

Concurrent Validity of the Multidimensional Health Profile—Health Functioning Scales (MHP-H) in the Pre-operative Assessment of Applicants for Gastric Bypass Surgery

Richard I. Lanyon · Barbara M. Maxwell ·
Paul Karoly · Linda S. Ruhlman

Published online: 7 March 2007
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Abstract The concurrent validity of a brief screening test, the Multidimensional Health Profile-Health Functioning (MHP-H) was examined in conjunction with a much more lengthy pre-operative assessment procedure in 449 applicants for gastric bypass surgery (GBS). The MHP-H is a 69-item screening inventory that assesses five areas of health functioning: Adult Health History, Health Habits, Health Care Utilization, Health Beliefs and Attitudes, and Response to Illness. The more lengthy procedure included a comprehensive 273-item structured interview plus the Minnesota Multiphasic Personality Inventory-2 (MMPI-2), Basic Personality Inventory (BPI), and Beck Depression Inventory (BDI). The MHP-H showed significant correspondence with the more comprehensive assessment on measures of potential relevance to outcome in GBS, supporting the use of the MHP-H as a low-cost alternative to the more extensive procedure. The utility of the MHP-Psychosocial Functioning (MHP-P), a companion instrument to the MHP-H, was demonstrated in an earlier study.

Keywords Gastric bypass surgery · Bariatric surgery · Multidimensional Health Profile · Health psychology assessment

In a recent paper, the authors demonstrated the utility of the Multidimensional Health Profile-Psychosocial Functioning (MHP-P), a relatively brief screening instrument covering four general areas of psychosocial relevance in health settings, in the pre-operative assessment of applicants for gastric bypass surgery (GBS) (Lanyon, Maxwell, Karoly, & Ruhlman, 2006). The present study evaluated the Multidimensional Health Profile-Health Functioning (MHP-H), a companion instrument to the MHP-P, for its utility in assessing health-related variables also believed to be of relevance in this situation.

Pre-operative psychological assessment for GBS applicants is important for several reasons. Success after GBS requires major changes in eating behavior and in general lifestyle, and applicants differ in their ability to make and sustain these changes. Pre-operative psychological assessment is thought to be able to identify those applicants for whom the probability of success is limited, and more importantly, those whose chances can be increased significantly through pre-operative and post-operative counseling, education, support, and in some cases formal treatment and medication. In this manner, long-term outcome can be improved, and a higher proportion of applicants can be offered the corrective surgery.

Two recent papers have reviewed studies that have attempted to identify pre-operative factors, either psychosocial or health-related, that predict degree of short-term and long-term weight loss after GBS (Herpertz, Kielmann, Wolf, Hebebrand, & Senf, 2004; van Hout, Vershure, & van Heck, 2005). Additionally, Bocchieri, Meana, and Fisher (2002) reviewed research that examined the nature of other related changes, including overall physical health, mental health, and lifestyle factors. In general, variables that have been suggested in the literature as possibly related to favorable outcome have included younger age, minimal psychiatric

R. I. Lanyon (✉) · B. M. Maxwell · P. Karoly · L. S. Ruhlman
Department of Psychology, Arizona State University,
Tempe, Arizona 85287-1104, USA
e-mail: rlanyon@asu.edu

B. M. Maxwell
Southwest Medical Psychology,
Phoenix, Arizona, USA

L. S. Ruhlman
Consultants in Behavioral Research,
Tempe, Arizona, USA

history, better quality of life, more social support, low alcohol consumption, higher self-esteem, more positive body image, and absence of binge-eating (see also DiGregorio & Moorehead, 1994; Sabbioni et al., 2002). Findings in regard to marital satisfaction and current psychological distress have been mixed. In general, an overall evaluation of this body of research reveals relatively little consistency in regard to predictors of success, perhaps because of variability in the conditions under which the different studies were conducted.

In clinical practice, current pre-operative assessments typically cast a wide and probably overinclusive net (perhaps because of the lack of consistency in the research findings as described above), and make predictions of outcome on a more or less subjective basis utilizing some of the above-listed variables. Consistent with this practice, the second author developed and routinely utilized a comprehensive procedure for pre-operative GBS assessments. It included a comprehensive interview based on the literature referred to above and the literatures related to successful outcome after other major surgeries (e.g., Collins, Holden, & Scheel, 1996; Leo, Smith, & Mori, 2003), and was supplemented by her medical knowledge as a registered nurse. The interview contained a total of 273 items, and was designed to be readily coded for research purposes in a quantitative format. Some of the interview items were later combined into composite scores, such as the total number of medical comorbidities and the extent to which alcohol was a problem in the patient's life. Overall, the interview included 21 major content areas of possible relevance to post-operative outcome, including current and past medical and mental health status, family and other biographical areas, occupational, educational, and interpersonal information, and topics related to weight and surgery issues.

Three formal psychological inventories were also included in the pre-operative assessment: the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989), the Basic Personality Inventory (BPI; Jackson, 1989), and the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988). The MMPI-2 assesses psychopathology, the BPI assesses personality-related variables with a possible link to psychopathology, and the BDI is a widely used measure of state depression.

The Multidimensional Health Profile (MHP; Karoly, Ruhlman, & Lanyon, 2005; Ruhlman, Lanyon, & Karoly, 1998a, 1998b, 1999) was also included in the pre-operative assessment procedure. The MHP is a relatively brief, structured psychometric instrument that captures the essence of most areas typically involved in pre-operative assessment. This instrument was designed to alert health care personnel to potential problems that should be addressed in more detail, and consists of two sections: Psychosocial Functioning (MHP-P), and Health-related Functioning (MHP-H). The

MHP-P (58 items) covers four basic areas: Life Stress, Coping Skills, Social Resources, and Mental Health. The MHP-H (69 items) covers five areas: Response to Illness, Health Habits, Adult Health History, Health Care Utilization, and Health Attitudes and Beliefs. Each of the two sections of the MHP was designed to be completed in 10–15 min. While prior work has shown validity for the MHP-H in the general population, the primary aim of the present study was to address its validity in an ongoing medical setting.

The MHP utilizes different test formats for the nine different areas, although 5-point rating scales are used wherever possible. Thus, it can be viewed as consisting of nine separate tests, each using the format best suited to its area. Most of the nine areas include several different constructs, making a total of 38 constructs in all: 17 for the MHP-P and 21 for the MHP-H. The MHP-H constructs are listed and briefly described in Table 1.

The development of the MHP can be summarized as follows. The psychological literature (theory, research, and practice) in health psychology was carefully reviewed in order to identify those concepts and characteristics that were of greatest interest and that could be reliably defined and measured. A written survey was then sent to urban and rural

Table 1 Constructs assessed by the MHP-H

<i>Adult Health History</i> (individual ratings of general health and the presence of chronic illness)
1. Severity of typical illness
2. Presence of a chronic illness
3. Impairment due to chronic illness
4. Overall health (over adult life)
5. Recent health (over past six months)
<i>Health Habits</i> (sums of 24 individual ratings of positive and negative health habits)
6. Positive habits
7. Negative habits
<i>Health Care Utilization</i> (frequency of utilizing four different types of health care)
8. Medical office visits
9. Overnight hospital treatments
10. Emergency-room visits
11. Over-the-counter medication
<i>Response to Illness</i> (response to a person's "typical" illness on a total of 13 items covering the following areas)
12. Professional help
13. Self-help
14. Help from friends
15. Spiritual help
<i>Health Beliefs and Attitudes</i> (23 items covering six beliefs/attitudes)
16. Self-efficacy
17. Health vigilance
18. Health values
19. Trust in health care personnel
20. Trust in health care system
21. Hypochondriasis

physicians in order to determine the importance of these concepts in their practice. Based on these dual foundations, the nine areas and their specific contents were identified and delineated. The procedure for selecting the areas for the MHP can thus be described as (1) identifying characteristics that could be measured reliably, and (2) determining which of them were most important to practicing physicians.

A large item pool was prepared that comprehensively sampled the content of each area, and items were screened for comprehension, readability, reliability, skewness, and excessive social desirability. Confirmatory factor analyses were then carried out for those areas for which they were appropriate, in order to assure the homogeneity of individual measures. Development involved three participant groups: 325 patients at a family practice unit; a national sample of 673 respondents stratified by age and gender and balanced on education and geographic distribution; and a second national sample of 2,411 respondents selected in the same manner.

National norms were based on the sample of 2,411 respondents and were presented in T-score format (mean 50, standard deviation 10) separately for six age by gender groups. Preliminary concurrent validity data have been presented for most of the areas of the MHP-P (Ruehlman et al., 1999) and the MHP-H (Karoly et al., 2005) based on respondents from the general population. These data involve correlations with established tests, and show significant relationships with measures of the same or similar variables.

In the present study, the comprehensive GBS pre-operative assessment procedure and the shorter procedure (MHP) were both utilized with GBS applicants. These data presented an opportunity to examine the utility of the MHP-H. Thus, the study was designed to determine whether the MHP-H measures adequately assessed the health-related factors of potential relevance as represented in the more comprehensive procedure. The MHP was introduced to the patients as a research project in which they were invited to participate anonymously with the goal of improving pre-operative assessment procedures. Only six patients declined to complete the MHP.

Method

Participants

Participants were 449 applicants for GBS who had undergone a comprehensive pre-operative evaluation with the second author in her independent practice, which was affiliated with a large bariatric surgery program at a major medical center in Phoenix. Informed consent was given by each patient for anonymous use of the data in subsequent research. The study was exempt from review under the rules of the Arizona State University Institutional Review Board. Some

applicants were referred to a psychiatrist for medication evaluation or to their family physicians if the need was judged to be less severe. The second author provided information and education related to GBS on a group and individual basis as appropriate. Although not directly relevant to the present study, ongoing post-operative support groups were also provided as part of a multidisciplinary program. Mean age of the patients was 42.8 (*SD* 11.3, range 17–71), mean educational attainment was 14.0 years (*SD* 2.4, range 8–28), mean weight was 303 lb. (*SD* 66.1, range 195–665), and 83 percent were female. Interviews averaged two hours in length. All data were gathered during 2002–2003.

Measures

Interview data

A highly structured interview and coding guide were employed for the 273 items of interview data. Not all of the 449 participants completed all of the assessment procedures. The number of participants for whom the individual interview variables were available ranged from 401 to 429 except for questions about children and spouse relationships, which ranged from 286 to 337.

Psychological test data

The three psychological inventories (MMPI-2, BPI, and BDI) and the MHP were administered in the same order to each participant prior to the interview. All testing was conducted under the supervision of a bachelor's level assistant trained by the second author, and was done in either one or two sittings. Of the participants, 428 completed the MMPI-2, 422 completed the BPI, 431 completed the BDI, and 449 completed the MHP.

Results

GBS assessment variables

Interview data

Coding of the interview data was conducted by research assistants who were trained as follows, using a structured coding guide prepared by the second author. An initial pair of coders worked together from the coding guide, making adjustments to the guide as needed, until full agreement was reached in coding all items. Each new coder worked with a trained coder until full agreement was reached. Over the course of the project, a notebook of questions, issues and decision rules was developed to deal with instances that involved ambiguity. Such instances accounted for less than one percent of all coding decisions.

Table 2 Correlations of MHP-H Adult Health History measures with relevant interview variables

MHP-H measure	Sum of medical comorbidities	Overall pain	Total prescription medications	Total surgeries	Increasing difficulty in living	Diagnosed with depression
Severity of Typical Illness	.26**	.16*	.23**	.18**	.19**	.15*
Presence of a Chronic Illness	.40**	.19**	.46**	.27**	.22**	.10
Impairment Due to Chronic Illness (N = 205)	.24**	.27**	.17	.14	.19*	.26**
Overall Health (Over Adult Life)	-.28**	-.15*	-.20**	-.08	-.15*	-.23**
Recent Health (Over Past Six Months)	-.39**	-.24**	-.29**	-.07	-.30**	-.34**

*p < .01.

**p < .001.

The interview procedure was designed for both clinical and research purposes. In order to combine related items of the interview data into variables for statistical analysis, some sets of related items were summed to form a total of 15 composite scores. In 7 cases, the individual scores were converted to z scores for summation, while for the remaining 8 that involved simple lists (such as a history of medical problems in participants’ families of origin), a simple raw-score sum was used. Composite scores and individual interview variables were both utilized in the study.

Psychological test data

All of the basic scores on the MMPI-2, BPI, and BDI were entered into the data base regardless of their relevance to the present study.

Relationship to the MPH-H

Each of the five MHP-H areas (see Table 1) was considered in turn. The variables within each were correlated with measures from the comprehensive GBS assessment judged to be most relevant to the GBS process and to their correspondence with the MHP-H variables.

Adult Health History

The MHP-H Adult Health History area (see Table 1) consists of three measures related to general/chronic illness and resultant impairment, and two measures related to recent and past health status. As shown in Table 2, six interview variables were hypothesized to be the most related to these MHP-H measures, four relating to overall severity of health problems and two to general life difficulty. The first four were composite variables, and the last two were single items coded 0 or 1. As shown in Table 3, eight scales from the psychological inventories (MMPI-2 and BPI) were also hypothesized to be related to the MHP-H Adult Health History area. The MMPI-2 Hs (hypochondriasis) and Hy (hysteria) scales and the BPI Hyp (hypochondriasis) scale represented the extent of reported physical symptoms; the MMPI-2 D (Depression) scale, the BPI Dep (Depression) scale, and the BDI assessed depression as indicative of general life difficulty; and the MMPI-2 Pt (psychasthenia/anxiety) scale and the BPI Axy (anxiety) scale assessed anxiety as another indication of general life difficulty.

Correlations of the five MHP-H Adult Health History measures with the independent measures of health history and status are shown in Tables 2 and 3. Inspection of these correlations shows highly significant and meaningful relationships for all of the MHP-H Adult Health History

Table 3 Correlations of MHP-H Adult Health History measures with relevant psychological inventory scales

MHP-H measure	MMPI-2 scales				BPI scales			
	Hs	D	Hy	Pt	Hyp	Dep	Axy	BDI
Severity of Typical Illness	.35**	.27**	.29**	.19**	.36**	.19**	.19**	.25**
Presence of a Chronic Illness	.27**	.20**	.28**	.12	.25**	.10	.06	.14*
Impairment Due to Chronic Illness	.26**	.23**	.23**	.18*	.26**	.29**	.16	.24**
Overall Health (Over Adult Life)	-.35**	-.33**	-.35**	-.25**	-.33**	-.27**	-.21**	-.26**
Recent Health (Over Past Six Months)	-.43*	-.37**	-.42**	-.30**	-.38**	-.33**	-.20**	-.39**

Note. MMPI-2 = Minnesota Multiphasic Personality Inventory-2, BPI = Basic Personality Inventory, BDI = Beck Depression Inventory, Hs = hypochondriasis, D = depression, Hy = hysteria, Pt = psychasthenia, Hyp = hypochondriasis, Dep = depression, Axy = anxiety.

*p < .01.

**p < .001.

Table 4 Correlations of MHP-H Health Habits measures with relevant interview variables

MHP-H measure	Education level	Sum of psychiatric comorbidities	Has stopped drinking	Diagnosed with depression	Sum smoking	Sum alcohol	Sum street drugs
Positive Health Habits	.25**	-.03	-.05	-.24**	-.09	-.06	-.01
Negative Health Habits	.05	.19**	-.28**	.06	.23**	.30**	.20**

***p* < .001.

measures, most of them significant beyond the .001 level. For the interview variables (see Table 2), the highest correlations were found between sum of medical comorbidities and MHP-H Presence of a Chronic Illness (.40) and Recent Health over Past Six Months (–.39); and between total prescription medications and MHP-H Presence of a Chronic Illness (.46).

In regard to the psychological inventory data (see Table 3), the highest correlations were found between scales representing physical symptoms (Hs, Hy, Hyp) and depression (D, BDI), and MHP-H Recent Health Over Past Six Months. These correlations ranged from –.33 through –.43, with a median of –.38. The median correlation of both of the two MHP-H overall and recent health status measures with all eight inventory variables was .33, indicating a broad correspondence between the MHP-H measures and the relevant inventory measures. The median correlation of the three inventory scales relating to physical symptoms (Hs, Hy, Hyp) with the three MHP-H general/chronic illness measures was .27, and all nine of these correlations were significant beyond the .001 level.

Health Habits

The MHP-H Health Habits area (see Table 1) consists of 14 Positive Habits (such as “eaten breakfast” and “worn your seat belt”), and 10 Negative Habits (such as “smoked cigarettes” and “snacked between meals”), rated on five-point scales for frequency over the past year. As shown in Table 4 seven interview items were hypothesized to be related to Health Habits including four involving substance use and

two involving general mental health. Relevant psychological inventory scales that were chosen (see Table 5) included six related to psychological distress and withdrawal: D, Pt, Si (MMPI-2 social introversion), Dep, and Axy (BPI anxiety). Also included were two scales assessing claims of extreme virtue: MMP-2 L (lie) and BPI Den (denial); and two scales assessing irritability and impulsivity: BPI IPs (interpersonal problems) and ImE (impulse expression); and antisocial attitudes (BPI Aln).

Correlations of the MHP-H Health Habits measures with the interview and inventory measures relevant to these characteristics are shown in Tables 4 and 5. Correlations for the interview variables (see Table 4) show highly significant relationships between undesirable health habits (smoking, alcohol use, street drugs) and scores on MHP-H Negative Health Habits. Positive Health Habits were significantly correlated with education level, and negatively with diagnosis of depression. Psychological inventory data (see Table 5) show that MHP-H Positive Health Habits were consistently negatively related to psychological distress and withdrawal (D, Pt, Si, Dep, Anx, and BDI), a finding which is also consistent with lower likelihood of a depressive diagnosis as shown in Table 4. Table 5 shows that MHP-H Negative Health Habits were significantly correlated with ready irritability and impulsivity (IPs, ImE), and also (negatively) with claims of extreme virtue (L, Den).

Health Care Utilization

The MHP-H Health Care Utilization area (see Table 1) consists of four items (see Table 1), each rated on 5-point scales

Table 5 Correlations of MHP-H Health Habits measures with relevant psychological inventory scales

MHP-H measure	MMPI-2 scales				BPI scales						
	L	D	Pt	Si	Dep	Den	IPs	Aln	Axy	ImE	BDI
Positive Health Habits	.05	-.20**	-.20**	-.20**	-.18**	.01	-.10	-.12	-.13*	-.20**	-.19**
Negative Health Habits	-.27**	.02	.11	.01	.06	-.28**	.30**	.21**	.12	.25**	.13*

Note. MMPI-2 = Minnesota Multiphasic Personality inventory-2, BPI = Basic Personality Inventory, BDI = Beck Depression Inventory, L = lie, D = depression, Pt = psychasthenia, Si = social introversion, Dep = depression, Den = denial, IPs = interpersonal problems, Aln = alienation, Axy = anxiety, ImE = impulse expression.

**p* < .01.

***p* < .001.

Table 6 Correlations of MHP-H Health Care Utilization measures with relevant interview variables

MHP-H measure	Sum of medical comorbidities	Overall pain	Total prescription medication	Total surgeries	Increasing difficulty in living
Medical Office Visits	.38**	.19**	.42**	.25**	.18**
Overnight Hospital Treatments	.23**	.16*	.18**	.26**	.11
Emergency Room Treatments	.28**	.21**	.18**	.16*	.21**
Over-the-counter Medications	-.17**	-.10	-.28**	-.18**	-.14*

* $p < .01$.** $p < .001$.

according to their frequency over the past year. Five interview variables (see Table 6) were hypothesized to be related to the MHP-H, all related to illness severity. Four were composite variables, and the fifth was a single variable coded 0 or 1. Nine scales from the psychological inventories (see Table 7) were also hypothesized to be related to the MHP-H Health Care Utilization area. They represented the extent of physical symptoms (Hs, Hy, Hyp), anxiety and depression (Pt, Anx, D, Dep, BDI), and deviant behavior patterns (BPI Dev).

Table 6 shows that most of the correlations between the MHP-H Health Care Utilization measures and the relevant independent measures were highly significant. Thus, persons with a higher degree of pain, difficulty in daily living, and more comorbidities and total surgeries scored higher on MHP-H Medical Office Visits, Overnight Hospital Treatments, and Emergency Room Treatments; and lower on Over-the-counter Medications. Of the 20 correlations, 15 were significant beyond the .001 level. In regard to the psychological inventory scales (see Table 7), MHP-H Overnight Hospital Treatments was consistently related to extent of reported physical symptoms (Hs, Hy, Hyp) and to psychological distress (anxiety and depression), while all four MHP-H measures were significantly related to all measures of reported physical symptoms. MHP-H Over-the-counter Medications was, once again, negatively related to level of reported physical symptoms.

Response to Illness

The MHP-H Response to Illness area (see Table 1) consists of four variables that are each assessed by three items rated on five-point scales, based on the participant's most likely response to a typical illness. Interview variables hypothesized to be related included three composite interview measures of overall health impairment (see Table 8): sum of medical comorbidities, overall pain, and total prescription medication. In regard to the psychological inventory scales, none was considered directly related to this area of the MHP-H.

Table 8 shows modest but significant relationships of all three interview variables to two of the four MHP-H Response to Illness measures: Professional Help and Spiritual Help. These can perhaps be viewed as formal responses to illness, presumably involving professional personnel or agencies, as contrasted with reliance on self or friends, neither of which showed significant correlations.

Health Beliefs and Attitudes

This area of the MHP-H (see Table 1) consists of six variables that are each assessed by four items rated on five-point rating scales. As shown in Table 9, six interview variables were hypothesized to be related to these MHP-H measures, five relating to the extent of physical and psychological disability and one indicating degree of support during childhood.

Table 7 Correlations of MHP-H Health Care Utilization measures with relevant psychological inventory scales

MHP-H measure	MMPI-2 scales				BPI scales				
	Hs	D	Hy	Pt	Hyp	Dep	Axy	Dev	BDI
Medical Office Visits	.25**	.10	.24**	.09	.27**	-.04	.02	.10	.14*
Overnight Hospital Treatments	.17**	.17**	.15*	.18**	.23**	.13*	.15*	.22**	.23**
Emergency Room Treatments	.26**	.11	.23**	.08	.23**	.08	.07	.12	.08
Over-the-counter Medications	-.19**	-.07	-.17*	-.06	-.14*	-.04	-.01	-.03	-.10

Note. MMPI-2 = Minnesota Multiphasic Personality Inventory-2, BPI = Basic Personality Inventory, BDI = Beck Depression Inventory, Hs = hypochondriasis, D = depression, Hy = hysteria, Pt = psychasthenia, Hyp = hypochondriasis, Dep = depression, Axy = anxiety, Dev = deviation.

* $p < .01$.** $p < .001$.

Table 8 Correlations of MHP-H Response to Illness measures with relevant interview variables

MHP-H measure	Sum of medical comorbidities	Overall pain	Total prescription medication
Self-help	.11	.07	.03
Professional Help	.20**	.14*	.26**
Help from Friends	.09	-.01	.04
Spiritual Help	.21**	.13*	.13*

**p* < .01.

***p* < .001.

Four were composite variables, while two (diagnosed with depression and support during childhood) were single items coded 0 or 1. As shown in Table 10, twelve scales from the psychological inventories were hypothesized to be related. These scales represented four areas: (1) social withdrawal, low self-esteem and depression (D Si, Dep, BDI, and the BPI SDp [self-depreciation] and SoI [social introversion] scales); (2) severity of claimed medical symptoms (Hs, Hy, Hyp); (3) claims of extreme virtue (L and Den); and (4) lack of trust in others (the BPI PID [persecutory ideas] scale).

Correlations of the MHP Health Beliefs and Attitudes measures with the relevant interview and inventory measures are shown in Tables 9 and 10. As expected, MHP-H Hypochondriasis showed highly significant correlations with interview measures of physical illness severity (sum of medical comorbidities, overall pain) and of psychological distress (sum of psychiatric comorbidities, diagnosed with depression). Also, MHP-H Trust in Health Care Personnel was significantly related to reported degree of support during childhood. In regard to psychological inventory data (see Table 10), the largest correlations were, as expected, between MHP-H Hypochondriasis and the six inventory measures of depression and reported physical illness symptoms, with a median correlation of .38. MHP-H Self-efficacy and Health Vigilance were consistently negatively related to scales assessing social withdrawal, low self-esteem, and depression; and Self-efficacy was negatively related to scales represent-

ing physical symptoms (Hs, Hy, Hyp). MHP-H Trust in Health Care Personnel and Health Vigilance were positively related to claims of extreme virtue (L, Den), while MHP-H Trust in Health Care System was negatively related to the presence of persecutory ideas (PID).

Discussion

The results can be summarized as follows. The 21 individual measures within the five areas of the MHP-H showed modest but highly significant correlations with measures based on much more extensive and comprehensive data from applicants for GBS: interview-based variables including single and composite items, and selected scales of the MMPI-2, the BPI, and the BDI. Because most of the MHP-H measures correspond broadly to the content of the GBS literature regarding variables that are believed to be differentially related to outcome, these results lend support to the utility of the five MHP-H areas and their 21 individual measures for assessment in this medical setting. Together with previous findings for the psychosocial section of the MHP (MHP-P; Lanyon et al., 2006), the results suggest that the MHP can be considered for use in place of more time-consuming procedures for assessing factors potentially relevant to GBS.

The strongest relationships between the comprehensive assessment variables and the MHP-H were found, as might be expected, for variables assessing the presence and severity of physical symptoms. In particular, the relevant MHP-H measures showed substantial correlations with other interview and psychological inventory measures related to illness, including number of illnesses, overall impairment, extent of medication, and pain. To summarize, MHP-H Positive Health Habits were, as would be expected, associated with greater education, lower psychological distress and withdrawal, and greater self-control. Scores on Negative Health Habits were associated with greater tobacco, alcohol and street drug use, antisocial and anti-authority attitudes, impulsivity, and openness in admitting faults.

As expected, MHP-H Health Care Utilization measures were found to be related to interview-based measures of

Table 9 Correlations of MHP-H Health Beliefs and Attitudes with relevant interview variables

MHP-H measure	Sum of medical comorbidities	Sum of psychiatric comorbidities	Diagnosed with depression	Overall pain	Support during childhood	Total surgeries
Self-efficacy	-.06	.00	-.12	.01	.00	.01
Health Vigilance	.03	.02	-.14*	.03	.04	.08
Health Values	.08	.00	.04	.07	-.02	.07
Trust in Health Care Personnel	-.01	-.12	-.05	.01	.20**	.13
Trust in Health Care System	-.12	-.10	-.09	-.11	.12	-.23**
Hypochondriasis	.32**	.21**	.31**	.21**	-.02	.01

**p* < .01.

***p* < .001.

Table 10 Correlations of MHP-H Health Beliefs and Attitudes with relevant psychological inventory scales

MHP-H measure	MMPI-2 scales					BPI scales						
	L	Hs	D	Hy	Si	Hyp	Dep	Den	Pid	SoI	SDp	BDI
Self-efficacy	.08	-.17**	-.18**	-.19**	-.11	-.17*	-.21**	.04	-.05	-.09	-.13*	-.17**
Health Vigilance	.11	-.05	-.16*	-.05	-.20**	-.03	-.22**	.08	-.03	-.25**	-.16*	-.16*
Health Values	.20**	.09	.18**	.09	.04	.09	.05	.20**	.04	.06	.10	.14*
Trust in Health Care Personnel	.15*	-.02	-.08	-.01	-.09	-.04	-.13	.22**	-.11	-.13	-.07	-.06
Trust in Health Care System	.09	-.09	-.03	-.01	-.04	-.09	-.10	.13*	-.15*	.03	-.09	-.10
Hypochondriasis	-.08	.41**	.39**	.37**	.20**	.42**	.30**	-.03	.16*	.08	.18**	.36**

Note. MMPI-2 = Minnesota Multiphasic Personality Inventory-2, BPI = Basic Personality Inventory, BDI = Beck Depression Inventory, L = lie, Hs = hypochondriasis, D = depression, Hy = hysteria, Si = social introversion, Hyp = hypochondriasis, Dep = depression, Den = denial, Pid = persecutory ideas, SoI = social introversion, SDp = self depreciation.

* $p < .01$.

** $p < .001$.

illness severity and chronicity and to MMPI-2 and BPI measures of physical symptoms and life distress. In regard to MHP-H measures of Response to Illness, correlations confirmed that persons with minor ailments tend to deal with them informally, but those with more serious illnesses seek formal help. Relatively few interview and psychological inventory variables were relevant to MHP-H Health Beliefs and Attitudes, but several expected relationships were found. For example, persons with more supportive childhoods were more trusting of health care personnel, while persons with a large number of surgeries were less trusting of the health care system, and persons whose lives tended to revolve around their ailments (MHP-H Hypochondriasis) showed correspondingly more severe and chronic medical problems on interview.

An important reason for conducting pre-operative assessments is to identify those persons whose probability of success after surgery is least certain, and to make an attempt to address their areas of potential difficulty in order to improve the probability of a positive outcome. This goal relies heavily on the availability of research-based knowledge regarding prediction of positive and negative outcomes, knowledge that is as yet incomplete but gradually emerging (e.g., Hertz et al., 2004; van Hout et al., 2005). Future directions for the present study include the evaluation of the validity of all the measures utilized in the follow-up prediction of weight loss and other outcome variables.

The study has several limitations. First, because the data were obtained in the context of an ongoing clinical process, there were some methodological constraints. Because of patient idiosyncrasies, not all the tests were administered to all the patients. Thus, the study utilized all applicants who were interviewed and completed the MHP. Persons for whom particular data were unavailable were dropped from those specific comparisons. Also, logistic requirements necessitated administering the tests in the same

order for everybody. Although there are no obvious reasons why these constraints might have introduced significant biases, this possibility could not be investigated in the present study.

Another limitation involves the fact that the obtained correlations, while in many cases highly significant, were mostly of modest magnitude. A possible inference from this finding would be that the MHP-H variables do not have a meaningful amount of variance in common with the interview and test variables of the more comprehensive assessment process. But the ultimate question involves their utility in meeting the goals of pre-operative assessment—namely, identifying persons for whom initial interventions could lead to a more positive surgical outcome, and those whose likelihood of success is most limited—questions that require outcome data. Replication of the present results in a setting unrelated to the development of the MHP-H is also needed.

It is worth noting that certain important factors affecting outcome might not be available for assessment prior to surgery. It could well be that successful weight loss after one or more years could depend in part on post-operative factors during that period, such as peer acceptance, social support, and continuing education. Such data are currently being sought for the participants of the present study. As an analogous example in a completely different field (sex offending), considerable attention is currently being paid to post-release or “dynamic” factors as a possible means of improving on the modest ability of historical or “static” data to predict future behavior (e.g., Thornton, 2002).

Acknowledgment The following persons served as research assistants in this project, including the coding procedures: Lourdes Charles, Margaret Kern, Kerry Moore, Lisa Weise, Jessica Williams, and Leann Williams. The authors would also like to acknowledge the assistance of Heather Burzinski, who provided extensive support to the research team.

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