30(60.0)	20(40.0)
6. The employee avoids excessive reaching in work place	31(62.0)	19(38.0)
7. Head tilt downward while working on the desk.	41(82.0)	09(18.0)
8. Repositioning after every 20-30 minutes of prolonged sitting	23(46.0)	27(54.0)
9. Use of any comfortable device while sitting	48(96.0)	02(4.0)
10. Do the employee uses their phones while working frequently.	26(52.0)	24(48.0)
11. The employees shows any body gesture and unpleasant facial expression	33(66.0)	17(34.0)
12. Always faces the direction of movement while working	39(78.0)	11(22.0)
13. The frequently used items were within the easy reach of an employee	24(48.0)	26(52.0)
14. The place of an employee is messy, overcrowded	17(34.0)	33(66.0)
15. Poorly designed workspace.	22(44.0)	28(56.0)
16. The elbows bent at 90 degree while working on computer	26(52.0)	24(48.0)
17. The height of the table and the elbows are at the same height while working	27(54.0)	23(46.0)
18. Do the top screen of the computer at or slightly below the eye level	38(76.0)	12(24.0)
19. The keyboard, mouse and work surface at the elbow height of an employee	31(62.0)	19(38.0)

Table 2(b) Depicts the frequency and percentage distribution of body mechanics practices as per standing posture, the result shows that most of the participants (84%) were balancing the weight equally with wide base and 37(74%) had the leaning posture while standing. Most of the participants (86%) were using the dominant leg before any activity and 26(52%) were using the

whole body while turning or moving. More than half of the participants (60%) were using the friction while moving the objects and 37(74%) were using the flexed knees at lower level. More than half of the participants (54%) were not avoiding the twisting movements while sitting or standing.

Table 2(b): Body Mechanics Practices as per standing posture/lifting bending posture and type of footwear used at workplace (N = 50).

Statements of standing/lifting/bending and type of shoes used	Yes f(%)	No f(%)
1. The employee balances the weight equally on both legs with wide base while standing	42(84.0%)	08(16.0%)
2. The employee uses leaning posture to one side while standing or take support	37(74.0%)	13(26.0%)
3. Employee put dominant leg forward before performing any activity	43(86.0%)	07(14.0%)
4. The employee moves the whole body while turning or moving	26(52.0%)	25(50.0%)
5. Employee uses the friction while moving the objects	30(60.0%)	20(40.0%)
6. Uses flexed knees while working at lower level	37(74.0%)	13(26.0%)
7. Avoids twisting movement while sitting or standing	23(46.0%)	27(54.0%)
8. For holding or shifting the objects strong grip is used	39(78.0%)	11(22.0%)
9. The employee maintains the center of gravity	34(68.0%)	16(32.0%)
10. The employee stands relaxed by keeping the shoulder down	42(84.0%)	08(16.0%)
11. Do the employee have rigid posture	41(82.0%)	09(18.0%)
12. Use of jerky movements	44(88.0%)	06(12.0%)
13. The employee bent their knees at 90 degree while lifting or bending	28(56.0%)	22(44.0%)
14. The employee holds the object close to the body at waist level	33(66.0%)	17(34.0%)
15. The shoes of the employees are comfortable	38(76.0%)	12(24.0%)

Most of the participants (78%) were using the strong grip for holding and 34(68%) were maintaining the center of gravity while standing. Most of the participants (84%) had the relaxed posture while standing and 41(82%) had rigid posture. Most of the partici-

pants (88%) were using the jerky movements and 28(56%) were bending their knees at 90 degree while bending or lifting. Further 33(66%) participants were holding the objects close to the body and 38(76%) were using comfortable shoes.

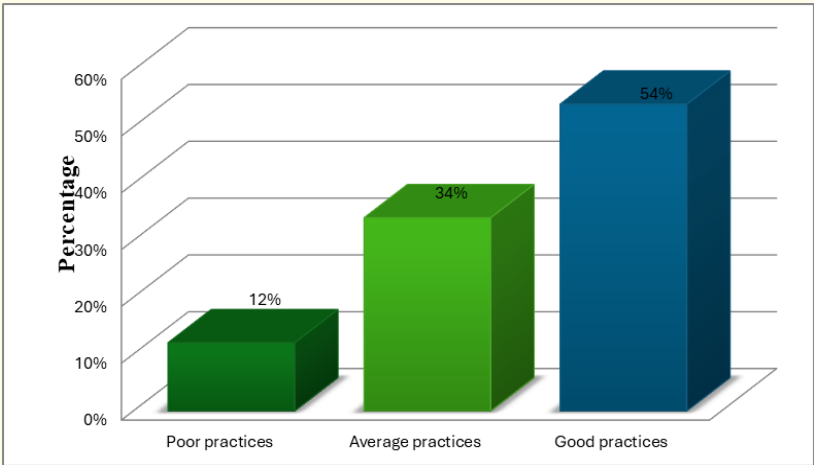


Figure 1: Practices of Body Mechanics.

Figure 1 shows the body mechanics practices score of participants. More than half of the participants (54.0%) had good practices of using body mechanics, 17(34.0%) of subjects had average

practices and 06(12.0%) of subjects had poor practices of using body mechanics. The mean S score of body mechanics was 21.92 and SD 6.09 and the mean percentage was 64.47% of body mechanics practices score.

Table 3: Association of Body Mechanics Practices with Sociodemographic variables (N = 50).

S. No.	Practices of Body Mechanics			Chi square Value (df) p
	Poor	Average	Good	
Age				2.73(4)0.60 ^{ns}
18-28 years	00	02(4.0)	04(8.0)	
29-48 years	06(12.0)	13(26.0)	22(44.0)	
49 and above	00	02(4.0)	01(2.0)	
Gender				4.48(2)0.10 ^{ns}
Male	02(4.0)	11(22.0)	09(18.0)	
Female	04(8.0)	06(12.0)	18(36.0)	
Working area				8.46(4) 0.07 ^{ns}
Banks	02(4.0)	03(6.0)	10(20.0)	
Schools	01(2.0)	03(6.0)	11(22.0)	
Hospital and office	03(6.0)	11(22.0)	06(12.0)	
Working hours per day				1.97(2)0.37 ^{ns}
≤ 8 hours	06(12.0)	14(28.0)	25(50.0)	
≥ 8 hours	00	03(6.0)	02(4.0)	
Footwear used				6.25(4)0.18 ^{ns}
Flat sole	02(4.0)	12(24.0)	12(24.0)	
Medium sole	04(8.0)	03(6.0)	13(26.0)	
High heeled	00	02(4.0)	02(4.0)	
Type of chair used				3.38(4)0.49 ^{ns}
Movable	02(4.0)	08(16.0)	08(16.0)	
Fixed	04(8.0)	09(18.0)	19(38.0)	

Table 3 shows that data presented in the association of body mechanics practices with socio demographic variables. There was no significant relationship between body mechanics practices and selected socio demographic variables i.e., age, gender, working area, working hours per day, type of foot wear used and type of chair used in selected working areas at 0.05 level of significance ($p > 0.05$).

Discussion

Body mechanics is described as a coordinated effort of musculoskeletal and nervous system to maintain balance, posture, and body alignment. It is directly related to effective body functions. Uncoordinated body posture increases the risk of damage to the body. Proper body mechanics allows an individual to carry out his or her daily activities without extra use of energy, and helps in preventing injuries for health care providers, patients and other work professionals. Therefore good body mechanics are important at work site and should be used at all times. Body mechanics revolves around balance, proper alignment and coordinated movement. But often no attention is paid towards correct body posture while moving, sitting, standing, lifting, and shifting or transferring which ultimately leads to posture related problems and other health issues. Poor body mechanics are often the cause of back problems. When we don't move our body in right and safe way, the spine is at the risk of getting stresses which can lead to degeneration of spinal structures and unnecessary wear and tear. Therefore the purpose of the present study is to assess the practice of good mechanics and ergonomics at the workplace and to throw the light on the various relaxation techniques which would be helpful for the various employees to reduce the musculoskeletal disorder due to poor ergonomics.

Findings of present study revealed that more than half of the participants (54%) had Good Practices, 17(34%) had Average practices of body mechanics and only 6(12%) had Poor practices of body mechanics. A similar study was conducted by Smamy P, *et al.* (2017) to assess the knowledge and practices of 100 internship students regarding assisted body mechanics to reduce musculoskeletal disorders and to develop safety guideline on manual handling technique. The study results showed that 85% of internship students had average knowledge regarding assisted body mechanics, 84% were practicing good body mechanics technique, 14% had fair practice, and 2% had poor practice of body mechanics. The findings of the present study are similar to the study however the sample in the present study was small.

In another study conducted by Dipayan Das., *et al.* (2020) to assess the work-related musculoskeletal disorders among 100 handicraft workers. The results reported that the prevalence of musculoskeletal symptoms among handicraft workers is 20 (40%) and the most affected body areas were the neck, back, knees and upper limbs. Risk factors including working posture, daily working hours, repetitive and forceful movements, work experience, age, gender and working under stressful conditions were found to be highly responsible for the poor body musculoskeletal related conditions. A similar study conducted by Rajinder Kumar., *et al.* (2015) to assess the prevalence of Musculoskeletal Disorder (MSD) among 60 computer operating Bank Office Employees in Punjab. The results reported that the Participants suffering from MSD had the problem of low-back pain (40.4%), upper back (39.5), Neck (38.6%), hand/wrist (36.8%) and shoulder (15.2%). The study showed a high prevalence of disorders in the low- back, upper back, neck, hand/wrist, shoulder etc.

In the present study the subjects who participated were not having any musculoskeletal impairment, and no deformities were observed among the subjects. Similarly in a study conducted by D'Souza Pramila., *et al.* (2020) to assess the usage of knowledge of body mechanics (N = 100). Results revealed that 64% of the subject had poor knowledge of usage of body mechanics practices at work place. Another study conducted by Frank JC., *et al.* (2018) to assess the Knowledge regarding the use of Body Mechanics among 50 B.Sc Nursing IV Year Students. The Study results revealed that 6(12%) had adequate knowledge, 41 (82%) had moderate knowledge and 3 (6%) had inadequate knowledge. There was a significant association between the level of knowledge and selected demographic variables such as regular exercising habits. In the present study the investigator could not assess the knowledge related to practices of body mechanics due to small period of data collection.

Conclusion

Improper working posture increases the risk of damage to the body. Proper body mechanics allows individuals to carry out activities without excessive use of energy, and helps prevent injuries for patients and health care providers. Computer and internet use has been increased recently over the past decades and has been linked with various musculoskeletal disorders. It is observed that video display terminals (VDTs) are also erupting at workplaces worldwide, causing health issues for individuals operating them. Poorly designed ergonomics for computers, is another important contributing factor in causing not only musculoskeletal problems but also visual problems. Up to 80 percent of adults experience back pain

at some point during their life and there are many risk factors that complicate these injuries, according to the Alabama Department of Public Health. Being overweight, lacking muscle strength and smoking are all common risk factors that place healthcare workers at higher risk of injury. Previous injuries and poor posture habits are also leading contributors to pain or further damage to bones, ligament, and muscles. A descriptive study was conducted to assess the posture of adults at their workplace by using body mechanics. The conceptual framework of study was developed based on FAYEE. G ABDELLAH THEORY. A total 50 subjects those fulfilling the inclusive and exclusive criteria were selected by purposive sampling technique. Data was collected from 50 working employees from selected working areas at Kurali, Punjab. The study findings of the present study revealed that half of the participants had good practices of using body mechanics, one third of participants had average practices and some of the participants had poor practices of using body mechanics. The present study concluded that half of the participants had good practices of using body mechanics, one third of the participants had average practices and some of the participants had poor practices of using body mechanics. Hence maximum of the working employees had good practices, no significant association was observed between the practices and the socio demographic variables of the subjects.

Recommendations

On the basis of present study, the following recommendations have been made for further study:-

- A similar study can be conducted on large scale to validate and generalize the findings.
- A study can be implicated on larger sample and different settings.
- A comparative study may be carried out to assess the posture of adults at their workplace after giving health education package on body mechanics.

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