

# Biopsychosocial clustering

**Clustering** in a biopsychosocial context involves grouping individuals based on common characteristics related to biological, psychological, and social factors. The biopsychosocial model is an approach that considers biological, psychological, and social factors as interconnected influences on health and illness. Cluster analysis is a statistical technique used to identify patterns or clusters within a dataset, to group similar individuals together.

When applied to a biopsychosocial context, cluster analysis might be used to identify subgroups of individuals who share common characteristics or profiles across various dimensions. Here's a breakdown of the components:

## Biological Factors:

This includes aspects related to the physical or physiological aspects of an individual's health. Examples could be genetic factors, medical conditions, and biomarkers.

**Psychological Factors:** This involves examining psychological traits, behaviors, and mental health aspects. It might include personality traits, cognitive functioning, emotional well-being, and coping mechanisms.

**Social Factors:** Social factors encompass various elements of an individual's social environment. This can include aspects like socio-economic status, family dynamics, social support, cultural influences, and the broader societal context. The process of biopsychosocial cluster analysis typically involves the following steps:

## Data Collection:

Gather data on relevant biological, psychological, and social variables for the individuals in the study.

**Variable Selection:** Identify the specific variables within each domain (biological, psychological, and social) that will be used in the analysis.

**Normalization/Standardization:** Normalize or standardize the data to ensure that variables with different units or scales can be appropriately compared.

**Cluster Analysis:** Apply cluster analysis techniques to group individuals based on similarities in their biopsychosocial profiles. Common methods include hierarchical clustering or k-means clustering.

**Interpretation:** Interpret the results of the cluster analysis to understand the distinct subgroups that have emerged. Explore the characteristics that define each cluster.

**Clinical or Research Implications:** Consider the clinical or research implications of the identified clusters. It may inform personalized interventions, treatment strategies, or targeted approaches based on the specific needs of each cluster. The goal of biopsychosocial cluster analysis is often to move beyond simplistic categorizations and better understand the complex interplay of factors influencing health and well-being. It can be particularly valuable in healthcare settings, where a more holistic understanding of patients can guide personalized and comprehensive care.

PROSTIM study is an [ongoing prospective](#), [multicentric](#), and [observational clinical study](#) (NCT05349695) that aims to identify different patient [clusters](#) and their outcomes after [spinal cord stimulation](#). Patients are recruited in different centers in [Europe](#). The [analysis](#) focuses on identifying significant patient clusters based on different health [domains](#) and the changes in biopsychosocial variables 6 weeks, 3, and 12 months after [implantation](#). This study is the first to include a [biopsychosocial cluster analysis](#) to identify significant patient groups and their response to [spinal cord stimulation treatment](#) <sup>1)</sup>

<sup>1)</sup>

Raymaekers V, Meeuws S, Goudman L, der Steen GV, Moens M, Vanloon M, Ridder D, Menovsky T, Vesper J, Plazier M. Patient [profiling](#) and [outcome assessment](#) in [spinal cord stimulation](#) for [chronic back](#) and/or [leg pain](#) (the PROSTIM [study](#)): a study [protocol](#). Pain Manag. 2023 Dec 6. doi: 10.2217/pmt-2023-0103. Epub ahead of print. PMID: 38054386.

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