

**Patterns of Physical Symptoms in Adolescents:  
Application of a Clustering Method**

Hyekyun Rhee, PhD, RN, PNP

**University of Virginia**

School of Nursing: PO Box 800782; Charlottesville, VA 22908-0782

**Adolescents, Physical Symptoms, Cluster**

**Purpose:** This study explored the patterns of 10 selected physical symptoms (headaches, stomachache, musculoskeletal pain, fatigue, feeling hot, cold sweat, sore throat, urinary problems, dizziness, and chest pain) using clustering methods and examined psychosocial profiles for each cluster of adolescents sharing similar symptom patterns.

**Method:** This was exploratory research using secondary data analysis from the National Longitudinal Study of Adolescent Health (Add Health), a school-based study that included a nationally representative sample of adolescents in grades 7 through 12 during the 1994-1995 school year. Multi-level stratified random selection procedures were implemented to obtain the sample from a total of 132 schools in the United States. The data were collected at 2 time points, 1 year apart. This study included those who participated in the In-Home Interview in Wave I and Wave II (N=9,141; ages 11 to 21). The sample consisted of 48% boys and 64% non-Hispanic Whites. Data were analyzed by using both hierarchical (ward methods) and non hierarchical methods (k-means). Psychosocial characteristics for each cluster of adolescents were compared using multiple univariate ANOVAs and plotting profiles. The stability of the identified clusters was examined by evaluating the reproducibility of the symptom patterns after a year.

**Findings:** Four clusters were identified based on the levels of overall symptom patterns: Cluster 1 (41%) represented those who were least likely to report any type of symptoms; Cluster 2 (38%) included those with symptoms of an episodic nature; Cluster 3 (19%) and Cluster 4 (2.3%) included those with a somatizing tendency in which the overall levels of symptom patterns were higher than that of sample average. Cluster 4 exhibited the highest level of overall symptom pattern, particularly for urinary symptoms. Those with the higher levels of symptom patterns (Cluster 3 and 4) presented unfavorable psychosocial profiles: high depressive symptoms, low self-esteem and low parental affection. Reproducing identical symptom patterns using Wave II data failed, indicating the unstable nature of symptom configurations. When examining the stability of cluster memberships based on the level of symptom patterns, only a small portion of respondents in the 2 lower levels of clusters (least somatizing and episodic groups) in Wave 1 progressed to somatizing groups in Wave II.

**Discussion:** This study demonstrated the usefulness of a clustering method in grouping adolescents based on the patterns of included symptoms, which suggested the nature of those symptoms. This pattern approach can be a cost-effective means of screening somatization in large groups such as school populations. Further, adolescents in clusters exhibiting a somatizing tendency appear to be at greater risk for psychosocial maladjustments, underscoring the importance of developing interventions targeted toward this group.