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Musculo-Skeletal Disorders (MSDs) Risk Assessment in Traditional Small Scale Industries by Using Reba (Rapid Entire Body Assessment) Method

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Abstract: ***Traditional small scale industries include khadi village industries, handlooms, handicrafts, Sericulture etc. Handicraft workers are prone to musculoskeletal disorders (MSDs) due to unnatural work postures, unsafe working practices, long working hours and many risks of work accidents caused by unsafe conditions. REBA (Rapid Entire Body Assessment) is ergonomics assessment tool useful for manual tasks risk assessment. The purpose of study is to find out the risk of MSDs and classify the risk in handicraft workers. To achieve this purpose70 healthy workers from 3 NGOs, Ahmedabad were selected. A video of different sections like sampling, stitching, weaving, embroidery, patch- working was taken. From videos Snapshots of 70 workers working in different sections were obtained. Both frontal and sagital plane analysis was done. The snapshots were analyzed to fill the scores in REBA. From REBA method it is assessed that 92-95% handicraft workers have risks of MSDs. Workers from embroidery and patch working are at high risk, while in stitching, sampling, weaving are at medium risk of MSDs.***

Keywords: Musculoskletal Disorders, Traditional Small Scale Industry, REBA method

1. Introduction

The Small scale industries (SSI) in India are broadly classified into two types: Traditional industries and Modern industries. Under traditional industries basically khadi village industries, handlooms, handicrafts, Sericulture etc. are included. Modern SSI industries include small scale export oriented ancillaries and small scale service and business enterprise.[1] The Indian handicrafts industry is highly labor intensive cottage based industry and decentralized, being spread all over the country in rural and urban areas.[2] Handicrafts can be defined simply as objects made by the skill of the hand.[3]The handicraft industry in India involves large number of artisans from rural and semi urban areas. The rural segment accounts for 78.2% of the units produced and 76.5% of the artisans while the urban segment accounts for the rest. (Ernst & Young, 2012)[4]

Musculoskeletal disorders (MSDs) are currently one of the most critical problems globally faced by the ergonomists in the workplace. Handicraft workers are prone to musculoskeletal disorders (MSDs) due to unnatural work postures, unsafe working practices, long working hours and many risks of work accidents caused by unsafe conditions.[5] REBA is ergonomics assessment tool useful for manual tasks risk assessment.[6] It is a reliable[6], valid[6], sensitive tool for MSDs risk by classifying the body into parts (wrist, upper arm, lower arm, neck, trunk, and legs).In REBA a single page worksheet is used to evaluate selected body posture, forceful exertion, type of movement or action, repetition and coupling.[6]

2. Problem Definition

To find the Percentage of handicraft workers having risk of MSDs.and screening of worker for risk of MSDs.To classify the risk of MSDs in different categories.

3. Methodology

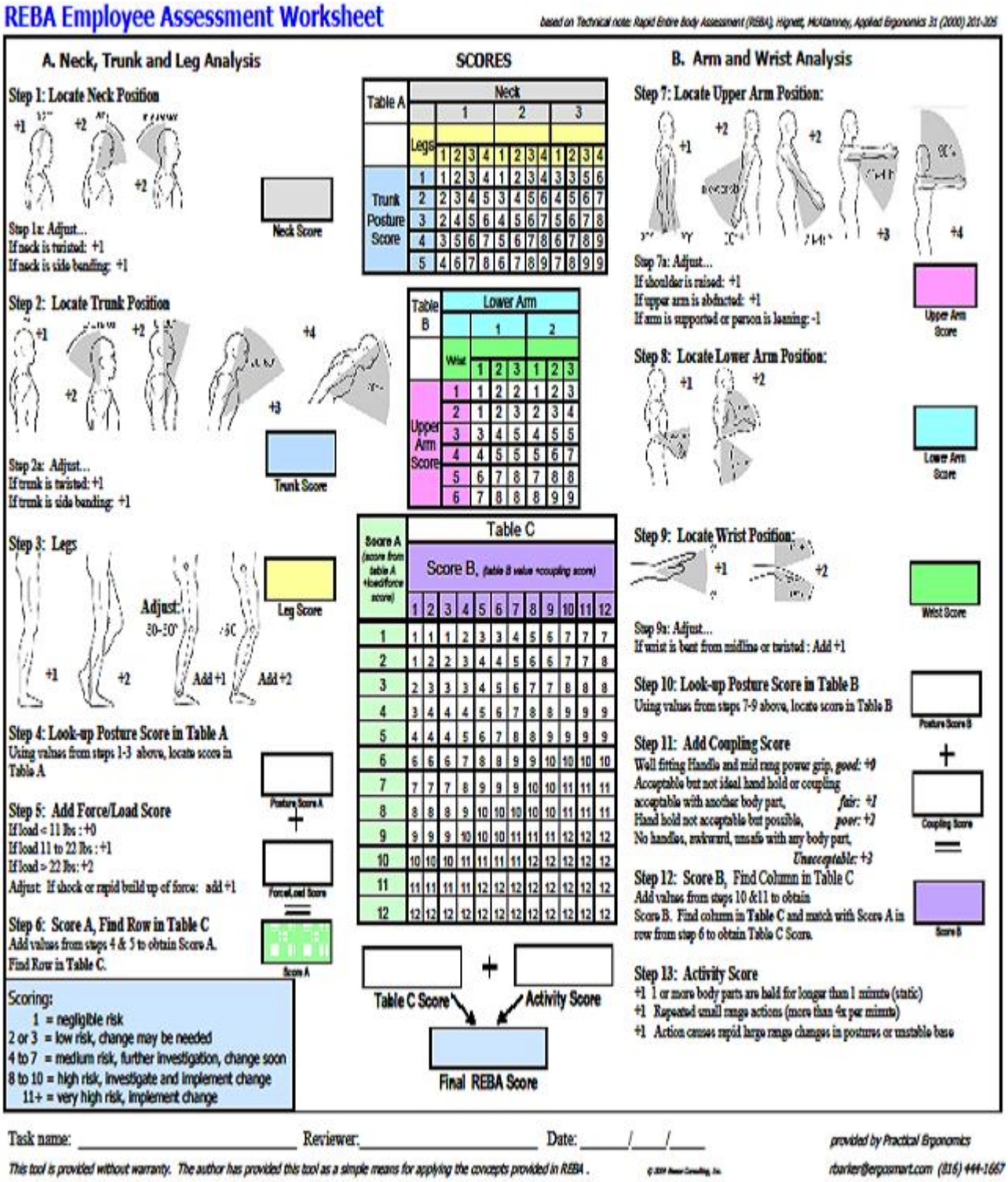
It was a Cross-Sectional study. Sample size was 70 as per as pilot study for further research. 70 healthy workers (50 females, 20 male) from Gramshree Women Empowerment, craftroots, Kalamkhush -3 NGOs of Ahmedabad were selected. Workers were selected by Convenience sampling. It was one session study

Participants were included in the study if they meet following criteria: (1) Normal Healthy SSI workers (2) Age: 20-50 years (3) Both genders are included (4) Workers who are working more than 5hours/day in a week (5) Worker's willingness to participate in study

Participants were excluded if: (1) History of trauma within last one year (2) History of any congenital/acquired musculoskeletal deformity, neurological conditions, cardio-pulmonary conditions. (3)History of other pathological condition like osteomyelitis, neoplasm etc (4) History of acute musculoskeletal pain

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4. Intervention



The demographic data including age, gender, height, weight, dominancy, working hours per day were collected through data collection sheet. Consent forms from the employee and employers were taken. The study was done in handicrafts unit-3NGOS (Gramshree, craftroots, kalamkhush) at Ahmedabad. A video of different sections like sampling, stitching, weaving, embroidery, patch- working was taken. From videos Snapshots of 70 workers working in different sections were obtained. Both frontal and sagital plane analysis was done. The snapshots were analyzed to fill the scores in REBA.

5. Procedure

In REBA method there was division of the body into two segments. In Group A the neck, trunk and legs were included while Group B the upper arms, lower arms and wrists were included. Each part was given a score based on pre-determined flexion and extension degrees Load, Force and coupling scores are added to calculation for the body and then final score for both groups were summated to form the final action score. After data collection final scoring was done. The tables were used to compile risk factor variables.

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Table 1: REBA Scoring System

REBA SCORE	Risk	Action
1	Negligible risk	Corrective action including further assessment is **not necessary**
2-3	Low risk	Corrective action including further assessment **may be necessary**
4-7	Medium risk	Corrective action including further assessment is **necessary**
8-10	High risk	Corrective action including further assessment is **necessary soon**
11+	Very high risk	Corrective action including further assessment is **necessary now**

6. Results

a) Demographic Profile:

Age Distribution: Age of the participants in the study was between 20 to 50 years. From the data mean age was 35 years.

Sex Distribution: The gender distribution in the study was 2:5 (20 males, 50 females) workers

b) REBA scoring: (Table No: 2)

From REBA method it is assessed that 92-95% handicraft workers have risks of MSDs. Among that 40% workers have high risks, 7% have very high risks, 30% medium risk, 15% have low risk on (Rt) side. While on (Lt) side 15% have high risk, 5% have very high risk, 45% have medium risks, 30% low risks. Workers from embroidery and patch working are at high risk, while in stitching, sampling, weaving are at medium risk of **MSDs.**

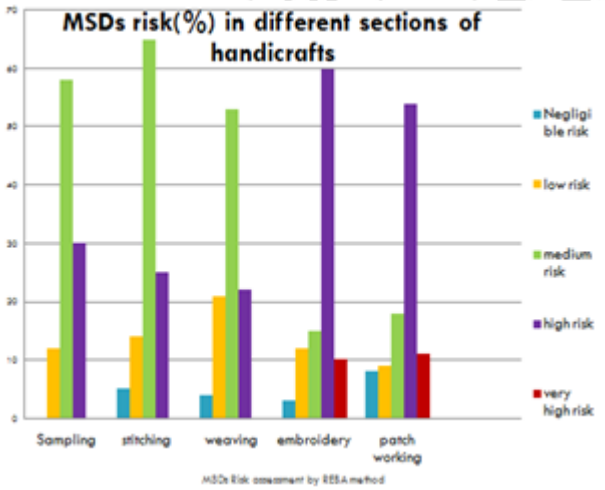


Figure 1

Table 2: REBA SCORE in Handicraft Workers

REBA SCORE (No. of workers distribution in each category of risk level)										
Sections	1	2 or 3			7-Apr		10-Aug		11^{+}	
	R	L	R	L	R	L	R	L	R	L
Sampling	0	0	2	4	7	3	3	3	0	0
Stitching	1	0	3	2	1	6	4	5	0	0
weaving	1	1	3	4	2	2	7	3	0	0
Embroidery	2	2	1	5	0	1	10	12	3	2
Patch working	1	1	2	5	0	1	6	9	2	2

7. Discussion

It was observed that in the small scale industries ergonomics is hardly given preferences as they have to assume specific positions repeatedly for prolonged period for their work. By using REBA method, it was observed that in every category of creating the art, many workers were under muscular stress. REBA methods of postural analysis closely co-relate with the awkward postures adopted by the workers. [7]Study and Justification of Body Postures of Workers Working in SSI by Using Reba analyzed by N. A. Ansari et al. (2013).They concluded that workstation modification is necessary in machining in the industries.[8] This tool is found to be sensitive to the type of unpredictable working posture in health care and other service industries. Ira L. Janowitz et al. (2006) measure the physical demands of work in hospital setting by REBA.[9]There is need for urgent improvement in the industries for betterment of the workers to perform their operations with minimum load and stress on their bodies.

8. Future Scope

1) As this was the pilot study sample size was small, study with larger population can be done.
2) Future study could be done on other areas of traditional small scale industries like handloom, sericulture, khadi village industries
3) Future study could be done on ergonomic modification in reference to REBA score

9. Conclusion

From REBA method it is assessed that 92-95% handicraft workers have risks of MSDs.

References

[1] IRJC Asia Pacific Journal of Marketing & Management Review Vol.1 No. 2, October 2012, ISSN 2319-2836
[2] K.Gautam and N. Bahl, "Occupational health and safety in the informal sector: Evidence from the craft sector.All India Artisans and Craftworkers Welfare Association, New Delhi., "2010, pp.1-2
[3] S. Purnawati, "Occupational Health And Safety-Ergonomics Improvement As A Corporate Responsibility Of A Bali Handicraft Company: A Case Study, " J. Human Ergol., vol. 36, 2007, pp. 75-80.
[4] **4)**Ms. Shreya Jadhav " Indian Handicrafts: Growing or Depleting?" IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668 PP 07-13
[5] Buckle P, Devereux J. Work Related Neck and Upper Limb Musculoskeletal Disorders. Bilbao, Spain: European Agency for Safety and Health at Work (1999)
[6] Sue Hignett and Lynn McAtamney, 2000. Rapid Entire Body Assessment (REBA).Applied Ergonomics, 31 (2):201-205
[7] A Proposed REBA on Small Scale Forging Industry. International Journal of Modern Engineering Research (IJMER) Vol. 3, Issue. 6, Nov - Dec. 2013 pp-3796-3802 ISSN: 2249-6645

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[8] N. A. Ansari, P. N. Shende, M. J. Sheikh, R. D. Vaidya.Study and Justification of Body Postures of Workers Working In SSI by Using Reba. International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-2, Issue-3, February 2013

[9] Ira L. Janowitz, Marion Gillen, Greg Ryan, David Rempel, Laura Trupin, Louise Swig, Kathleen Mullen, Reiner Rugulies, Paul D. Blanc, 2006. Measuring the physical demands of work in hospital settings: Design and implementation of an ergonomics assessment. Applied Ergonomics, 37 (5):641-658

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