



Occupational Health Problems Among Nutmeg Production Workers: A case from Grenada, The Caribbean

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Presenter Disclosures

- Muge Akpınar-Elci, MD, MPH
 - The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:
 - “No relationships to disclose”

Grenada (Spice Island)

- Nutmeg is the national icon
- Total area 132.8 sq mi.
- Population 110,000



Why nutmeg industry?

- Major agricultural product
 - The world's second largest producer
- Hurricane Ivan 2004
 - 90% of the nutmeg trees lost
- Lack of use of:
 - Technology
 - Information



Background

- The Department of Public Health and Preventive Medicine
- Grenada Cooperative Nutmeg Association
 - Established by an act of the Grenada Legislature in 1947
 - Registered Nutmeg Farmers



Goal and Objectives

- To determine the association between occupational risk factors, and health problems among nutmeg workers.
 - To identify occupational risk factors related to the nutmeg production process,
 - To describe occupational related health problems and their severity among nutmeg workers,
 - To investigate the possible relationship between occupational risk factors and health problems.

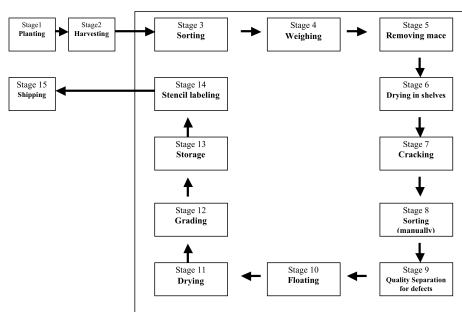
Methodology

- A cross-sectional study
- Study procedures were approved by
 - Institutional Review Board at St. George's University
 - The Ministry of Agriculture
 - The GCNA Board of Directors
- All participants provided a written informed consent

Data collection

- Workplace evaluation
- Trained interviewers administered the validated questionnaires
 - Demographics, occupational history, symptoms (respiratory, musculoskeletal, skin), physician-diagnosed diseases, and smoking status.

Workplace Evaluation



Questionnaire Results

- 87 workers (93.6 %) completed the questionnaire
- Mostly female (77%)
- Mean age 47.2±11.4 years.
- Nonsmoker 83.9%

Results

- 56% of the workers are involved in the cracking and sorting
 - High dust exposure



Musculoskeletal Symptoms

| Musculoskeletal Symptoms | Overall n (%) | Severity* n (%)** |
|--------------------------|---------------|-------------------|
| Neck pain | 35 (40.2) | 11 (31.4) |
| Shoulder pain | 49 (56.3) | 21 (42.9) |
| Elbow pain | 13 (15.1) | 2 (15.4) |
| Wrist pain | 40 (46.0) | 18 (47.4) |
| Upper back pain | 55 (65.5) | 23 (41.8) |
| Lower back pain | 69 (81.2) | 22 (31.9) |
| Hip pain | 37 (43.0) | 14 (38.9) |
| Knee pain | 49 (57.0) | 13 (27.7) |
| Ankles pain | 32 (37.2) | 11 (34.4) |

* Have you at any time during the last 12 months, been prevented from doing normal work (at home or away from home) because of this trouble in your...

** percentage of workers with positive symptoms

Musculoskeletal Symptoms

- Cracking/sorting workers had statistically significant high prevalence of shoulder pain ($\chi^2= 7.155$, $p < 0.05$)
- No observed significant relationship between musculoskeletal symptoms and work duration or work intensity

Respiratory Symptoms

| Symptoms | Overall n (%) | Work-related n (%)* |
|-------------------------------|---------------|---------------------|
| Lower airways symptoms | | |
| Wheezing | 25 (28.7) | 16 (64.0) |
| Dry Cough | 43 (49.4) | 20 (46.5) |
| Chest tightness | 33 (37.9) | 18 (56.3) |
| Shortness of breath | 24 (27.6) | 10 (45.5) |
| Upper airways symptoms | | |
| Sneezing | 59 (67.8) | 34 (60.7) |
| Stuff nose | 43 (49.4) | 16 (37.2) |
| Runny nose | 19 (22.4) | 6 (33.3) |
| Itchy nose | 17 (19.5) | 5 (29.4) |
| Eye symptoms | | |
| Watery, Itchy Eyes | 50 (58.1) | 22 (44.9) |

* percentage of workers with positive symptoms

Respiratory Symptoms

- Work-related wheezing was statistically high among cracking/sorting workers ($\chi^2= 3.849$, $p < 0.05$).
- Overall allergic condition was high among cracking/sorting workers ($\chi^2= 3.613$, $p < 0.05$)

Physician diagnosed diseases

| Physician diagnosed diseases | n (%) |
|------------------------------|-----------|
| Asthma | 13 (14.9) |
| Sinusitis | 22 (25.3) |
| Rhinitis | 0 |
| Eczema | 1 (1.1) |
| Hearing problem | 4 (4.8) |
| Positive skin prick test | 2 (11.2) |

Physician diagnosed diseases

- Physician diagnosed sinusitis was associated with
 - dust exposure ($\chi^2= 3.280$, $p < 0.05$) and
 - high work duration (Mann-Whitney U= 489.5, $p < 0.05$).

Conclusion

- Regardless of their tasks observed exposure patterns and the prevalence of symptoms were high for all workers.



Current Project

- Health and exposure assessment
- Implementing renewable energy
- Occupational safety and health training



Participants

Co-authors

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- GCNA
- WINDREF
- Nutmeg workers

