Meta-analytic study on treatment effectiveness for problem behaviors with individuals who have mental retardation

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Authors' objectives
To assess treatment effectiveness for problem behaviours of individuals who have mental retardation.

Searching
Thirty journals that focused on mental handicap, mental retardation, mental subnormality or developmental disabilities were searched, as well as reference lists of identified studies (published and unpublished). In addition, reports in textbooks and studies in psychological journals were also considered. No restrictions were discussed.

Study selection
Empirical studies comparing a control and a treatment phase rather than individuals, presenting data in a line or bar graph. No additional information was provided.

Specific interventions included in the review
The interventions were categorised into four groups: pharmacological procedures, e.g. antidepressants; antecedent control procedures, e.g. diet; response contingent procedures, e.g. guided movement training; and response noncontingent procedures, e.g. differential reinforcement of other behaviour.

Participants included in the review
Patients receiving treatment who were diagnosed as having mental handicaps, mental retardation, developmental disabilities or delays, as well as autism.

Outcomes assessed in the review
Reduction or elimination of a defined topography of problem behaviour, specifically: internal maladaptive behaviour; socially disruptive behaviour; and external destructive behaviour.

How were decisions on the relevance of primary studies made?
Two reviewers, with inter-rater agreement determined on 100 randomly-selected studies, selected the papers.

Assessment of study quality
The authors do not report a method for assessing validity.

Data extraction
One reviewer extracted the data.

Methods of synthesis
How were the studies combined?
An index of treatment effectiveness was calculated based on the percentage of non-overlapping data, representing the proportion of data points in one phase that overlaps with any of the data points in a comparison phase. A baseline or control phase was compared with a treatment phase that either immediately followed or followed after another phase of treatment. The percentage of non-overlapping data scores were calculated for the main treatment procedures and combined treatment procedures. Comparisons were made using analysis of variance, t-tests, and stepwise regression analysis.
How were differences between studies investigated?
Differences were investigated through a subgroup analysis based on categories of behavioural topography and categories of treatment procedure. A chi-squared analysis was used to assess the independence of topographies and primary treatment procedures.

Results of the review
A total of 482 studies (1,451 comparisons) were included.

The analysis revealed a statistically-significant lower mean percentage of non-overlapping data for treatment of external destructive behaviour than for internal maladaptive behaviour (t(991)=2.78; p<0.001) and for socially disruptive behaviour (t(991)=3.88; p<0.001). Response contingent procedures were significantly more effective than were antecedent control procedures (t(991)=4.10; p<0.001), pharmacology (t(991)=6.68; p<0.001) and response non-contingent procedures (t(991)=5.92; p<0.001). Response non-contingent procedures were significantly more effective than pharmacology (t(991)=3.33; p<0.001). There were no statistically-significant differences of mean percentage of non-overlapping data scores between antecedent control procedures and pharmacology (t(991)=2.25; p=0.02) and between response contingent and antecedent control procedures (t(991)=0.47; p=0.64). Comparisons of the mean percentage of non-overlapping data scores of the combined treatment procedures (mean = 80.92, SD=29.64) were significantly higher than the mean percentage of non-overlapping data scores of the primary treatment procedures (mean = 71.27, SD=34.13; t(585.84)=4.97; p<0.001).

Stepwise regression analysis of the variance of percentage of non-overlapping data attributable to patient characteristics revealed that pretreatment functional analysis accounted for 8% of the variance. A positive relation between preciseness of assessment and mean percentage of non-overlapping data was found. Informal assessment had the lowest (mean=65.83) and experimental analysis had the highest mean percentage of non-overlapping data (mean=82.60). Mean percentage of non-overlapping data scores for scatterplot and Motivation Assessment Scale (mean=66.02) and antecedent-behaviour-consequence-analysis (mean=71.54). Least significant difference test showed that informal assessment significantly differed from experimental analysis (LSD=2.78, p<0.05), with lower percentage of non-overlapping data scores associated with informal analysis.

Authors’ conclusions
The review of effectiveness of treatment for problem behaviours with individuals who have mental retardation draws four conclusions. First 26.5% of all behaviours can be treated quite effectively, 47.1% of all behaviours can be treated fairly effectively, 23.5% of all behaviours can be treated questionably and 2.9% of all behaviours cannot be treated reliably. Accordingly, 20.3% of the primary treatment procedures fall in the range of highly effective, 37.5% fairly effective, 21.9% questionably effective and 20.3% of the primary procedures are unreliable. Second, behaviours defined as externally destructive tend to be less successfully treated than are behaviours defined as internally maladaptive or as socially disruptive. Third, response contingent procedures tend to be more effective than are other categories of treatment, with pharmacological least effective. Fourth, functional analysis is significantly related to percentage of nonoverlapping data. An element of caution should be taken when interpreting the results as the review did not examine the effects of study design, allocation of patients, disease severity, heterogeneity on the validity and generalisability of the results.

CRD commentary
The review provided adequate descriptions of its objective, interventions, outcomes, participants, search strategy, methods of combining studies and results. Limited information was provided on the study designs included, validity criteria, process involved in applying inclusion and validity criteria, methods of data extraction, and methods of analysis of heterogeneity. The search strategy targeted specific publications, but did not include searches of electronic databases. In addition, the review failed to provide adequate attention to the effects of study design, patient characteristics and heterogeneity on the validity and generalisability of the results. Detailed information from individual studies and their references are not provided. It is evident from the review that most studies have small sample sizes and are likely not to have control groups (comparisons are based on a baseline or control phase rather than individuals or groups).
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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.