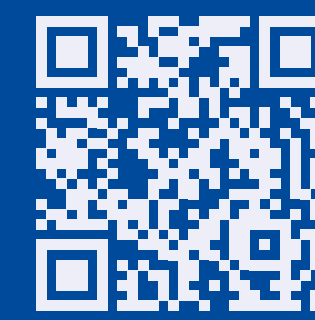# Pensionsversicherung
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Screening for Anxiety and Depression: Validation of the PHQ-4 in a Large Sample of Rehabilitation Patients

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1 Background and aims

Anxiety and depression are the most prevalent mental disorders in general and rehabilitation populations. The Patient Health Questionnaire for Depression and Anxiety (PHQ-4)[1] was developed as an ultra-short screening instrument for anxiety and depression, previously validated for general populations and various primary care populations[2]. The objective of this study was to validate the PHQ-4 for the rehabilitation setting, establishing its factorial and convergent validity.

2 Methods

The study's sample consisted of 66,412 rehabilitation patients (43.7 % = female) from 15 inpatient rehabilitation centers in Austria, covering several medical indications, including orthopaedic, cardiac, respiratory, oncological, and neurological rehabilitation. Mean age was 59.6 (SD 13.3) years; age ranged from 18 to 98, with a median of 59. Data were collected as part of standard procedure during operations in these facilities. To assess the factorial validity of the PHQ-4, we conducted confirmatory factor analyses (CFA)[3] comparing models with one factor (psychological distress) or two factors (anxiety and depression). Furthermore, we conducted multi-group CFAs to assess measurement invariance across age and sex. To examine the convergent validity of the PHQ-4, we correlated the PHQ-4 score with theoretically implicated measures including quality of life (EQ-5D-5L), impairment in vocational participation (SIMBO-C), and work ability (WAI) related items and test scores.

Figure 1: Age Composition of the Dataset
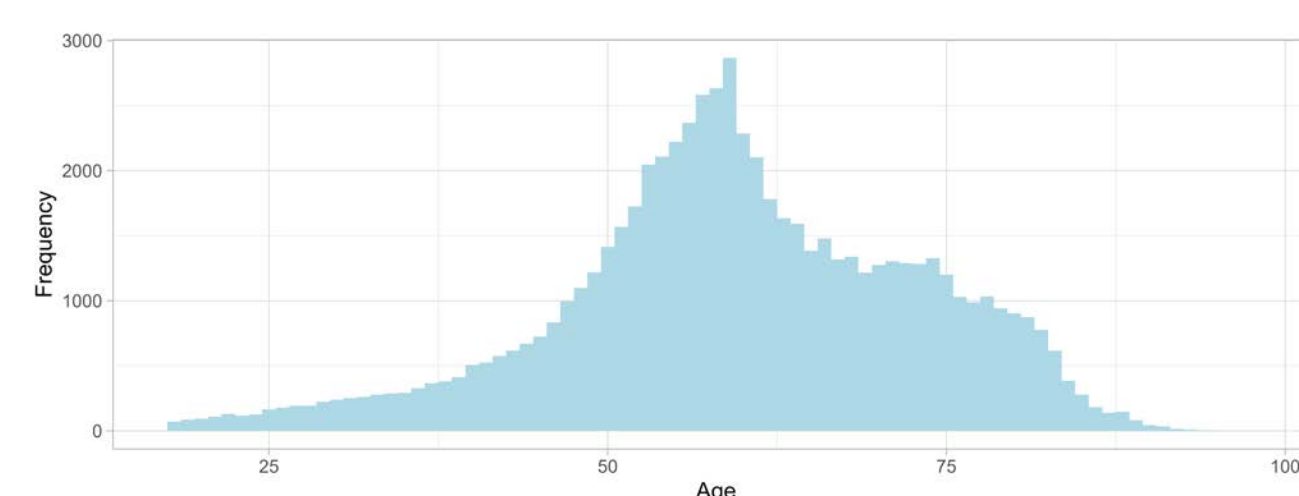
Note: Histogram of the distribution of age within the sample.

3 Results

The results showed overall excellent fit for the two-factor solution ($\chi 2(1)$ = 7.046, p = 0.008, RMSEA (90 %-CI) = 0.014 [0.006; 0.025]; SRMR = 0.001, CFI = 1.0, TLI = 1.0), which also fitted better than the one factor solution.

The reliability indexes of the two-factor solution were adequate for a screening instrument (anxiety: ω = 0.758; depression: ω = 0.775). The overall results of the multi-group CFA showed strong support for configural and metric invariance, with scalar invariance results being inconclusive. Correlation analyses showed medium to large effects in the expected directions, indicating desirable validity.

Figure 2: Convergent Validity
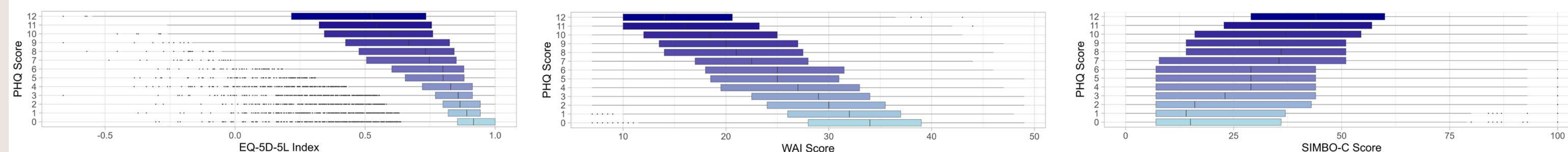
Note: Boxplots illustrating correlations between PHQ-4 and EQ-5D-5L Index, WAI Score and SIMBO-C Score.

4 Conclusions

The findings of this study indicate that the PHQ-4 is a valid and reliable screening instrument for anxiety and depression in rehabilitation. This analysis, based on a substantial sample, is likely to generalize to rehabilitation populations in other countries, particularly those in which the PHQ-4 has already been validated for the general population.

Figure 3: Path Diagrams
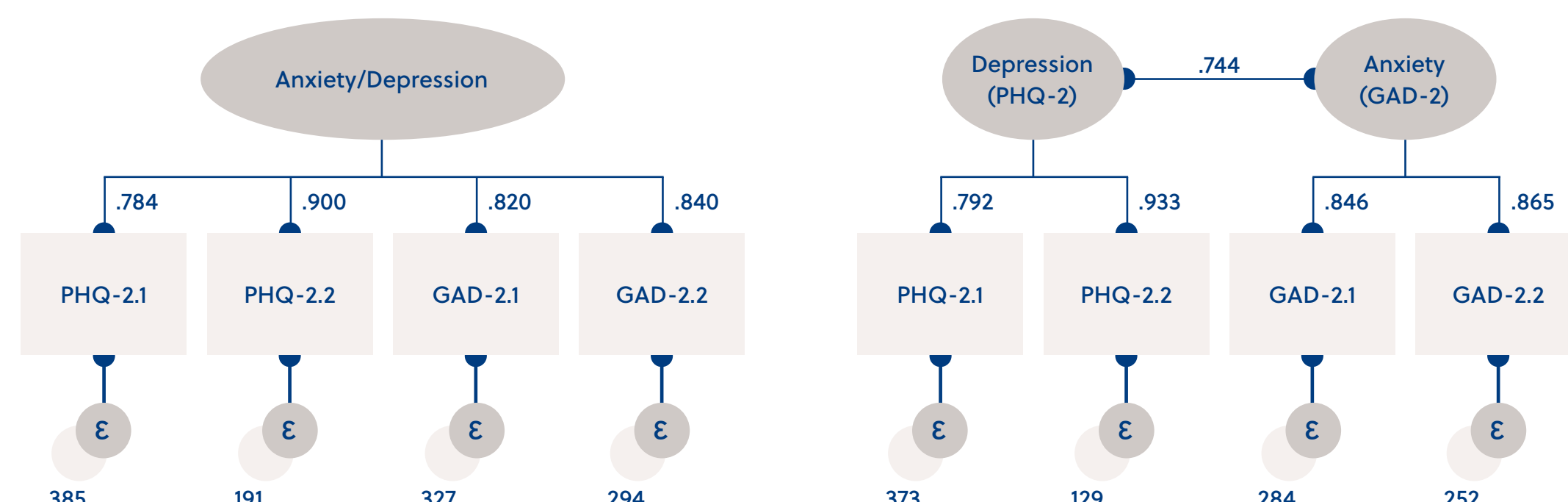
Note: Path diagram showing factor loadings and correlations for the one- and two-factor solution.

Literatur
[1] Kroenke, K., Spitzer, R. L., Willimas, J. B. W., & Löwe, B. (2009). An Ultra-Brief Screening Scale for Anxiety and depression: The PHQ-4. Psychosomatics 50(6), 613–621. https://doi.org/10.1016/S0033-3182(09)70864-3
[2] Löwe, B., Wahl, I., Rose, M., Spitzer, C., Glaesmer, H., Wingenfeld, K., Schneider, A., & Brähler, E. (2010). A 4-item measure of depression and anxiety: validation and standardization of the Patient Health Questionnaire-4 (PHQ-4) in the general population.
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