MMPI Profiles of Female Candidates for Obesity Surgery: A Cluster Analytic Approach

Joan B. Lauer, PhD; Richard Wampler, PhD; Joanne B. Lantz, PhD; James A. Madura, MD

Department of Psychology, Indiana University-Purdue University at Indianapolis; *Marriage & Family Therapy Program, Texas Tech University; †Department of Psychology, Indiana University-Purdue University at Ft. Wayne; ‡Department of Surgery, Indiana University Medical School, USA

Background: Early attempts to characterize personality in obese persons led to the conclusion that the severely obese are not homogeneous on personality measures. More recently, cluster analysis procedures have been applied to identify meaningful personality subtypes in populations of persons with severe obesity; some progress has been made in this effort, but researchers have indicated the need for replication in other settings.

Methods: In the present study, the Minnesota Multiphasic Personality Inventory (MMPI) was administered to 163 female candidates for intestinal bypass surgery.

Results: Eight clusters were identified. Of the MMPI profiles, 71% were in one of four normal limit clusters. The remainder were distributed across four clusters, all beyond normal limits.

Conclusions: Present and previous results appear to converge on representative personality subtypes in severe obesity. Identification of such meaningful subgroups of candidates for obesity surgery may enhance the prediction of surgery outcomes, and yield a better understanding of personality in severely obese women.

Key words: MMPI profiles, personality and severe obesity, cluster analysis

Introduction

Severe obesity results in increased morbidity and mortality, and it is accompanies frequently by significant psychosocial and economic problems. Approximately 5.5 million Americans are obese, when a definition of a body mass index (BMI) over 35 kg m$^{-2}$ is used, and, of these, 1.5 million would be classified as 'clinically severely obese' with a BMI exceeding 40 kg m$^{-2}$. Given the failure of less invasive interventions, surgical procedures have been developed to reduce the degree of obesity and, thereby, reduce morbidity and mortality rates. Over the past 20 years, these procedures have evolved from intestinal bypass procedures to various forms of gastric reduction or gastric bypass procedures. Both intestinal and gastric procedures are effective in producing weight loss; however, there are fewer reported medical complications with gastric procedures.

There have been efforts to understand better the psychological make-up of the person with severe obesity throughout the history of the use of surgical weight loss procedures. The general approach has been to evaluate patients with interview schedules and personality measures, such as the Minnesota Multiphasic Personality Inventory (MMPI). The first psychological questions were twofold. (1) One question was whether persons with severe obesity, alike in their extreme degree of overweight, were also homogeneous in personality characteristics. The consensus of the research literature on this question is that there is heterogeneity, not homogeneity, of personality characteristics among persons with severe obesity. However, there is little consensus on the degree of heterogeneity. (2) Another question was whether patients improved psychologically after surgery. Overall, research findings support the conclusion that psychological outcomes are generally positive following surgery for obesity.
The generally positive psychological result of surgery for severe obesity does not, of course, mean that every patient demonstrates improved psychological functioning. Research groups are aware of individual patients who deteriorate psychologically after surgery, and most surgeons can name the problematic postsurgical patients who absorb large amounts of time and energy for what seem to be psychological complaints and problems.

More recently, research efforts have focused on the heterogeneous personality profiles of persons with severe obesity. Cluster analysis procedures have been used to categorize patients into meaningful subgroups, based on assessment results.4 Since the ultimate intent of such research is to relate the personality subgroupings to surgical outcome measures (weight loss, postoperative psychological adjustment, etc.), preoperative personality data have been collected and analyzed. All researchers who have conducted cluster analysis procedures have utilized the MMPI, because of its widespread use and because it assesses a number of aspects of personality.

Four different research groups have used cluster analytic techniques of MMPI profiles to identify meaningful subgroups of patients who are candidates for surgery for severe obesity.2-9 However, the results have not been entirely consistent, cluster analytic procedures have differed, and all four groups of researchers have emphasized the importance of replication of the findings with data from other settings. Of the four studies, three used empirical grouping developed in cluster analysis procedures.5-9 Avoiding a priori categories, they tried to identify clusters that differed among each other and also contained a substantial percentage of patient profiles. The fit of the cluster solutions ranged from 100% to approximately 55%.9 Blankmeyer and her colleagues3 used two different facilities to recruit patients, and they reported only on clusters that were found in both facilities. Barrash and his colleagues2 began with 19 a priori categories and could fit only 56% of patients into one of ten refined categories.

Duckro et al.4 using a principal components analysis and classifying all of their sample of 199 females, identified three clusters: normal limit profiles without distinct elevations, normal limit profiles with distinct elevations on Scales 2 and 0 (Depression and Social Introversion) and lesser elevations on Scales 1 and 3 (Hypochondriasis and Hystera), and profiles within normal limits with distinct elevations on Scales 4, 8 and 9 (Psychopathic Deviate, Schizophrenia, and Hypomania).

Webb et al.9 with a cluster analysis procedure using squared Euclidian distance as a measure of similarity between patients, classified all of their sample of 129 females and 86 males into four clusters: normal limit profiles, normal limit profiles with elevations on Scales 1 and 3 (Hypochondriasis, Hystera); Spike 4 profiles (marked elevation on Scale 4 — Psychopathic Deviate); and profiles distinctly beyond normal limits (generally elevated scale scores with particularly high scores on Scale 2 — Depression).

Barrash et al.2 using nearest centroid clustering (the method used in the present study) and a sample of 138 females, carried out a much more complex process in which 16 discharge profiles seen in psychiatric patients9 and the three patterns observed by Duckro et al.4 were used to define initial cluster centroids. When 19 possible clusters were used as the starting point, ten apparently meaningful clusters emerged which categorized 56% of patients in clusters with 5—15 members (mean = 7.7 patients per group). The small group size and the failure to classify 44% of patients make the results of Barrash et al.2 difficult to interpret. In a second cluster analysis, the Duckro et al.4 clusters were used alone, and all subjects were placed in one of the three clusters. A different approach was taken by Blankmeyer et al.9 using 170 female patients from two different medical facilities. They used a cluster analysis procedure that minimizes the average distance between cases in a particular cluster (COSINE/WAVERAGE) and compared the results from the two locations. Blankmeyer et al.9 retained only clusters found in both facilities, resulting in exclusion of 45% of patient profiles. The five profiles (55% of patients) retained were categorized as: normal limit profiles with elevations in Scales 2 and 0 (Depression, Social Introversion), normal limit profiles with elevations in Scales 6 and 0 (Paranoia, Social Introversion), marginally normal limit profiles with elevations in Scales 1, 3 and 4 (Hypochondriasis, Hystera, and Psychopathic Deviate, respectively), and distinctly lower scores on Scale 5 (Masculinity-Femininity), and profiles clearly beyond normal limits (marked elevations on Scales 1, 2, 3, 4, 6, 7, and 8 — Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, Paranoia, Psychasthenia, and Schizophrenia, respectively).

The present study was an attempt to explore the reasons for the differences in the previous cluster analysis studies and to resolve these differences if possible. Our working hypothesis was that there would be a cluster analysis solution that would incorporate the results of the previous studies while still producing clinically meaningful groupings. As with the earlier studies5-9 the MMPI profile was used as the basic data from each patient.