Description of morbidity and occupational risks among tannery and factory workers in an urban slum, Dhaka, Bangladesh

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Background
- Kamrangirchar and Hazaribag slums are located in Dhaka, Bangladesh, where an unknown number of workers are engaged in largely unregulated work in small-scale factories (e.g., plastic reprocessing, metal works, tanneries, leather work, garments).
- Since 2014, MSF has been running an occupational health project in the areas providing:
  - Medical care to the workers in registered factories
  - Tetanus Vaccination
  - Health promotion
- In 2017 MSF carried out a hazard assessment in order to benchmark the hazards MSF patients are exposed to.

Aim
- To describe the health of factory workers that visited MSF clinics between 2014 and 2016
- To identify the hazards inside the factory work space
- To improve outcome for workers and design possible preventive interventions inside factories

Method
- Analysis of clinical data on:
  - first medical consultations were extracted from the 2014-2016 occupational health databases
  - descriptive analyses for adults (≥ 18 years) and child factory workers (< 18 years) were conducted separately;
- Assessment of working conditions:
  - general physical safety (e.g. presence of light)
  - control measures (e.g. chemical stored in closed labelled containers)
  - protective equipment (e.g. hand protection)
  - ergonomics (e.g. hold the same position for a prolonged time)
  - Descriptive analyses were performed by factory type.
- A score was developed to assess the overall performance by calculating the percentage of positively scored questions/positively assessed items by factory, using all questions with a valid answer (i.e. yes and no-answers) as a denominator.
- Analysis was performed in Microsoft Excel and Stata (Stata Corp. version 12.1, Texas, USA).

Results
- Medical data
  - 5198 patients: adult (n=4,291; 83%) and 907 patients were children (17%).
  - Socio-demographic characteristics (Table 1)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Adult ≥18 years old</th>
<th>Children ≤18 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (interquartile range)</td>
<td>27 years (22-35)</td>
<td>15 years (13-16)</td>
</tr>
<tr>
<td>Sex (male %)</td>
<td>76.2</td>
<td>71.3</td>
</tr>
<tr>
<td>No education (%)</td>
<td>55.1</td>
<td>69.9</td>
</tr>
<tr>
<td>Married (%)</td>
<td>47.6</td>
<td>47.4</td>
</tr>
<tr>
<td>Living in a factory (%)</td>
<td>15.7</td>
<td>21.8</td>
</tr>
<tr>
<td>Work activities (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leather/tanneries (%)</td>
<td>47.6</td>
<td>27.9</td>
</tr>
<tr>
<td>Plastic</td>
<td>20.9</td>
<td>19.7</td>
</tr>
<tr>
<td>Garments</td>
<td>17.6</td>
<td>32.0</td>
</tr>
<tr>
<td>Metal</td>
<td>13.4</td>
<td>19.2</td>
</tr>
</tbody>
</table>

- Factory data
  - 151 factories participated, representing the working conditions of 5084 workers.
  - Less than 10% of factories provide safe drinking water for workers
  - 78% did not have soap
  - 2.7% had adequate personal protective equipment
  - Almost all factories failed to provide an ergonomically acceptable working environment
  - Tanneries scored lower in all the components (Figure 3)

Morbidity (Figure 2)
- Adults most often suffered from musculoskeletal, gastrointestinal, skin, and respiratory conditions.
- Gastrointestinal and skin conditions were highest among workers in the leather/tannery sector.
- Children suffered from musculoskeletal, skin, respiratory, and gastrointestinal conditions.
- Dermatitis/eczema occurred most often among metal, leather and tannery factories.

Injuries and tetanus vaccination
- 6% of workers reported having had an injury in the past
- 8% presented with an injury upon the first consultation
- 38% of injured workers received a tetanus vaccination

Conclusion and recommendations
Both adult and child factory worker populations show high levels of morbidity that appear to correlate with the poor working conditions documented by the factory hazard assessment.
These findings support the need for improved access to health care as well as interventions within the working space.

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