Treatment of hand mouthing in individuals with severe to profound developmental disabilities: a review of the literature
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CRD summary
This review determined the effectiveness of hand mouthing interventions in individuals with severe to profound developmental disabilities. The authors concluded that various intervention strategies led to a decrease in hand mouthing in such individuals. Whilst the results were largely consistent in direction and thus promising, the number of studies identified, small sample sizes and uncertain quality of the included studies limit interpretation of the findings.

Authors' objectives
To assess the effectiveness of hand mouthing interventions in individuals with severe to profound developmental disabilities.

Searching
ERIC, PsycINFO and MEDLINE were searched for studies published between 1995 and 2004; the search terms were not reported. The references of relevant papers were also checked.

Study selection
The authors did not report a priori criteria for the study design. Study designs included baseline intervention, reversal (with or without multi-element), multiple baseline (with or without follow-up), alternating treatments and multiple-element. Studies that investigated the treatment and/or assessment of hand mouthing were eligible for inclusion in the review. This abstract focuses on the assessment of treatment studies only. Studies of individuals with severe to profound developmental disabilities were eligible for inclusion. The level of disability of participants in most of the included studies was categorised as profound: profound multiple disability in 2 studies, severe multiple disability in 2 studies, both profound and profound multiple disability in 2 studies, and one study included participants with Rett syndrome. Where reported, the age of the participants ranged from 3 to 66 years. The primary outcome in the review was the rate of hand mouthing behaviour.

The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they systematically assessed the validity of the primary studies.

Data extraction
The studies were grouped into seven intervention categories and one assessment category (function of hand mouthing). The intervention categories were antecedent, multi-component, pharmacological, interventions utilising reinforcement, response blocking interventions, interventions utilising response effort and sensory stimulation interventions.

The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
The studies were combined in a narrative, grouped by intervention.

Results of the review
Twenty intervention studies (n=33) were included in the review; the number of participants in each study ranged from 1 to 4.

Antecedent interventions (4 studies, n=4): all 4 studies investigating the effect of antecedent interventions, such as
environmental enrichment, choice or supported mealtime routine, reported positive results in favour of these interventions. One study also found a weaker response for an environmental enrichment intervention in favour of soft toys compared with hard toys.

Multi-component interventions (4 studies, n=4): all 4 studies using multi-component interventions, including reinforcement and response effort, found a positive response to the intervention.

Pharmacological interventions (1 randomised controlled trial, n=1): a 46% reduction in hand biting per minute was found in favour of naltrexone hydrochloride (1.5 mg/kg per day) compared with placebo in an adult male with profound disability. No serious adverse events were reported.

Interventions utilising reinforcement (2 studies, n=4): both studies found a positive effect of intervention with noncontingent access to toys (with or without parent interaction) in children with profound disability. One study found a positive response to the differential reinforcement of other behaviour (DRO) compared with an ignore condition and a noncontingent attention condition, while the other study found a negative response to DRO (changing DRO and reinforcement intervals).

Response blocking interventions (4 studies, n=11): all 4 studies found a positive effect of response blocking interventions, although one found a mixed response using a hands down, drying hands and redirection (for whole group) procedure in 3 children with profound or profound multiple disability.

Interventions utilising response effort (4 studies, n=9): all 4 studies investigating the influence of response effort, including arm restraints, flexible arm splints and soft arm splints, on hand mouthing found a positive response to the intervention.

Sensory stimulation intervention (2 studies, n=2): both studies investigated the effects of matched and unmatched stimuli or sensory stimulation using food. Both studies found a positive effect of sensory stimulation intervention.

Authors’ conclusions
The various intervention strategies led to a decrease in hand mouthing in individuals with severe to profound developmental disabilities. Hand mouthing is often maintained by automatic reinforcement.

CRD commentary
The review question was supported by inclusion criteria in terms of the intervention and population. No a priori criteria were reported for the study design or outcomes. Several sources were searched for relevant articles unrestricted by language, thus minimising the likelihood of language bias. The methods used to select studies and extract the data were not fully reported, therefore the possibility of reviewer error or bias at these stages cannot be assessed. The validity of the included studies does not appear to have been systematically assessed. Given the differences between the studies, a narrative description of the results was appropriate. The results were reported only in terms of a positive or negative response, which does not enable a full interpretation of the findings. Whilst the results were largely consistent in direction and thus promising, the number of studies identified, small sample sizes and uncertain quality of the included studies limit interpretation of the findings.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that future research should consider which intervention would be most appropriate for particular individuals; whether the results can be replicated across a variety of settings and participants; and whether or not the use of preference assessment and functional analysis data to develop an intervention would lead to more beneficial treatments of automatically maintained hand mouthing in individuals with severe to profound developmental disabilities.

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Record Status
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.