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FREQUENCY OF OCCUPATION RELATED MSD IN DAY CARE WORKERS

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Abstract:

Background: Musculoskeletal system is that system which enables human or animals to move. Musculoskeletal system comprises bones, muscles, tendons, ligaments and joints. It mainly functions to support body, making movement possible and protecting vital organs.

Objective: To observe the Frequency of occupation related MSD in day care workers

Methodology: It was a cross sectional survey, which was held in the Day Cares. 148 workers were taken in the study after matching the inclusion criteria. Collected data, entered in form of scores of the NMQ. Data was analyzed by using software SPSS version20.

Results: Age distribution seen in the pie chart and frequency table shows that the age of day care workers were very from 20 years to 49 years. It was seen that in 148-day care workers there were solely females and no males. Among n=148 females, 82.4% were married and 17.6% unmarried. Daily working hours were checked, mostly servants work for 6 to 8 hours. (21.6% for 6 hours and 60% for 8 hours a day). In case of service duration 25% were working from 3 years, 19.6% from 2 years, and 12 % from 6 years and 18 % from 5 years.

The frequency of various musculoskeletal disorders was analyzed, 56 % participants had neck pain ,65.5% had shoulders pain, 3% workers had elbows pain, 64% had wrist pain, 40% had pain in upper back, 60% had pain in lower back and 90.5% workers had pain in knee joints. Association was checked by using chi square among age and risk factors of the jobs ($p=0.00$), age and Treating patients in day ($p=0.01$), age and Not enough rest breaks or pauses during the work day ($p=0.03$), age and Working in awkward and cramped positions ($p = 0.00$), age and continue to work while injured ($p = 0.02$).

Conclusions: Rate of work induced MSK problems increased in day care center employees. it was concluded that working in bad postures in day care center had negative effect on the performance of day care workers. Servants of the day care centers have maximum chances of developing knee, lumber, shoulder and hip pain due to repeated lifting and prolong and improper sitting postures. Ergonomically modifications in the surroundings and work methodology were requested to reduce the risks. If the workers get some education or training regarding the good postures while working and their working environment settings are changed accordingly, these MSK disorders can be avoided

KEYWORDS: NMQ, Day Care, MSK Disorders.

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INTRODUCTION:

A musculoskeletal system is that system which enables human or animals to move. Musculoskeletal system comprises bones, muscles, tendons, ligaments and joints. It mainly functions to support body, making movement possible and protecting vital organs. It also functions like main collective site for the calcium. All-important components of Blood forming System are situated in that musculoskeletal system especially joints and bone. This is the system actually which make human sit, stand, walk or run. The skeleton system has two distinct divisions, axial skeleton consists of skull and vertebral column, appendicular skeleton consists of limbs. Briefly, 206 bones all connected to one another in a single chain. The five main types of bones are long bones, short bones, irregular and flat bones sesamoid. Central nervous system and sensory organs are also an important part of the MSK system

Muscles are of three type cardiac, smooth and skeletal muscles. Smooth muscles are involuntary and control the movement of substances within hollow organs like GIT. Skeletal and cardiac muscles are striated and control voluntarily. Only smooth and skeletal muscles are the part MSK system and only skeletal muscles can move the body. [1]

Briefly, the MSK system comprise of different size of the bones, almost 200 bones all connected to one another in a single chain. Central nervous system and sensory organs are also an important part of the MSK system. Common musculoskeletal problems are CTS, TOS, RS, RCS, DeQuervain's disease, Tendinitis, Tenosynovitis, Trigger finger and Ganglion cyst in upper limb of the body. Lower limb MSK disorders are leg pains, knee pains, LBP, spasm in hamstring and quadriceps, sprain and strain at different levels.

Among work related problems, the musculoskeletal problems are the one most common and most prevalent. This has direct or indirect impact on quality of life of respective professional working population and may lead to economic burden in terms of health cost, less efficiency and loss of resources both at the end of professionals and organization [2]. Mostly observed working positions of the workers are sitting on floor, kneeling, squatting and bending. Servants who deal younger children assume more awkward lower limb and back posture during lifting than employees who work with older children [3]. Great attention is given on preventing the disease and injuries, purpose is to enhance the quality of health in workers. NORA is the occupation research agenda in America reported that the major cost spend by the workers is on health especially

MSK disease in United States of America. MSD represents the common and the costliest worker conditions and issues in under developed countries and other countries. MSK problems cause reduced productivity at work place due to various reasons such as absenteeism, sick leave and pre time retirement [4]. Work related health problems are very much common in many work places. Major complaints recorded by the workers were increased pains, weakness in muscles and joints and different body aches are increasing according to their work styles [5]. The work-related musculoskeletal disorders among the child care servants are very high given the reality that workers frequently lift the child and carry out physical activities with improper postures. These cumulative micro traumas of the MSK system caused by repetitive strain during work were called WRMSD [6]. Ratio of the related MSK problem is common. It's only because of one major reason and that is the staff working in day care carry baby frequently in different bad postures. When these minute repetitive injuries combine, they resulted into the major or severe trauma and it happened because of the nature of their job [7].

Management of musculoskeletal disorders is done usually through multidisciplinary approach. Physical therapy is hallmark of any of such disorders. Physical therapy Treatment of these disorders ranges from proper educational training for poor or bad posture and improving of job area settings, electrotherapy to manual therapy techniques and exercise therapy are indicated to prevent work-related musculoskeletal [8].

MATERIALS AND METHODS:

It was a cross sectional survey, which was held in the Day Cares. 148 workers were taken in the study after matching the inclusion criteria. Collected data, entered in form of scores of the NMQ. Data was analyzed by using software SPSS version20. Data was collected from day care setups situated in Lahore. All the variables like age, gender, job hours and duration of the service was present in the form descriptive statistics in form of pie charts and graphs. The statistical test, Chi-square was used to check the association in between personal characteristics and musculoskeletal disorders. P-value less than or equal to 0.05 was considered as significance.

Inclusion Criteria

- Females, age range 20-49 years.
- Day care workers with at least 1-year experience were included.

Exclusion Criteria

- Any participant associated with known comorbidities, especially neurological nature.

- Those working in setups of disabled and mentally retarded children.

THE NMQ

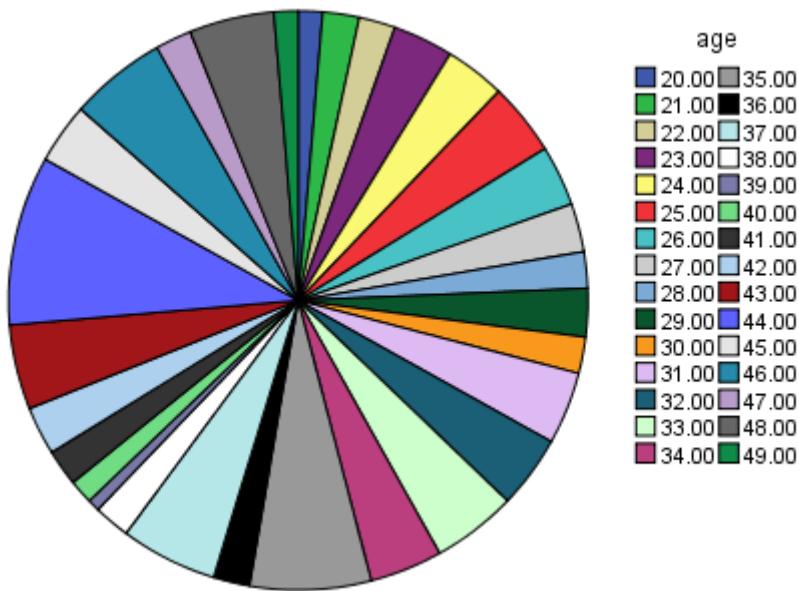
The Nordic scale was composed by ministry council. It measures the comparison of LBP, neck pain, shoulder pain and general body pains and their causes. This scale was not composed for the diagnostic purpose. It can be utilized as the

structural interview and a questionnaire. This questionnaire can be used by the complete multidisciplinary team for example physical therapist, dentist, computer IT, nurses and midwives etc. it can also be used by simple workers for example computer user, drivers call center workers and many more. This questionnaire is basically used for the evaluation of the musculoskeletal problems [9].

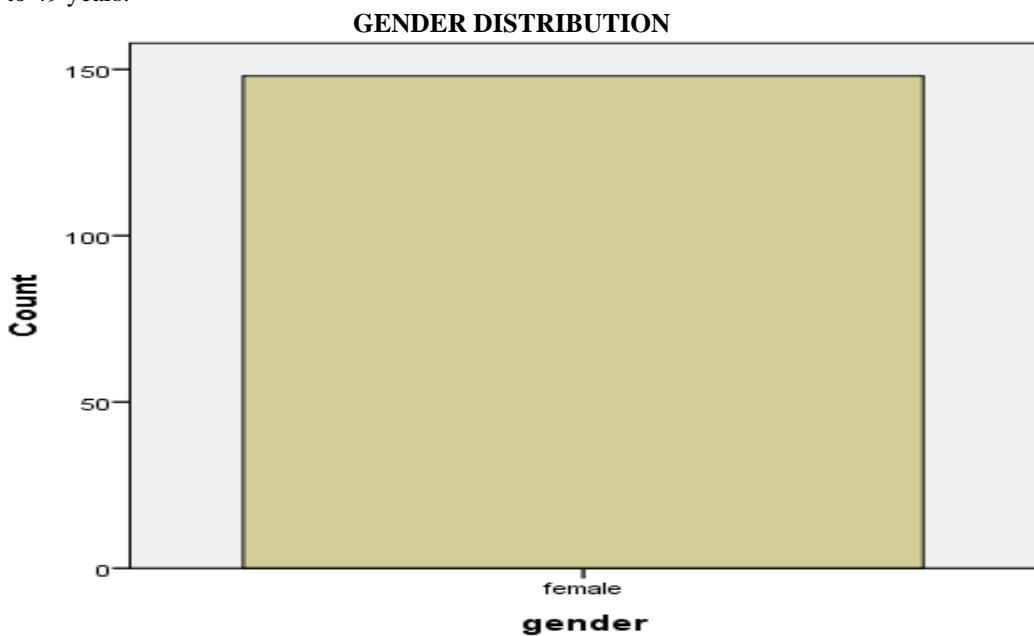
RESULTS:

AGE DISTRIBUTION

	Frequency	Percent	Valid Percent	Cumulative Percent
20.00	2	1.4	1.4	1.4
21.00	3	2.0	2.0	3.4
22.00	3	2.0	2.0	5.4
23.00	5	3.4	3.4	8.8
24.00	5	3.4	3.4	12.2
25.00	6	4.1	4.1	16.2
26.00	5	3.4	3.4	19.6
27.00	4	2.7	2.7	22.3
28.00	3	2.0	2.0	24.3
29.00	4	2.7	2.7	27.0
30.00	3	2.0	2.0	29.1
31.00	6	4.1	4.1	33.1
32.00	6	4.1	4.1	37.2
33.00	7	4.7	4.7	41.9
34.00	6	4.1	4.1	45.9
Valid	35.00	10	6.8	52.7
	36.00	3	2.0	54.7
	37.00	8	5.4	60.1
	38.00	3	2.0	62.2
	39.00	1	.7	62.8
	40.00	2	1.4	64.2
	41.00	3	2.0	66.2
	42.00	4	2.7	68.9
	43.00	7	4.7	73.6
	44.00	14	9.5	83.1
	45.00	5	3.4	86.5
	46.00	8	5.4	91.9
	47.00	3	2.0	93.9
	48.00	7	4.7	98.6
	49.00	2	1.4	100.0
	Total	148	100.0	100.0

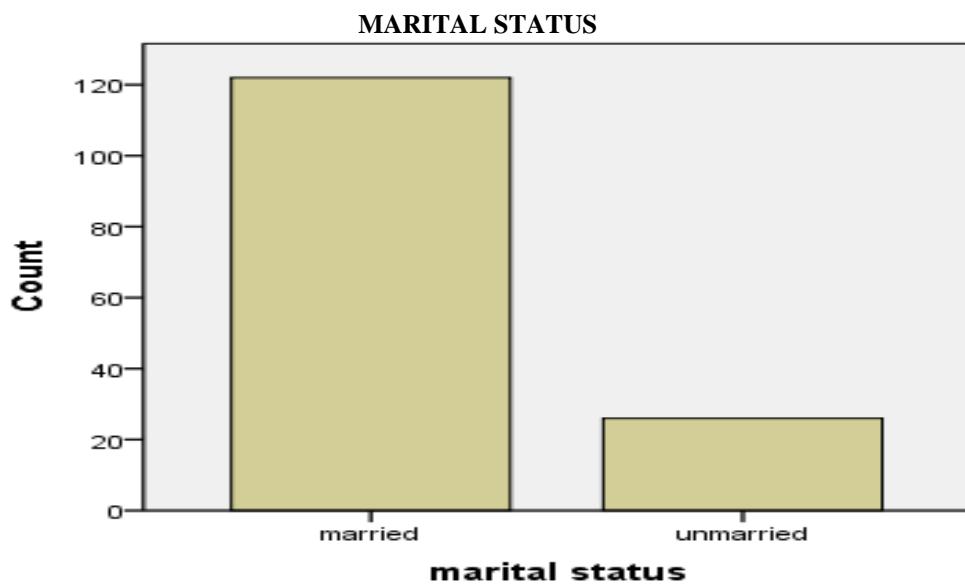


Age distribution seen in the pie chart and frequency table shows that the age of day care workers was very from 20 years to 49 years.



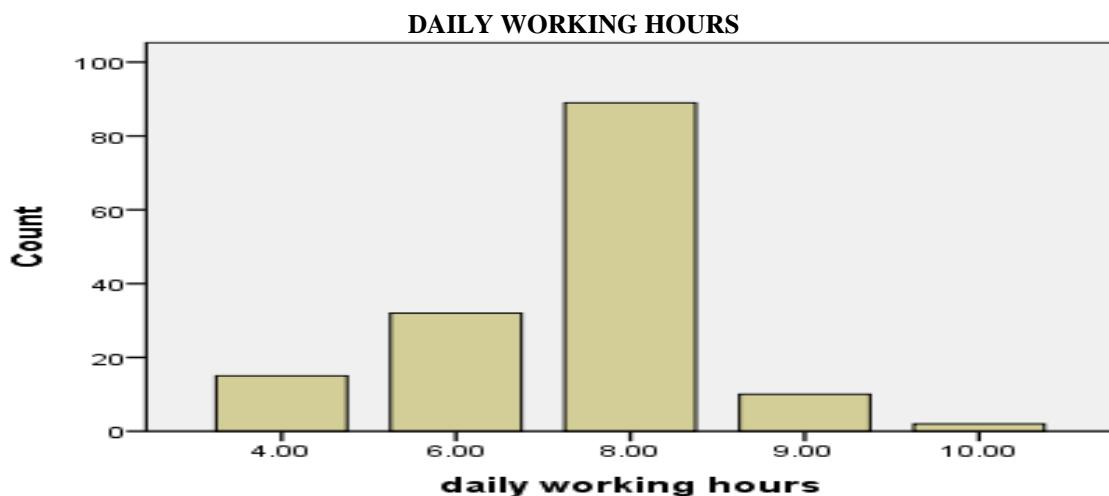
Gender				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid female	148	100.0	100.0	100.0

It was seen that in 148-day care workers there were solely females and no males. There was n=148, 100% females working in the day care centers.



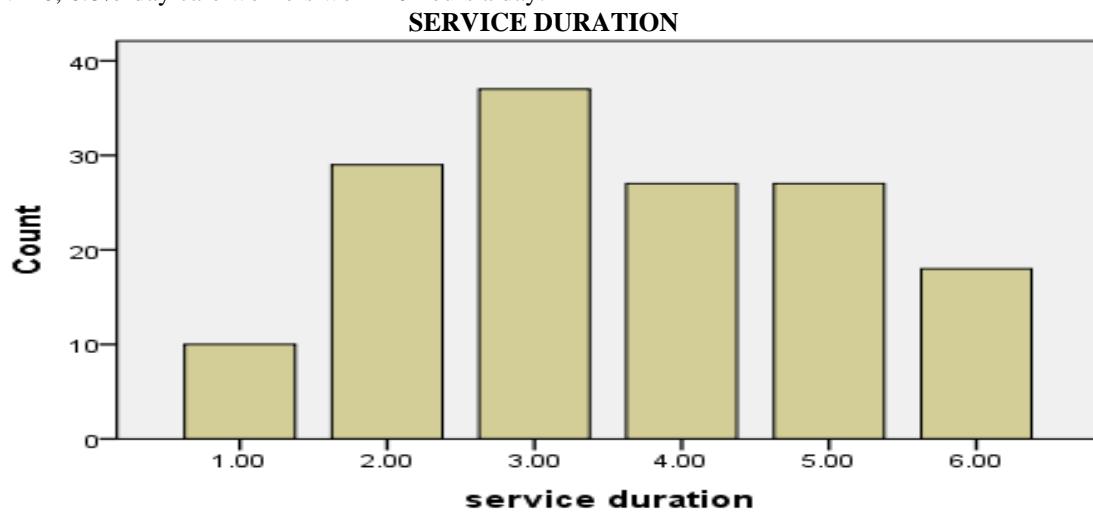
		Marital Status			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	122	82.4	82.4	82.4
	Unmarried	26	17.6	17.6	100.0
	Total	148	100.0	100.0	

It was seen that among n=148 females there were n=122, 82.4% were married and n=26, 17.6% were unmarried.



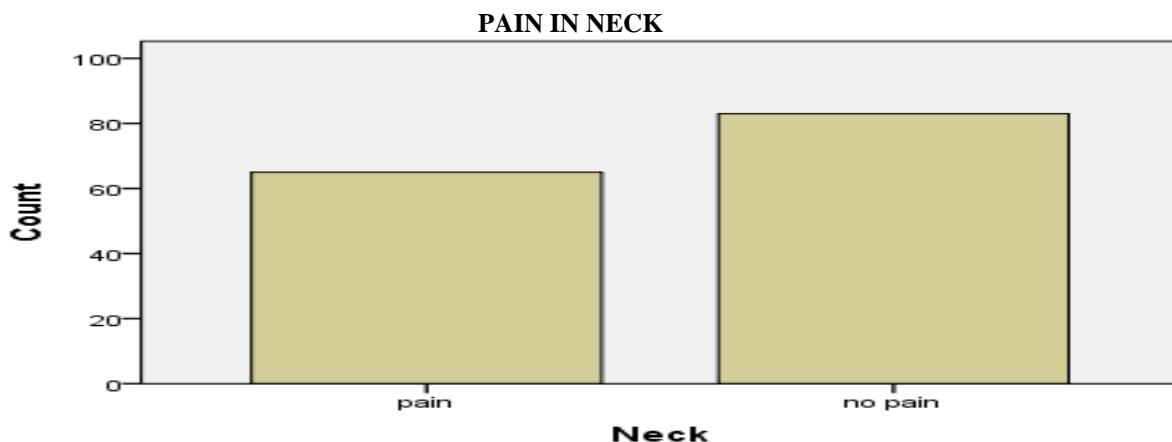
		Daily Working Hours			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4.00	15	10.1	10.1	10.1
	6.00	32	21.6	21.6	31.8
	8.00	89	60.1	60.1	91.9
	9.00	10	6.8	6.8	98.6
	10.00	2	1.4	1.4	100.0
	Total	148	100.0	100.0	

Daily working hours were checked in the day care workers, it was seen that n=15 10%-day care workers work 4 hours a day. N=32, 21.6%-day care workers work 6 hours a day. N=89, 60%-day care workers work 8 hours a day. N=10, 6.8%-day care workers work 10 hours a day.



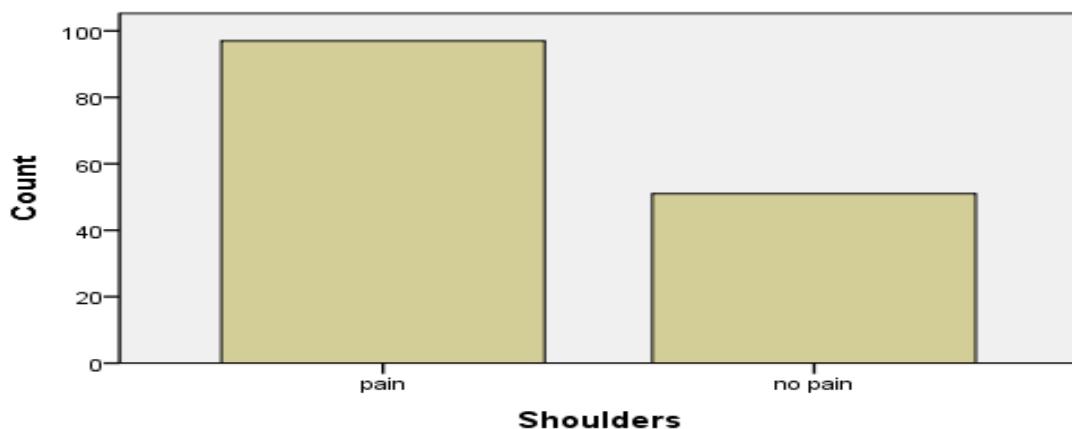
		Service Duration			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	10	6.8	6.8	6.8
	2.00	29	19.6	19.6	26.4
	3.00	37	25.0	25.0	51.4
	4.00	27	18.2	18.2	69.6
	5.00	27	18.2	18.2	87.8
	6.00	18	12.2	12.2	100.0
	Total	148	100.0	100.0	

In case of service duration n=37, 25% day care workers were working from 3 years. N=29, 19.6% were working from 2 years. 12 % were working from 6 years 18 % were working from 5 years.



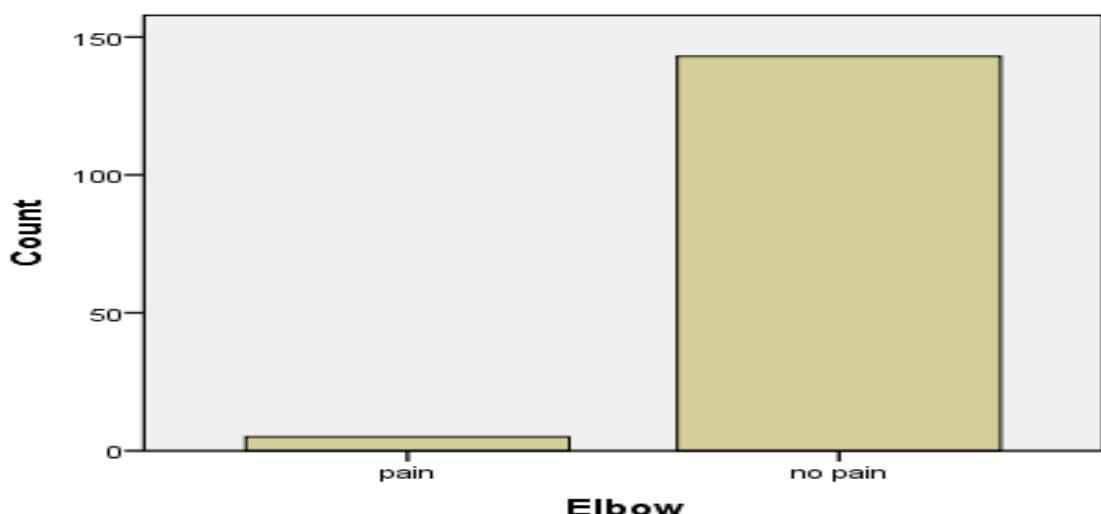
		Neck			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No pain	65	43.9	43.9	43.9
	Pain	83	56.1	56.1	100.0
	Total	148	100.0	100.0	

It was seen n= 83, 56 %-day care workers had pain in neck and n=65, 43.9% had no pain in neck.

PAIN IN SHOULDER**Shoulders**

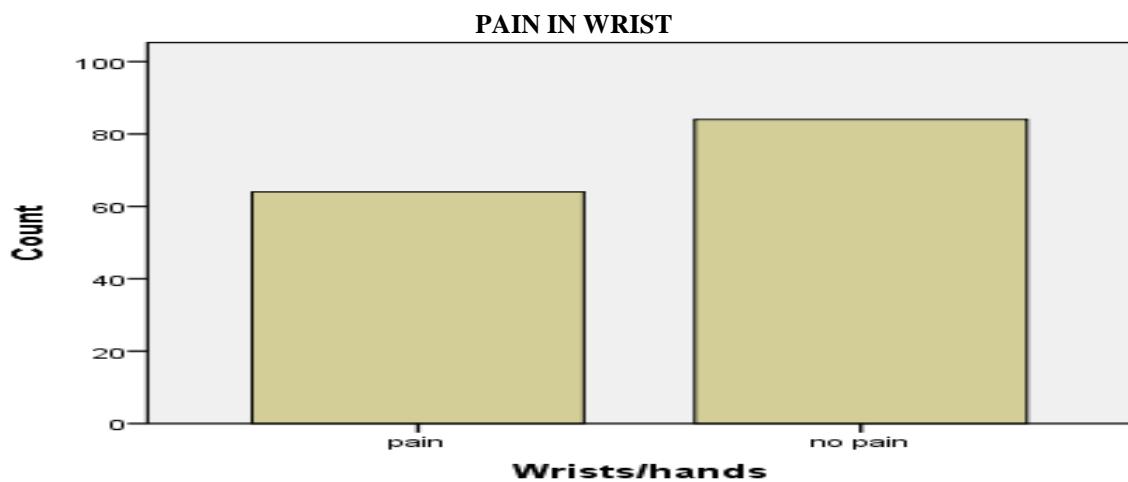
	Frequency	Percent	Valid Percent	Cumulative Percent
Pain	97	65.5	65.5	65.5
Valid no pain	51	34.5	34.5	100.0
Total	148	100.0	100.0	

It was seen that n=97, 65.5% workers had pain in shoulders.

PAIN IN ELBOW**Elbow**

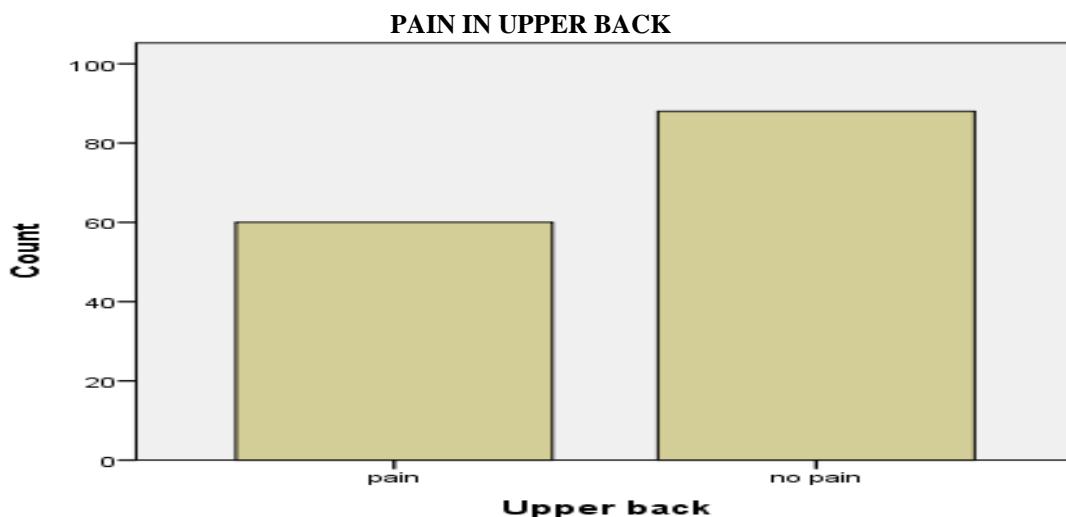
	Frequency	Percent	Valid Percent	Cumulative Percent
Pain	5	3.4	3.4	3.4
Valid no pain	143	96.6	96.6	100.0
Total	148	100.0	100.0	

It was seen that n=143, 96% workers had no pain in elbow and n= 5, 3% workers had pain in elbows.



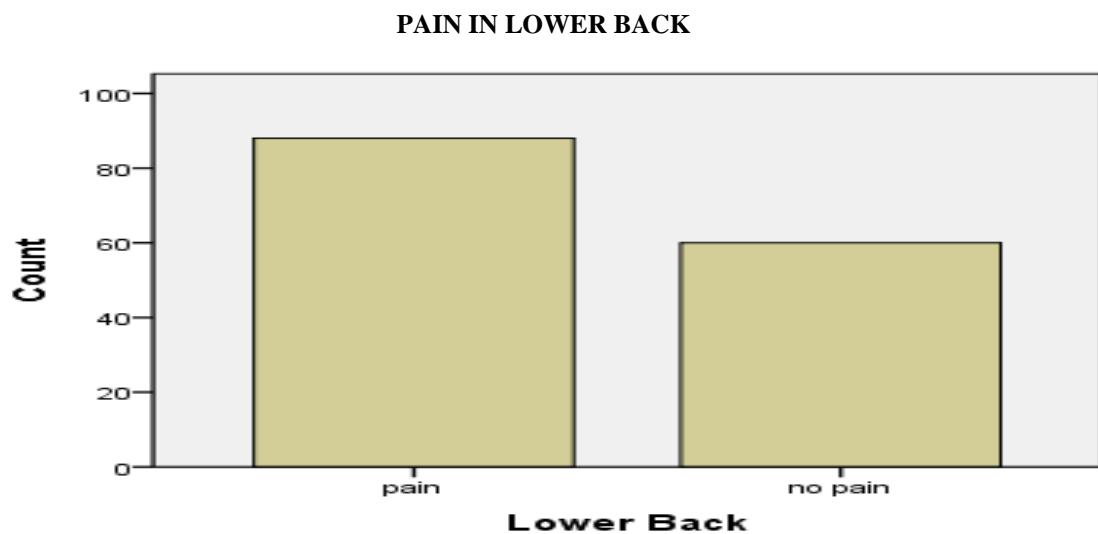
Wrists/hands				
	Frequency	Percent	Valid Percent	Cumulative Percent
Pain	64	43.2	43.2	43.2
Valid no pain	84	56.8	56.8	100.0
Total	148	100.0	100.0	

It was seen that 64% workers experienced pain in wrist joints while working.



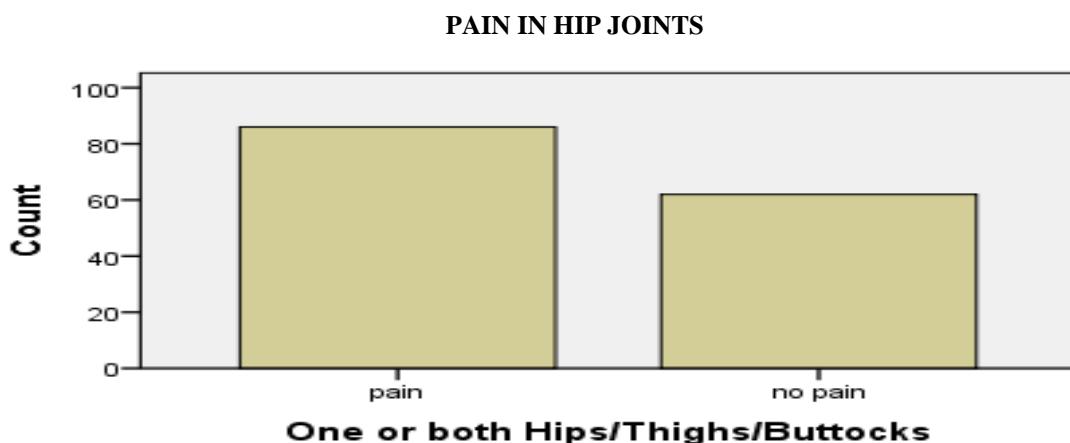
Upper back				
	Frequency	Percent	Valid Percent	Cumulative Percent
Pain	60	40.5	40.5	40.5
Valid no pain	88	59.5	59.5	100.0
Total	148	100.0	100.0	

It was seen that 88% had no pain in upper back and n= 60, 40% workers had pain in upper back.



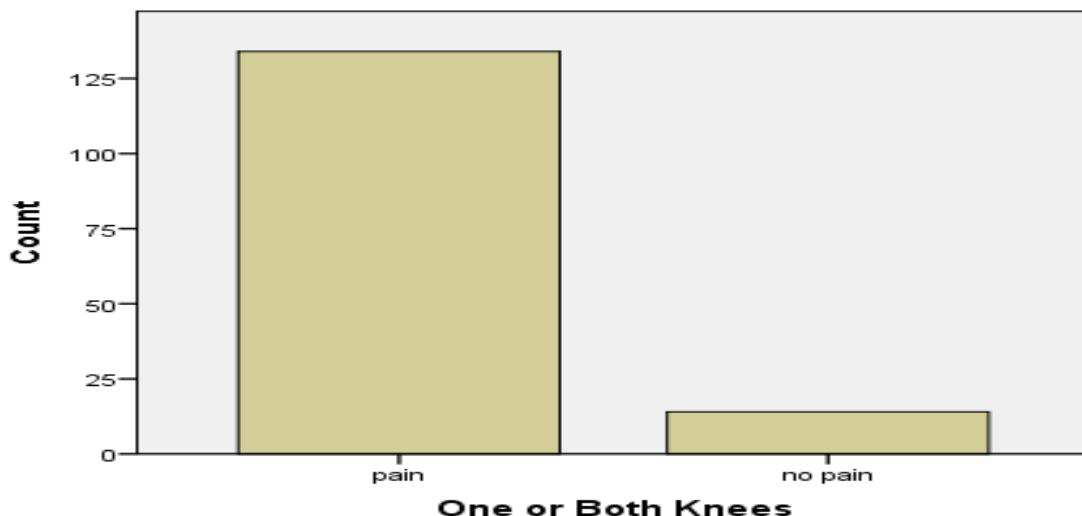
Lower Back					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid Pain	88	59.5	59.5	59.5	
Valid no pain	60	40.5	40.5	100.0	
Total	148	100.0	100.0		

It was seen that n=88, 59.5% workers had pain in lower back.



One or both Hips/Thighs/Buttocks					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid Pain	86	58.1	58.1	58.1	
Valid no pain	62	41.9	41.9	100.0	
Total	148	100.0	100.0		

It was seen that n=86, 58% workers had pain in hip joints.

PAIN IN KNEES**One or Both Knees**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pain	134	90.5	90.5	90.5
	no pain	14	9.5	9.5	100.0
	Total	148	100.0	100.0	

It was seen that n=134, 90.5% workers had pain in knee joints while working in day care.

AGE AND PERCEPTIONS ON JOB RISK FACTORS THAT MAY CONTRIBUTE TO DEVELOPMENT OF WORK-RELATED MUSCULOSKELETAL DISORDER**Crosstab**

		Perceptions on job risk factors that may contribute to development of work-related musculoskeletal disorder			Total
		no problem (0-1)	mild to moderate (2-7)	major problem (8-10)	
Age	20 to 30	Count	7	6	23
		% of Total	4.7%	4.1%	15.5%
	30 to 40	Count	43	7	57
		% of Total	29.1%	4.7%	38.5%
	40 to 50	Count	2	0	68
		% of Total	1.4%	0.0%	44.6%
Total		Count	52	13	148
		% of Total	35.1%	8.8%	56.1%
					100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square N of Valid Cases	101.673 ^a 148	4	.000

it was seen that the p value is 0.00 that is less than 0.05.

AGE X TREATING AN EXCESSIVE (MORE THEN SHE CAN HANDLE EASILY) NUMBER OF PATIENTS IN ONE DAY

Crosstab

		Treating an excessive (more than she can handle easily) number of patients in one day			Total
		no problem (0-1)	mild to moderate (2-7)	major problem (8-10)	
Age	20 to 30	Count	7	16	0
		% of Total	4.7%	10.8%	0.0%
	30 to 40	Count	45	0	12
		% of Total	30.4%	0.0%	8.1%
Age	40 to 50	Count	2	21	45
		% of Total	1.4%	14.2%	30.4%
	Total	Count	54	37	57
		% of Total	36.5%	25.0%	38.5%
					100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	109.713 ^a	4	.010
N of Valid Cases	148		

it was seen that the p value is 0.01 that is less than 0.05.

AGE AND NOT ENOUGH REST BREAKS OR PAUSES DURING THE WORKDAY

Crosstab

		Not enough rest breaks or pauses during the workday		Total
		mild to moderate(2-7)	major problem (8-10)	
Age	20 to 30	Count	16	7
		% of Total	10.8%	4.7%
	30 to 40	Count	0	57
		% of Total	0.0%	38.5%
Age	40 to 50	Count	26	42
		% of Total	17.6%	28.4%
	Total	Count	42	106
		% of Total	28.4%	71.6%
				100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45.032 ^a	2	.030
N of Valid Cases	148		

Association was checked among age and not enough rest breaks or pauses during the workday through chi square it was seen that the p value is 0.03 that is less than 0.05.

AGE AND BENDING OR TWISTING YOUR BACK IN AN AWKWARD WAY

Crosstab

		Working in awkward and cramped positions			Total
		no problem (0-1)	mild to moderate (2-7)	major problem (8-10)	
Age	20 to 30	Count	12	4	23
		% of Total	8.1%	2.7%	15.5%
	30 to 40	Count	0	0	57
		% of Total	0.0%	0.0%	38.5%
	40 to 50	Count	26	0	68
		% of Total	17.6%	0.0%	28.4%
Total		Count	38	4	148
		% of Total	25.7%	2.7%	71.6%
					100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	59.621 ^a	4	.000
N of Valid Cases	148		

Association was checked among age and working in awkward and cramped position through chi square it was seen that the p value is 0.00 that is less than 0.05.

AGE AND CONTINUING WORK WHILE INJURED

Crosstab

		Continuing work while injured			Total
		(0-1)	(2-7)	(8-10)	
Age	20 to 30	Count	6	10	23
		% of Total	4.1%	6.8%	15.5%
	30 to 40	Count	0	0	57
		% of Total	0.0%	0.0%	38.5%
	40 to 50	Count	0	26	68
		% of Total	0.0%	17.6%	28.4%
Total		Count	6	36	148
		% of Total	4.1%	24.3%	71.6%
					100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	68.132 ^a	4	.020
N of Valid Cases	148		

Association was checked among age and continue to work while injured through chi square it was seen that the p value is 0.20 that is less than 0.05.

DISCUSSION:

Results indicated that the workers of the day care centers have maximum chances of developing lumber, knee, shoulder and hip pain due to repeated lifting and prolong and improper sitting postures. The musculoskeletal disorders related pain is common among child care workers [10]. Among various body parts, the higher prevalence rates

were found in the shoulder, the low back and the shoulder. The pain intensity of these three body parts had a significantly positive association with work absence days [11]. This association implicated that the musculoskeletal disorders had negative impact on work ability and job performance [12].

A study was conducted in 2014 by Caroline on the maximum MSK problems like back pain or knee pain in the workers of the day care centers, there were 160 women and 40 men in the study. It was concluded that neck injury was predominant among 44% of workers followed by 18% with wrist pain. 11% of shoulder pain, 9% of knee pain, 7% of elbow, 6% of wrist, 4% of others and surprisingly 1 % had no musculoskeletal complaints. In the current study it was seen n= 83, 56 %-day care workers had pain in neck and n=65, 43.9% had no pain in neck. In the current study n=148, 100 % workers were females and no males [13,14] conducted a study on work induced MSD in day care servants., 85 workers were included in study and given CHQ, result was shoulder girdle pain was fifty seven percent back ache on the whole is fifty four percent, cervical pain is forty five percent. On the whole there was seventy two percent had work induced MSK disorders [14].

Owen et al., conducted a study on treatment of MSD among day care servants, twenty-seven-day care servants interviewed and observed ranged in age from 17 to 58 years with 20 months of working experience. They listed eighteen tasks as physically stressful. In this study age ranged from 20 years to 49 years [15]. In current study ergonomic risk factors of WRMD involved lifting heavy children, and working in awkward postures. Similar risk factors were identified in some previous studies. For examples, Owen identified lifting, bending, and stooping were the most physically stressful tasks for child care workers. King et al. also cited similar biomechanical stressors in a worksite analysis of 125-day care workers [16]. In this study, the workers often used inadequately sized furniture, sat unsupported on the floor, and reached repetitively above shoulder height. It was also noted that workers' strains could result from continuously spending in awkward postures at the work place. For examples, since the height of the beds are quite low, the workers must bend forward when they performed body rolling, percussion, and changing diapers for those disabled children; to feed children in the wheelchairs, the workers stood beside the wheelchairs and bent forward with waist twists; and when performing some certain activities, the workers needed to squat themselves or to sit unsupported on the floor [17].

Another author King and his co-workers examine the same mechanical problems in one hundred and twenty-five-day care workers. Findings were employees' primary concern was lifting young children and physical endurance required for older children. The main problems identified were incorrect lifting of children, toys, supplies; inadequate work heights, frequent sitting on floor with unsupported back, reaching above shoulder height. In the current study it was checked that

association was checked among age and working in awkward and cramped/ improper lifting positions through chi square it was seen that the p value is 0.00 that is less than 0.05 [18].

Eighteen workers that become sixty one percent of the respondents reported of severe pain in the lower back. All these eighteen workers were working in the day care center. Cervical pain thirty three percent, legs pain thirty three percent and the wrist joint pains were noted by eleven percent. Observational analysis resulted declared the, prolong sitting postures of the workers of day care. Another research was conducted about the workers of the day care with low back pain. Those workers were working with children aged between six weeks to eighteen months through the NIOSH lifting equation; the reason was again lifting heavy weight with improper postures. Results indicated that the workers of the day care centers have maximum chances of developing lumber and knee pain due to repeated lifting and prolong and improper sitting postures.

The workers lifted, moved, and transferred children manually. Thus, to increase workers' knowledge level on safe lifting is as important as to improve workers' working conditions by providing technical innovation.

LIMITATIONS

This study was conducted in limited place by using no probability convenience sampling. But it may be better, if done on a large area and using a qualitative interview

CONCLUSION:

Rate of work induced MSK problems increased in day care center employees. it was concluded that working in bad postures in day care center had negative effect on the performance of day care workers. Servants of the day care centers have maximum chances of developing knee, lumber, shoulder and hip pain due to repeated lifting and prolong and improper sitting postures. Ergonomically modifications in the surroundings and work methodology were requested to reduce the risks. If the workers get some education or training regarding the good postures while working and their working environment settings are changed accordingly, these MSK disorders can be avoided

REFERENCES:

- ALLSOP, L. & ACKLAND, T. 2010. The prevalence of playing-related musculoskeletal disorders in relation to piano players' playing techniques and practising strategies. *Music Performance Research*, 3, 61-78.

3. BORK, B. E., COOK, T. M., ROSECRANCE, J. C., ENGELHARDT, K. A., THOMASON, M.-E. J., WAUFORD, I. J. & WORLEY, R. K. 1996. Work-related musculoskeletal disorders among physical therapists. *Physical Therapy*, 76, 827-835.
4. CRAWFORD, J. O. 2007. The Nordic musculoskeletal questionnaire. *Occupational Medicine*, 57, 300-301.
5. CROMIE, J. E., ROBERTSON, V. J. & BEST, M. O. 2000. Work-related musculoskeletal disorders in physical therapists: prevalence, severity, risks, and responses. *Physical Therapy*, 80, 336-351.
6. GLOVER, W. 2002. Work-related Strain Injuries in Physiotherapists: Prevalence and prevention of musculoskeletal disorders. *Physiotherapy*, 88, 364-372.
7. GLOVER, W., MCGREGOR, A., SULLIVAN, C. & HAGUE, J. 2005. Work-related musculoskeletal disorders affecting members of the Chartered Society of Physiotherapy. *Physiotherapy*, 91, 138-147.
8. HOLDER, N. L., CLARK, H. A., DIBLASIO, J. M., HUGHES, C. L., SCHERPF, J. W., HARDING, L. & SHEPARD, K. F. 1999. Cause, prevalence, and response to occupational musculoskeletal injuries reported by physical therapists and physical therapist assistants. *Physical Therapy*, 79, 642-652.
9. MIERZEJEWSKI, M. & KUMAR, S. 1997. Prevalence of low back pain among physical therapists in Edmonton, Canada. *Disability & Rehabilitation*, 19, 309-317.
10. YI-SHIUNG-HORNG, SHIH-FU HSIEH, HSIN-CHI WU, CHITZU FENG, MING-CHUAN LIN. Work-related Musculoskeletal Disorders of the Workers in a Child Care Institution, Tw J Phys Med Rehabil 2008; 36(1): 15 – 21
11. SALIK, Y. & ÖZCAN, A. 2004. Work-related musculoskeletal disorders: a survey of physical therapists in Izmir-Turkey. *BMC Musculoskeletal Disorders*, 5, 27.
12. SAMAD, A., IZZAH, N., ABDULLAH, H., MOIN, S., TAMRIN, M., BAHRI, S. & HASHIM, Z. 2010. Prevalence of low back pain and its risk factors among school teachers. *American Journal of Applied Sciences*, 7, 634-639.
13. SHEHAB, D., AL-JARALLAH, K., MOUSSA, M. A. & ADHAM, N. 2003. Prevalence of low back pain among physical therapists in Kuwait. *Medical Principles and Practice*, 12, 224-230.
14. WEST, D. J. & GARDNER, D. 2001. Occupational injuries of physiotherapists in North and Central Queensland. *Australian Journal of Physiotherapy*, 47, 179-190
15. YEUNG, S. S., GENAIDY, A., DEDDENS, J., ALHEMOOD, A. & LEUNG, P. 2002. Prevalence of musculoskeletal symptoms in single and multiple body regions and effects of perceived risk of injury among manual handling workers. *Spine*, 27, 2166-2172.
16. BRIGHT KA., CALABRO K. Childcare workers and workplace hazards in the United States: overview of research and implications for occupational health professionals. *Occup Med* 1999;49:427-37
17. KING PM., GRATZ R., SCHEUER G., CLAFFEY A. The ergonomics of child care: conducting worksite analyses. *Work J Prev Assess Rehab* 1996; 6: 25-32. 37.
18. OWEN B. Intervention for musculoskeletal disorders among child care workers. Paper presented at the International Conference on Child Day Care Health: Science, Prevention, and Practice, Atlanta, GA (USA), 1992.
19. KATHARYN A. GRANT. DANIEL J. HABES ALLISON L. TEPPER. .US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, USA 1995; 6:405-410.26.