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### The classification of the children by their behavior for the dental treatment using cluster analysis

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**Abstract** The aim of this study is construct a systematic classification system of children by their behavior. The study population consisted of 104 children who visited the pediatric dentistry at the Dental Hospital of Tsurumi University for the first time. The behavior of the children was evaluated by the Frankl Behavior Rating Scale and the behavior evaluation score developed by Kurosu. For the classification, *k*-means and two-step cluster and a large scale clustering method, the Kohonen network were used. The Frankl Behavior Rating Scale and all clusters were statistically significant according to Fisher's exact tests. Among them, the results using the two-step cluster analysis were well classified for the Frankl Behavior Rating Scale and may seem to be clinically available. Decision analysis to clarify the decision rules for affiliation extracted 5 items such as 'Moving the body left and right', 'Putting hands over the mouth', 'Crying softly', 'Holding the hands of the dentist', 'Closing the eyes'. And these items would be key items to peg uncooperative behavior in clinical practice. By the observation of some of the behavior of the children and using decision tree, systemic decisions can be made for the obscured Frankl Behavior Rating Scale.

**Key words** Behavior, Children, Cluster analysis, Decision tree

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