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Work-Related Musculoskeletal Disorders for Garments-Making Employees at Sewing Workplace

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Abstract

Work-related Musculoskeletal Disorders (MSDs) have become one of the main problems in the working environment, and it increases employees' risk of illness. This health problem, however, may contribute to the long-run effects on production performance. The aim of this paper, therefore, was to assess the work-related MSDs for garments-making employees at the sewing workplace, Rivatex East Africa Limited (REAL), Eldoret, Kenya. In order to determine the working postures and identification of the hazard and risk factors of the MSD system depending on the working posture. Rapid Entire Body Analysis (REBA) was used to assess the ergonomic work-related MSDs. The analysis results of employee posture for the existing sewing workplace had a final REBA score of 5, which meant that there was a medium ergonomic risk of MSDs and changes needed. In conclusion, the findings from this paper showed that the existing sewing workplace at the REAL factory needs to be redesigned in order to reduce awkward postures and anthropometric mismatches to lower MSD problems and improve productivity among employees.

Keywords: MSDs, Working environment, REBA, Ergonomic risk, REAL factory.

1 | Introduction

Work-related Musculoskeletal Disorders (MSDs) are one of the common well-being problems of employees. This well-being problem, however, may contribute to the long-run effects on production performance. Further, one of the key problems encountered by the garments-making employees at the sewing workspace is the MSDs, which, if not removed, can lead to increasing trauma disorders in the employees in the long run [1].

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The avoidance of work-related MSDs is one of the most predominant issues to be considered in the safety and occupational health research in both developing and developed countries [2]. In addition, the employees are also present with such individual hazards and risk factors for MSDs [3]. Additionally, work-related MSDs comprise well over half of all testified work-related diseases [4].

Work-related MSDs are one of the key prevalent working well-being problems for employees [5]. In addition, the garment-making industry is, therefore, known to have a huge number of work-related MSDs as compared to other engineering fields. Further, it is of most significance to understand the work-related MSDs as they affect the garment-making employees' health considerably. And therefore have also, a trivial adverse effect on the economic and the profit factors, such as the impact on the production and revenues [6].

According to [7] work-related MSDs, principally of the upper limbs and neck, have become a public problem among dentists in working environments. Further, the results demonstrated that 68.3% of back harms were the most common work-related MSDs among industrial-making employees [8]. As stated by Bao et al. [9], an awkward working posture has been considered a hazard and risk factor related to MSDs in workplace environments.

Physical hazards and risks assessments are performed in order to analyze various human body postures, forces acting on the human body, and stress exerted on the human body of the users when performing complex job tasks [10]. Moreover, awkward postures in building activities pose substantial risks and hazards in both rapid harm and long-term work-related MSDs [11].

As stated by Braganca et al. [12], using new techniques, like 3D full-body scanners, is likely to have very reliable data to use in the development of the industrial workplace redesign and/or other ergonomic mediations in order to avoid work-related MSDs for sewing employees. Furthermore, work-related MSDs have been measured as the key potential intimidations of the main public fitness problems associated with the dangerous garment-making industry environments [13].

The efficiency of the employees nowadays is affected by the work-related MSDs, which bounds to the movement of the garment-making industrial employees [14]. In addition, work-related MSD discomfort has been an important issue over the decades among sewing manufacturing employees [15]. Furthermore, a high occurrence of work-related MDSs of the upper lamp limits has been reported for the industries' sewing employees.

According to [16], standing and sitting while working may be the most productive posture in the assembly and manufacturing working environments. However, it can be the opposite if the sewing employees are exposed to work-related MSDs and weakness because of working in standing and sitting positions for a long period of time. Further study by Eswaramoorthi et al. [17] observed that frequent MSDs are only a part of work-related MSDs, and there is an important underreporting of harm cases with less than 10% stated.

The experiential evidence proposes that the sewing employees in the garment manufacturing units are suffering from work-related MSDs such as forearm tendinitis, carpal tunnel syndrome, epicondylitis, bicipital tendinitis, neck pain, lower back pain, shoulder pain and osteoarthritis of the knees [18]. Additionally, handling low loads at high incidence may cause fatigue and pain, which should lead to MSDs, deteriorated posture, reduced productivity and movement coordination.

MSDs affect the human body parts, with harshness ranging from mild to intense. Once the MSDs were grown in the occupational settings, the sequel to the physical tasks involved in the performance of the work and the condition of the sewing workspace environment, they are signified as work-related MSDs. The MSDs were documented as one of the main causes of work-related disability and loss of efficiency in manufacturing countries [19].

The high incidence of poor ergonomic and psychosocial working conditions in most developing countries of the region should be having a negative impact on the employee's health. In detail, a recent research that used a sample of employees from the working condition surveys of Central America where established a high incidence of work-related MSDs, ranging from 32% in Panama to 64% in Nicaragua [20].

The unsafe effects of work-related MSDs on the employee's participation are well-documented. Further, one impediment that ergonomists, scholars, and healthcare breadwinners all face in evaluating work-related MSDs is a lack of efficient tools and validated with which to quantify the ergonomic hazard and risk factors credited to these disorders [21].

Additionally, the deterrence of MSDs is very important in the world, as companies and governments are the most interested [22]. Furthermore, the number of work-related MSDs is still increasing, and temporarily, these harms are causing high costs for garment manufacturing and the whole of society, and it is very important to avoid them through ergonomic analysis and workplace design [23].

According to [24], the term work-related MSDs are used to mention to diseases and injuries of the different body structures complicated in the movement. In addition, the encumbrance of work-related MSDs could be measured in terms of the problems attendant with them, and that is, the pain and/or reduced functioning (disability) allied to the musculoskeletal system and/or in relation to the cause, such as shock and/or joint disease [25].

As mentioned by Rana et al. [26], MSDs are the discomfort and/or nervousness in the joints, muscles, cartilage, nerve and tendons, and are generally found in the neck, lower back and limbs. Furthermore, work-related MSDs take place when the physical capabilities of the garment manufacturing employee do not match the physical requirements of the work job. And they are produced by job activities and conditions, similar lifting repetitive motions, heavy matters, and working in confined areas.

Previous study by Ning et al. [27] has been stated in the United States of America, work-related MSDs like shoulder pain, lower back pain and carpal tunnel syndromes are extremely prevalent. And around 33% of all sewing workplace diseases and injuries that require days away from work are the consequence of MSDs. Additionally, MSD is the most common healthiness problems for the garment manufacturing employees. This fitness problem, therefore, should contribute to the long-term effect on the garment manufacturing performance [28].

In addition, a Pareto analysis acknowledged a substantial number of MSD associated with the physical and machine sewing of canvas automobile addition products [29]. Furthermore, the working posture of the sewing employees in the case of garment-making manufacturing was not properly designed/redesigned based on ergonomic principles. Further, a number of MSDs could befall these employees [30].

Awkward wrist postures may cause MSD-like medial epicondylitis and lateral epicondylitis [31]. According to [32], the overall finding listed that the whole process of the selected work task shall be donated to the MSDs either for a short and/or long-term exposure work environment.

According to a recent study by Esmaeel et al. [33], in garment-making productions, employees have to work for more than eight hours recurrently, either by sitting and/or by standing in one position. Then, stress is recognized in their bodies, which might principal to MSDs in the long run.

Previous study by Saguyod et al. [34] was concluded the following points which were inferred in the analysis; first, based on the evaluation of the MSD, thus the employees in the cutting, knitting and sewing operations experience body embarrassment on their upper arm, lower back, lower leg, neck and foot. Second, based on the outcome of regression analysis, it was proved that personal factors expressively affect the prevalence of body uneasiness of the employees in the workplace environments.

According to a recent study by Esmaeel et al. [35] an awkwardly designed and redesigned sewing workplaces in the garment industrial may cause work-related MSDs that increase global healthiness concerns for industrial sewing employees and the working environments. Previous studies have shown that internationally and nationally, there is a high incidence of MSDs and related bodily problems in the clothing, textile and garment-making manufacturing industries due to un-standardized workplaces, awkward work postures and extremely repetitive work [36].

As stated by Ahmed [37], the occurrence of work-related MSDs among Bangladeshi garment-making employees is very high, at 60.7%, due to the use of unsuitably designed workplaces. Further, MSDs are, therefore, a badly-behaved among the garment-making employees in the Philippine industrial sector [38].

According to [39] MSD risk assessment is an observational broadcast method for determining whether or not there is attendance of high and/or potential ergonomic hazard and risk factors among industrial employees in the work environments. Further study by Deros et al. [40] was revealed that the prevalence of work-related MSDs among sewing employees in garment workplace environments.

Furthermore, California is the home to the largest garment-making production center in the United States of America, with the majority of the garment shops located in the Los Angeles Basin. Altogether, these shops hire over 144,000 sewing machine operators, the majority of whom are minimum-wage, unrepresented immigrant women. In this previous study, therefore, the researcher found that high prevalence of work-related musculoskeletal pain in this population [41].

Research by Ebara et al. [2] suggest that the ISO/TS 20646-1 helps managers and employees control multiple work-related MSD risks on their own initiative and promote maintainable activities. There is a need to develop working standards and conditions in order to reduce work-related MSDs, the incidence of ergonomic and psychosocial risks and hazards [42].

The applicants were suggested postural correction in order to reduce and/or minimize the hazard and risk of the development of work-related MSDs. Further study is needed to conduct a detailed analysis of hazard and risk factors for the advance of work-related MSDs [43]. As stated by Burgess-Limerick [44], participating ergonomics programs had been suggested as the most effective means of the redesigning and designing manual tasks with the goal of reducing the occurrence of the occupational MSDs.

In addition, due to enhanced work posture at band knife and straight knife cutting machine at the sewing workplace, this, therefore, considerable reduction in MSDs to the body parts and higher manufacture rates were reported [45].

Ergonomic assessment of work-related MSDs involves the assessment of the risks and hazards of emerging a range of illnesses to the muscles, joints and nerves. Which are primarily to the lower back and upper limb concomitant with the occupational job tasks [46]. Further, ergonomics knowledge principles are crucial in any garment-making manufacturing industry without knowledge principles applied. Thus, one can be easily exposed to the hazards and risks of the working environment at the workplace [47].

Ergonomics is the science of designing and redesigning the work job in order to fit the employees, rather than bodily forcing the employee's body to fit the jobs. It helps to reduce bodily stress on an employee's body and eliminate many possibly serious, disabling work-related MSDs. Further, ergonomics can draw on a number of technical disciplines, including biomechanics, physiology, psychology, industrial hygiene, anthropometry and kinesiology.

Furthermore, ergonomic valuations can automatically be achieved by evaluating the risks for work-related MSDs [48]. As stated by Rittel, ergonomics is also known as the study of the design and redesign of the work task in relation to the psychological and physiological competencies of the people, and plays a large part in preventing MSDs from arising.

Rapid Entire Body Analysis (REBA) is a tool that is technologically advanced to investigate dynamic activities where there is a hazard and risk of work-related MSDs [49]. Moreover, the estimate by using postural analysis, therefore, the REBA indicates that the employees are working above the secure limit. And the major percentage of the employees have awkward postures. Thus, the garment-making employees are under moderate to high hazard and risk of work-related MSDs [50].

According to [14], the ergonomic analytical tool where used to identify the occupational risks and hazards of industrial employees was REBA. Further, based on the calculation of work posture using the REBA analytical method, it revealed that the employee's work posture has a high level and dangerous hazard and risk. Thus, the employee needs to immediately improve and enhance the work posture in order to reduce work-related MSDs [51].

Previous research showed that the REBA's convenience for the postural assessment of work tasks in several professional settings, including the garments-making manufacturing, industrial and health care jobs, sawmill tasks, construction industry, supermarket industry, food industry, classroom environments, computer-based jobs, packaging jobs, school workshop, ontological services, water industry, firefighters and emergency medical technicians as well [46].

As stated by Jadhav et al. [52], the REBA method is one of the most popular ergonomic evaluation analytical tools in any manufacturing industry. Moreover, the REBA method was designed and developed in the United Kingdom in order to provide a quick and easy observational postural investigation analytical tool for whole body activities in the health care and other service industries. Further, the basic idea of the REBA method is to observe the positions of individual body segments at the work task and score them [23].

REBA method survey has been established and developed in order to assess the working postures of the entire body when a physical material handling job task is taking place and is to ascertain the posture for the hazard and risk of the work-related MSDs [53]. Further study by Isler et al. [54] stated that the MSDs were ascended as a result of the adverse special effects of the working conditions in the garment sector.

According to [54] the working postures of the garment employees working in the sewing, cutting, ironing, quality control and packaging departments in the garment industry were examined by using the REBA analytical method. Further, there are several ergonomic assessment methods for physical job tasks that exist in the market nowadays; for instance REBA analytical method [28]. According to [40] REBA method was the most popular and widely used as the observational ergonomic analytical tool for postural assessment of jobs task for both industrial and service sectors.

The aim of this paper, therefore, is to assess the work-related MSDs for garment-making employees at a sewing workplace in Rivatex East Africa Limited (REAL), Eldoret, Kenya. In order to determine the working postures and identification of the hazard and risk factors of the MSDs system depending on the working postures.

2|Methodology

2.1|Introduction

The REBA can be used as a comfort analysis tool and as a way to assess the risk of work-related MSDs. Additionally, to assess the ergonomics of a sewing workstation, first, it is necessary to know the characteristics of the sewing worker that will work on it. In addition, for achieving the present research objective, therefore, the entire methodology can be achieved by using the following section.

2.2|REBA Procedure Methodology

Hignett and McAtamney [49] have implemented ergonomic assessment using the REBA method through several stages.

2.2.1|Collecting the workers' posture data by using documentation (photos)

In order to obtain a detailed description of the sewing workers' attitude (posture) and their neck, back, arms, wrists and feet. Further, it was conducted by documenting the sewing workers' body posture (photos), as seen in *Fig. 1*. Hence, the researchers get detailed (valid) body posture data from the recorded photos, as well as obtaining accurate data from the calculation and subsequent analysis stages.

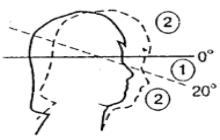
Fig. 1. Postures adopted during working at the existing sewing workstation.

2.2.2 | Determination of the angles of the workers' body part

After recording the photos of the sewing workers' posture, therefore, the calculations of the angles of each body segment were obtained, such as back, neck, upper arms, forearms, wrists, and feet.

Additionally, in the implementing REBA method, the body segments were divided into two groups, such as group A and group B. Further, group A consists of the back, neck and knees, while group B consists of the upper arms, forearms and wrists. Furthermore, based on the data of the angle of the body segment in each group, therefore, the scores of Group A and Group B can be seen in *Table 1* and *Table 2*, respectively.

Table 1. Determination of the angles of the sewing workers' body parts (Group A).

The Score of Neck Movement				
Movement	**Score**	**Change Score**	**Figure**	**References**
$0^0 - 20^0$ flexion	1	+1 if twisting or side flexed		[55].
> 20 flexion or extension	2			

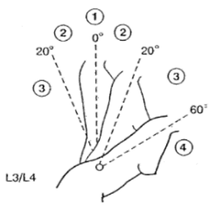
The Score of Back Movement				
Movement	**Score**	**Change Score**	**Figure**	**References**
Straight/natural/upright	1	+1 if twisting or side flexed		[56]
$0^0 - 20^0$ flexion	2			
$0^0 - 20^0$ extension				
20 – 60 flexion	3			
> 20^0 extension				
> 60^0 flexion	4			

Table 1. Continued.

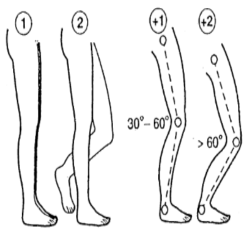
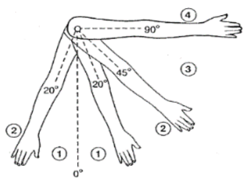
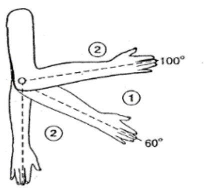
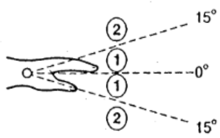
The Score of Knee Movement				
Movement	**Score**	**Change Score**	**Figure**	**References**
The feet are supported, the load is uniformly distributed, walking or sitting	1	+1 if the knee(s) between 30^0 and 60^0 flexion.		[51].
The feet are supported, the load is not uniformly distributed, and the body posture is unstable.	2	2+ if the knee(s) are > 60^0 flexion.		

Table 2. Determination of the angles of the sewing workers' body parts (Group B).

The Score of Upper Arm Movement				
Movement	**Score**	**Change Score**	**Figure**	**References**
20^0 extension to 20^0 flexion.	1	+1 if the position of the arm is abducted or rotated		[57].
> 20^0 extension and/or $20^0 – 45^0$ flexion.	2	+1 if the shoulder is raised		
$45^0 – 90^0$ flexion.	3	-1 if leaning, supporting weight of arm or if body posture is gravity assisted		
> 90^0 flexion.	4			
The Score of Lower Arms Movement				
Movement	**Score**	**Change Score**	**Figure**	**References**
$60^0 – 100^0$ flexion.	1	No change should be done.		[58].
< 60^0 flexion or > 100^0 flexion.	2			
The Score of Wrists Movement				
Movement	**Score**	**Change Score**	**Figure**	**References**
$0^0 – 15^0$ flexion / extension.	1	+1 if wrists are deviated or twisted.		[59].
> 15^0 flexion / extension.	2			

2.2.3 | Determination of the weight of the coupling and the workers' activities

In order to calculate each body segment's score, therefore, other factors need to be considered, which are weight lifted, coupling and the workers' activities. Moreover, each of these factors, therefore, similarly has its scoring category, as seen in *Table 3*.

Table 3. Determination of the weight, coupling and the workers' activities.

Load/Force			
Weight		**Score**	**References**
< 5 kg		0	[59]
5 – 10 kg		1	
> 10 kg		2	
Shock or rapid build-up of force		+1	
Table Coupling			
Coupling Score		**Action**	**References**
0	Good	Well-fitting handle and a mid-range-power grip.	[46].
1	Fair	The hand is acceptable but not ideal, or coupling is acceptable via another part of the body.	
2	Poor	Handhold is not acceptable, although possible.	
3	Unacceptable	Coupling is unacceptable if using other parts of the body.	
One or more parts are static, e.g., holding more than 1 minute.		+1	[50].
Repeated small-range action, e.g., repeated more than 4 times per minute.			
Action cause rapid large range changes in postures or an unstable base.			

2.2.4 | Calculation of the REBA score for the workers' posture

After obtaining the scores from *Table A* then, it is added to the score of the weight of the load lifted, and it results in the part A score. Meanwhile, the scores obtained from *Table B* are added to the score from the coupling Table, and it results in the Part B score. In addition to that, part A and part B scores are used to calculate the part C score, based on *Table C*. Further, the REBA score was obtained from the sum of the part C scores with the scores of the sewing workers' activities as shown in *Table 4*.

Table 4. Calculation of the REBA score for the workers' posture.

Table A

Back	**Knee**	**Neck**											
		1				2				3			
		1	2	3	4	1	2	3	4	1[1]	2	3	4
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[2]		
Upper arm	Wrist	1	2	3	1	2	3
		1	2	2	1	2	3
2		1	2	3	2	3[2]	4
		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 B											
		1	2	3[T]	4	5	6	7	8	9	10	11	12
Score A	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

2.2.5 | Check the results of the REBA

The final score of the REBA, which is divided into 5 degrees of the severity of the risk of the ergonomics, such as score 1, which represents a negligible risk and none necessary, scores 2 to 3 represents low risk and suggests change may be needed (may be necessary), score 4 to 7 represents a medium risk, which changes soon (necessary), score 8 to 10 represents high risk and requires investigation and implementation (necessary soon), and score 11 represents very high risk and implements change (necessary now). However, according to the level of action, it can be seen that the level of risk on the musculoskeletal and actions need to be done in order to reduce the work injury risk and improve the quality of the work. Besides, the ways of using the REBA method and the level of risk can be seen in *Table 5*.

Table 5. REBA action level.

Reba Level	Reba Score	Risk Level	Action Description	References
0	1	Negligible	None necessary	
1	2-3	Low	May be necessary	
2	4-7	Medium	Necessary	
3	8-10	High	Necessary soon	
4	11+	Veri High	Necessary now	

3 | Results and Discussion

The results of the work-related risks and hazards for garments-making workers at the sewing workstation are discussed below in detail.

3.1 | REBA Results

The sewing worker's work body posture data processing is carried out at the sewing workstation environment in the existing sewing workstation design for garments manufacturing at REAL, Eldoret, Kenya, namely by marking a straight line along with the angles of the photos that have been taken. The data that has been processed is followed by analyzing the data and scoring the work body posture using the REBA method. Additionally, *Fig. 2* and *Table 6* show the body posture of the sewing worker who has been given a body posture scale.

In addition, for the number of scores in *Table A* in the methodology section, a result of 3 is obtained and added to a load score of 0 because the load weight is less than 5kg. Then, the resulting score A is 4. From each angle of group B, the *Table B* score is generated that is equal to 3 and coupled with a coupling score of 0 because the grip is right and in the middle; thus, the grip on the load is strong.

Then, the resulting score B is 3. Moreover, based on the score A and score B, by using *Table C*, therefore, it can be seen that the value of score C is 4. Furthermore, to get the REBA score, by adding up the score C of 4 with an activity score of 1, as seen in in *Table 7* and *Fig. 3*. In this present paper, therefore, the REBA score in the existing design of sewing workstations for garments manufacturing at REAL, Eldoret, Kenya, was 5, which indicated that postures are at medium risk where action level 2 requires necessary change.

Fig. 2. Worker's posture for ergonomic assessment.

Table 6. REBA angle dimensions for worker's posture.

Group	Dimensions	Angle
A	Neck	28.07º
	Back	16.93º
	Knee	73.23º
	Load	0 kg
B	Upper arm	28.86º
	Lower arm	54.88º
	Wrist	35.12º
	Coupling	0 kg

Table 7. REBA score for the worker's working posture.

Group	Dimensions	Angle	Score	Table A	Score A	Score C	REBA Score
A	Neck	28.07°	2		4	4	5
	Back	16.93 °	3	4			
	Knee	73.23°	1				
		ad		0			
Group	**Dimensions**	**Angle**	**Score**	**Table B**	**Score B**		
B	Upper arm	28.86°	2		3		
	Lower arm	54.88°	2	3			
	Wrist	35.12°	2				
	Coupling			0			
	Activity score					1	

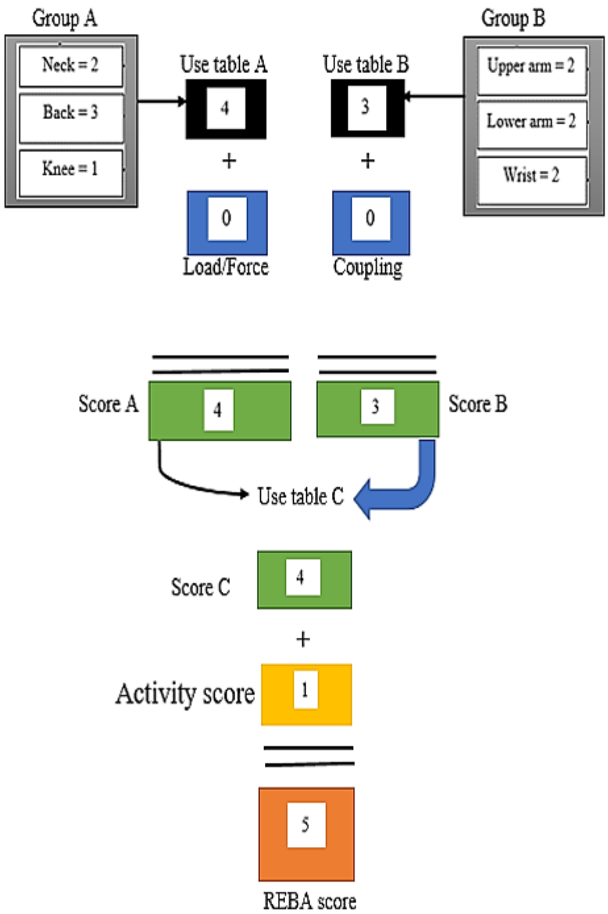


Fig. 3. The REBA score sheet.

3.2|Comparison of REAB Results of the Present Study with the Previous Studies

The comparison between the REBA results of the present study and the previous studies for assisting work-related risks and hazards for sewing workers in garment industries is seen in *Table 8*. Therefore, this present result is closer to studies by [60] and [24] as findings where they measured the REBA score as 5 (medium level of risk and requires necessary change) for sewing workers at sandpaper machine single head and garments manufacturing, respectively.

Earlier research by [37], [61] identified that the final REBA score is 8 (high risk and requires necessary change soon) for sewing workers in the clothing industry. Also, previous studies by [46], [51], [55] and found that the final REBA score is 11 (a very high level of risk and requires necessary change now) for sewing workers' body posture in garment industries.

This study, therefore, is in accordance with the previous studies, which state that the REBA method can show maximum results in assessing work-related risks and hazards in the existing design of the sewing workstation for garments manufacturing at RELA, Eldoret, Kenya. This present study, therefore, agrees with the previous studies, which state that the REBA is a method that can provide comprehensive results in assessing work-related risks and hazards for garment-making workers in order to know whether repairs need to be done immediately and/or not by using ergonomics principles.

Table 8. REBA score for the worker's working posture.

Objectives	Methods	REBA Score	Action Level	References
To analyse the work activities of the finishing process.		5	Medium level of risk and requires necessary change.	[61]
To identify the level of ergonomic risk.				[24]
'To assess work-related musculoskeletal disorders.				[61]
'To improve sewing workers' comfort and workplace safety by reducing WRMSDs.	REBA	8	High risk and requires necessary change soon.	[37]
To analyze the work body posture of sewing workers at the garments manufacturing.			Very high level of risk and requires necessary change	[51]
To provide a summary of the REBA, in terms of validity.		11	requires necessary change now.	[46]
To assess work-related MSDs.		12		[55]

4|Conclusions

This paper aims to assess work-related MSDs for garments-making workers at a sewing workstation in REAL, Eldoret, Kenya. In order to determine the working postures and identification of the risk factors of the MSDs system depending on the working postures. The analysis results of the sewing worker's body posture for the existing sewing workstation had a final REBA score of 5, which meant that there was a medium ergonomic risk for MSDs and necessary changes.

The results, however, can help to better understand the working conditions of the work involving sewing workers and highlight the potential for ergonomic interventions in order to reduce MSDs among the sewing workers. In conclusion, the findings from this present study showed that the existing sewing workstation at the REAL factory needs to be redesigned in order to eliminate awkward postures and anthropometric mismatches to lower MSD problems and improve productivity among sewing workers.

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Data Availability

All the data are available in this present paper.

Conflicts of Interest

The authors declare there is no conflict of interest.

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