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PREVALENCE OF POSTURAL DEVIATIONS IN CLINICAL PHYSIOTHERAPISTS- A CROSS SECTIONAL STUDY

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ABSTRACT

AIM AND OBJECTIVE: The aim of present study was to find out percentage of postural deviations in clinical physiotherapists using REBA scale.

BACKGROUND: Physiotherapists are known to be prone to adopt various awkward positions during treating the patients that may lead to abnormal postural deviations among clinical physiotherapists but its prevalence in india has not been reported . This study investigated the of prevalence of postural deviations in clinical physiotherapists.

DESIGN: A Cross Sectional Study.

METHODS: A Study was administered to clinical physiotherapists in different parts in Latur.

RESULT: The study group of 68 clinical physiotherapists having work experience of minimum 1 year working 6-8 hours per day. The highest prevalence of work related posture in clinical physiotherapists is 43.47 percentage individual who has been score 8 to 10 found out high risk then followed by 33.33 percentage individual score 4 to 7 found out medium risk and 23.18 percentage individual score 11 or more found out very high risk for work related musculoskeletal disorders. The sample population included both male as well as female physiotherapists. The prevalence of work related posture in male physiotherapists were 23% very high risk (REBA score 11), 42% high risk (REBA score 8-10), 30% medium risk (REBA score 4-7). The prevalence of work related posture in female physiotherapists were 22.85% very high risk (REBA score 11), 42% high risk (REBA score 8-10), 33% medium risk (REBA score 4-7). There were no significant difference in the gender based (male vs female) postural deviations in clinical physiotherapists using REBA scale. This study was used



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for the prevalence of body part affected in work related posture in clinical physiotherapists .The Trunk was the most common site (57.35 %),upper arm (36.76 %) ,neck (32.35%) then lower arm (5.8%) while the wrist and legs (1%) were least affected site in work related posture .Therefore, study also showed prevalence of most commonly affected site in work related posture is trunk and least affected wrists and legs.

CONCLUSION: This study concluded that prevalence of postural deviations in clinical physiotherapists is high .There is no significant difference of work related posture in male vs female physiotherapists working in clinical settings.The most common site involved in posture is trunk and least are legs and wrists in postural assessment using REBA scale.

KEYWORDS: REBA, WRMDs.



INTRODUCTION Physiotherapy is most demanding and challenging profession in India. Physiotherapy profession demands more physical work involvement ⁽¹⁾. Around 1.37 billion population of India 0.59 physiotherapists per 10000 population ⁽²⁾. Physiotherapy is considered as very old profession in India ⁽²⁾. Physiotherapy profession is dedicated for people of community ⁽³⁾. Role of physiotherapy is to restore health and lifestyle, to reduce pain, to maintain minimum of the body ⁽⁴⁾. Multifaceted profession care of patient, strategies for public health to advocate society towards healthy lifestyle, to supervise others, to lead, to manage and to participate in research and development ⁽⁵⁾. Assessment, planning and implementation of protocol for reduction of pain, restoration of movement, prevention of physical challenges caused due to injuries or diseases etc are the steps of clinical physiotherapist working at ground level in clinical setting ⁽⁶⁾. As mentioned above, physiotherapy adopts various posture at work place. Prolonged duration of time all the postural adaptations may acquire at work may not considered as healthy ⁽⁷⁾. Physiotherapist aware of biomechanics and side effects related to harmful posture ⁽⁷⁾. These postural deviations alter the body biomechanics resulting into asymmetrical loads and pressures on muscles, articulating surfaces of joints and ligaments, as this adaptations are predisposing factor for musculoskeletal dysfunction in the body ⁽⁹⁾. The treatment protocol of physiotherapy is multidimensional includes exercise therapy, electrotherapy and manual therapy ⁽¹⁰⁾. The posture adapt by physiotherapist during work is task specific. The therapist working for hours in awkward posture will have to use more force to accomplish the equal amount of work compromising neutral posture ⁽¹¹⁾. As these will have increase in compressive forces and loading forces on muscles and inter vertebral disc ⁽⁸⁾. Physiotherapy profession more prone to work related high risk factors like working long hours for treating patients, lifting and carrying activities, no rest periods while working, working in sustained posture etc ⁽⁹⁾. The physically challenging tasks like handling patients or clients applying various manual therapy techniques etc may lead to have chances of development of work related musculoskeletal disorders ⁽¹¹⁾. Later on physiotherapist may reduce quality of life ⁽¹²⁾. The pathogenesis behind musculoskeletal disorders is multifactorial ⁽¹³⁾. The REBA scale is used to assess unpredictable working posture risk assessment tool ⁽¹⁴⁾. REBA is sensitive tool and more useful in manual tasks risk assessment ⁽¹¹⁾. The scale is used for assessment of working posture in health care. These scale is first step towards the risk reduction and prevention ⁽¹³⁾. REBA Scale provide the scoring system for muscle activity caused by static, dynamic, rapid changing or unstable postures ⁽¹³⁾. Thus, this study is to identify postural deviations causing



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musculoskeletal disorders in clinical physiotherapists, involvement of body segment in work related posture and comparing which gender is more prone to get work related musculoskeletal disorder using REBA in clinical physiotherapists.

NEED OF STUDY

Physiotherapy is most challenging profession in India. There is more of manual work in physiotherapy profession. They are routinely exposed to work related physically demanding tasks. Physical, mechanical, physiological, psychological and occupational factors linked to the work related musculoskeletal disorders. There are potential risk factors for work related musculoskeletal disorders which predisposition to injury.

Therapist related risk factors such as working in awkward position for long time, repeated bending and twisting, dealing with heavy patient, helping the patient to move passively, continue work, lack of sufficient resting time, treating a lot of patient in clinical setups, so there is involvement of overall body segment during work.

There are previous studies who mentioned about the involvement of body region is more common in work related posture in clinical physiotherapist. There is no such articles who mentioned about upper and lower quadrant involvement in work related posture in clinical physiotherapists using REBA.

There are very less articles who mentioned about upper quadrant involvement in compromised working posture of physiotherapists in clinical setups using REBA. This study will help in assessment of segment more involved in the physiotherapists working for longer duration in clinical setups. Also there are very less studies who mentioned about which gender is more prone to get work related musculoskeletal disorders in clinical physiotherapists using REBA.

REVIEW OF LITERATURE



1. Rapid Entire Body Assessment (REBA), HigSue nett, Lynn McAtamney-Ergonomist ,2000
CONCLUSION : These articles includes the development of risk assessment tool,(REBA).This risk assessment tool specifically designed to be sensitive to the type of unpredictable working posture found in health care and other industries.

2. Evaluation of working posture among the dentist using rula and reba ,Jinu Merlin Koshy, ArchanaR., Bini Markose, ,Johnson, W. M. S., Sankar Narayanan and Sathya priya, B.

CONCLUSION :These studies concluded that the dentist should maintain a healthy sitting posture. Dentist should adopt symmetrical upright posture to reduce spine problems,correct postural practices,relaxation interval sessions during work and weight monitoring.

3. Prevalence of work related musculoskeletal disorders among physiotherapists in sabah: A cross-sectional study,Rajan Balakrishnan, Nur Asyikin Binti Moh Naib

CONCLUSION:These studies concluded that working musculoskeletal disorders prevalence in Egyptian physiotherapists most five affected anatomic locations were lower back ,neck ,shoulder and wrist/hands and upper back due to common risk factors were working in faulty positions or treating obese patients .

4. Role of Physiotherapy in Public Health Domain: India Perspective,Kirti Sundar Sahu, Bhavna Bharati

CONCLUSION: These articles stated that physiotherapy profession role in the public health sector in restoration of healthy lifestyle ,reduce pain and maintain the individuals quality of life .Also, the increasing present burden of diseases within india and lack of sufficient resource making situation difficult.

5. Analysis of risk factors for work related musculoskeletal disorders in radiological technologists,Taehyung kim RT PhD,Hyolyun roh, PhD,PT.

CONCLUSION: These articles stated that musculoskeletal disorders of radiological technologists occur various regions in the body but more frequently shoulder and lumbar region.

6. Work related musculoskeletal disorders among egyptian physical therapists,walaa abu taleb, aliaa rehan youssef.



CONCLUSION: These articles stated that the prevalence of work related musculoskeletal disorders among egyptian physiotherapists more frequently affecting females than males .

7. Working postures and Physiotherapy Students,joanna jackson,Clive liles.

CONCLUSION: These article showed the contribution of postures in risk assessment during manual handling activities acquired by the two years of students reflects a lack of awareness.

AIM OF THE STUDY

- To find out percentage of postural deviations in Clinical Physiotherapist using REBA.

OBJECTIVE

- To find out the percentage of postural deviations in Clinical Physiotherapists using REBA.
- To evaluate more involvement of any specific quadrant of the body in Clinical Physiotherapists using REBA.
- To find gender based postural deviation in Clinical Physiotherapists using REBA.

RESEARCH QUESTION

What are the effects of percentage of postural deviations in clinical physiotherapists?



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METHODOLOGY

- Study design : Cross Sectional study
- Study population : Clinical Physiotherapist
- Study sampling : Convenient sampling
- Sample size calculation : 68
- Data collection and statistical analysis: given studies based on descriptive statistics.

MATERIALS

- Pen
 - Pencil
- Reba scale



SELECTION CRITERIA

Inclusion criteria

1. Including both the sexes (male and female)
2. Physiotherapists who work minimally for 6-8 hours in clinical setting.⁽²⁾
3. Working experience of minimum 1 year.⁽²⁾

Exclusion criteria

1. History of any systemic illness .
2. History of any neurological conditions and rheumatoid disease.
3. History of any musculoskeletal pathologies like tendonitis ,ligaments sprain ,rotator cuff injuries , epicondylitis
4. Deformities like scoliosis ,kyphosis , swayback posture
5. History of trauma like spine fractures.

TEST PROCEDURE

TESTER

Primary tester was a physiotherapy intern who has completed graduation in Bachelors of Physiotherapy (B.P.Th) from SVSS Latur College of Physiotherapy .

TEST PROCEDURE FOR REBA

Group A included combinations for the trunk, neck and legs. This reduced to nine possible scores to which a 'Load/Force' score was added. Group B included upper arms, lower arms and wrists reduce to nine possible scores to which a Coupling score was added. The A and B scores was combined in TABLE C to give a total combinations, and finally an activity score was added to give the final REBA score. The Group B diagrams



was used to score the right upper limb as follows: Upper arm was Flexed between 45 and 90, abducted and gravity assist due to the position of the trunk. Lower arm was also flexed less than 60 and Wrist 8between 0 and 15 flexion/extension with no deviation or twist. Then It was used to find the subtotal and the COUPLING score was added to get Score B .Score C was obtained from Table 3 and the activity score too was added. There were large changes seen in the posture as physiotherapists reached forward to the floor to reposition the foot. The total REBA score is 11.





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OUTCOME MEASURE



REBA Employee Assessment Worksheet

based on Technical note: Rapid Entire Body Assessment (REBA), Hignett, McAtamney, Applied Ergonomics 31 (2000) 201-205

A. Neck, Trunk and Leg Analysis

Step 1: Locate Neck Position

 Step 1a: Adjust...
 If neck is twisted: +1
 If neck is side bending: +1

Step 2: Locate Trunk Position

 Step 2a: Adjust...
 If trunk is twisted: +1
 If trunk is side bending: +1

Step 3: Legs

 Adjust: 30-60° +1, 60° +2

Step 4: Look-up Posture Score in Table A
 Using values from steps 1-3 above, locate score in Table A

Step 5: Add Force/Load Score
 If load < 11 lbs: +0
 If load 11 to 22 lbs: +1
 If load > 22 lbs: +2
 Adjust: If shock or rapid build up of force: add +1

Step 6: Score A, Find Row in Table C
 Add values from steps 4 & 5 to obtain Score A.
 Find Row in Table C.

Scoring:
 1 = negligible risk
 2 or 3 = low risk, change may be needed
 4 to 7 = medium risk, further investigation, change soon
 8 to 10 = high risk, investigate and implement change
 11+ = very high risk, implement change

SCORES

Table A: Neck

		1			2			3					
Legs	1	2	3	4	1	2	3	4	1	2	3	4	
Trunk Posture Score	1	1	2	3	4	1	2	3	4	3	3	5	6
	2	2	3	4	5	3	4	5	6	4	5	6	7
	3	2	4	5	6	4	5	6	7	5	6	7	8
	4	3	5	6	7	5	6	7	8	6	7	8	9
5	4	6	7	8	6	7	8	9	7	8	9	9	

Table B: Lower Arm

		1			2		
Wrist	1	2	3	1	2	3	
Upper Arm Score	1	1	2	2	1	2	3
	2	1	2	3	2	3	4
	3	3	4	5	4	5	5
	4	4	5	5	5	6	7
	5	6	7	8	7	8	8
	6	7	8	8	8	9	9

Table C

Score A (score from table A + load/force score)	Score B, (table B value + coupling score)											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1	1	1	2	3	3	4	5	6	7	7	7
2	1	2	2	3	4	4	5	6	6	7	7	8
3	2	3	3	3	4	5	6	7	7	8	8	8
4	3	4	4	4	5	6	7	8	8	9	9	9
5	4	4	4	5	6	7	8	8	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10
7	7	7	7	8	9	9	9	10	10	11	11	11
8	8	8	8	9	10	10	10	10	10	11	11	11
9	9	9	9	10	10	10	11	11	11	12	12	12
10	10	10	10	11	11	11	11	12	12	12	12	12
11	11	11	11	11	12	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12

Step 7: Locate Upper Arm Position

 Step 7a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1

Step 8: Locate Lower Arm Position

Step 9: Locate Wrist Position

 Step 9a: Adjust...
 If wrist is bent from midline or twisted: Add +1

Step 10: Look-up Posture Score in Table B
 Using values from steps 7-9 above, locate score in Table B

Step 11: Add Coupling Score
 Well fitting Handle and mid range power grip, good: +0
 Acceptable but not ideal hand hold or coupling acceptable with another body part, fair: +1
 Hand hold not acceptable but possible, poor: +2
 No handles, awkward, unsafe with any body part, Unacceptable: +3

Step 12: Score B, Find Column in Table C
 Add values from steps 10 & 11 to obtain Score B. Find column in Table C and match with Score A in row from step 6 to obtain Table C Score.

Step 13: Activity Score
 +1 1 or more body parts are held for longer than 1 minute (static)
 +1 Repeated small range actions (more than 4x per minute)
 +1 Action causes rapid large range changes in postures or unstable base

Neck Score

Trunk Score

Leg Score

Posture Score A

Force/Load Score

Score A

Table C Score

Activity Score

Final REBA Score

Upper Arm Score

Lower Arm Score

Wrist Score

Posture Score B

Coupling Score

Score B

Task name: _____ Reviewer: _____ Date: ____/____/____

This tool is provided without warranty. The author has provided this tool as a simple means for applying the concepts provided in REBA.

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Score	Level of MSD Risk
1	negligible risk, no action required
2-3	low risk, change may be needed
4-7	medium risk, further investigation, change soon
8-10	high risk, investigate and implement change
11+	very high risk, implement change

Reliability – 62% - 85%.

Intra rater reliability- 0.925

Inter rater reliability- 0.54.



DATA ANALYSIS AND INTERPRETATION

Software used Graph pad prism method used

frequency distribution And unpaired t test used with P value set as $P < 0.05$.

STATISTICAL ANALYSIS AND INTERPRETATION

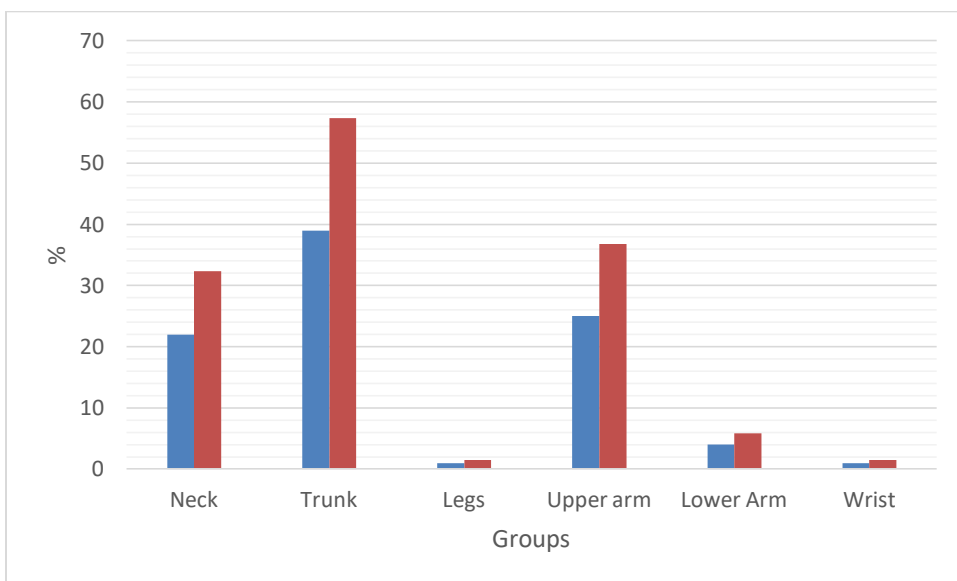
Reba score	Risk of MSD	% risk
1.	0.000	0
2.	0.000	
3.	0.000	
4.	0.000	33.33
5.	14.49275	
6.	14.49275	
7.	4.347826	
8.	13.04348	43.47
9.	17.3913	
10.	13.04348	
11.	23.18841	23.18





Parameter	Neck	Trunk	Legs	Upper arm	Lower Arm	Wrist
Value/68	22	39	1	25	4	1
%	32.35	57.35	1.47	36.76	5.88	1.471

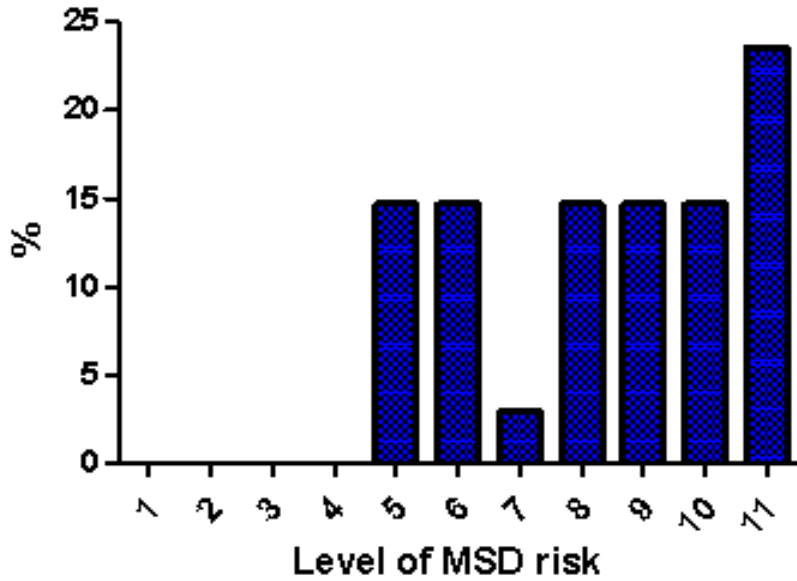
Interpretation : The highest prevalence of work related posture in clinical physiotherapists is 43.47 percentage (individual who has been score 8 to 10) found out high risk then followed by 33.33 percentage individual score 4 to 7 found out medium risk and 23.18 percentage individual score 11 or more found out high risk for work related musculoskeletal disorders.





Interpretation : The above graph shows Prevalence of body part affected in work related posture in clinical physiotherapists . The Trunk was the most common site (57.35 %),upper arm (36.76 %) ,neck (32.35%) then lower arm (5.8%) while the wrist and legs (1%) were least affected site in work related posture .

Percent frequency distribution of Level of MSD risk in Male subjects	
Bin Center	REBA score (Male)
1.	0.000
2.	0.000
3.	0.000
4.	0.000
5.	14.70588
6.	14.70588
7.	2.941176
8.	14.70588
9.	14.70588
10.	14.70588
11.	23.52941

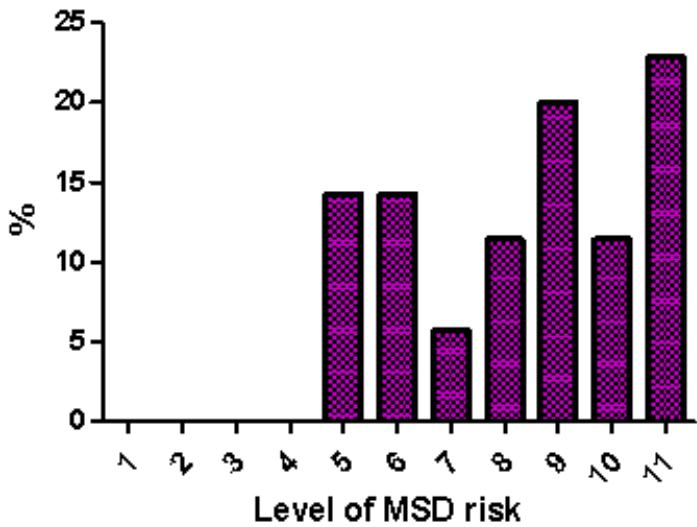


Interpretation : The prevalence of work related posture in male physiotherapists were 23% very high risk(reba score 11) ,42% high risk (reba score 8-10) , 30% medium risk (reba score4-7).

Percent frequency distribution of Level of MSD risk in Female subjects	
Bin Center	REBA score (Female)
1.	0.000
2.	0.000
3.	0.000
4.	0.000
5.	14.28571
6.	14.28571
7.	5.714286
8.	11.42857



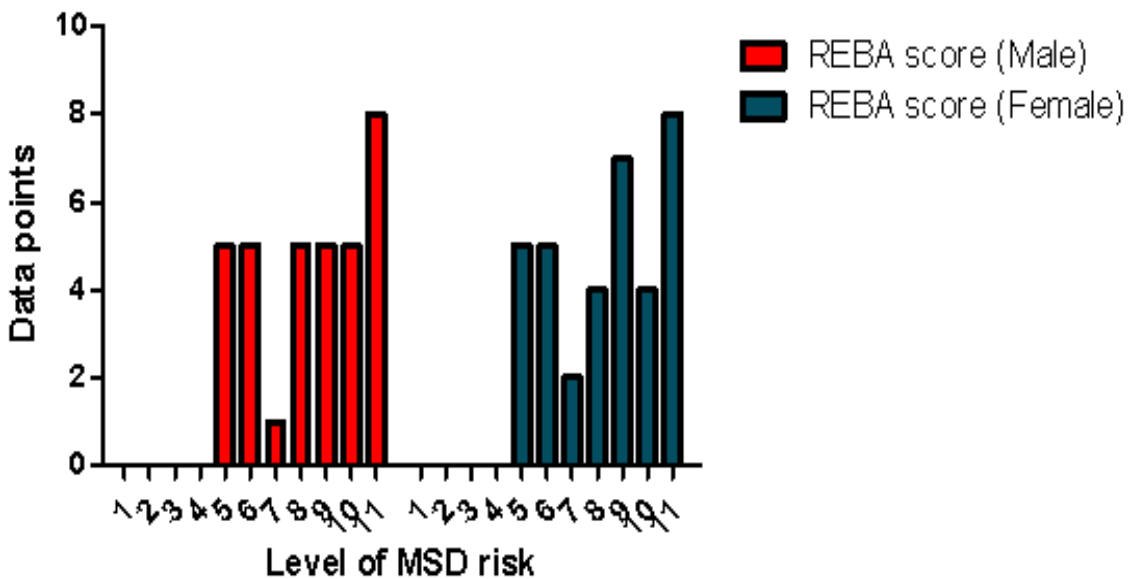
9.	20.000
10.	11.42857
11.	22.85714



Interpretation: The prevalence of work related posture in female physiotherapists were 22.85% very high risk (Reba score 11), 42% high risk (Reba score 8-10), 33% medium risk (Reba score 4-7).



Bin Center	REBA score (Male)	REBA score (Female)
1.	0.000	0.000
2.	0.000	0.000
3.	0.000	0.000
4.	0.000	0.000
5.	5.000	5.000
6.	5.000	5.000
7.	1.000	2.000
8.	5.000	4.000
9.	5.000	7.000
10.	5.000	4.000
11.	8.000	8.000



Interpretation: Above graphs and tables indicates the frequency distribution of the male and females recorded based on REBA score and compared with level of msd risk reported earlier test analysis of male versus female as per scale analyzed. there was no significant difference.

RESULT



The study group of 68 clinical physiotherapists having work experience of minimum 1 year. The highest prevalence of work related posture in clinical physiotherapists is 43.47 percentage individual who has been score 8 to 10 found out high risk then followed by 33.33 percentage individual score 4 to 7 found out medium risk and 23.18 percentage individual score 11 or more found out very high risk for work related musculoskeletal disorders. The sample population included both male as well as female physiotherapists. The prevalence of work related posture in male physiotherapists were 23% very high risk (REBA score 11), 42% high risk (REBA score 8-10), 30% medium risk (REBA score 4-7). The prevalence of work related posture in female physiotherapists were 22.85% very high risk (REBA score 11), 42% high risk (REBA score 8-10), 33% medium risk (REBA score 4-7). There were no significant difference in the gender based (male vs female) postural deviation in clinical physiotherapists using REBA scale. These study were used for the Prevalence of body part affected in work related posture in clinical physiotherapists. The Trunk was the most common site (57.35%), upper arm (36.76%), neck (32.35%) then lower arm (5.8%) while the wrist and legs (1%) were least affected site in work related posture. Therefore, study also showed prevalence of most commonly affected site in work related posture is trunk and least affected wrists and legs.

DISCUSSION



This study conducted to determine the prevalence of postural deviations in clinical physiotherapists in Latur. The present study group was conducted in 68 clinical physiotherapists having work experience of minimum 1 year in any type of clinical settings working minimum 6-8 hours per day. The sample population included both male as well as female physiotherapists. The data collected were analyzed. The highest prevalence of work related posture in clinical physiotherapists is 43.47 percentage (individual who has been score 8 to 10) found out high risk then followed by 33.33 percentage individual score 4 to 7 found out medium risk and 23.18 percentage individual score 11 or more found out very high risk for work related musculoskeletal disorders.

These study were used for the Prevalence of body part affected in work related posture in clinical physiotherapists. The Trunk was the most common site (57.35 %), upper arm (36.76 %) ,neck (32.35%) then lower arm (5.8%) while the wrist and legs (1%) were least affected site in work related posture. Therefore, study also showed prevalence of most commonly affected site in work related posture is trunk and least affected wrists and legs.

The prevalence of work related posture in male physiotherapists were 23% very high risk (reba score 11) ,42% high risk (REBA score 8-10) , 30% medium risk (reba score 4-7). The prevalence of work related posture in female physiotherapists were 22.85% very high risk (REBA score 11),42% high risk (REBA score 8-10),33% medium risk (REBA score 4-7). There were no significant difference in the gender based (male vs female) postural deviations in clinical physiotherapists using reba scale. Agreeing with the studies of Tamilnadu (2017), our sample has presented an average score of posture is between 8 to 10, action needed necessary soon to avoid work related musculoskeletal disorders in future.

Previous study conducted by Jinu Merlin Koshy (2017) on dentists having work experience of minimum 3 years and maximum of 20 years including both gender using REBA Found that 85% of the subjects were 7 and above which indicates risk medium to high and RULA score for most of the subjects 54% that suggested investigations and changes acquired in posture⁽¹¹⁾.

Several studies by Walaa Abu-Taleb in 2021 showed the prevalence of WMSDs was 99.5%. The five top affected anatomic regions were lower back (69.1%), neck (65.7%), shoulder (47.7%), wrist/hand (39.1%), and upper back (37.0%) done on Egyptian physiotherapists. Also the prevalence of female physiotherapists is greater than male for getting high percentage of work related musculoskeletal disorders in Egyptian physiotherapists.⁽³⁾



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Physiotherapy is most challenging profession sustainable for variety of improper posture during clinical setup. The current number of registered physiotherapists are approximately in India ⁽¹⁾. This study used for analyzing occupational hazards and job factors that includes lifting and transferring patients, more working hours, treating patients with manual therapy techniques, etc among physiotherapists in Latur. The musculoskeletal disorders are related to occupational conditions among health care. The previous studies done on Egyptian physiotherapists in sabah have mentioned about the risk factor that contribute work related musculoskeletal disorders (WRMDs) are unanticipated sudden movement or falls by patients, working with agitated patients, performing the same task over and over, work scheduling, carrying, lifting and moving heavy materials, performing manual orthopedic techniques, working in a same position for long periods such as standing, bending over, sitting and twisting⁽³⁾. These postural deviations of clinical physiotherapists during work mostly affected biomechanics that created ergonomical risks in physiotherapy that caused into musculoskeletal discomfort and pain⁽¹⁴⁾.



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CONCLUSION

This study concluded that prevalence of postural deviations in clinical physiotherapists is high .

There is no significant difference of postural deviations in both male vs female physiotherapists working in clinical settings.

The most common site involved in posture is trunk and least are legs and wrists in postural assessment using reba scale.

Adaptive and preventive coping management strategies are recommended to minimize work related musculoskeletal disorders in physiotherapists.

Also reduced the level of risk of work related musculoskeletal disorders in clinical physiotherapists.

Appropriate posture must be maintain during treatment of patient.



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LIMITATION OF STUDY

Clinical setup was vary among physiotherapists as there were ICU based ,OPD based physiotherapist etc .

Therefore, that data was not taken into consideration during study.

Sample was randomly choosen among physiotherapists in Latur.

Area of study was limited.

RECOMMENDATION

Study can be done in larger area.

Study can be done considering in which clinical setup where ICU,OPD and community based physiotherapist is working.



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FUTURE SCOPE

Early intervention and correction of posture for medium and lower risk in clinical physiotherapists.
This study will help for the job modification in physiotherapists with sustainable very high risk.

CLINICAL IMPLICATION

- To modify patients position and therapist position during treatment.
- To adjust plinth /bed height.
- Rest periods in between treatment.
- Use of taping or splinting or supportive devices during applying manual therapy techniques by therapist.
- Warm up and stretch before performing a manual techniques.



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APPENDIX

CONSENT FORM

TITLE OF STUDY : PREVALENCE OF POSTURAL ANALYSIS
IN CLINICAL PHYSIOTHERAPISTS- A CROSS SECTIONAL STUDY

I ----- have read the information sheet provided to me (dated-----).I have asked question about the study, and have received satisfactory answers to my questions. I know that participation is voluntary and I am free to withdraw myself or my data at any time, without giving any reason, and without any adverse consequences.



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I -----have been informed about the study and procedure. I also have been explained about the purpose of research, the procedure required.

Signature

Date

PROFORMA

Name :

Age:

gender:

Occupation :

Specialization :

Working experience (in years):

Working hours :

Signature



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REBA SCALE



REBA Employee Assessment Worksheet

based on Technical note: Rapid Entire Body Assessment (REBA), Hignett, McAtamney, Applied Ergonomics 31 (2000) 201-205

A. Neck, Trunk and Leg Analysis

Step 1: Locate Neck Position

 Step 1a: Adjust...
 If neck is twisted: +1
 If neck is side bending: +1
Neck Score

Step 2: Locate Trunk Position

 Step 2a: Adjust...
 If trunk is twisted: +1
 If trunk is side bending: +1
Trunk Score

Step 3: Legs

 Adjust: 30-60° Add +1
 60° Add +2
Leg Score

Step 4: Look-up Posture Score in Table A
 Using values from steps 1-3 above, locate score in Table A.
Posture Score A

Step 5: Add Force/Load Score
 If load = 11 lbs: +0
 If load 11 to 22 lbs: +1
 If load = 22 lbs: +2
 Adjust: If shock or rapid build up of force: add +1
Force/Load Score

Step 6: Score A, Find Row in Table C
 Add values from steps 4 & 5 to obtain Score A.
 Find Row in Table C.
Score A

Scoring:
 1 = negligible risk
 2 or 3 = low risk, change may be needed
 4 to 7 = medium risk, further investigation, change soon
 8 to 10 = high risk, investigate and implement change
 11+ = very high risk, implement change

B. Arm and Wrist Analysis

Step 7: Locate Upper Arm Position:

 Step 7a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1
Upper Arm Score

Step 8: Locate Lower Arm Position:

Lower Arm Score

Step 9: Locate Wrist Position:

 Step 9a: Adjust...
 If wrist is bent from midline or twisted: Add +1
Wrist Score

Step 10: Look-up Posture Score in Table B
 Using values from steps 7-9 above, locate score in Table B.
Posture Score B

Step 11: Add Coupling Score
 Well fitting Handle and mid range power grip, good: +0
 Acceptable but not ideal hand hold or coupling acceptable with another body part, fair: +1
 Hand hold not acceptable but possible, poor: +2
 No handles, awkward, unsafe with any body part, Unacceptable: +3
Coupling Score

Step 12: Score B, Find Column in Table C
 Add values from steps 10 & 11 to obtain Score B. Find column in Table C and match with Score A in row from step 6 to obtain Table C Score.
Score B

Step 13: Activity Score
 +1 1 or more body parts are held for longer than 1 minute (static)
 +1 Repeated small range actions (more than 4x per minute)
 +1 Action causes rapid large range changes in postures or unstable base

SCORES	
Table A	Neck
	1 2 3
Legs	1 2 3 4 1 2 3 4 1 2 3 4
Trunk Posture Score	1 1 2 3 4 1 2 3 4 3 3 5 6 2 2 3 4 5 3 4 5 6 4 5 6 7 3 2 4 5 6 4 5 6 7 5 6 7 8 4 3 5 6 7 5 6 7 8 6 7 8 9 5 4 6 7 8 6 7 8 9 7 8 9 9
Table B	Lower Arm
	1 2
Wrist	1 2 3 1 2 3
Upper Arm Score	1 1 2 2 1 2 3 2 1 2 3 2 3 4 3 3 4 5 4 5 5 4 4 5 5 5 6 7 5 6 7 8 7 8 8 6 7 8 8 8 9 9
Score A (score from table A head/force score)	Table C
	Score B, (table B value + coupling score)
	1 2 3 4 5 6 7 8 9 10 11 12
1	1 1 1 1 2 3 3 4 5 6 7 7 7
2	1 2 2 3 4 4 5 6 6 7 7 8
3	2 3 3 3 4 5 6 7 7 8 8 8
4	3 4 4 4 5 6 7 8 8 9 9 9
5	4 4 4 5 6 7 8 8 9 9 9 9
6	5 6 6 7 8 8 9 9 10 10 10 10
7	7 7 7 8 8 9 9 10 10 11 11 11
8	8 8 8 9 10 10 10 10 11 11 11 11
9	9 9 9 10 10 10 11 11 11 12 12 12
10	10 10 10 11 11 11 12 12 12 12 12 12
11	11 11 11 11 12 12 12 12 12 12 12 12
12	12 12 12 12 12 12 12 12 12 12 12 12

Table C Score + Activity Score = Final REBA Score

Task name: _____ Reviewer: _____ Date: ____/____/____

This tool is provided without warranty. The author has provided this tool as a simple means for applying the concepts provided in REBA.

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