Sensitivity to change of scales assessing symptoms of bulimia nervosa

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Abstract

Measures employed in a therapy study with a pre-post design must be sensitive to the detection of treatment-related changes. In the present study, the treatment sensitivity of 12 internationally established scales that assess bulimia-relevant aspects of eating and body concern is analyzed. The scales can be sorted along three dimensions (Disturbed Eating, Restrictive Eating Behaviors and Body Dissatisfaction). Measures of the same dimension were compared in a sample of 45 women with the diagnosis of bulimia nervosa. Patients completed the scales before and 6 weeks after the end of cognitive-behavioral therapy. Significant differences between scales with respect to treatment sensitivity occurred in all three dimensions. Post hoc analysis revealed that scales are particularly sensitive to change if they include disorder-relevant aspects beyond the main dimension of a scale. Implications of the findings for meta-analytical treatment research, for designing effectiveness studies, and for future research on the treatment sensitivity of outcome measures are discussed.

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1. Introduction

In the field of behavioral assessment, little effort has been addressed to the comparison of various outcome measures in their ability to detect treatment-related changes (Taylor, 1999). This lack of attention is rather surprising, given that it is common practice to employ psychometric questionnaires for therapy evaluation. Due to the lack of research on outcome measures, the investigator is forced to choose more or less blindly among available scales when conducting therapy research with a pre-post design (Lambert et al., 1986). Moreover, any comparison of treatment outcomes based on different outcome measures is bound to remain inconclusive as long as there is no information about differences in the scales’ sensitivity to change.

At least some strategies have been introduced to compare the treatment sensitivity of measures. For example, Lambert et al. (1988) simply compared effect sizes found on three measures of depression without employing any inferential statistics. A more sophisticated strategy was chosen by Denollet (1993). He employed a repeated measures analysis of variance (ANOVA) to examine changes on seven outcome
measures after treatment. In his ANOVA, both the
time and the outcome measures were within-subject
factors. Based on a significant time by measures
interaction, it can be concluded that there are differ-
ences between the outcome measures with respect to
their sensitivity to change. The strategy chosen by
Denollet (1993), however, does not allow a direct
comparison of the sensitivities of any pair of meas-
ures. Therefore, it does not allow any conclusion
about the superiority of one scale over another.

The procedure suggested by Taylor et al. (1997)
does allow such conclusions. Implicit in their strategy
is the computation of a standardized change score for
each participant and for each measure. The standard-
ized change score represents a common metric that is
expressed as the difference between an individual’s
pretreatment and posttreatment scores, divided by the
pretreatment standard deviation of the whole therapy
group. The standardized change score is similar to the
effect size as used in meta-analyses, since the mean
standardized change score of a scale employed in a
treatment condition equals the effect size for the
treatment condition on the scale. Moreover, since the
standard deviation served as the denominator in the
formula, standardized change scores are directly com-
parable both between participants and between meas-
ures. Therefore, the strategy suggested by Taylor et al.
(1997) allows a one-way ANOVA to be conducted with
measures as within-subject factors and with the stan-
dardized change score as the dependent variable. A
significant result would indicate differences with re-
spect to the sensitivities of measures. However, op-
posed to the strategy suggested by Denollet (1993), the
standardized change scores do allow comparisons of
single measures in post hoc analyses. Thus, it is
possible to draw conclusions about the superiority of
a scale.

To the best of our knowledge, the standardized
change score, up to now, has only been employed to
compare measures for social phobia (Taylor et al.,
1997; Ries et al., 1998). In these studies, factorial
validity of the scales remained untested. This is
understandable, since all the analyzed scales obviously
assess core symptoms of social phobia. If scales
assessing a multidimensional form of psychopatholo-
gy were analyzed, however, it would raise the ques-
tion of which scales should be compared with one
another.

Bulimia nervosa must be considered such a multi-
dimensional form of psychopathology because some
evidence suggests that bulimia-relevant aspects of
eating and body concern can be sorted along three
dimensions in women with bulimia nervosa (Gleaves
et al., 1993; Gleaves and Eberenz, 1995) as well as in
healthy women (Varnado et al., 1995). The dimen-
sions can be labeled Disturbed Eating, Restrictive
Eating Behaviors and Body Dissatisfaction. A priori
assignment of scales to these dimensions has appeared
to be unsatisfactory. Therefore, before comparing
scales that assess a multidimensional psychopatholo-
gy, one must analyze which scales tap into the same
dimension. Unfortunately, it is also uncertain whether
a scale’s underlying dimension is the same in clinical
and nonclinical populations (e.g., Anderson, 1993).

Given that after therapy successfully treated patients
might belong to the healthy population, the scales’
underlying dimensions should be analyzed in both a
clinical sample and a sample of healthy controls.

In the present study, sensitivity to change of 12
internationally established scales that assess bulimia-
relevant aspects of eating and body concern were
analyzed. Data were taken from a sample of a recent
evaluation study (Tuschen-Caffier et al., 2001). Be-
fore computing and comparing standardized change
scores, a factor analysis of scale scores was conducted
in a sample of women receiving the diagnosis of
bulimia nervosa as well as in a healthy sample.

2. Methods

2.1. Subjects

Three data sets were analyzed: (1) Pretreatment
data of a recent evaluation study (Tuschen-Caffier
et al., 2001) were used to explore the factorial
structure of the included scales in women with bu-
limia nervosa. The diagnoses were determined by a
reliable and valid structured interview based on DSM-
III-R (Margraf et al., 1994). It should be noted that
data collection of the present study had started before
a structured clinical interview for DSM-IV criteria
was available in German. To avoid any change of
diagnostic standard during an ongoing study, all
participants were diagnosed on the basis of DSM-
III-R. Of the 73 patients of Sample 1, 69 filled out all
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