B

Beck Anxiety Inventory

Glen A. Palmer, Andrew Dahlstrom, Andrew Kingwell and Jane Van Sickle
Department of Psychology, St. Cloud VA Healthcare System, St. Cloud, MN, USA

Definition

Anxiety is the persistent expectation of a real or imagined threat. It is characterized by muscle tension and hypervigilance and may include cautious or avoidant behaviors. The thoughts and emotions that accompany anxiety are often viewed as excessive and outside of the developmental norm (American Psychiatric Association 2013). The Beck Anxiety Inventory (BAI) is a measure used to assess severity of anxiety (Beck and Steer 1993).

Introduction

The BAI is a 21-item self-report instrument designed as a screening tool, in which patients rate their experience of the severity of each symptom of anxiety. It is a widely used instrument that has been translated into a variety of languages (Steer et al. 1993). Patients are instructed to focus their answers on the last week, including the day of administration. Respondents rank symptoms on a Likert scale with the anchors of 0 (Not at All) to 3 (Severe). Examples of items found on the BAI include "Fear of the Worst Happening," "Unsteady," or "Difficulty Breathing" (Beck and Steer 1993).

Symptoms of anxiety and depression are highly correlated (Watson and Kendall 1989). Because of this issue, items of the BAI present symptoms which are minimally shared with symptoms of depression (Beck and Steer 1993). The BAI was originally constructed to identify severity of anxiety in adult and adolescent psychiatric populations. It has been used in research for both clinical and nonclinical samples (Bardhoshi et al. 2016).

Currently, scores falling in the range of 0–7 are classified as "Minimal" anxiety, scores in the range of 8–15 are indicative of "Mild" anxiety, scores falling in the range of 16–25 indicate "Moderate" anxiety, and scores falling in the range of 26–63 indicate a "Severe" level of anxiety. The BAI may be administered and scored by paraprofessionals. However, instruments of this type should only be used and interpreted by professionals with appropriate clinical training (Beck and Steer 1993).

Psychometric Properties

Although originally developed as an instrument to assess anxiety in psychiatric populations (Beck et al. 1988), the BAI has been used in various clinical and research settings (Muntingh et al.

V. Zeigler-Hill, T.K. Shackelford (eds.), *Encyclopedia of Personality and Individual Differences*,
DOI 10.1007/978-3-319-28099-8_5-1

2011; Palmer et al. 2016; Piotrowski 1999). The screening instrument is considered a reliable and valid measure of anxiety. Internal reliability is excellent for the instrument ($\alpha = .92$; Beck et al. 1988; Beck and Steer 1993), and it has high test–retest reliability ($r = .75$; Beck et al. 1988; Beck and Steer 1993).

According to Beck and Steer (1993), the BAI has been determined to have good content validity, and the items were chosen to correspond with the Diagnostic and Statistical Manual of Mental Disorders-3rd Edition, revised (DSM-III-R; American Psychiatric Association 1987) criteria for anxiety disorders, especially generalized anxiety disorder and panic disorder. Concurrent validity has been examined with a variety of different anxiety measures. For example, the Hamilton Rating Scale-Revised (Hamilton 1959; reconstructed by Riskind et al. 1987) revealed a moderate correlation ($r = .51$; Beck et al. 1988) with the BAI. The BAI was also compared State-Trait Anxiety Inventory-Form Y (STAI; Spielberger 1983). Fydrich et al. (1992) reported moderate correlations with the State ($r = .47$) and Trait ($r = .58$) subscales of the STAI.

Factor Structure

Beck et al. (1988) examined the factor structure of the BAI in a sample of diagnostically mixed psychiatric patients. Findings revealed that the BAI consisted of a two-factor structure. The first factor contained items consistent with somatic symptoms, and the second factor consisted of subjective anxiety and panic symptoms. Steer et al. (1993) identified a two-factor solution on a computer version of the BAI in an inpatient sample that included somatic and subjective factors.

Several studies have examined the factor structure of the BAI with both clinical and nonclinical samples. Studies have generally revealed models ranging from two- to five-factor structures. Beck and Steer (1991) conducted a study with a sample of outpatients that revealed a four-factor solution consisting of subjective, neurophysiological, autonomic, and panic. Osman et al. (1997) conducted a confirmatory factor analysis for BAIs completed by college students. Findings revealed a four-factor model that consisted of neurophysiological, subjective, panic, and autonomic factor loadings. They further found that a single second-order factor of "general anxiety severity" also provided a good fit. In a sample of undergraduates, Borden et al. (1991) reported a five-factor solution consisting of subjective fear, somatic nervousness, neurophysiological, muscular/motoric, and respiration.

There has been some disagreement in the literature on whether the BAI actually serves as a good measure of overall anxiety (Cox et al. 1996a, b; Steer and Beck 1996; Palmer et al. 2016). There is research to indicate that the BAI might best serve as an instrument for assessing symptoms of panic with and without symptoms of agoraphobia (Cox et al. 1996b; Leyfer et al. 2006). Leyfer et al. (2006) noted that BAI items were chosen, at least in part, to be independent of symptoms of items of depression on the Beck Depression Inventory-2nd Edition (BDI-II; Beck et al. 1996). Select symptoms of anxiety that overlap with depression may have been excluded from the BAI. Therefore, the BAI might have sacrificed some construct validity regarding general symptoms of anxiety in order to ensure discriminant validity with the BDI-II (Leyfer et al. 2006).

Applications

Originally, the instrument was developed for use with psychiatric populations; and it was designed to help discriminate between symptoms of depression and anxiety (Fydrich et al. 1992). However, its application has since been expanded for use with a wide range of populations. For example, in a meta-analysis of the English version of the BAI, Bardhoshi et al. (2016) found excellent ($\alpha = .91$) internal consistency across clinical and nonclinical samples, and this suggests that the BAI has broad application for various groups. The BAI has also been researched and applied to assess anxiety in samples of cardiac patients (Clark et al. 2016), veterans (Palmer et al. 2016), primary care patients (Muntingh et al. 2011), persons with intellectual disabilities (Lindsay and Skene 2007),

and African-American and European-American adults (Chapman et al. 2009). Further, the BAI has been found useful in evaluating anxiety symptoms in adolescents. In a study of adolescent inpatients, Jolly et al. (1993) found the BAI was significantly correlated with clinician ratings and self-report measures of anxiety.

Palmer et al. (2016) found that, for a sample of veterans referred to a polytrauma clinic who had served in combat zones, examination of responses to certain items thought to be related to fear of personal safety (i.e., fear of dying and feeling terrified) were uniquely correlated as compared to findings of studies with other groups. Gould et al. (2014) utilized the instrument in conjunction with other measures to examine levels of anxiety between subgroups in an older sample of male veterans and nonveterans. They found elevated anxiety symptoms were not associated with veteran status, rather symptoms were better explained by age, ethnicity, education, and medical condition.

The BAI has been studied in the Native American population. A study conducted by Gray et al. (2016) examined the validity and reliability of the BAI with Northern Plains Indians. However, they found that the instrument was not accurate in distinguishing between symptoms of mood disorders and anxiety disorders.

Despite the BAI's longevity, there remain specific limitations within subgroups that need to be considered before administering the instrument. For example, Carney et al. (2011) conducted a correlational study with a sample of insomnia patients and found that cutoff scores were not helpful in identifying anxiety disorders in this subgroup. In a study evaluating anxiety in adults age 55 and older, results indicated the BAI was useful in identifying somatic symptoms, but not useful in identifying the cognitive symptoms of anxiety (Wetherell and Gatz 2005).

Conclusion

The Beck Anxiety Inventory has been shown to be a psychometrically valid and reliable self-report instrument. There have been criticisms that the BAI may not serve as an overall measure of anxiety, and some researchers have suggested that the instrument may serve as a measure of panic rather than generalized anxiety. However, its utility has been noted as being an effective tool to use within both a clinical and nonclinical population. Its value has also been recognized in research.

Cross-References

- ▶ Anxiety
- ▶ Beck Depression Inventory
- ▶ Depression
- ▶ Internal Consistency
- ▶ Panic

References

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Bardhoshi, G., Duncan, K., & Erford, B. T. (2016). Psychometric meta-analysis of the English version of the Beck Anxiety Inventory. *Journal of Counseling & Development, 94*, 356–373. doi:10.1002/jcad.12090.

Beck, A. T., & Steer, R. A. (1991). Relationship between the Beck Anxiety Inventory and the Hamilton Anxiety Rating Scale with anxious outpatients. *Journal of Anxiety Disorders, 5*, 213–223. doi:10.1016/0887-6185(91)90002-B.

Beck, A. T., & Steer, R. A. (1993). *Manual for the Beck Anxiety Inventory.* San Antonio: Psychological Corporation.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*, 893–897. doi:10.1037/0022-006X.56.6.893.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory manual* (2nd ed.). San Antonio: Psychological Corporation.

Borden, J. W., Peterson, D. R., & Jackson, E. A. (1991). The Beck Anxiety Inventory in nonclinical samples: Initial psychometric properties. *Journal of Psychopathology and Behavioral Assessment, 13*, 345–356. doi:10.1007/BF00960446.

Carney, C. E., Moss, T. G., Harris, A. L., Edinger, J. D., & Krystal, A. D. (2011). Should we be anxious when assessing anxiety using the Beck Anxiety Inventory in clinical insomnia patients? *Journal of Psychiatric*

Research, 45, 1243–1249. doi:10.1016/j.jpsychires.2011.03.011.

Chapman, L. K., Williams, S. R., Mast, B. T., & Woodruff-Borden, J. (2009). A confirmatory factor analysis of the Beck Anxiety Inventory in African American and European American young adults. *Journal of Anxiety Disorders, 23*, 387–392. doi:10.1016/j.janxdis.2008.12.003.

Clark, J. M. R., Marszalek, J. M., Bennett, K. K., Harry, K. M., Howarter, A. D., Eways, K. R., & Reed, K. S. (2016). Comparison of factor structure models for the Beck Anxiety Inventory among cardiac rehabilitation patients. *Journal of Psychosomatic Research, 89*, 91–97. doi:10.1016/j.jpsychores.2016.08.007.

Cox, B. J., Cohen, E., Direnfeld, D. M., & Swinson, R. P. (1996a). Does the Beck Anxiety Inventory measure anything beyond panic attack symptoms? *Behaviour Research and Therapy, 34*, 949–954. doi:10.1016/S0005-7967(96)00037-X.

Cox, B. J., Cohen, E., Direnfeld, D. M., & Swinson, R. P. (1996b). Reply to Steer and Beck: Panic disorder, generalized anxiety disorder, and quantitative versus qualitative differences in anxiety assessment. *Behaviour Research and Therapy, 34*, 959–961.

Fydrich, T., Dowdall, D., & Chambliss, D. L. (1992). Reliability and validity of the Beck Anxiety Inventory. *Journal of Anxiety Disorders, 6*, 55–61.

Gould, C. E., Rideaux, T., Spira, A. P., & Beaudreau, S. A. (2014). Depression and anxiety symptoms in male veterans and non-veterans: The Health and Retirement Study. *International Journal of Geriatric Psychiatry*. doi:10.1002/gps.4193.

Gray, J. S., McCullagh, J. A., & Petros, T. (2016). Assessment of anxiety among Northern Plains Indians. *American Journal of Orthopsychiatry, 86*, 186–193. doi:10.1037/ort0000103.

Hamilton, M. (1959). The assessment of anxiety states by rating. *British Journal of Medical Psychology, 32*, 50–55.

Jolly, J. B., Aruffo, J. F., Wherry, J. N., & Livingston, R. (1993). The utility of the Beck Anxiety Inventory with inpatient adolescents. *Journal of Anxiety Disorders, 7*, 95–106. doi:10.1016/0887-6185(93)90008-9.

Leyfer, O. T., Ruberg, J. L., & Woodruff-Borden, J. (2006). Examination of the utility of the Beck Anxiety Inventory and its factors as a screener for anxiety disorders. *Journal of Anxiety Disorders, 20*, 444–458. doi:10.1016/j.janxdis.2005.05.004.

Lindsay, W. R., & Skene, D. D. (2007). The Beck Depression Inventory II and the Beck Anxiety Inventory in people with intellectual disabilities: Factor analysis and group data. *Journal of Applied Research in Intellectual Disabilities, 20*, 401–408. doi:10.1111/j.1468-3148.2007.00380.x.

Muntingh, A. D. T., van der Feltz-Cornelis, C. M., van Marwijk, H. W. J., Spinhoven, P., Penninx, B. W., & van Balkom, A. J. L. M. (2011). Is the Beck Anxiety Inventory a good tool to assess the severity of anxiety? A primary care study in the Netherlands Study of Depression and Anxiety (NESDA). *BMC Family Practice, 12*, 66. doi:10.1186/1471-2296-12-66.

Osman, A., Kopper, B. A., Barrios, F. X., Osman, J. R., & Wade, T. (1997). The Beck Anxiety Inventory: Reexamination of factor structure and psychometric properties. *Journal of Clinical Psychology, 53*, 7–14. http://dx.doi.org/10.1002/(SICI)1097-4679(199701)53:1_7::AID-JCLP23.0.CO;2-S.

Palmer, G. A., Happe, M. C., Paxson, J. M., Jurek, B. K. W., & Olson, S. A. (2016). Dimensionality of the Beck Anxiety Inventory in a polytrauma sample of OEF/OIF/OND veterans: Findings from exploratory and confirmatory factor analysis. *Military Psychology, 28*, 296–305. doi:10.1037/mil0000117.

Piotrowski, C. (1999). The status of the Beck Anxiety Inventory in contemporary research. *Psychological Reports, 85*, 261–262. doi:10.2466/pr0.1999.85.1.261.

Riskind, J., Beck, A. T., Brown, G., & Steer, R. A. (1987). Taking the measure of anxiety and depression: Validity of the reconstructed Hamilton scales. *Journal of Nervous and Mental Disease, 175*, 474–479.

Spielberger, C. D. (1983). *Manual for the State-Trait Anxiety Inventory (Form Y)*. Palo Alto: Consulting Psychologists Press.

Steer, R. A., & Beck, A. T. (1996). Generalized anxiety and panic disorders: Response to Cox, Cohen, Direnfield, and Swinson. *Behaviour Research and Therapy, 34*, 955–957. doi:10.1016/S0005-7967(96)00059-9.

Steer, R. A., Rissmiller, D. J., Ranieri, W. F., & Beck, A. T. (1993). Structure of the computer-assisted Beck Anxiety Inventory with psychiatric inpatients. *Journal of Personality Assessment, 60*, 532–542. doi:10.1207/s15327752jpa6003_10.

Watson, D., & Kendall, P. C. (1989). Common and differentiating features of anxiety and depression: Current findings and future directions. In P. C. Kendall & D. Watson (Eds.), *Anxiety and depression: Distinctive and overlapping features* (pp. 83–129). New York: Academic.

Wetherell, J. L., & Gatz, M. (2005). The Beck Anxiety Inventory in older adults with generalized anxiety disorder. *Journal of Psychopathology and Behavioral Assessment, 27*, 17–24. doi:10.1007/s10862-005-3261-3.