

Prevalence Of Musculoskeletal Disorders and Impact Of Sensitization Programme On Reduction Of Musculoskeletal Disorders Among Sugar Cane Factory Workers

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Abstract-

Background- Approximately 1.71 billion people have MSDs worldwide and leading contributor to disability worldwide, with low back pain being the single leading cause of disability in 160 countries. In the world India stands at 2nd top largest sugar producing country after Brazil, where sugar factories are basically agro-based industries. Consequently factory workers are more exposed for RSI [Repetitive strain injury] and MSDs [Musculoskeletal disorders] specially neck, upper neck, lower neck etc due to constant movements₃.

Objectives-assess the impact of Sensitization Programme On Reduction Of Musculoskeletal Disorders Among Sugar Cane Factory Workers

Materials and Methods-A Quasi experimental research design is used for the study.300 study samples were selected through convenient random sampling technique. Nordic Musculoskeletal, structured knowledge Questionnaires and practice check list is adopted for data collection.

Results-All 300 workers were male, 185(61.5%) were aged less than 35 years of age, 15(5.0%) of the were suffering from /NCDS. 207(69%) had Musculoskeletal Disorders, 103(49.7%) had Frequency of Musculoskeletal Disorders 2 times. workers had poor knowledge and practices on reduction of MSDs and it was found highly associated with their demographic data. The study concludes that periodical sensitization programs will helps them to maintain their health status.

Key Words: Prevalence, Sensitization, Musculoskeletal Disorder, Impact and Reduction

I. INTRODUCTION

In the world, India stands at 2nd top largest sugar producing country after Brazil, where sugar factories are basically agro-based industries. It is highly diverse placed where workers are exposed to different types of exposes who may be skilled or unskilled workers pulled from rural area¹. “Work-related musculoskeletal disorders are also known as Cumulative Trauma Disorder (CTD)” There are

numerous risk factors that are responsible for MSD such as occupational, medical and way of life¹⁴. The most important risk factor for the developing of work related musculoskeletal disorder is the sedentary life style such as working in awkward position for lengthy time World health organization (WHO) global burden of disease report on bone and joint decade acknowledge the burden of musculoskeletal disorders around world, there is strong correlation between musculoskeletal disorders and span of employment in work place¹⁵.

Majority of the sugar cane factories are not providing healthy occupational environment with proper safety measures which make them to become high risk for acquiring many occupational hazards due to poor infrastructure and policies. Consequently they are exposed for RSI [Repetitive strain injury] and MSDs [Musculoskeletal disorders] specially neck, upper neck, lower neck etc due to constant movements. Since from last 20 years many reviews have showed that there is lack of suggestions and measures to preserve the health of risky workers. The study at Central American countries related to sugar cane factory also revealed that there is high mortality and morbidity related to epidemics of chronic kidney diseases are more in workers working at sugar cane factories⁴.

Usually workers belong to sugar cane factories will not give importance for adopting safety measures like masks/hearing muffs etc. And they are high risk for musculoskeletal disorders which also includes nerves, tendon, and muscles and inter vertebral discs. Hence preventing work related musculoskeletal disorders has been considered as a national priority to identify risk factories and plan supportive measures to reduce hazards. Considering as national priority this study has been taken to identify the risk factors for musculoskeletal disorders with view to prepare a educational material for workers.

II.OBJECTIVES

- 1-To describe the socio-demographic characteristics of sugar cane factory workers
- 2-To assess the prevalence of Musculoskeletal Disorders among sugar cane factory workers
- 3-To assess the Knowledge and practice regarding reduction of musculoskeletal disorders among sugarcane factory workers
- 4-To evaluate the effectiveness of sensitization programme on knowledge and practice regarding reduction of musculoskeletal disorders
- 5-To find out the correlation between Knowledge and practice regarding reduction of musculoskeletal disorders among sugar cane factory workers

Hypothesis: Will be tested at 0.05 level of significance

H₁; There will be a significant association between Musculoskeletal Disorders with selected socio demographic variables

H₂: There will be Significant correlation between pre –test scores of Knowledge and practice regarding reduction of musculoskeletal disorders among sugar cane factory workers

H₃: There will be significant difference between Pre test scores of Knowledge and practice with post test scores of Knowledge and practice regarding reduction of Musculoskeletal Disorders

H₄: There will be a significant association between Pre test scores of Knowledge and practice regarding

ASSUMPTIONS:

- Sugar cane works are more risk for getting musculoskeletal disorders
- Sugar cane works will neglect in adopting safety measures
- Sensitization programme may enhance the knowledge and practice regarding reduction of musculoskeletal disorders among sugar cane factory workers

DELIMITATION:

Study is delimited to

- One time data collection
- Data will be collected as in natural setting only from sugar cane work and does not includes any invasive procedure

III. MATERIALS AND METHODS

Research Approach: Quantitative approach

Research Design: Quasi experimental one group pretest and post test research design

Variable:

Baseline variables-Age, Gender, Education Status, Marital Status, Diet, Income, Occupation, Height, Weight, BMI, Source Of Infection Etc

Independent Variable-Sensitization programme on reduction of musculoskeletal disorders

Dependent Variable: knowledge and practice on reduction of musculoskeletal disorders

Setting of the study: Selected sugar cane factories of Vijayapur .

Study Population: Workers working more than 2 years

Sampling Technique: Convenient sampling technique

Sample size: 300 workers

Instrument to be used:

1. Demographic data sheet
2. Nordic Musculoskeletal Questionnaire [standard tool to assess musculoskeletal disorders]
3. Structured Knowledge Questionnaires
4. Practice checklist

Data collection process: Prior permission will be taken from concerned authority. Participants will be oriented to the process of study and data will be through Structures interview schedule by help of structured questionnaires, standardized tool and practice check list which has been converted into Kannada .Pretest knowledge and practice will be assessed & followed with implementation of sensitization programme and on 10th day post test will be conducted

Statistical analysis and interpretation:

Data will be analyzed by using descriptive and inferential statistics.

IV. RESULTS AND DISCUSSION

1- Socio-demographic characteristics of sugar cane factory workers-

All the study participants were males, out of 300 workers 185(61.5%) were aged less than 35 years of age ,114(38.0%) were studied ITI, 196(65.3%) were married, 165(55.0%) had mixed diet, 277(92.3%) had income less than 25000Rs, 111(37.0%) had 5-10 years of work experience, 166(55.3%) had normal BMI, 170(56.7%) of the sugar cane workers had not heard about Musculoskeletal Disorders and 68(22.7%) were fitters followed by 65(21.7%) were electricians, 59(19.7%) were mechanics, 1(0.3%) of the study participants were unloader, operator, supervisor, manufacturing, and Pan Incharge. 15(5.0%) of the sugar cane workers were suffering from /NCDS [DM/Hypertension/cancer/stroke] among 15, 8(53.3%) had DM and remaining 7(46.7%) had HTN

2- The prevalence of Musculoskeletal Disorders among sugar cane factory workers

Table no 1: The prevalence of Musculoskeletal Disorders among sugar cane factory workers

Musculoskeletal Disorders	Frequency	Percentage
Present	207	69
Absent	93	31
Total	300	100.0

From table no 1 explains that, out of 300 sugar cane workers 207(69%) had Musculoskeletal Disorders and remaining 93(31%) does not have Musculoskeletal Disorders. In 1999, About 1 million people took duration of the time far from work to treat and recover from work-related musculoskeletal pain or impairment of function in the low back or upper limbs ¹¹. Musculoskeletal disorder remains the foremost reason of work related illnesses ¹². Large number of cross sectional studies and few prospective studies gave positive findings that provide a strong evidence for the musculoskeletal problems due to work ¹³.

3- Musculoskeletal Disorders and measures among sugar cane factory workers-

Out of 207 sugar cane workers, 92 had neck pain and UB neck ache respectively followed by 57 had wrist pain and 25, 14, 9 , 7 and 3 had knee pain, UB pain, shoulder pain, ankle pain, and Hips pain respectively. 193 workers have taken treatment.

Aremu A B[2022] study explains that the most affected part among the sugar cane workers was lower back pain [64%] and upper back [46%] and which was more highly significant with absentees’ for the work and effect on economic product of country⁷.Prathok V Pawar et.al [2019] explains that duration for development of complaints related WMSDs was started within 1-5 years and maximum of complaints started from 10-20 years⁹.

4- Sugar cane factory workers based frequency of Musculoskeletal Disorders

Table no 2: Frequency and percentage distribution of sugar cane factory workers based frequency of Musculoskeletal Disorders

Frequency of Musculoskeletal Disorders	Frequency	Percentage
2 times	103	49.7
3 times	74	35.7
4 times	17	8.3
5 times	13	6.3
Total	207	100.0

From Table no 2,it was observed that , out of 207, majority 103(49.7%) had Frequency of Musculoskeletal Disorders 2 times followed by 74(35.7%) who complained 3 times Frequency of Musculoskeletal Disorders /month , 17(6.3%) had 4 times and 13(6.3%) had 5 times Musculoskeletal Disorders.

Sushma Ganwar [2027] reveals that repetitive work, aquad position and long duration of work has lead into frequent occurrence of Musculoskeletal discomfort among workers.⁸

5- The Knowledge and practice regarding reduction of musculoskeletal disorders among sugarcane factory worker- Out of 300 sugar cane workers, majority 222(74.0%) of them had Inadequate knowledge regarding musculoskeletal disorders and remaining 78(26.0%) had moderately adequate knowledge, majority 184(61.3%) had good practice regarding reduction of musculoskeletal disorders and remaining 116(38.75) had poor practice.

Table no 3: The comparison of pre and post test of Knowledge and practice regarding reduction of musculoskeletal disorders among sugarcane factory workers

Knowledge Level	Knowledge level				Practice Level	Practice Level			
	Pre-test		Post-test			Pre-test		Post-test	
	Fre	%	Fre	%		Fre	%	Fre	%

Inadequate	222	74.0	04	1.3					
Moderately Adequate	78	26.0	18	6.0	Poor	116	38.7	09	3.0
Adequate	00	00	278	92.7	Good	184	61.3	291	97.0
Total	300	100.	300.0	100	Total	300	100.	300.	100.0

Table no 3 revealed that mean pre-test knowledge score of sugar cane workers regarding reduction of musculoskeletal disorders was 6.51 which was increased to 14.61 after sensitization program. Majority 291(97.0%) had good practice regarding reduction of musculoskeletal disorders after sensitization program. It was concluded that sensitization program was effective in improving both knowledge and practice of workers regarding reduction of musculoskeletal disorders.

Tableno-4 Comparison of pr-test and post-test knowledge regarding reduction of musculoskeletal disorders among sugarcane factory workers

Knowledge	Mean	N	Std. Deviation	Std. Error Mean	t-value	P-value
Pre-Test	6.51	300	1.61	0.092	58.5	< 0.0001 (S)
Post-Test	14.16	300	1.81	0.104		

Table no 4 revealed that mean pre-test knowledge score of sugar cane workers regarding reduction of musculoskeletal disorders was 6.51 which was increased to 14.61 after sensitization program. The increase in knowledge was highly significant with t-value=58.5 with p-value < 0.001

Table no 5: Comparison of pre-test and post-test practice regarding reduction of musculoskeletal disorders among sugarcane factory workers

Practice	Mean	N	Std. Deviation	Std. Error Mean	t-value	P-value
Pre-Test	6.78	300	1.400	0.080	45.9	< 0.0001 (S)
Post-Test	12.37	300	1.76	0.102		

Table no 5 revealed that mean pre-test practice score of sugar cane workers regarding reduction of musculoskeletal disorders was 6.78 which was increased to 12.37 after sensitization program. The improvement in practice was highly significant with t-value=58.5 with p-value < 0.001.

6-Effectiveness of sensitization programme-

Table no 4-Paired t-sample statistics for comparing pre-test post test knowledge score regarding reduction of musculoskeletal disorders among sugarcane factory workers

Paired Differences			t	df	Sig. (2-tailed)
Mean	Std. Deviation	SE Mean			
7.64	2.26	0.13	58.46	299	<0.000(S)

Table no 4 showed that mean paired difference in knowledge score was 7.64 with t-value= 58.46 with p-value less than 0.0001 indicates that sensitization programme on knowledge regarding **reduction of musculoskeletal disorders among sugarcane factory workers was effective**

Paired t-Sample statistics for comparing pretest posttest practice score regarding reduction of musculoskeletal disorders among sugarcane factory workers

Paired Differences			t	df	Sig. (2-tailed)
Mean	Std. Deviation	SE Mean			
5.58	2.10807	0.121	45.9	299	<0.000(S)

Table no 4 showed that mean paired difference in practice score was 5.58 with t-value= 45.9 with p-value less than 0.0001 indicates that sensitization programme on practice regarding reduction of musculoskeletal disorders among sugarcane factory workers was effective

Mitha A H[2021] a study done on evaluate the difference between WMSDs before and after introduction of stretching exercises. Performing of various regress movements like climbing, lifting, crawling, reaching and bending will leads to strain and fatigue for muscles of the body. 34 workers were included in the study. Result explains that there was a significant variation between MSDs complaints before and after stretching exercises i,e 43 and 37 respectively. The study concludes that even there was difference of complaint before and after interventions¹⁰.

7-Association between knowledge regarding Musculoskeletal Disorders with selected socio demographic variables of sugar cane factory worker

it was observed that knowledge sugar cane factory worker regarding Musculoskeletal Disorders was not associated with their selected socio demographic variables such as Education, marital status , diet, Experience , BMI, source, occupation , Musculoskeletal Disorders Status, Musculoskeletal Disorders(specific), treatment taken , Frequency of Musculoskeletal Disorders, suffering from /NCDS , and Suffering From [DM/ Hypertension/ cancer/stroke] But it was highly associated with age , income,

8-Association between practice regarding Musculoskeletal Disorders with selected socio demographic variables of sugar cane factory worker

it was observed that knowledge Of sugar cane factory worker regarding Musculoskeletal Disorders was not associated with their selected socio demographic variables such as age , education ,marital status, diet, income, experience , BMI, source, occupation, Musculoskeletal Disorders Status, Musculoskeletal Disorders(specific), treatment taken, Frequency of Musculoskeletal Disorders, workers suffering from /NCDS [DM/Hypertension/cancer/stroke] But it was highly associated with duration of working hours.

9-Association between prevalence of Musculoskeletal Disorders with selected socio demographic variables of sugar cane factory worker

it was observed that, prevalence of Musculoskeletal Disorders was not associated with their selected socio demographic variables such as age, marital status, diet income ,experience, source But it was highly associated with Education, BMI, occupation, workers suffering from DM and Hypertension.

V.CONCLUSION

Around 171 million workers are suffering with one or the other WMSDs during their job period and come across with mild to severe disability leads into losing of job. If every factories adopt ergonomic measure and periodical sanitization, awareness , screening programme and refreshment activates in between the work schedule will reduce much of WMSDs.

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CONFLICT OF INTEREST-None declared

ETHICAL CLEARANCE- Ethical clearance certificate was obtained by institutional ethical committee.

VII.REFERENCES

1. N R Ramesh Masthi , Manasa A R, Mohan J, Pruthvi S , Dhruva , A cross sectional study on morbidities among sugar cane factory workers in Mandya district, Karnataka, India, RGUHS Journal of Medical Sciences, 2018;8(4):167-173.
2. Abi Varghese , Vinay V Panicker, Impact of musculoskeletal disorders on various agricultural Operations: a systematic review, Indian Academy of Sciences Sadhana ;2022:47-46
3. Pratik V Pawar, Pranjali Gosavi, G Varadharajulu, Amrutkuvar Jadhav, Brinda Patel, A study to find impact of work duration on health in sugarcane factory workers. Biomedical Research 2019; 30 (4): 524-528.
4. Marcelli Rocha LeiteI, Dirce Maria Trevisan ZanettaII, Iara Buriola TrevisanIII, Emmanuel de Almeida,BurdmannIV, Ubiratan de Paula SantosI, Sugarcane cutting work, risks, and health effects: a literature review,Revista Sauda De Publica , 2018;52(80) :01-15.
5. Alireza Choobineh, Sayed Hamidreza Tabatabaee , Mahmoud Behzadi, Musculoskeletal Problems Among Workers of an Iranian Sugar-Producing Factory, International Journal of Occupational Safety and Ergonomics,2009;15(4): 419–424.
6. Smita Yashvants Vasave, Deepak B. Anap, Prevalence of musculoskeletal disorders among sugarcane workers – a cross sectional study, Indian Journal of Basic and Applied Medical Research, 2016;5(04): 752-758.
7. Aremu AB , Owino Alfred Odongo, Joseph J and Suleiman MA, Musculoskeletal Disorders among Sugar Factory Workers in Jinja-Uganda: A Cross-Sectional Study: Journal of Musculoskeletal Disorders and Treatment;2022,8(2):PP-01-10.
8. Sushma Gangwar , Seema Kwatra. Prevalence of Musculoskeletal Problems among Sugarcane Workers in Uttar Pradesh; International Journal of Advanced Engineering Research and Science (IJAERS):2017, 4(7):PP:25-28.
9. Pratik V Pawar , Pranjali Gosavi, G Varadharajulu , Amrutkuvar Jadhav , Brinda Patel: A study to find impact of work duration on health in sugarcane factory workers. Biomedical Research ;2019; 30 (4): PP.524-52
10. MithaAuliaHarahap ,DecySitungkir ,Ahmad Irfandi ,Ira Marti Ayu , Cut Alia Keumala Muda; The Difference Of Musculoskeletal Disorders Before And After Workplace Stretching Exercise; Journal of Vocational Health Studies2021; vol-5;126-132.
11. Thamrin Y, Wahyu A, Russeng SS, et al. Ergonomics and musculoskeletal disorders among seaweed workers in Takalar Regency: a mixed method approach. Med Clin Pract. 2020;3:100110.
12. Ayub Y, Shah ZA. Assessment of work related musculoskeletal disorders in manufacturing industry. J Ergon. 2018;18-22.
13. Salve UR, Jadhav GS, Shete HK. Design solution of shoe sole (base of the footwear) preparation in traditional hand sewn footwear manufacturing: a case study on Kolhapuri Chappal BT. In: Rebelo F, Soares M, editors. Advances in ergonomics in design. Cham: Springer International Publishing; 2018. P

PP. 995–1003.

14. Pal A, Dhara P. Evaluation of work-related musculoskeletal disorders and postural stress of female “Jari” workers. *Indian J Occup Environ Med.* 2017;21:132.
15. Barro D, Anselmo Olinto MT, Araldi Macagnan JB, et al. Job characteristics and musculoskeletal pain among shift workers of a poultry processing plant in Southern Brazil. *J Occup Health.* 2015;57:448–56.