AET
(Arbeitswissenschaftliches Erhebungsverfahren zur Tätigkeitsanalyse; ergonomic job analysis procedure)

General description and development of the method

AET is a job and stress analysis procedure giving a broadspectrum description of work characteristics. The individual doing the job is not evaluated. Of 216 items, 143 target on person-at-work system, after which the analysis of tasks is performed with 31 items, and finally an analysis of demands is performed (42 items). Within the last part 17 items are directly related to muscular work (Analysis of demands / Activity). Coding of items is based on observation at worksite and interviews. The data can be used to characterise the job or task with a profile. A common databank with over 7000 jobs serves as a reference for comparisons. (Landau 1999)

In 70tees the German government ordered to investigate discrimination against women at work with respect to pay. A job analysis procedure was required that allowed a detailed investigation of workload and strain within a given person-at-work system. AET was the product of an iterative process. Data on jobs have been collected into a databank (Darmstad, Germany). (Landau 1999) (Rohmert 1985, Rohmert 1979)

Exposure descriptors

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Description of exposure*</th>
<th>magnitude/amplitude</th>
<th>duration</th>
<th>frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>posture</td>
<td></td>
<td>.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>movements</td>
<td></td>
<td>.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(external) force</td>
<td></td>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vibration</td>
<td></td>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contact forces</td>
<td></td>
<td>.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(# of AET item in parentheses) (Rohmert 1979)

Duration of shift: <1/10; 1/10 - 1/3; 1/3 - 2/3; > 2/3; nearly uninterrupted during the whole shift

Repetition: very seldom 1 -- very often 5

Postural load: Sitting: normal (200), bent (201)

Standing: normal (202), bent (203; note kneeling, squating/crouching and laying with the same code), bent >90º (204)

Static work: Forearm, hand (205); arms - shoulder - back (including manual material handling)(206); foot - ankle - lower limb (207)

Dynamic work Use of large muscle groups: Use of both upper limbs (208); Use of both lower limbs (209); Use of small muscle groups: Use of fingers (210); Use of forearms / hand (211); Use of foot (212)

For the items 205 - 212 assess use of muscular force: 1 very low -- 5 very high (213-215)

For the items 210 - 215 assess use of frequency of movements: 1 very low -- 5 very high (216)
Resource demands and usability

Equipment needed
Checklist

Process of coding and analysis
Items are coded on a standard checklist, based on the interviews and observations

Output type/level (risk assessment)
Profiles of job / task can be compared to other ones

Criteria to help the evaluator to make decision
Activity codes "high" (4) and "extreme" (5) describe items to be considered to be potentially harmful

Fields of the working life where the method has been used

Validity

Face validity / Contents validity
Does the method seem to be valid for the aimed purpose?

<table>
<thead>
<tr>
<th>(Landau 1999, Rohmert 1979)</th>
<th>yes</th>
<th>+ -</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The contents of the method is such that a relevant assessment can be expected</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Comments: Does not consider e.g. twisting of the back, neck postures and elevated upper arm postures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Items to be observed have a sound basis</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>3. Sound operationalization of the items to be observed</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Comments: Basis of the observed items not described, definition of the observed items not clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Sound process to collect data</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>5. Sound process to get the output of the collected data</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>6. Output can help in decision making</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Comments: The scope is on the whole job and therefore individual tasks are not considered</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The method seems to well separate dynamic physical work and non-physical work and describes the characteristics of them.
Concurrent validity
How well does the method correspond with more valid method/s?
- No formal studies

"Predictive validity"
How well has the risk-estimation of the method been shown to be associated with or predicting musculoskeletal disorders (MSDs)?
- No formal studies

Intra-observer repeatability (within observers)
- No formal studies

Inter-observer repeatability (between observers)
1) (Landau 1999): Table 20.4 AET Versions and Reliability
2) (Rohmert 1979): Fig 1 and 2 (p.23)
3) (North 1980): Fig 4 (p. 150)
4) (Haider 1982): Fig 2 (p. 205)
- The description of methods in these trials is so scanty that the validity of results cannot be evaluated. In the repeatability studies the musculoskeletal part has not been separated from the compound method.

Conclusions

Strengths of the method
- Gives a broad description of work characteristics. Large experience and databank of results from various fields of occupations to be used as a reference.

Limitations in the use of the method
- Only 17 items of 216 are targeted to assess musculoskeletal load.

To whom can this method be recommended?
- For general classification and charactrization of jobs

References

