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Original Research Article

Occupation related health problems among women cashew industry workers in Kollam district, Kerala: a cross sectional study

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ABSTRACT

Background: Majority of the workers in cashew industry are women who belong to economically disadvantaged strata of the society. Work related musculoskeletal disorder is one of the major occupational health problems in industrialized countries. The objective of study was to find out the occupation related health problems among women workers of cashew industries in Kollam district, Kerala.
Methods: This is a cross sectional community-based study conducted among 350 women cashew workers of Kollam district of age above 45 years using quantitative method. Simple random sampling method was used to collect the sample. The data was collected from all the respondents using pretested interview schedule in local language Malayalam. Details of basic socio demographics, occupation related health problems were collected.
Results: Around 72% of the workers are doing cashew shelling,19% of the workers are in grading section and the remaining 9% of them are doing peeling job. Majority of the women (73%) performed their job by sitting on the floor. Around 342 (97.7%) workers have reported at least one health problems in the last one year. Musculoskeletal disorders (MSDs) (89.7%) were the predominant work-related health problem of the women cashew workers. Among MSDs, the most affected region is lower back (37.6%) and the least affected one is elbow (4.5%).
Conclusions: There is an urgent need to introduce participatory ergonomic interventions among the women workers with more comfortable working positions and healthy work stations.

Keywords: Cashew industry, Kerala, Musculoskeletal disorders, Women workers, Work profile

INTRODUCTION

Cashew, a tropical fruit, is grown mainly for the edible kernel of the nut and phenolic oil in the shell lining. The Portuguese who are called paranki in Malayalam planted cashew trees around the fort and hence cashew trees are also called Parankimavu in Malayalam and cashew nuts are called Parankiyandi. India is largest producer, processor, exporter and consumer of it in the world and earns a sizeable amount of foreign exchange.[1-3] About 94% of the workers in these industries are women from poor economic and social backgrounds thus providing income source to large number low-income families. Cashew industry involves the conversion of raw cashew nut shells to blanched graded kernel form. Cashew industry is high labour intensive agro based industry. Kerala accounts for the highest proportion of cashew workers with the approximation of more than 3 lakh workers.[4-6]

The kernel processing manual tasks such as shelling, peeling and grading are performed by women while in roasting and work in heating and cooling sections it is performed by men which need more technical skills.[9,10]

The different stages of cashew processing include A) Roasting B) Shelling/Cutting C) Peeling D) Grading.[11]

In work environment, workers are exposed to many types of health hazards due to the characteristics of the job. It is mainly due to poor housekeeping, ventilation and lighting, poor and long work posture, exposure to chemicals etc.[12] Most of the cashew industries are using traditional equipment and tools. Exposure to smoke from the furnace, contact with the cashew shell liquid, unhealthy sitting posture, avoidance of rest intervals to maximize output, unhygienic environment in a section of the factories and the chances of accidents make the workers in the cashew sector vulnerable to health risks.[7,8] The Musculoskeletal disorders, chronic respiratory illness, burns, staining of palm and fingers, eye pain, prolapse of uterus are the most common occupation related health problems reported among cashew workers.[13]

The objective of study was to find out the occupation related health problems among women cashew industry workers in Kollam district, Kerala.

METHODS

Study design

This study was an industry based cross sectional survey using quantitative methods conducted in the different Taluks of Kollam district of Kerala from August 2021.

Study setting

Since a majority of cashew industries in the Kerala state are located in Kollam district, private cashew industries from this district were selected as the study setting.

Study population

The study was primarily conducted among women cashew industry workers of age above 45 years in Kollam district of Kerala who are engaged in roasting, shelling, peeling and grading. Temporary women workers in the cashew industry were excluded.

Sampling method

Simple random technique was used to select the cashew factories from the latest directory of cashew processors and exporters. Using the list of women cashew workers engaged in these seven cashew industries as the sampling frame, participants are randomly selected using random sampling method.

Sampling technique and Sample size calculation

Kollam revenue district is divided into six taluks namely Kollam, Karunagapally, Kunnathur, Kottarakara, Punalur and Pathanapuram. Before COVID-19 pandemic, from these taluks, Kottarakara was selected purposively and the proposed numbers of cashew industries to collect data were three. But due to COVID-19 situation it has come to know that many of the cashew industries in the selected Taluk were closed because of the shortage of work and labours. So, in order to meet the estimate sample size, seven cashew industries from the different Taluks of Kollam district have randomly selected for the study.

Sample size was calculated using the formula,

$N = Z^2 \times PQ/ d^2$

N = sample size

Z = Standard normal deviate, which is 1.96 for 95% confidence interval

P = Prevalence, which is taken as 32 % (From a previous study done in cashew processing industry of Kollam district found that, Prevalence of neck pain among female workers was 32%) [14]

q = 1-p, which is 68%

d= Difference between assumed prevalence and worst expected prevalence, it is taken as 5% For this study precision is taken as 5.

$Z = (1.96)\ 2 \times 0.32 \times 0.68 / (0.5)\ 2 = 334$

Assuming a non-response rate of 10 %, the final sample size is 350.

Data collection tool

An extensive literature review followed by the construction of questionnaire, collection of data and investigation of primary data were used for this study. Final participant selection has done in Microsoft excel using random number generator. The study subjects were approached at the site of their settlements during their non-working hours. The data was collected from all the respondents using pretested interview schedule in local language, Malayalam using quantitative methods. A pilot study was conducted among selected industries. The informed consent was obtained from each participant prior to the interview schedule. The data from questionnaire was coded and entered in Microsoft excel.

The sections included in the interview are: 1) Sociodemographic information, 2) Work profile of cashew workers, and 3) Occupation related health problems.

Ethical considerations

The study has done in compliance with the basic principles of ethics in research. Privacy and

confidentiality of the respondents were ensured during study and in the future by removing personal identifiers during data analysis. Written informed consent in Malayalam was taken from all participants and contact details of the researcher have given to each participant for clarifying any doubts. Ethical clearance for the study was obtained from Institutional Ethics Committee (IEC) of Ananthapuri Hospitals and Research Institute, Trivandrum.

Statistical analysis

Statistical analysis was done by IBM SPSS software version (20). Univariate analysis has expressed as frequencies with their percentages.

RESULTS

Sociodemographic profile of the study population

All the study participants were in the age group of 45-58 years. Table 1 presents the sociodemographic factors related to the study population. The mean (±SD) age of workers was 51.3±4.0 years. About 82.9% women population are married. About 31.7% of the study population had completed upper primary education; on the other hand, 6% of them had no formal education of any kind. 188 out of 350 women workers have other source of income in the family. Out of this; 26% have livestock/crop, 17% have rent and 7% have pension and as their other source of income.

Table 1: Socio-demographic profile of the study participants (n=350).

Characteristics	N=350	Frequency (%)
Age		
Mean age±SD	51.30±4.018	
Marital status		
Unmarried	10	2.9
Married	290	82.9
Divorced	20	5.7
Widowed	30	8.6
Religion		
Hindu	276	78.9
Christian	54	15.4
Muslim	20	5.7
Caste		
General	63	18.0
Other backward community	175	50.0
Scheduled caste	89	25.4
Scheduled tribe	23	6.6
Ownership of house		
Own house	321	91.7
Children's house	6	1.7
Rent house	23	6.6
Type of house		
Kutcha house	86	24.6
Semi pucca house	126	36
Pucca house	138	39.4
Major drinking water source		
Own wells	268	76.6
Public wells	26	7.4
Hand pumps	18	5.1
Tube wells	38	10.9
Other source of income		
No of people having other source of income	188	53.7
Type of income source		
Rent	59	16.9
Pension	25	7.1
Livestock/crop	91	26.0
Others	16	4.6

The economic status of the study participants was assessed using the colour of the ration card. The poverty status was classified as women who possess pink or yellow cards belonging to below poverty line (BPL) and women having white or blue cards as above poverty line (APL). Nearly, 75.7% of the respondents have pink colour ration cards and 18.3% workers have blue ration cards. Only a few (2.3%) possess white cards. Around 78% had BPL cards (Table 2).

Table 2: Distribution of women workers by colour of ration card (n=350).

Colour of ration card	N	Frequency (%)
White	13	3.7
Blue	64	18.3
Pink	265	75.7
Yellow	8	2.3
Total	350	100.0

Work experience and work profile of the cashew industry workers

Almost 76% of the women workers have work experience between 10 and 30 years. Only 6% of them have greater than 30 years of experience (Figure 1). It is evident that 72% of the workers are doing shelling in the cashew industry. 19% of the workers are in grading section and the remaining 9% of them are doing peeling job (Figure 2).

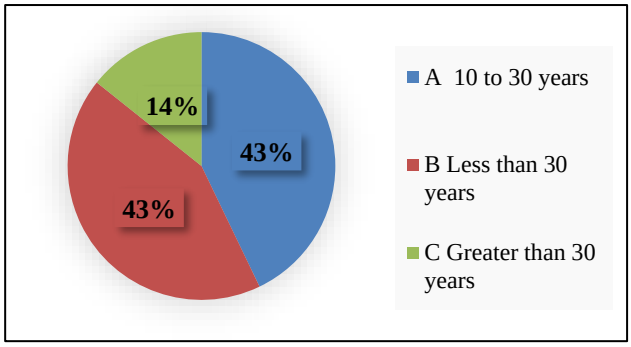

Figure 1: Work experience in the cashew industry (n=350).

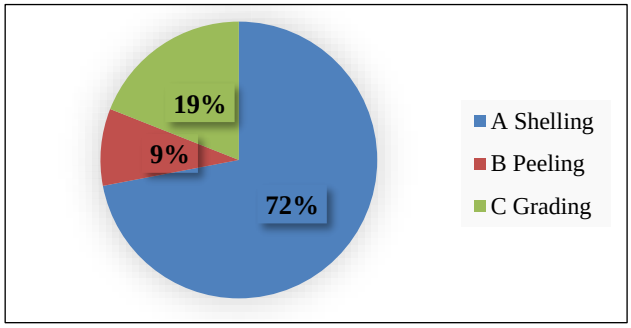

Figure 2: Distribution of workers according to their activity performed (n =350).

Working positions of women workers and Type of activity involved in the labour

Majority of the women (73%) reported that they performed their job by sitting/squatting on the floor. Around 25% of the women were doing their job by sitting on the chair or bench and 2.6 % of the women were performing their job by standing (Table 3).

Table 3: Working positions of women workers.

Working positions	N	Frequency (%)
Sitting or squatting on the floor	255	72.9
Sitting on the chair or bench	86	24.6
Standing	9	2.6
Total	350	100.0

Majority (97%) of the women reported that they are engaged in fully manual labour. About 1.7% of women engaged in manual activity with machine support. And 1.4% of the workers are engaged in the activity mainly done by machinery but supported by manual labour (Table 4).

Table 4: Type of activity involved in the labour.

Type of activity	N	Frequency (%)
Fully manual labour	339	96.9
Mainly manual labour but supported by machinery	6	1.7
Mainly machinery but supported by manual labour	5	1.4
Total	350	100

Work related health problems

Due to the work characteristics, the workers in the cashew industry are exposed to health risks. Smoke emission from furnaces, contact with liquid cashew nutshell, unhealthy sitting position, avoidance of rest periods to optimize production, unhygienic atmosphere in a factory section and the chances of accidents make workers vulnerable to health problems in the cashew sector.

Among 350 participants, 342 workers have reported work related health problems in the last one year. Among the non-communicable diseases, 12.9% are affected with diabetes, 11.1% are affected with hypertension and hyperlipidemia. Respiratory problems were presented by 9.4% workers,7.9% have staining on fingers and palms and 6.4% are affected with prolapse of uterus. Other health problems faced by women workers in cashew industry are, skin allergy, (12.9%), eye problems (8.2%), anemia (4.4%), and acid peptic disease (3.5%) and burns (3.2%.) (Table 5).

Table 5: Prevalence of health problems (n=342).

Health problems in the last one year	N	Frequency (%)
Yes	342	97.7
No	8	2.3
Type of health problems		
Musculoskeletal disorder	314	89.7
Respiratory illness	32	9.4
Diabetes mellitus	44	12.9
Skin allergy	44	12.9
Hypertension	38	11.1
Hyperlipidemia	38	11.1
Eye problems	28	8.2
Staining of palm and fingers	27	7.9
COVID-19	26	7.4
Prolapse of uterus	22	6.4
Anemia	15	4.4
Acid peptic diseases	12	3.5
Burns	11	3.2
Urinary tract infection	7	2.0
Cardiovascular disease	5	1.4
Thyroid	4	1.1
Accident	3	0.9
Fever	3	0.9
Others	48	13.7

DISCUSSION

We conducted study on women cashew workers in Kollam district of Kerala which deals with their work-related musculoskeletal disorders and their health seeking behaviour. Majority of our study participants were of an older age and mostly from rural area. From the analysis, it is evident that workers engaged in cashew industries faces various health problems irrespective of the work category. Musculoskeletal disorders, skin allergy, staining of palms and fingers, eye strain, burns, prolapse of uterus, acid peptic diseases, respiratory problems etc. are the health issues reported by women cashew workers. They also had non-communicable diseases (NCDs) like diabetes mellitus, hypertension, hyperlipidemia and uterus problems. This could indicate the presence of potential determinants of poor health like unhealthy diet pattern.

Many researches shown that long hours without regular break, repetitive movements, and fixed working position are common which led to high prevalence of musculoskeletal disorders among cashew workers. It includes repetition, contact stress, forceful contraction, awkward and sustained postures in the work place which affect neck, shoulder, back, arms, wrist, legs and feet.

In our study, majority of the workers (72%) are doing shelling job and remaining them are in peeling (9%) and in grading sections (19%). We have found that 96.9% of the workers are doing their work manually without machine support. Among the health problems reported work related musculoskeletal disorders (89.7%) were more. We noticed that among WMSDs low back pain (37.6%) holds a highest number. The region at knee/ankle was the second most prevalent (22.9%). WMSDs followed are neck and shoulder (10.2%) each, hand/wrist (8.9%), upper back (5.7%) and the least affected area is elbow (4.5%). This is similar to a study conducted in Cuddalore district of Tamil Nadu in 2021 where muscular skeletal pain in the various regions holds a major part of all health hazards faced by the workers.[1]

It is also noticed that low back pain and wrist/hand pain holds a higher number. In a study done by Borah et al in a cashew industry show that majority of the women felt severe to very severe pain in fingers, wrist and upper and lower arm of both hands and upper and lower back and they perceived more than intolerable joint discomfort while shelling cashew.[9] The proportion of low back pain is highly noticed among shelling workers and wrist/hand pain among peeling and grading. On the other hand, neck pain and knee pain were highly concentrated among shelling workers. Another study in 2016 done among women cashew workers in Kollam district of Kerala throws light on the health-related issues of the workers. They presented that low back pain was the predominant work-related health problem (48.8%) followed by hand and wrist pain (46.6%), knee pain (37.8%) and neck pain (32.5%). They found that MSDs are more among workers engaged in shelling and peeling of nuts due to repetitive movements of the same joints and fixed squatting working position.[14] The workers also experienced other health problems like respiratory infections, skin allergy, Diabetes mellitus, hypertension etc. Of the participants, 12.9% reported Non-communicable diseases like Diabetes mellitus,11.1% reported hypertension and 11.1% have hyperlipidemia. Similar results are observed in a study conducted at Kollam district where prevalence of Diabetes mellitus is 17.9 % and hypertension of (15.2%) [14]

This study has few limitations. The field work for this study was carried out during the COVID-19 pandemic and that needs to be a considered when evaluating the findings of this study in future. Many of the participants had worn face masks as a part of preventive measures associated with COVID-19 situation and maybe reversed as the pandemic waves. The data collected through the survey was entirely self-reported and so, the possibility of reporting bias cannot be discounted. As the workers are from a single district in Kerala, generalizability is limited.

CONCLUSION

In our study to understand the work-related musculoskeletal disorders among women cashew industry workers of Kollam district clearly suggest that poor socioeconomic status and lower level of ergonomic interventions at workplace have manifested as a range of health concerns including occupation related morbidities,

reproductive morbidities and non-communicable diseases. Musculoskeletal problems in the form of back pain, leg/had/wrist pain, knee pain and neck pain constitute a major share of the health problems among this group of workers.

This study finding provides evidence to program decision-makers and planners, which will help develop and implement intervention programs for improving the quality of life of women cashew workers in similar settings. One way to ensure better health to cashew workers is to schedule a regular health screening among these workers is by organizing monthly medical camps. This is especially critical considering the high prevalence of MSDs among the workers. There is an urgent need to introduce participatory ergonomic interventions among the women workers through more comfortable working positions, convenient and healthy work stations with chairs and work desks, introduction of exercises and stretches before starting their work shifts and in microbreaks with which they can continue the work while managing their pain and institution of compulsory work breaks.

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REFERENCES

1. Priya J, Ayyasamy L, Madhu S, Mahendiran P. Occupational safety and health hazards among cashew processing workers of Cuddalore district: A cross sectional study. Indian J Heal Sci Biomed Res. 2021;14(2):254-9.
2. Waikar, G, & Suman, S. Health status of women workers involved in cashew processing Units in Konkan Region of Maharashtra, India. Inter JCurr Microbiol Appl Sci. 2018;7(8):1745-51.
3. Dhanushkodi S, Wilson VH, Sudhakar K. Energy analysis of cashew nut processing agro industries: A case study. Bulg J Agric Sci. 2016;22(4):635-42.
4. Bhat V. Issues and Challenges Faced by Cashew Processing Enterprises-a Study in Udupi District. J Emerg Technol Innov Res. 2019;6:1821-9.
5. D'Silva RJ, S. GB. A Case Study of Cashew Industry in Karnataka. Int J Case Stud Business, IT, Educ. 2021;5(2):329-41.
6. Paramasivan K. Indian cashew processing industry-an overview. J Food Res Technol. 2014;2(2):60-6.
7. Kazi R, Bote MM. A cross sectional study to find out the health seeking behaviour of brick kiln workers. Int J Community Med Public Heal. 2018;5(12):5334-7.
8. Kuzhiparambil A. A secondary informal circuit of globalisation of production: home-based cashew workers in Kerala, India. Glob Labour J 2016;7(3):279-96.
9. Borah S, Baruah M. Musculo-skeletal disorder of women worker engaged in shelling activity of cashewnut factory. Int J Agric Eng. 2013;6:386-90.
10. Borah S, Baruah M. Health hazards of women workers involved in cashewnut industry. Asian J Home Sci. 2013;8:794-5.
11. Veeranjaneya V, Polisetty K, Banana K. A study on cashew manufacturing process. Int J Res Cult Soc. 2017;1:2456-6683.
12. Kinslin D, Jaya Kumar D. Occupational hazards of cashew workers in Kerala. Int J Recent Technol Eng. 2019;8:103-5.
13. Sethulekshmi JR, Ambily AS, Vidyapeetham AV. The quality of work life of employees in cashew industry: an empirical study. Int J Pure Appl Math. 2018;119(12):2727-36.
14. Nelson V, Rakesh PS, Simon S, Hashim A, Usman A, Rassia AA. Work related health problems of female workers engaged in Cashew processing Industries-a cross-sectional study from Kollam district, Kerala, southern India. Ind J Commu Heal. 2016;28(4):359-63.

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