Construct validity of the Swedish version of the BAT

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Aims

- To evaluate construct validity of the BAT-SWE using Rasch analysis
- Whether the responses on the four subscales can be combined into a single burnout score
- To evaluate differential item functioning (DIF) regarding age and gender

Study population

National cohort of Swedish midwives (n=2060)*

National representative sample of Swedish physicians (n=2620)

Employee survey data from engineers (medical solutions company) (n=398)

*Hadžibajramović E., Hansson M., et. al. Burnout among midwives - **The factorial structure of the Burnout Assessment Tool and an assessment of burnout levels in a Swedish national sample**, *BMC Health Services Research* 2022, **22**(1):1167.

Study population

	Age median	% Women	BAT range	Median (IQR)
Midwives	47	99.6	1.0-4.4	2.0 (1.6;2.4)
Physicians*	46	55	1.0-4.65	1.8 (1.4;2.3)
Engineers*	40-49	64	1.1-4.0	2.2 (1.9;2.52)

*Preliminary results, not to be cited

Methods

Rasch analysis separately for each sample

1) analysis with 23 items
2) analysis with 4 subscales

Item fit indicators:

1) the item's ability to discriminate
2) appropriateness of the response categories
3) response independence relative to other items
4) the absence of DIF

Model fit indicators:

1) the item-trait interaction statistic
2) person and item fit residuals
3) person separation index (PSI) (internal consistency)
4) dimensionality
5) targeting

Hadžibajramović E, Schaufeli W, De Witte H: **A Rasch analysis of the Burnout Assessment Tool (BAT)**, *PLoS One* 2020, **15**(11):e0242241.
Hadžibajramović E., Hansson M., et. al. Burnout among midwives - **The factorial structure of the Burnout Assessment Tool and an assessment of burnout levels in a Swedish national sample**, *BMC Health Services Research* 2022, **22**(1):1167.
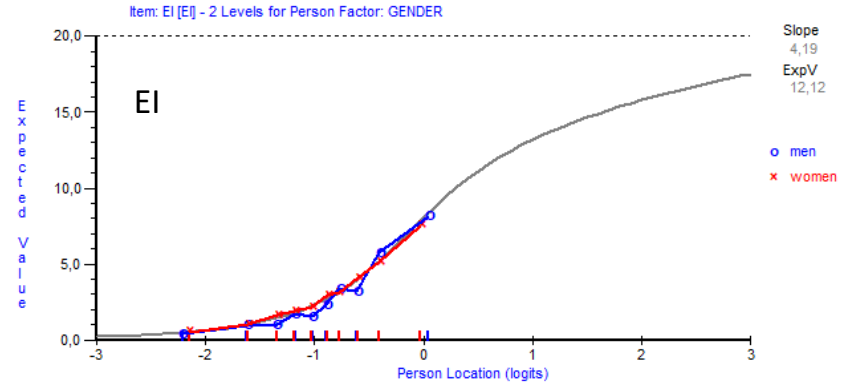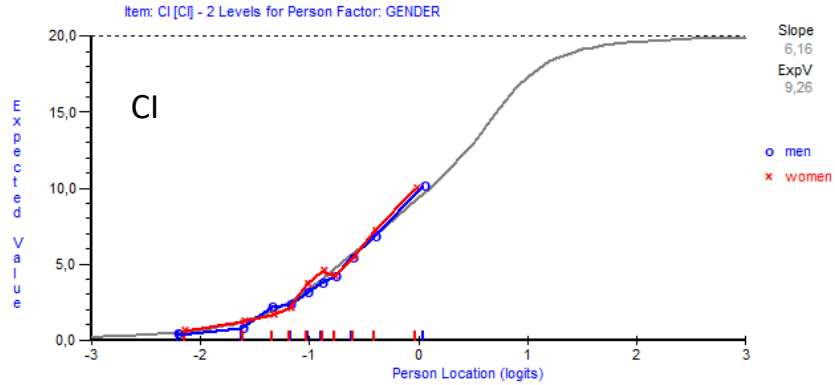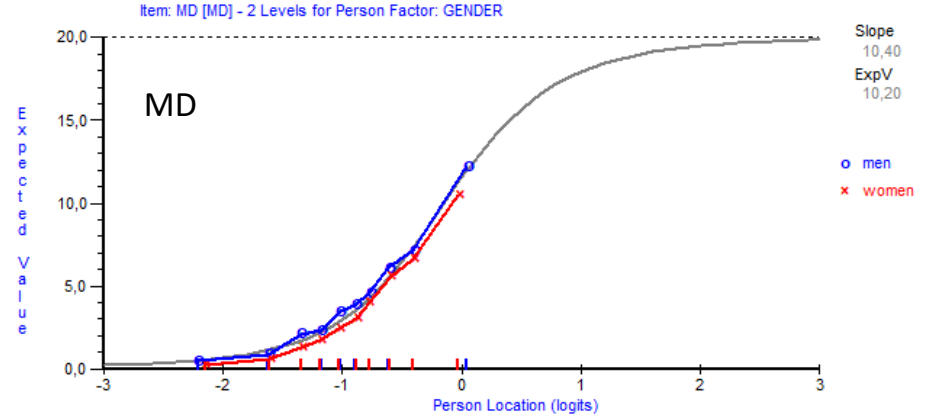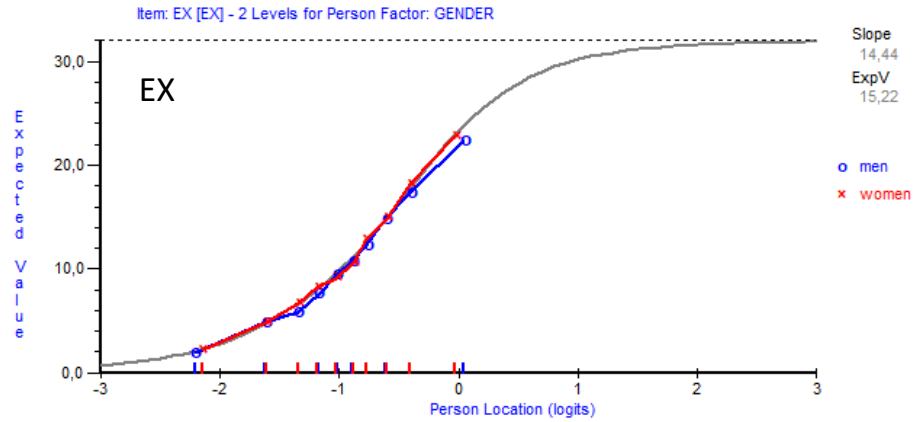
Results

- Local dependency between items within each subscale (cross-loading midwives MD1-EX5)

- Good fit to the Rasch model the four subscales model

- The four subscales structure with a strong general factor
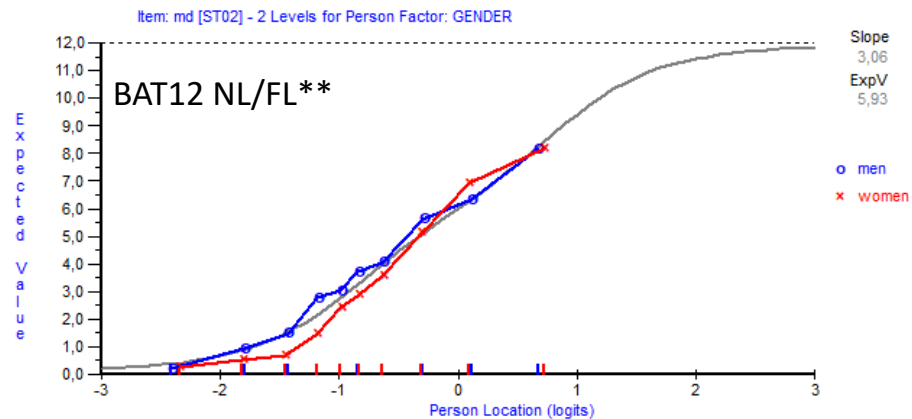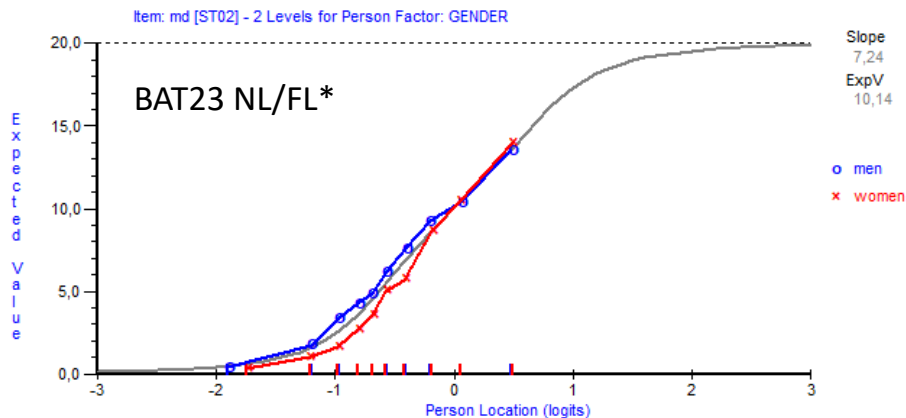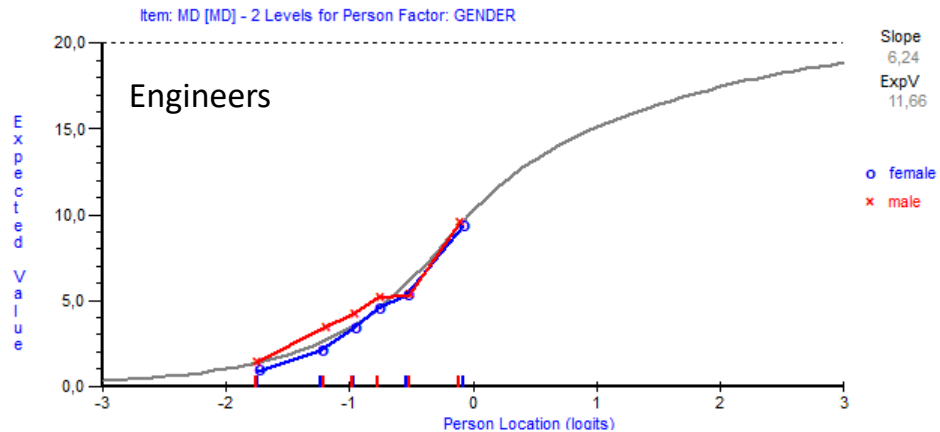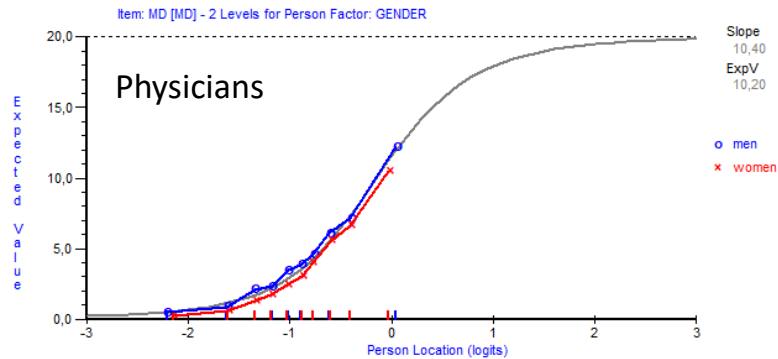 (ECV midwives/physicians/engineers 0.86/0.87*/0.87*)

*Preliminary results, not to be cited

Results – DIF

No problems with DIF for age

DIF gender – MD subscale among physicians and engineers

Item: EX [EX] - 2 Levels for Person Factor: GENDER

Slope 14,44
ExpV 15,22

EX

o men
x women

Item: MD [MD] - 2 Levels for Person Factor: GENDER

Slope 10,40
ExpV 10,20

MD

o men
x women

Item: CI [CI] - 2 Levels for Person Factor: GENDER

Slope 6,16
ExpV 9,26

CI

o men
x women

Item: EI [EI] - 2 Levels for Person Factor: GENDER

Slope 4,19
ExpV 12,12

EI

o men
x women

*Hadžibajramović E, Schaufeli W, De Witte H: **A Rasch analysis of the Burnout Assessment Tool (BAT)**. *PLoS One* 2020, **15**(11):e0242241.

Shortening of the Burnout Assessment Tool (BAT)—from 23 to 12 items using content and Rasch analysis. *BMC Public Health* 2022, **22**(1):560.

Conclusion

- The results regarding construct validity of the BAT-SWE are in line with previous studies on the BAT in other countries

- The results indicated a strong general factor and justify for combining the items into a single burnout score

- DIF for gender MD subscale was observed in two samples and this issue need to be address in future studies in Sweden

Discussion

- Given the strong general factor, is the BAT total score enough when the BAT is used in e.g., employee surveys, or do we also recommend investigating the levels of each subscale for differentiating the picture?

- We have observed statistically significant gender DIF for the MD scale, any thoughts about what is minimal important difference on the BAT total score as well on different subscales?

- What are experiences from different countries regarding the burnout levels in different occupations on the BAT total score and the four subscales?

Thank you for your attention