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COMPARATIVE ASSESSMENT OF OCCUPATIONAL HEALTH HAZARDS AMONG WOMEN CASHEW WORKERS IN PUBLIC AND PRIVATE SECTORS OF KERALA

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ABSTRACT

Cashew processing is one of Kerala's oldest agro-based industries, and its workforce is overwhelmingly female. The work involves handling caustic shell oil, squatting for long hours and repeating the same hand movements thousands of times a day, yet little comparative evidence exists on how these hazards differ between public and private sector units. This paper compares the occupational health of women cashew workers in the two sectors using primary data collected in 2024 from 401 workers (116 in public and 285 in private units) in 50 factories in Kollam district. Chi-square tests, independent-sample t-tests and binary logistic regression were used. About 94 per cent of the women reported at least one health problem (95.1 per cent in private and 90.5 per cent in public units); the difference between sectors was not statistically significant, but the difference across categories of work was (peeling 96.2 per cent, shelling 93.1 per cent, grading 86.2 per cent). Musculoskeletal pain was the most common complaint in both sectors, while respiratory, skin and urinary complaints were concentrated among shelling workers, and public sector workers reported every listed problem more often than their private sector counterparts. Workers who reported health problems rated workplace safety, work-life balance and work conditions lower, had a lower socio-economic index and were older. In the logistic model the work condition index, socio-economic index and category of work were not individually significant, although the model as a whole was ($\chi^2 = 13.94$, $p = 0.008$). The results point to the need for ergonomic seating, ventilation, protective equipment and regular health surveillance in cashew factories of both sectors.

KEYWORDS: *Cashew workers; women workers; occupational health hazards; musculoskeletal disorders; workplace safety; public and private sector; Kerala*

1. INTRODUCTION

India is among the leading cashew-producing countries in the world, and the processing industry sustains a large rural workforce. In Kerala it is a traditional agro-based industry concentrated in Kollam district, which has long been called the "cashew capital of the world". According to the Kerala State Planning Board (2023), the state's processing units employ roughly three lakh workers, about 90 per cent of them women, and about 65 per cent of the units registered with the Cashew Export Promotion Council of India are located in Kerala. In 2020-21 the state exported 24,929 tonnes of cashew kernels worth ₹1,461.27 crore, close to half of India's kernel exports by both quantity and value. Raw nut production within the state, however, has slipped from 88,180 tonnes in 2017-18 to 74,630 tonnes in 2022-23, and the industry continues to struggle with scarce raw nuts, high processing costs, slow adoption of modern technology and competition from other processing regions (Kerala State Planning Board, 2022, 2023).

Most processing is done by private firms. Two public bodies also run factories: the Kerala State Cashew Development Corporation (KSCDC) and the Kerala State Cashew Workers Apex Co-operative Society (CAPEX). In 2021-22 KSCDC employed 12,518 workers, but its factories worked only 96 days, and CAPEX employed 4,100 workers for 179 working days (Kerala State Planning Board, 2022). Public units therefore offer fewer days of work than private units, which on average provide about 220 days a year against roughly 150 days in the public sector, although daily earnings are somewhat higher in the public sector (about ₹350 against ₹320). About 93 per cent of the women in both sectors work in shelling, peeling or grading. Shelling and peeling are paid at piece rates, whereas graders receive a daily wage with dearness allowance. Earlier work on the industry has documented the weak socio-economic position of these workers and the decline in the employment the industry offers them (Salam, 2003; Rajan & Binilkumar, 2004; V. V. Giri National Labour Institute, 2014).

The health consequences of this work are the subject of the present paper. Shelling exposes the hands to cashew nut shell liquid, peeling is done with a sharp knife, roasting involves heat and fumes, and nearly all of the tasks are carried out squatting on the floor. Ill-health is not only a personal burden for these women. It reduces earning days and productivity, adds medical expenses to households that have little to spare, and so feeds back into the poverty that keeps women in this work. Kerala's record on women's well-being makes the question all the more pressing.

The studies reviewed in the next section have mostly described the prevalence of specific complaints in one set of factories, or relied on hospital records. Few set public and private units side by side with a common questionnaire, and fewer still test whether the health of individual workers is associated with work conditions and socio-economic position. This paper attempts to fill part of that gap. It uses survey data from Kollam district to compare the health status of women cashew workers in public and private units, describe the

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problems they report and how they seek care, and identify the factors that are associated with ill-health.

2. REVIEW OF LITERATURE

The earliest detailed account is that of James (1981), who found that insufficient working days and employer exploitation were the central problems of cashew workers. She described shelling as the most unpleasant job in the factory, with droplets of shell liquid splashing onto the skin and abrading it. She also noted that the workforce was about 95 per cent female and that nearly three-quarters of the women in roasting and shelling came from Scheduled Caste and other backward communities, with low levels of schooling. The workers who had completed secondary school tended to be placed in the cleaner operations of peeling and grading.

Clinical studies connected particular tasks to particular conditions. Varghese et al. (1986) found oral submucous fibrosis in 7.85 per cent of cashew workers in Kerala, with most cases among shelling workers, which pointed to exposure to kernel oil. Pasricha and Srinivas (1990) reported severe dermatitis of the hands and feet among women in cashew units, attributing it to the shell oil. Survey-based work followed. Remani (1992) listed respiratory or chest disease and joint pain in the arms and legs (25 per cent each), back pain (10 per cent), headache (5 per cent) and tanning of the palms (24 per cent) among the complaints of women workers. Rajan et al. (1993) found a similar set of complaints, but because they drew on records of the Employees' State Insurance hospitals, women treated privately were left out, and the authors themselves concluded that primary data from individual workers were needed.

Later work has widened the lens. Thresia (2007) traced severe health problems among women in the industry to poor working conditions, domestic violence and limited access to health care, and called for a multi-pronged response involving public health services, local self-governments and trade unions. Divakar et al. (2012) examined the nutritional status and health knowledge of cashew workers and recommended nutrition and hygiene education. In Karnataka, Girish et al. (2012) found that pain in the knee, then the back and shoulder, was the most common complaint, and linked it to repetition, contact stress and sustained awkward postures. More recent studies have examined the general health of women cashew workers in Kerala (Kerala Institute of Labour and Employment, 2021), their physical and mental morbidity in Kollam (Rebello et al., 2023) and their reproductive health (Ravi, 2013).

The cross-sectional study of Rakesh et al. (2016) in Kollam is the closest antecedent to the present one. They found low back pain, wrist and hand pain, knee pain and neck pain to be the major musculoskeletal complaints, and associated the hand and wrist problems with the repetitive hammering and cutting involved in shelling and peeling. Squatting on the floor with the trunk bent, long hours with few breaks and sustained visual concentration were identified as probable reasons for back and eye complaints. Chronic respiratory illness was more common among shelling workers, burns among those in roasting, and staining and dryness of the skin among those handling the nuts. Gloves were seldom worn, partly because workers feared that wearing them would lower their output. The authors recommended benches or chairs, exhaust fans, masks, glove-use orientation and steam cooking in place of drum roasting.

3. OBJECTIVES AND HYPOTHESES

The study has four objectives:

(i) to compare the overall health status of women cashew workers in public and private sector units and across categories of work;

(ii) to describe the types of health problems they report;

(iii) to examine their preferred sources of health care and the accessibility of hospitals; and

(iv) to identify the factors associated with their health status. Three null hypotheses were tested:

H1. There is no significant difference in the health status of women cashew workers in public and private sector units.

H2. There is no significant difference in the health status of women cashew workers across the categories of work (shelling, peeling and grading).

H3. There is no meaningful association between work conditions and the health status of women cashew workers.

4. DATA AND METHODOLOGY

4.1 Data sources and study area

The study uses primary and secondary data. Secondary data come from the Kerala State Cashew Development Corporation, CAPEX, the Kerala Cashew Board Ltd., the Cashew Export Promotion Council of India, the Directorate of Cashew Nut and Cocoa Development, the Kerala State Cashew Worker's Relief and Welfare Fund Board, various issues of the Economic Review of the Kerala State Planning Board, and published research. Primary data were collected through a structured survey of women workers in public and private sector units in Kollam district in 2024.

Kollam was chosen because the industry is concentrated there: according to the Kerala Cashew Board, 541 of Kerala's 692 factories and 249,849 of its 268,655 cashew workers are in the district. Of the 541 units, 32 are in the public sector and 509 in the private sector. Fifty units were selected from ten blocks of the district by systematic sampling, comprising 14 public and 36 private units.

4.2 Sample

Within these units the sample was stratified by sector and category of work (Table 1). The required sample size was calculated with the standard formula for a 5 per cent margin of error, a 50 per cent population proportion and a 95 per cent confidence level, which gave a total of 401 respondents: 116 in the public sector and 285 in the private sector. Peeling workers form the largest group (212), followed by shelling (131) and grading (58) workers.

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Table 1: Distribution of the population and sample by sector and category of work

Category of work	Population			Sample		
	Public	Private	Total	Public	Private	Total
Shelling	4,604	7,967	12,572	42	89	131
Peeling	5,388	13,476	18,864	55	157	212
Grading	1,763	3,541	5,304	19	39	58
Total	**11,756**	**24,984**	**36,740**	**116**	**285**	**401**

Source: Kerala Cashew Worker's Relief and Welfare Fund Board, Kollam. Sample size calculated with the standard formula (5 per cent margin of error, 50 per cent population proportion, 95 per cent confidence level).

4.3 Variables and methods

The dependent variable is self-reported health status: whether the respondent reported at least one health problem (coded 1) or none (coded 0). Respondents who reported a problem were also asked which problems they had. Three composite measures were constructed from the survey and used as explanatory variables: a work condition index and a socio-economic index (both on a 0–1 scale, constructed by principal component analysis, with higher values indicating better conditions), and scores for workplace safety and health culture and for work-life balance (five-point scales on which higher values are more favourable). Percentages and cross-tabulations describe the data. The association of health status with categorical variables was tested with the chi-square test, and differences in mean scores between workers with and without health problems with the independent-sample t-test. A binary logistic regression with category of work, the work condition index and the socio-economic index as predictors was used to examine the factors associated with ill-health, with shelling as the reference category.

5. RESULTS AND DISCUSSION

5.1 Health status of women cashew workers

Of the 401 women surveyed, 376 (93.8 per cent) reported at least one health problem (Table 2). The proportion was 95.1 per cent in private units and 90.5 per cent in public units. This gap of 4.6 percentage points is not statistically significant ($\chi^2 = 2.946$, df = 1, p = 0.086), so H1 cannot be rejected: ill-health is close to universal in both sectors, and ownership alone does not separate them at the conventional 5 per cent level. The p-value is nonetheless close to the 10 per cent level, and with only 25 women reporting no problem the test has limited power to detect a real difference.

Table 2: Health status of women cashew workers by sector

Health status	Private	Public	Total	χ^2 (df), p
Has health issues	271 (95.1)	105 (90.5)	376 (93.8)	2.946 (1), 0.086
No health issues	14 (4.9)	11 (9.5)	25 (6.2)	
Total	**285 (100.0)**	**116 (100.0)**	**401 (100.0)**	

Source: Primary survey, 2024. Figures in parentheses are percentages of the column total.

Health status does differ by the kind of work performed (Table 3). The share reporting a problem was 96.2 per cent among peeling workers, 93.1 per cent among shelling workers and 86.2 per cent among graders ($\chi^2 = 7.995$, df = 2, p = 0.019). H2 is therefore rejected. Graders work at the last, cleaner stage of processing and are paid daily wages rather than piece rates, which may help to explain why fewer of them report problems. The same ordering appears in both sectors (Figure 1), and public sector graders reported the lowest prevalence of any group (78.9 per cent).

Table 3: Percentage of workers reporting health issues, by sector and category of work

Sector	Grading	Peeling	Shelling	All workers
Private	89.7 (35/39)	96.8 (152/157)	94.4 (84/89)	95.1 (271/285)
Public	78.9 (15/19)	94.5 (52/55)	90.5 (38/42)	90.5 (105/116)
All workers	**86.2 (50/58)**	**96.2 (204/212)**	**93.1 (122/131)**	**93.8 (376/401)**

Source: Primary survey, 2024. Figures in parentheses show workers with health issues / workers surveyed. For all workers, $\chi^2 = 7.995$, df = 2, p = 0.019.

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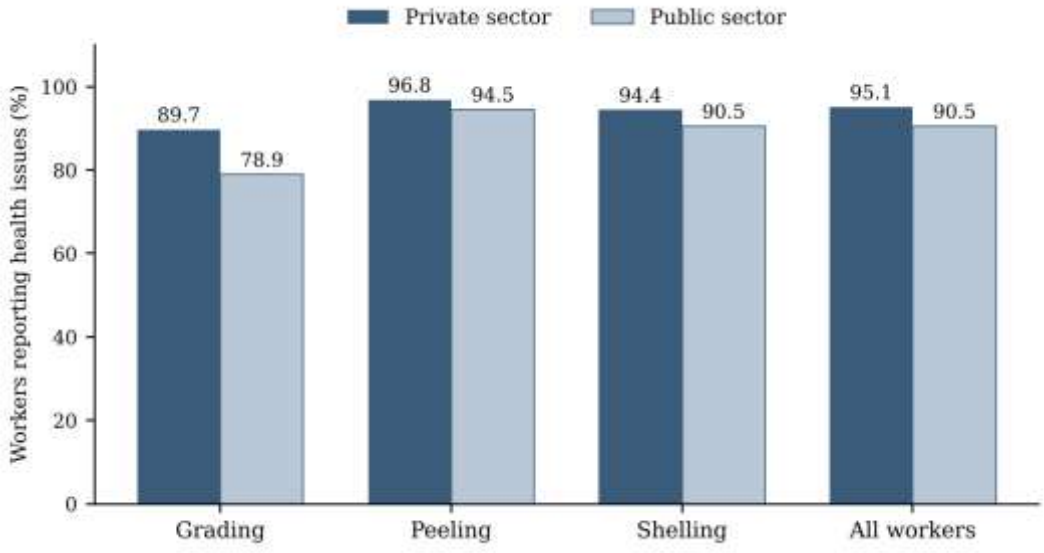


Figure 1: Workers reporting health issues by category of work and sector (%)
Source: Primary survey, 2024.

5.2 Health problems reported

Table 4 lists the problems reported by the 376 workers who had at least one. Because workers could report more than one, the percentages sum to more than 100. Body pain was reported by 96.0 per cent, back pain by 69.9 per cent, neck pain by 52.4 per cent, joint pain by 48.4 per cent and leg, hand or knee pain by 42.8 per cent, so musculoskeletal complaints dominate in both sectors. Skin disease (30.6 per cent), sneezing (27.7 per cent), headache (27.7 per cent), cough (25.3 per cent) and allergy (25.0 per cent) come next, followed by urinary infection (17.3 per cent), asthma or bronchitis (16.8 per cent), arthritis (14.1 per cent) and tuberculosis (9.6 per cent).

Public sector workers reported each of the fifteen problems more often than private sector workers, and the differences are significant at the 1 per cent level for all but neck pain, which is significant at 5 per cent. The widest gaps are for sneezing (66.7 against 12.5 per cent), skin disease (61.9 against 18.5 per cent), arthritis (42.9 against 3.0 per cent), asthma or bronchitis (40.0 against 7.7 per cent) and tuberculosis (31.4 against 1.1 per cent). This is a striking reversal of the overall pattern in Table 2, where private sector workers were slightly more likely to report some problem. In other words, public sector workers are not more likely to report ill-health at all, but those who do report a wider range of conditions.

Table 4: Types of health problems reported, by sector

Health problem	Private (n = 271)	Public (n = 105)	All (n = 376)
Body pain***	256 (94.5)	105 (100.0)	361 (96.0)
Back pain***	169 (62.4)	94 (89.5)	263 (69.9)
Neck pain**	133 (49.1)	64 (61.0)	197 (52.4)
Joint pain***	120 (44.3)	62 (59.0)	182 (48.4)
Leg/hand/knee pain***	101 (37.3)	60 (57.1)	161 (42.8)
Headache***	53 (19.6)	51 (48.6)	104 (27.7)
Skin disease***	50 (18.5)	65 (61.9)	115 (30.6)
Sneezing***	34 (12.5)	70 (66.7)	104 (27.7)
Cough***	47 (17.3)	48 (45.7)	95 (25.3)
Allergy***	42 (15.5)	52 (49.5)	94 (25.0)
Urinary infection***	25 (9.2)	40 (38.1)	65 (17.3)
Asthma/bronchitis***	21 (7.7)	42 (40.0)	63 (16.8)
Arthritis***	8 (3.0)	45 (42.9)	53 (14.1)
Tuberculosis***	3 (1.1)	33 (31.4)	36 (9.6)
Other diseases***	7 (2.6)	10 (9.5)	17 (4.5)

Source: Primary survey, 2024. Percentages are of workers reporting at least one health issue; multiple responses allowed. *** and ** indicate that the chi-square test of difference between sectors is significant at 1 and 5 per cent respectively.

The type of work matters even more (Table 5). Shelling workers reported the highest rate for fourteen of the fifteen problems, the exception being the residual category of other diseases. Their rates of neck pain (76.2 per cent), joint pain (67.2 per cent), skin disease (62.3 per cent) and sneezing (54.1 per cent) are far above those of graders (28.0, 12.0, 0.0 and 0.0 per cent). Respiratory and skin complaints, arthritis and urinary infection were reported by none of the graders in this sample, but by between 18 and 62 per cent of shelling workers. Peeling workers occupy a middle position. Back pain is reported by a

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similar share of graders and peelers (64.0 and 62.3 per cent) and is higher among shelling workers (85.2 per cent). All differences across categories are significant at the 1 per cent level.

Table 5: Types of health problems reported, by category of work

Health problem	Grading (n = 50)	Peeling (n = 204)	Shelling (n = 122)	All (n = 376)
Body pain***	42 (84.0)	197 (96.6)	122 (100.0)	361 (96.0)
Back pain***	32 (64.0)	127 (62.3)	104 (85.2)	263 (69.9)
Neck pain***	14 (28.0)	90 (44.1)	93 (76.2)	197 (52.4)
Joint pain***	6 (12.0)	94 (46.1)	82 (67.2)	182 (48.4)
Leg/hand/knee pain***	20 (40.0)	66 (32.4)	75 (61.5)	161 (42.8)
Headache***	3 (6.0)	49 (24.0)	52 (42.6)	104 (27.7)
Skin disease***	0 (0.0)	39 (19.1)	76 (62.3)	115 (30.6)
Sneezing***	0 (0.0)	38 (18.6)	66 (54.1)	104 (27.7)
Cough***	1 (2.0)	45 (22.1)	49 (40.2)	95 (25.3)
Allergy***	1 (2.0)	32 (15.7)	61 (50.0)	94 (25.0)
Urinary infection***	0 (0.0)	12 (5.9)	53 (43.4)	65 (17.3)
Asthma/bronchitis***	0 (0.0)	21 (10.3)	42 (34.4)	63 (16.8)
Arthritis***	0 (0.0)	17 (8.3)	36 (29.5)	53 (14.1)
Tuberculosis***	0 (0.0)	5 (2.5)	31 (25.4)	36 (9.6)
Other diseases***	0 (0.0)	11 (5.4)	6 (4.9)	17 (4.5)

Source: Primary survey, 2024. Percentages are of workers reporting at least one health issue; multiple responses allowed. *** indicates that the chi-square test is significant at 1 per cent.

These patterns are in line with what the occupational literature would lead one to expect. Shelling combines the hazards of shell liquid on the skin, hammering of the nuts, which raises aerosols, and a bent, squatting posture, and the sharper respiratory and skin gradient in Table 5 fits the findings of Rakesh et al. (2016), Varghese et al. (1986) and Pasricha and Srinivas (1990). The high prevalence of back, neck and joint pain across all three categories matches the musculoskeletal burden reported by Girish et al. (2012). Why public sector workers report more of every condition cannot be settled with these data. The public sample has a somewhat larger share of shelling workers (36 against 31 per cent), but this can account for only a small part of gaps as wide as 43 against 3 per cent for arthritis. Differences in age, length of service or willingness to report are other possibilities that the survey did not isolate. The self-reported tuberculosis figure for public units (31.4 per cent) in particular should be read with caution; it was not clinically verified and needs to be confirmed through screening.

5.3 Health care use and access

Table 6 shows that the Employees' State Insurance (ESI) system is the main source of care for both groups. For consultation during illness, 75.6 per cent of workers preferred ESI dispensaries or hospitals and 24.4 per cent other government doctors. The preference for ESI doctors was stronger in the public sector (82.8 per cent) than in the private sector (72.6 per cent), and the difference is significant (χ^2 = 4.579, df = 1, p = 0.038). For hospitalisation the two sectors do not differ: 71.2 per cent of private and 73.3 per cent of public sector workers chose ESI hospitals (p = 0.679).

Access is a different matter. Only 4.2 per cent of private sector workers reported difficulty in reaching a hospital, against 13.8 per cent of public sector workers (χ^2 = 11.656, df = 1, p = 0.001). Taken with the previous section, this means that the group reporting the widest range of conditions is also the group that finds it harder to reach a hospital. Differences in the location of units, transport and local health infrastructure are the likely explanations, though the survey did not measure distance or travel time.

Table 6: Health care preferences and accessibility, by sector

	Private (n = 285)	Public (n = 116)	All (n = 401)	χ^2 (df), p
Preferred care for illness				
ESI doctor/dispensary/hospital	207 (72.6)	96 (82.8)	303 (75.6)	4.579 (1), 0.038
Other government doctors	78 (27.4)	20 (17.2)	98 (24.4)	
Preferred hospital for admission				
ESI hospital	203 (71.2)	85 (73.3)	288 (71.8)	0.171 (1), 0.679
Other government hospital	82 (28.8)	31 (26.7)	113 (28.2)	
Accessibility of hospital				
No problem in accessing	273 (95.8)	100 (86.2)	373 (93.0)	11.656 (1), 0.001
Problem in accessing	12 (4.2)	16 (13.8)	28 (7.0)	

Source: Primary survey, 2024. Figures in parentheses are column percentages.

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5.4 Factors associated with health status

Table 7 compares workers with and without health problems on six variables. Workers who reported problems gave lower scores for workplace safety and health culture (mean 1.89 against 2.23 on a five-point scale; $|t| = 2.166$, $p = 0.031$) and for work-life balance (2.96 against 3.49; $|t| = 9.159$, $p < 0.001$). The overall mean for workplace safety and health culture was only 1.91 out of 5, which points to weak safety arrangements in the factories generally, not just among those who fell ill. The work condition index was also lower among workers with problems (0.394 against 0.430; $|t| = 2.760$, $p = 0.006$). Although the difference in absolute terms is modest, it is statistically significant, so H3 is rejected: work conditions and health status are associated.

The socio-economic index was lower among workers with health problems (0.374 against 0.423; $|t| = 2.020$, $p = 0.044$), consistent with the view that low income, poor housing and weak nutrition worsen the health effects of hard physical work. Workers with health problems were also older, with a mean age of 46.9 years against 43.0 years for those without ($|t| = 3.440$, $p = 0.001$). Marital status showed no significant association with health status ($\chi^2 = 1.473$, df = 3, $p = 0.688$): 93.4 per cent of the 380 married women reported a problem, as did all 18 widowed, 2 unmarried and 1 separated or divorced respondent, though the last three groups are too small for the test to mean much. The number of working days in a month did not differ between the two groups (20.9 against 20.1 days; $|t| = 0.540$, $p = 0.589$), so the reported ill-health is not simply a matter of the number of days worked.

Table 7: Health status and selected variables (independent-sample t-tests)

Variable	Has issues Mean (SD)	No issues Mean (SD)	|t| (df)	p	Higher score means
Workplace safety and health culture	1.887 (0.404)	2.231 (0.664)	2.166 (399)	0.031	Better
Work-life balance	2.957 (0.902)	3.493 (1.046)	9.159 (399)	<0.001	Better
Work condition index	0.394 (0.063)	0.430 (0.060)	2.760 (399)	0.006	Better
Socio-economic index	0.374 (0.116)	0.423 (0.149)	2.020 (399)	0.044	Better
Age (years)	46.94 (5.13)	42.96 (7.15)	3.440 (371)	0.001	Older
Working days per month	20.94 (5.56)	20.13 (6.19)	0.540 (244)	0.589	More days

Source: Primary survey, 2024. Workers with / without health issues: 376 / 25 (age: 351 / 22; working days: 231 / 15, because of missing responses). Test statistics are as reported from the survey analysis; sign omitted, direction is given by the means.

Table 8 reports the logistic regression of health status (1 = has a health problem) on the work condition index, the socio-economic index and category of work. The model as a whole is statistically significant ($\chi^2 = 13.935$, df = 4, $p = 0.008$), but explains little of the variation (Nagelkerke $R^2 = 0.092$). Both indices carry negative coefficients, indicating that better work conditions and higher socio-economic status are associated with a lower probability of reporting a problem, but neither is significant on its own (work condition index, $p = 0.114$; socio-economic index, $p = 0.484$). Category of work is of borderline significance overall (Wald = 5.845, df = 2, $p = 0.054$). With shelling as the reference group, the odds of a health problem are about 2.3 times higher for peeling workers and about one-third lower for graders, but neither contrast is significant ($p = 0.118$ and 0.459). The classification table shows that the model assigns all workers to the 'has health issues' category, so the overall accuracy of 93.8 per cent simply equals the share of workers who reported a problem and does not indicate predictive power. With only 25 workers in the 'no health issues' group, the model has little information to separate the two groups.

Table 8: Binary logistic regression of health status

Variable	B	S.E.	Wald	p	Exp(B)
Work condition index	−6.588	4.173	2.493	0.114	0.001
Socio-economic index	−1.605	2.295	0.489	0.484	0.201
Category of work (overall, df = 2)			5.845	0.054	
Grading (vs. shelling)	−0.425	0.574	0.548	0.459	0.654
Peeling (vs. shelling)	0.829	0.530	2.446	0.118	2.290
Constant	5.791	1.468	15.572	<0.001	327.325

Source: Primary survey, 2024. Dependent variable: 1 = has health issues, 0 = none. Omnibus $\chi^2 = 13.935$ (df = 4), $p = 0.008$; −2 log likelihood = 173.227; Cox & Snell $R^2 = 0.034$; Nagelkerke $R^2 = 0.092$. Both indices are scaled 0–1, so their coefficients refer to a change from the lowest to the highest possible value.

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5.5 Discussion

Three points emerge from the results. First, the burden of ill-health is almost the same in the two sectors in terms of the share of workers affected. This suggests that the hazard lies in the technology and posture of the work itself, which are much the same in public and private units, more than in who owns the factory. The occupational pattern within the factory floor supports this: shelling and peeling, the tasks with the heaviest hand work, the most contact with shell oil and the least comfortable posture, account for the highest prevalence and the widest range of complaints.

Second, the sectors differ in the range of problems and in access to care. Public sector workers report more conditions of every kind and find it harder to reach a hospital. The evidence here is descriptive and self-reported, and the explanations offered earlier need to be tested with data on age, years of service and distance to facilities. The pattern nonetheless does not show that public sector workers, who get fewer days of work (about 150 a year against 220 in private units), are healthier on balance.

Third, the factors associated with ill-health are the working environment (safety, work conditions, work-life balance) and the worker's socio-economic position, as well as age. The weak showing of the work condition and socio-economic indices in the regression, once they are entered together with category of work, may be because these variables overlap with the type of work and because very few respondents were free of health problems. This should be taken as a reason for more refined measurement, not as evidence that conditions do not matter.

6. CONCLUSION AND POLICY IMPLICATIONS

More than nine in ten women cashew workers in the sample (93.8 per cent) reported at least one health problem, and the proportion was similarly high in the private (95.1 per cent) and public (90.5 per cent) sectors. Musculoskeletal pain is the commonest complaint everywhere; respiratory, skin and urinary problems are concentrated among shelling workers; and public sector workers report a wider range of problems and greater difficulty in reaching hospitals. Poor workplace safety, weaker work-life balance, poorer work conditions, lower socio-economic status and older age are associated with a greater likelihood of ill-health. The findings suggest the following measures:

1. Ergonomic improvements. Benches or raised seating and work tables should replace floor squatting wherever possible, and the three standard rest intervals should be ensured, particularly for piece-rate shelling and peeling workers who are tempted to skip them.
2. Protective equipment and exposure control. Gloves, masks and footwear should be provided at no cost to the worker, accompanied by orientation on their use and, where output is a concern, by piece-rate arrangements that do not penalise their use. Exhaust ventilation should be installed in the shelling and roasting sections, and steam cooking, which the earlier literature found less hazardous, should replace drum roasting where possible.
3. Health surveillance. Periodic screening for skin, respiratory and musculoskeletal conditions, and for tuberculosis in particular, should be built into the ESI and Welfare Fund Board machinery. This is especially important for public sector units, where reported prevalence is highest.
4. Access to care. Transport or mobile clinic arrangements for workers in locations from which hospitals are hard to reach would address the access gap found among public sector workers.
5. Nutrition and health education, along the lines recommended by Divakar et al. (2012), together with measures that stabilise earnings and working days, would address the socio-economic dimension of ill-health.

Several limitations should be kept in mind. Health status is self-reported and was not clinically verified; the design is cross-sectional, so the associations found cannot be read as causal; only 25 respondents reported no health problem, which restricts statistical power; and the survey covers one district. Future work should combine clinical examination with longitudinal data on exposure, tenure and age, and compare the findings with other cashew-producing districts.

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