

# A new instrument for measuring insight: the Beck Cognitive Insight Scale

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# Outline of presentation

- Introduction
- Methodology
- Results
- Discussion
- Critique

# Introduction

- Lack of insight as a feature of psychosis - Kraepelin (1919)
- Insight as Unitary phenomenon
  - Presence or absence of insight
  - Sine qua non of psychosis - Absence of insight
- Insight as a multi-dimensional construct (Awareness/unawareness)
  - McEvoy et al. - Insight not a unitary phenomenon (1989)
    - Acute psychosis & intact insight
    - Resolved psychosis but insight not improved
  - Psychosis & insight - Two separate phenomenon with complex interactions
- Impaired insight → Development of psychotic phenomenon
- Attenuated processes of reality testing in psychosis
- Intense aberrant beliefs → Override normal processes of reality testing

# Introduction

- Overall weak relation of symptoms and insight
- Need to investigate cognitive processing of experiences
- Intellectual & emotional insight
  - Intellectual insight - Agreement & acceptance to explanation without change in underlying delusional belief system
  - Emotional insight - Sufficient self-understanding to modify dysfunctional beliefs and their affective and behavioral consequences
- Clinical insight - Awareness of a mental illness requiring treatment
- Cognitive insight - Evaluation & correction of distorted beliefs and misinterpretations

# Introduction

- Cognitive problem
  - Consistent distortions in experiences
  - Relative inability to distance themselves from these distortions
  - Relative impermeability to corrective feedback
  - Overconfidence in conclusions
  
- Clinically oriented scale to access insight
  - Helpful in diagnosis, prognosis & management of mental illness
  - Not helpful for understanding cognitive deficiencies

# Introduction

- To investigate the **psychometric characteristics** and **clinical utility** of the Beck Cognitive Insight Scale (BCIS),
  
- BCIS - a self-report instrument developed
  - Self-reflectiveness about unusual experiences
  - Capacity to correct erroneous judgments,
  - Certainty about mistaken judgments.

# Methodology

- Sample - 150 inpatients (75 Schizophrenia/schizoaffective disorders, 75 MDD without psychosis/MDD with psychosis) (DSM IV-TR) (1 BCIS item to five inpatients)
- Schiz group - 43 schizoaffective disorder (29%), 26 paranoid schizophrenia (17%), 6 undifferentiated schizophrenia (4%)
- MDD group - 9 single-episode (6%), 66 recurrent-episode (44%)
- MDD group - 16 psychotic depressives (21%), and 59 depression without psychosis (79%)



# Methodology

- 60 inpatients (40%) with comorbid disorders
- 49 of these comorbid disorders (82%) - Alcohol, substance abuse, or both of these disorders
- 14 inpatients (9%) with personality disorders
- No significant differences in socio-demographic characteristics
  - Schiz group: MDD group::38(51%) women:35(47%) women
  - Schiz group: MDD group::43(57%) Caucasians:47(63%) Caucasians
  - Schiz group: MDD group::38.92±11.44 years:37.89±11.70 years (Age)
- Comorbidities significantly more in MDD group (N=39, 52%) (p<0.02)

# Methodology - BCIS

- Step 1 - 10 items scale to assess cognitive insight (Items based on clinical observations and on concepts regarding self-correction)
- Step 2 - Analysis of responses within framework of Cognitive theory
- Step 3 - Addition of 5 more items and rewording of items

(vocabulary in BCIS represents third-grade reading level)

- Responses on 4-point scale (0=do not agree at all to 3=agree completely)
- No time frame for readings
- Items divided into two categories
  - Reflectiveness, objectiveness, openness to feedback
  - Certainty

# Methodology (BDI-II & SUMD-A)

- Beck Depression Inventory (21 items)
  - Self-reported measure
  - Past two weeks ratings
  - 4 point scale (ranging from 0 to 3); Score - 0 to 63 (High score, more severe depression)
  - Addresses all nine diagnostic criteria for MDD
- Scale to assess Unawareness of Mental Disorders - Abbreviated (9 items)
  - Clinician administered
  - 4 point scale (0=Not applicable; 1 to 3=Aware to severely unaware)
  - Scoring is for individual aspects for all 9 items
  - Interrater intraclass correlation coefficients for SUMD 0.76 to 0.99

# Methodology - Procedure

- Clearance from Institutional review board
- Administration of BDI-II & BCIS within 72 hours in alternate order (All patients)
- Two raters rated patients on SUMD-A [blind to each other and to patients BDI-II and BCIS scores (For 15 consecutive patients with schizophrenia/schizoaffective disorders)]

# Results - Factor Analysis

- Statistical Analysis Software (SAS)
- Principal factor analyses with orthogonal (varimax) as well as oblique rotations (promax)
  - All 150 subjects
  - 75 subjects in each group

(Two or three underlying factors)

- Due to minimal correlations ( $<0.30$ ) of factors, orthogonal rotation was tried
- Scree test - first six, consecutive eigenvalues - 2.87, 1.92, 1.48, 1.22, 0.99, and 0.92 suggesting two or three components

- Principal component analysis Orthogonal (varimax) rotation
- Factor loadings on two components
- Component I - Nine salient loadings (Self-reflectiveness 14.01±4,84)
- Component II - Five salient loadings (Self-certainty 6.99±3.50)
- Composite index (7.02±5.51)
- Non-significant correlation between self-reflectiveness & self cartainty 0.16
- Item 13 - Highest loading (0.25)

### Varimax-rotated principal components for the Beck Cognitive Insight Scale

| Item                       | I           | II          | $h^2$ |
|----------------------------|-------------|-------------|-------|
| (6) Ideas were false       | <i>0.66</i> | 0.04        | 0.44  |
| (4) Jumped to conclusions  | <i>0.63</i> | 0.19        | 0.43  |
| (5) Due to imagination     | <i>0.59</i> | 0.19        | 0.38  |
| (1) Have misunderstood     | <i>0.58</i> | 0.07        | 0.34  |
| (8) Could be wrong         | <i>0.57</i> | -0.24       | 0.39  |
| (15) Due to stress         | <i>0.50</i> | 0.18        | 0.28  |
| (3) Others more objective  | <i>0.43</i> | 0.11        | 0.20  |
| (12) Willing to consider   | <i>0.41</i> | -0.10       | 0.18  |
| (14) Possible explanations | <i>0.33</i> | -0.19       | 0.15  |
| (10) People are wrong      | 0.08        | <i>0.67</i> | 0.45  |
| (7) Feels right is right   | -0.06       | <i>0.64</i> | 0.42  |
| (11) Cannot trust opinion  | 0.15        | <i>0.63</i> | 0.42  |
| (9) Know problems          | 0.11        | <i>0.61</i> | 0.38  |
| (2) Definitely right       | 0.12        | <i>0.49</i> | 0.26  |
| (13) Trust own judgment    | -0.12       | 0.25        | 0.08  |
| % Total                    | 18          | 14          | 32    |
| % Common                   | 60          | 40          | 100   |

$N=150$  salient loadings  $\geq 0.30$  are in italic.

# Results - Subscale internal consistencies

- Coefficient  $\alpha$ 
  - Self-reflectiveness (150 patients) - 0.68 ( $p < 0.05$ )
  - Self-certainty (150 patients) - 0.60 ( $p < 0.05$ )
  - For patients with schizophrenia/schizoaffective disorder
    - Self-reflectiveness (75 patients) - 0.67
    - Self-certainty (75 patients) - 0.61
  - For patients with major depressive disorder
    - Self-reflectiveness (75 patients) - 0.69
    - Self-certainty (75 patients) - 0.59

(Coefficient  $\alpha$  less than recommended value 0.70, but considered acceptable for research purposes)

# Results - Convergent validity

- Self-reflectiveness
  - Self-certainty
  - Composite index
- Nine mean  
SUMD-A ratings  
of 15 patients
- Two significant correlations
    - Composite index & SUMD-A mental disorder
    - Self-reflectiveness & SUMD-A delusion
  - Multiple non-significant correlations but with moderate to large effect sizes
  - Significance not achieved due to small sample size

Correlations of the Beck Cognitive Insight Scale subscales and index with the abridged scale to assess unawareness of mental disorder for inpatients with schizophrenia and schizoaffective disorder

| Item               | Self-reflectiveness (R) |          | Self-certainty (C) | Composite index |
|--------------------|-------------------------|----------|--------------------|-----------------|
|                    | <i>N</i>                | <i>r</i> | <i>r</i>           | <i>r</i>        |
| Mental disorder    | 15                      | -0.41    | 0.31               | -0.62*          |
| Consequences       | 15                      | -0.38    | 0.07               | -0.40           |
| Medication effects | 13                      | -0.32    | -0.09              | -0.34           |
| Hallucinations     | 11                      | -0.45    | -0.01              | -0.57           |
| Delusions          | 13                      | -0.67*   | -0.14              | -0.52           |
| Thought disorder   | 15                      | -0.47    | 0.05               | -0.47           |
| Blunt affect       | 10                      | -0.55    | 0.17               | -0.50           |
| Anhedonia          | 9                       | 0.64     | 0.39               | 0.31            |
| Asociality         | 8                       | 0.37     | 0.32               | 0.17            |

The varying *Ns* represent the number of inpatients for whom the items were appropriate. Composite index = self-reflectiveness score – self-certainty score.

\**p* < 0.05, Bonferroni adjusted.



# Results - Psychosocial correlates

- Correlations

- BCIS subscales & index scores with sex, race, age, comorbid disorder, a personality disorder order of administration of BDI-II, BDI-II suicidal ideation item (#9) and of order of administration with the subscales
- For schizophrenia/schizoaffective group - Majority correlations depicted small effect size & non-significant

Table 3

Correlations of the Beck Cognitive Insight Scale subscales and index with selected psychosocial characteristics by diagnostic groups

| Item   | Self-reflectiveness | Self-certainty | Composite |
|--|---------------------|----------------|-----------|
|  | (R)                 | (C)            | index     |
|  | <i>r</i>            | <i>r</i>       | <i>r</i>  |
| <i>Schizophrenias and schizoaffective disorder (N= 75)</i> |                     |                |           |
| Sex (0 = male, 1 = female)                                 | 0.03                | - 0.08         | 0.08      |
| Being Caucasian (0 = no, 1 = yes)                          | 0.09                | - 0.07         | 0.12      |
| Age (years)  | - 0.18              | - 0.02         | - 0.13    |
| Comorbid disorder (0 = no, 1 = yes)                        | 0.08                | 0.16           | - 0.03    |
| Personality disorder (0 = no, 1 = yes)                     | - 0.02              | - 0.14         | 0.07      |
| Order BCIS administered (1 = first, 2 = second)            | - 0.09              | - 0.14         | 0.02      |
| BDI-II total scores  | 0.17                | 0.01           | 0.14      |
| BDI-II suicidal ideation Item                              | 0.21                | 0.11           | 0.11      |

BDI-II = Beck Depression Inventory-II, composite index = self-reflectiveness score - self-certainty score.

\*  $p < 0.05$ , Bonferroni adjusted.

# Results - Psychosocial correlates

- For MDD group
  - Two significant correlations ( $p < 0.05$ ) - self-reflectiveness & self-certainty with BDI-II total scores for MDD without psychosis (moderate effect size)
- Mean difference between 1st & 2nd completers of BDI-II total scores [27.41 (S.D. = 14.52) and 30.95 (S.D. = 15.35) respectively] not significant,  $t(148) = 1.45$ ,  $d = 0.24$ .

Table 3

Correlations of the Beck Cognitive Insight Scale subscales and index with selected psychosocial characteristics by diagnostic groups

| Item  | Self-reflectiveness | Self-certainty | Composite |
|---|---------------------|----------------|-----------|
|   | (R)                 | (C)            | index     |
|   | <i>r</i>            | <i>r</i>       | <i>r</i>  |
| <i>Major depressive disorder (N = 75)</i>       |                     |                |           |
| Sex (0 = male, 1 = female)                      | 0.09                | 0.04           | 0.06      |
| Being Caucasian (0 = no, 1 = yes)               | -0.28               | -0.21          | -0.12     |
| Age (years)                                     | -0.01               | 0.16           | -0.11     |
| Comorbid disorder (0 = no, 1 = yes)             | -0.13               | -0.09          | -0.06     |
| Personality disorder (0 = no, 1 = yes)          | 0.04                | -0.28          | -0.15     |
| Order BCIS administered (1 = first, 2 = second) | -0.16               | -0.06          | -0.11     |
| BDI-II total scores                             | 0.33*               | 0.32*          | 0.10      |
| BDI-II suicidal ideation Item                   | 0.20                | 0.27           | 0.01      |

BDI-II = Beck Depression Inventory-II, composite index = self-reflectiveness score - self-certainty score.

\*  $p < 0.05$ , Bonferroni adjusted.

# Results - Diagnostic Discrimination

- Across four diagnostic categories (One way ANOVA + Bonferroni adjustments)
  - BCIS composite index (One way ANOVA + Bonferroni adjustments)
    - Significant difference among the four groups,  $[F(3,146) = 5.33, \eta^2 = 0.10, p < 0.01]$ .
    - Mean score of major depressive disorder without psychotic features was significantly higher than the mean scores of schizophrenia or psychotic depression.
  - Self-reflectiveness subscale (One way ANOVA + Bonferroni adjustments)
    - Mean score higher for non-psychotic but non-significant  $[F(3,146) = 2.39, \eta^2 = 0.05, ns]$

Table 4  
Means and standard deviations of the Beck Cognitive Insight subscales and index by diagnostic groups

| Group   | Self-reflectiveness (R) |          |      | Self-certainty (C) |      | Composite index |      |
|---|-------------------------|----------|------|--------------------|------|-----------------|------|
|   | <i>N</i>                | <i>M</i> | S.D. | <i>M</i>           | S.D. | <i>M</i>        | S.D. |
| <i>Diagnosis</i>  |                         |          |      |                    |      |                 |      |
| Schizophrenia   | 32                      | 12.97    | 5.00 | 7.94               | 3.78 | 5.03            | 5.76 |
| Schizoaffective   | 43                      | 13.26    | 4.70 | 6.53               | 3.45 | 6.63            | 5.78 |
| Major depressive disorder<br>with psychotic features    | 16                      | 13.69    | 6.67 | 8.94               | 4.19 | 4.75            | 5.60 |
| Major depressive disorder<br>without psychotic features | 59                      | 15.29    | 4.07 | 6.29               | 2.92 | 9.00            | 4.51 |

*N* = 150.

# Results - Diagnostic Discrimination

- Across four diagnostic categories (One way ANOVA + Bonferroni adjustments)
  - Self-certainty subscale (One way ANOVA + Bonferroni adjustments)
    - Mean self-certainty scores of these diagnostic groups differed, [ $F(3,146) = 3.65, \eta^2 = 0.07, p < 0.05$ ].
    - Bonferroni contrasts - Mean score of psychotic depression was higher than the mean score of major depressive disorder without psychosis; the mean difference of 2.53 with effect size - 0.82.
- Two diagnostic categories - Psychotic [Schiz (75)+Psychotic depression(16)] vs Non-psychotic [MDD without depressions(59)] diagnosis (Independent t-test)
  - Mean composite index score of 5.74 (S.D. = 5.74) psychosis lower than without a psychosis 9.00 (S.D. = 4.51);  $t(148) = 3.69, d = 0.66, p < 0.001$ .
  - Mean self-reflectiveness score (M = 13.19, S.D. = 5.14) of psychoses lower than that without psychosis (M = 15.29, S.D. = 4.07);  $t(148) = 2.65, d = 0.44, p < 0.01$ .
  - Mean self-certainty score (M = 7.45, S.D. = 3.78) of psychosis higher than that without psychosis (M = 6.29, S.D. = 2.92);  $t(148) = 2.00, d = 0.33, p < 0.05$ .

# Results - Diagnostic Discrimination

- Effect size
  - Moderate for subscales
  - Large effect size for composite index
- Controlling for self-reported depression with the BDI-II total scores in a regression analysis
  - Differentiation provided by the self-reflectiveness scores among the four diagnostic groups was not significant and comparable to that afforded by the self-reflectiveness subscale by itself,  $F(3,145) = 2.00$ ,  $\eta^2 = 0.12$ , ns.
  - Differentiation provided by the self-certainty subscale scores, after controlling for the BDI-II total scores, comparable to that found for the self-certainty subscale by itself,  $F(3,145) = 3.88$ ,  $\eta^2 = 0.09$ ,  $p < 0.05$ .

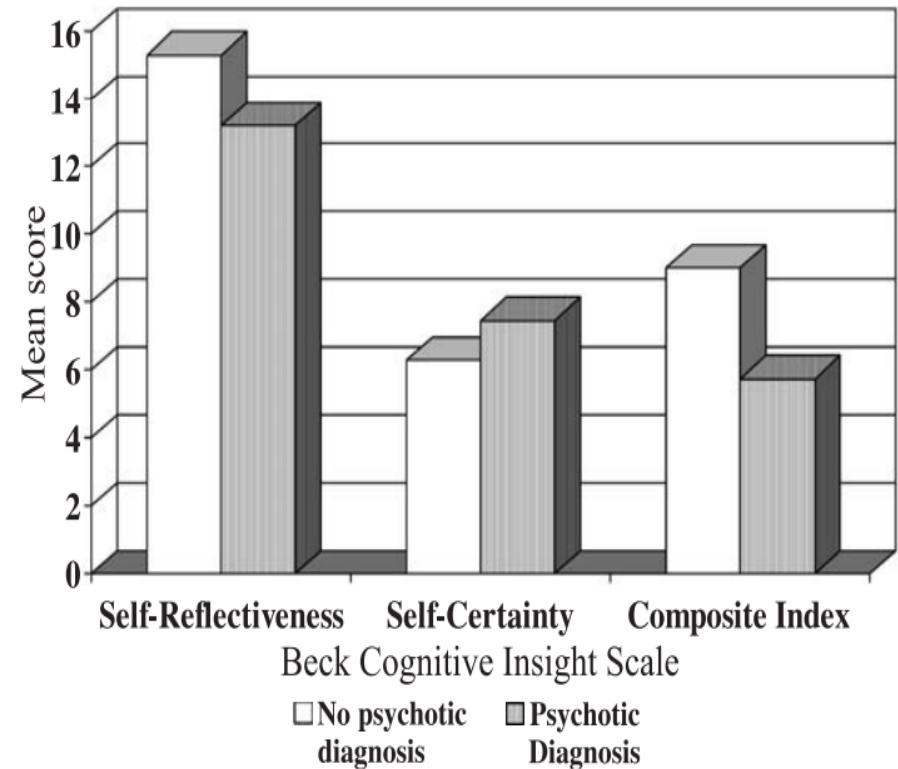


Fig. 1. Mean Beck Cognitive Insight subscale and index scores for inpatients with and without psychotic diagnoses ( $t(148)=2.65$ ,  $p<0.01$ ).

# Discussion

- Two subscales
  - Self-reflectiveness - Capacity & willingness to observe their mental productions & consider alternative explanations
  - Self-certainty - Overconfidence in validity of their beliefs
  
- Coefficient  $\alpha$ s for self-reflectiveness & self-certainty 0.68 & 0.60.
  - Internal consistency below 0.70
  - Scales not for clinical purposes
  - For research purposes  $\alpha$  acceptable (as subscales are with items less than 10)
  - Lower levels attributed to severity of ailments of patients (especially with thought disturbances & concentration difficulties)

# Discussion

- **Convergent validity (BCIS & SUMD-A)**
  - Self-reflectiveness scale & Delusion item (SUMD-A) [ $r = 0.67, p < 0.05$ ]
  - Composite index & mental disorder (SUMD-A) [ $r = 0.62, p < 0.05$ ]
  - Majority of the correlations of subscales and composite index with SUMD-A items - Moderate to large effect sizes (but ns)
  - Composite index yielded highest differentiation ( $d = 0.66$ ) between inpatients with and without psychotic diagnoses
- **Construct Validity (Hypothesis testing)** (Study by Granholm et al. 2002)
  - Significant correlation between change scores in positive ( $r=0.65$ ) & negative symptoms ( $r=0.58$ ) with change scores in BCIS (CBT intervention)
  - No correlation in symptomatology & BCIS scores in control group - Insight a mediating variable in CBT

# Discussion

- Convergent validity (BCIS & SUMD-A)
  - Self-reflectiveness scale & Delusion item (SUMD-A) [ $r = 0.67, p < 0.05$ ]
  - Composite index & mental disorder (SUMD-A) [ $r = 0.62, p < 0.05$ ]
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# Limitations

- Psychotic depression under-represented
- Caucasian/General hospital/ Suburban community
- No structured set of interview for diagnosis
- Average stay at hospital was one week; 2-week test-retest reliability not checked
- Further research needed in diverse psychiatric samples

# Critique

- Well written article
- No discrepancy in information
- Minimal unnecessary details
- Limitations highlighted clearly

# Critique - Title & Abstract

Title - Appropriate; Psychometric properties

Abstract - Unstructured

- Reference in abstract
- Conclusion of another study in favour of construct validity (hypothesis testing) of BCIS

# Critique - Introduction (Approx 1000 words)

- Covered all relevant aspects
- Clinical & cognitive insight (Instead of intellectual & emotional insight) could have been focussed to keep it short & crisp
- Repetition about cognitive problems - though justified due to importance of cognitive aspect being centre of discussion for article

The crucial cognitive problem in psychotic patients resides not only in their consistent distortions of their experiences, but also in their relative inability to distance themselves from these distortions and in their relative impermeability to corrective feedback. Some

psychosis are: (a) impairment of objectivity about the cognitive distortions, (b) loss of ability to put these into perspective, (c) resistance to corrective information from others, and (d) overconfidence in conclusions.

# Critique - Methodology

- All relevant details provided/Psychiatrist involved in training residents made diagnosis (Minimal chances of mistakes in diagnosis)
- GAF (DSM-IV) <30 (Severe impairment in functioning) - Difficulty in assessments (BCIS & BDI-II both self-administered scale) - BDI-II & BCIS done within 72 hours after hospitalization

**30** Behavior is considerably influenced by delusions or hallucinations  
**OR** serious impairment in communication or judgment (e.g., sometimes incoherent, acts grossly inappropriately, suicidal preoccupation)  
**21** **OR** inability to function in almost all areas (e.g., stays in bed all day; no job, home, or friends).

- Results mixed in methodology section - though justified (Socio-demography)
- Not much details about how authors reached to conclusion of two dimensions of reflectiveness & certainty

# Critique - Results & discussion

- KMO for Sampling adequacy
- Bartlett's Test of sphericity (Interdependency)
- Analysis of patients with comorbidities (60) & personality disorders (14) (Small number)
- Construct validity supported by another study - Granholm et al.
- A randomized controlled trial - Possibly not a way to establish construct validity
- No mention of missing values
- Discrepancy in information in results & discussion (Convergent validity for self-certainty)

# COSMIN - COnsensus-based Standards for the Selection of health Measurements INstruments

- Content validity
  - Assessed by asking patients and professionals about the relevance, comprehensiveness and comprehensibility of the items, response options, and instructions.
- Structural validity (only relevant for reflective model)
  - Reflective model - All items manifest same underlying construct (highly correlated & interchangeable items)
  - Formative model - Items together form the construct (Items need not be correlated)
- Internal consistency (only relevant for reflective model)
  - To be checked for unidimensional (sub) scales
  - Factor analysis for unidimensional (sub) scales
- Cross-cultural validity/ Measurement invariance
  - Items behave similarly or differently in different populations

**{VERY GOOD - ADEQUATE - DOUBTFUL - INADEQUATE}**

# COSMIN - COnsensus-based Standards for the Selection of health Measurements INstruments

- Measurement error & reliability
  - Two measurements are needed in a group of people who are all assumed to be stable on the construct to be measured
- Criterion validity
  - No gold standards for these measures (except long version while investigating short version)
- Hypothesis testing for construct validity (No gold standard)
  - Expected relationship with other outcome measures of good quality (convergent validity)
  - Expected differences between relevant groups (discriminant or known-groups validity)
- Responsiveness (Indicates longitudinal validity)
  - Criterion approach (comparison to a gold standard)
  - Construct approach (hypothesis testing - comparison with other outcome measurement instruments)
  - Construct approach (hypothesis testing - comparison between subgroups)
  - Construct approach hypothesis testing - before and after intervention

**{VERY GOOD - ADEQUATE - DOUBTFUL - INADEQUATE}**



# COSMIN - COnsensus-based Standards for the Selection of health Measurements INstruments

- Content validity (**Adequate**)
  - Assessed by asking patients and professionals about the relevance, comprehensiveness and comprehensibility of the items, response options, and instructions.
- Structural validity - Factor analysis (only relevant for reflective model) (**Adequate**)
  - Reflective model - All items manifest same underlying construct (highly correlated & interchangeable items)
  - Formative model - Items together form the construct (Items need not be correlated)
- Internal consistency (only relevant for reflective model) (**Adequate**)
  - To be checked for unidimensional (sub) scales
  - Factor analysis for unidimensional (sub) scales
- Cross-cultural validity/ Measurement invariance (**Not applicable**)
  - Items behave similarly or differently in different populations

**{VERY GOOD - ADEQUATE - DOUBTFUL - INADEQUATE}**

# COSMIN - COnsensus-based Standards for the Selection of health Measurements INstruments

- Measurement error & reliability (**Inadequate**)
  - Two measurements are needed in a group of people who are all assumed to be stable on the construct to be measured
- Criterion validity (**Adequate**)
  - No gold standards for these measures (except long version while investigating short version)
- Hypothesis testing for construct validity (No gold standard) (**Adequate**)
  - Expected relationship with other outcome measures of good quality (convergent validity)
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**Thank you**