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REVIEW

Validity and reliability of instruments designed to measure factors influencing the overuse of antibiotics

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Abstract

Background: Antibiotic overuse is a global public health issue that is influenced by several factors. The degree and prevalence of antibiotic overuse is difficult to measure directly. A more practical approach, such as the use of a psycho-social measurement instrument, might allow for the observation and assessment of patterns of antibiotic use.

Study objective: The aim of this paper is to review the nature, validity, and reliability of measurement scales designed to measure factors associated with antibiotic misuse/overuse.

Design: This study is descriptive and includes a systematic integration of the measurement scales used in the literature to measure factors associated with antibiotic misuse/overuse. The review included 70 international scientific publications from 1992 to 2010.

Main results: Studies have presented scales to measure antibiotic misuse. However, the workup of these instruments is often not mentioned, or the scales are used with only early-phase validation, such as content or face validity. Other studies have discussed the reliability of these scales. However, the full validation process has not been discussed in any of the reviewed measurement scales.

Conclusion: A reliable, fully validated measurement scale must be developed to assess the factors associated with the overuse of antibiotics. Identifying these factors will help to minimize the misuse of antibiotics.

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Introduction

Antibiotic misuse and overuse is a major public health issue worldwide. Antibiotic misuse/overuse is influenced by several contributing factors related to patients and/or their parents or to doctors. Factors leading to antibiotic overuse are likely to include demographic characteristics (e.g., socio-economic status, age, and education level) or psycho-social aspects, such as behaviors and attitudes (e.g., self-medication, over-the-counter medication, and patients' expectations). Other factors, such as lack of health education, may also contribute to the misuse/overuse of antibiotics. A valid and reliable measurement scale is needed to measure these factors. The development of measurement instruments is a central aspect of psycho-social research because these instruments offer a way to assess constructs that are not otherwise observable, such as the phenomenon of antibiotic misuse.

Scale development includes several steps to establish validity and reliability. The content validity of an instrument can be assessed using qualitative methods, such as the Delphi technique or focus groups. Face validity can be assessed in a pilot study. The number and nature of the underlying constructs and the item selection process can also be established in a pilot study using exploratory factor analysis (EFA). In addition, construct validity can be assessed using confirmatory factor analysis (CFA). Ideally, criterion-related validity should be established by gauging the strength of the new instrument against an existing valid instrument (or a gold standard). However, this method assumes that an established instrument exists for this purpose. This article will review various worldwide measurement scales designed to measure factors associated

with antibiotic misuse. The validity and reliability of these scales will be reviewed.

Methods

The data sources included in this review article are studies that attempted to establish factors associated with antibiotic misuse/overuse. Typically, the reviewed studies in this article were cross-sectional, and the scales used in these studies were directed at patients/parents, doctors, or both of these populations. The inclusion criteria required that only articles that measured patterns of antibiotic use were included in this study.

Full workup of an instrument

Rating scales are one of the most important instruments used in the psycho-social healthcare field because they facilitate the measurement of constructs that are otherwise unobservable or difficult to measure. Assessing the validity and reliability of such instruments is integral to assessing an instrument's usefulness. Reliability can be assessed by confirming an instrument's ability to measure a consistent attribute [1]. The validity of an instrument is assessed by confirming the instrument's capability to measure what it is intended to measure. Four types of validity are often discussed: content validity, face validity, construct validity, and criterion validity [2]. The content validity of an instrument can be assessed using qualitative methods, such as the Delphi technique or focus groups. Construct validity is usually assessed using confirmatory factor analysis. In the following sections, each stage of the

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