

MMPI FOR PERSONALITY CHARACTERISTICS OF PATIENTS WITH DIFFERENT DISEASES

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Abstract

In the field of psychosomatic medicine the relationship between personality characteristics and diseases is supposed to be an important issue.

The aim of this article is to present group's MMPI profiles obtained for patients with different chronic diseases and to discuss about possible specific features of these different groups.

We summarized results obtained by psychological testing of following groups of patients: adult patients treated with chronic maintenance dialysis, patients with diabetic retinopathy, general anxiety group, attack panic syndrome, parents of children with rheumatoid arthritis, as well as adolescents with mental anorexia, cystic fibrosis, diabetes mellitus and leukemia. Two control groups comprised adults and adolescents, both without any health problems, selected randomly. As a psychometric test MMPI-201 was used. Statistic 10 package is used for statistical analysis.

In our presentation it can be seen some typical personality characteristics for patients with chronic conditions. These findings could be helpful for clinicians concerning treatment planning and follow-up. In general, the MMPI helps us to obtain a global, factual picture from the self-assessment of the patient, explained in a psycho-technical language. Group's profile could be used in clinical practice for planning treatment and to suppose the prognosis of the illness.

Key words: personality profile, MMPI-201, chronic diseases.

Introduction

By definition, personality refers to individual differences in characteristic patterns of thinking, feeling and behaving. The study of personality focuses mainly on two areas: the first one is understanding individual differences in particular personality characteristics, and the other is understanding how the various parts of a person come together as a whole.

In the field of psychosomatic medicine the relationship between personality characteristics and diseases is supposed to be an important issue. In this context, research of Grosarth-Maticek (2000) is devoted to diseases-proneness based mainly on Eysenck personality typology (Larsson, 1995; Nagano, 2001). These, so called "health-related personality

characteristics", are divided in two main types: healthy and stress-related personalities, the second ones comprising proneness to main psychosomatic diseases (i.e. coronary diseases, rheumatoid arthritis, cancer, immunological/allergic manifestation, peptic ulcer, colitis etc.).

However, it is obvious that in the clinical practice, the most used personality test is MMPI (Minnesota Multiphasic Personality Inventory) which gives much more information's about personality than Eysenck's questionnaire. Searching in PubMed it could be found about 370 articles in which MMPI was used in the evaluation of patients with different diseases.

There are studies related to the personality specifics of patients with fibromyalgia,

traumatic brain injuries, malignant pleural mesothelioma, interstitial cystitis, anorexia nervosa, agenesis of the corpus callosum, irritable colon syndrome, patients with glaucoma, PTSD, substance addictive people etc. (Paolucci *et al.* 2014; Vural *et al.* 2014; Alkemade *et al.* 2014; Granieri *et al.* 2014; Fazio *et al.* 2013; Kawai *et al.* 2014; Pop-Jordanova, 2013; Klein *et al.* 2014; Tomic-Golubovic *et al.* 2010; Lim *et al.* 2007; Begic D. 2007; Polimeni *et al.* 2010)

The scientific literature demonstrates that personality traits are associated with the individual's adaptation to chronic diseases, but they can also be an important factor in the etiology and prognosis of many physical illnesses. In the study of Mucci *et al.* 2014, it was showed that some personality traits, especially neuroticism, psychasthenia, and schizoid aspects, may be associated with tinnitus perception and with the annoyance due to this symptom.

Nausea and vomiting during pregnancy are considered normative somatic experiences, particularly during the first trimester. Growing evidence supports the theory that hyperemesis gravidarum may be an adverse reaction to physiological changes during pregnancy (e.g., altered hormone levels or gastrointestinal tract abnormalities). Other, more long-standing and pervasive theories suggest that the cause of this condition may have psychiatric underpinnings or may be associated with psychosocial risk factors, such as stress. Most psychogenic theories of hyperemesis gravidarum come from the psychoanalytic field, where pregnancy is viewed as a time of increased vulnerability to conversion disorders, such as hysteria, and psychiatric comorbidity. In the study of D'Orazio *et al.* 2010, the MMPI-2 hypochondriasis scale was found to be clinically elevated in women with hyperemesis.

There are many other studies concerned to specific personality characteristics of somatic ill patients in which the obtained profiles are used for managing the treatment and follow-up of patients.

The aim of this article is to present group's MMPI profiles obtained for patients with different diseases and to discuss about possible specific characteristics of these different groups. The main question to be answered is whether these profiles are typical for specific disease.

Subjects and methodology

In this article we summarized results obtained by psychological testing of the following groups of patients: adult patients with terminal renal disease treated by chronic maintenance dialysis, patients with diabetic retinopathy, general anxiety group, attack panic syndrome, parents of children with rheumatoid arthritis, as well as adolescents with mental anorexia, cystic fibrosis, diabetes mellitus and leukemia. Two control groups comprised adults and adolescents, both without any health problems, selected by chance.

As a psychometric test MMPI-201 was used. The original MMPI, first published by the University of Minnesota Press in 1943, was replaced by an updated version, the MMPI-2, in 1989. The MMPI-201 used in this research, is an oldest form of the test standardized in ex-Yugoslavia and until now it is used more frequently in this region. MMPI-201 contains ten clinical scales: Scale 1- Hypochondriasis scale which measures a person's perception and preoccupation with their health and health issues; Scale 2- the Depression scale measures a person's depressive symptoms level; Scale 3- the Hysteria scale measures the emotionality of a person; Scale 4- the Psychopathic Deviate scale measures a person's need for control or their rebellion against control; Scale 5- Paranoia scale measures a person's inability to trust; Scale 6- the Psychasthenia scale measures a person's anxiety levels and tendencies for somatization and obsession; Scale 7- the Schizophrenia scale measures a person's unusual/odd cognitive, perceptual, and emotional experiences, and Scale 10- the Mania scale measures a person's energy, euphoria or hyperactivity.

Three scales L, F and K are validity scales and measure the readiness of the responders to this kind of examination. L scale refers to rigidity or naiveté of responder's approach to the test material; F scale refers to confused thinking/ lack of understanding the questions or malingering; K scale refers to responses chosen to be socially acceptable.

Raw scores on the scales are transformed into a standardized metric known as T-scores (Mean or Average equals 50, Standard Deviation equals 10), making interpretation easier for clinicians. Before analysis of clinical scales, some criteria should be satisfied: L and K scales must

be with the score ≤ 70 and F scale ≤ 80 . A significant advantage of the MMPI over other self-report and observer rating scales is that it provides valid and reliable estimates of response bias.

Groups of scales are examined at the same time, for example, the validity scales (L, F, K), the neurotic triad (Hs, D, Hy), and the psychotic tetrad (Pa, Pt, Sc, Ma). It is argued that the overall elevation of the clinical scales presents a reasonably accurate presentation of the degree of distress the client is experiencing (Greene, 2000).

Obtained results are presented as a group's profiles and discussed further. Statistics is calculated using Statistic 10 package.

Results and discussion

The sample of students comprised 18 males and 15 girls, mean age 20.5 (SD 2.3) years,

recruited from the Computer science faculty. They are without any health problems (somatic or neuropsychiatric) and we used them as a **control group 1**. Obtained MMPI profiles are presented on Figure 1. As can be seen, all control and clinical scales have obtained scores in normal range. In girls we obtained pick on Pa scale but in "normal" range which can be a sign of hypersensitivity.

The second **control group** comprised healthy adults' selected by chance comprising 15 males and 15 females, mean age 44.16 (SD 10.9) years. Obtained MMPI-201 profiles are shown on Figure 2. There is not significant gender difference obtained with ANOVA testing in both control groups.



Figure 1 – Personality profiles obtained with MMPI-201 for students

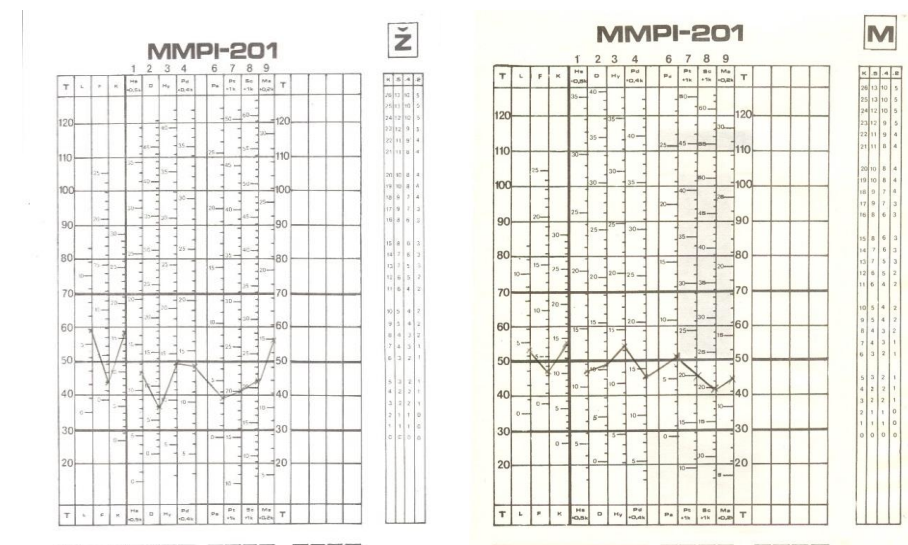


Figure 2 – Profiles obtained for healthy adults

On the Figure 3 obtained profiles for a group of patients with **general anxiety** are presented.

The group comprised 20 females and 15 males diagnosed as general anxiety, mean age 25.7 (SD 5.35) years. Diagnosis is made by a clinical psychologist according DSM-IV criteria. Testing is made before any treatment. As can be seen females showed only Hy peak, but

in the normal range. However, statistics confirmed significant difference between scores in anxiety group and control ($t = 2, 25164$; $p = 0, 038749$). Males showed **Hs-Hy-Pt** peaks with higher (pathological) scores, related to hypersensitivity of the autonomic nervous system as well as with manifested anxiety. Calculation confirmed significant difference between control and anxiety in men ($t = 15.13$, $p = 0.000$).

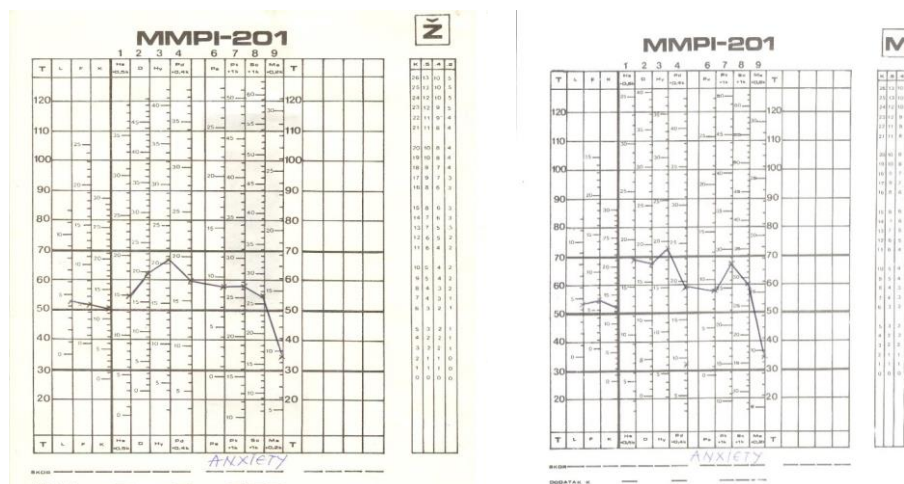


Figure 3 – Profiles for patients with general anxiety

Obtained profiles for patients with **attack panic syndrome** comprising six males and five females, mean age 19.3 (SD 4.9) years are shown on Fig. 4. Control scales for females showed typical V form (scales 1 and 3) related to conversive tendencies. In addition, females showed peaks on Pt-Sc scales, but in normal

ranges. Pathological profile is obtained in males, with **Hy-Sc** peaks; this profile corresponds to persons with regressive characteristics, emotionally instable and with accentuated social withdraw. Females showed peaks on Pt-Sc scales, but in normal ranges.

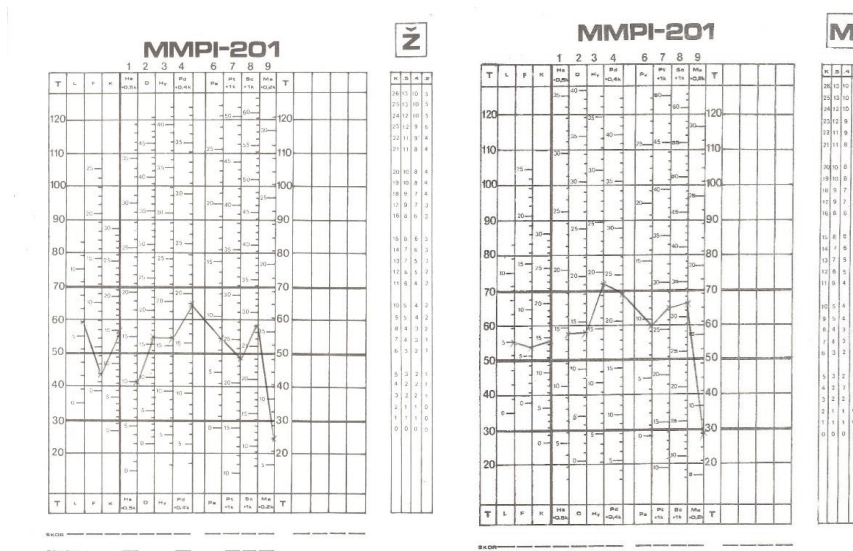


Figure 4 – Profile obtained for patients with panic attack syndrome

The group of patients with terminal renal illness treated with maintenance **hemodialysis** is a biggest one and consisted of 128 patients. Females were 70 (mean age 62.3 years); Men were 58 (mean age 56.5 years). Mean duration

of dialysis for females was 6.73 years, and for men 6.68 years. Variation of dialysis duration was from 0.5 to 18 years. Obtained profiles are presented in Fig. 5.

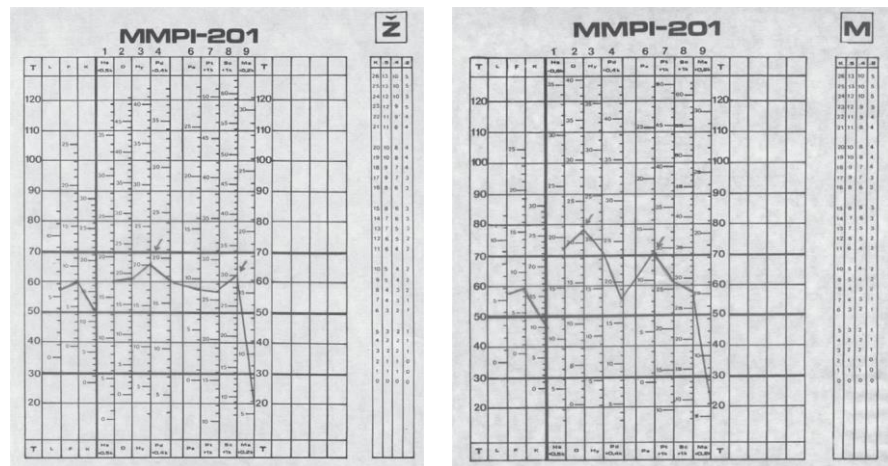


Figure 5 – MMPI profiles for females and men for patients on dialysis

For men we obtained two significant peak on the profile: **D-Hy** which correspond to the accentuated depression and hypersensitivity. For females, the profile is in the "normal" scores but also two peaks can be seen: **Hs** and **Sc** which correspond to regression, emotional instability and social introversion. ANOVA confirmed significant difference between control females and female patients on dialysis ($t = 3.533$ $p = 0, 0013$), as well as for control men

and male patients on dialysis ($t = 2, 1925$ $p = 0, 033553$).

The group of adolescents with **cystic fibrosis** comprises 25 patients, mean age 17.5 ± 2.6 years. Fig 6 shows MMPI profiles for girls and boys. So called "neurotic" profile (**Hs-D-Hy**), as can be seen, is more accentuated in boys. Girls showed peak on **Hy** which can be interpreted as an accentuated tendencies for conversive reactions.

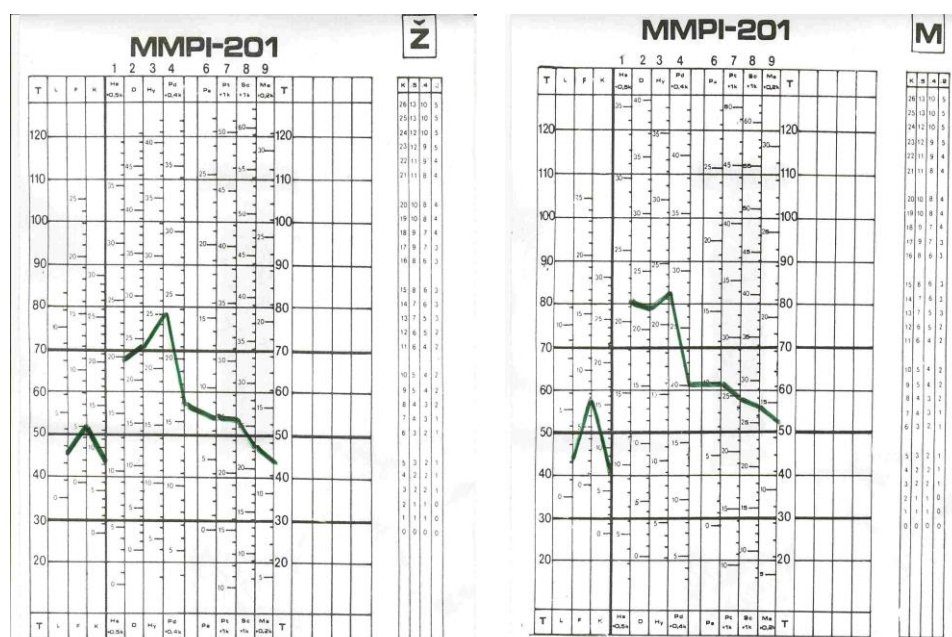


Figure 6 – Profiles obtained for adolescent with cystic fibrosis

Very interesting profiles we obtained for 20 **diabetic patients**, mean age 12.5 ± 1.5 years. Comparison of their own profile and the profile obtained for their mothers is presented on Figure 7. Obtained **Pd-Pa-Sc** profile correspond to the emotional instability, as well as the possible psychopathic traits for girls.

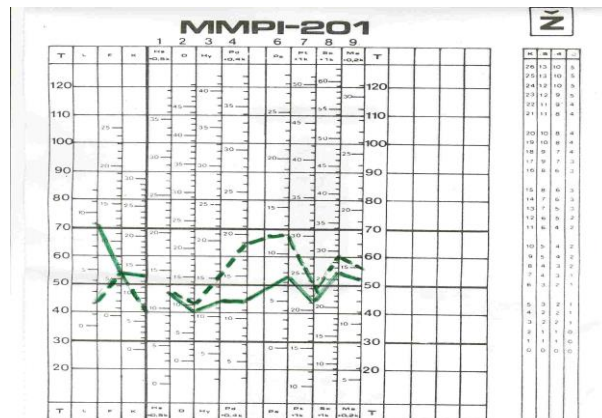


Figure 7 – Mothers and girls with diabetes mellitus

Mothers
girls

For 20 adolescents with **leukemia**, mean age 19.5 ± 1.3 years we obtained group's profile presented on Figure 8. The typical **Hs-D-Hy** profile for boys corresponds to hypersensitivity and high neurotic tendencies, combined with depression. For girls pathological unimodal profile with peak on **Hy** scale could be related to conversive tendencies.

The group of children with **juvenile rheumatoid arthritis** comprised mainly small age patients (2–10 years) incapable for MMPI testing, but we tested their parents with MMPI-201 and obtained profiles are presented on Figure 9. Fathers showed **L-Hy-Pt** profile, where **Pt** scores are higher than **Hy** score, which corresponds to accentuate psychopathic traits. For mothers the obtained profile is under T-scores but the **Pt** score is also the highest one. This profile could be related to related difficulties in care of such children, where pain is dominant in every day's life.

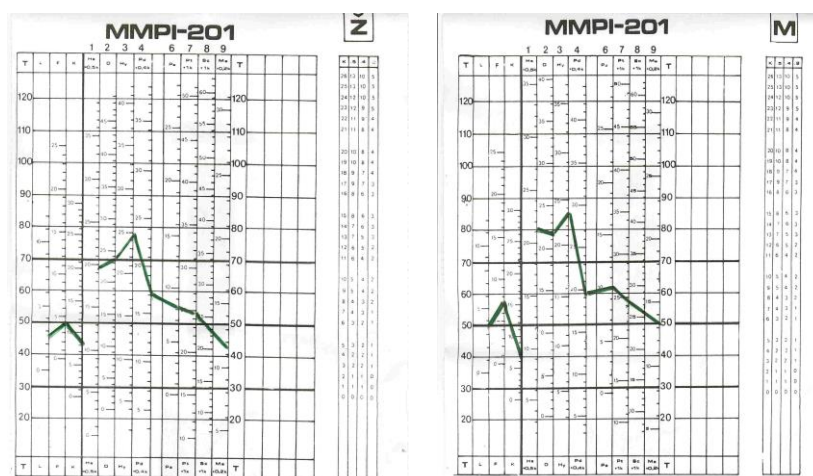


Figure 8 – Profiles for adolescent patients with leukemia

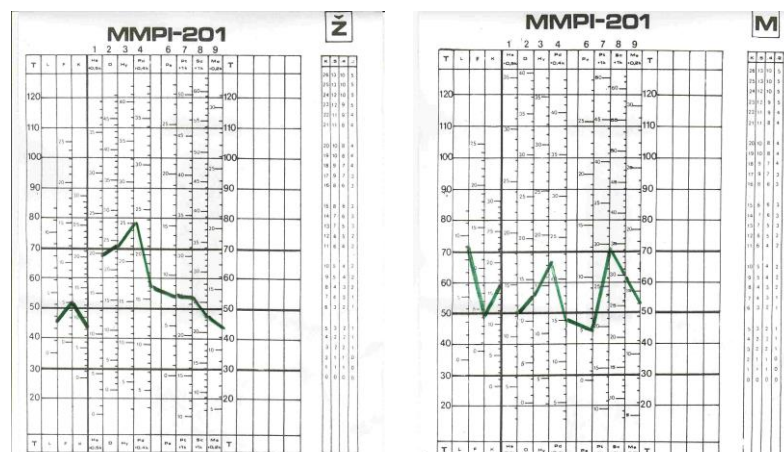


Figure 9 – Profiles for parents of JRA children

The group of 25 **anorectic girls**, mean age 16.27 (SD 2.56) showed profiles with score in "normal" ranges (Figure 10). However, ANOVA test showed that there is significant variation of obtained scores between anorectic

and control girls ($p = 0, 007560$). In this context, **Pd-Pa** peaks can be interpreted as some psychopathologic traits. In this group, two girls manifested psychiatric problems after resolving the eating crisis.

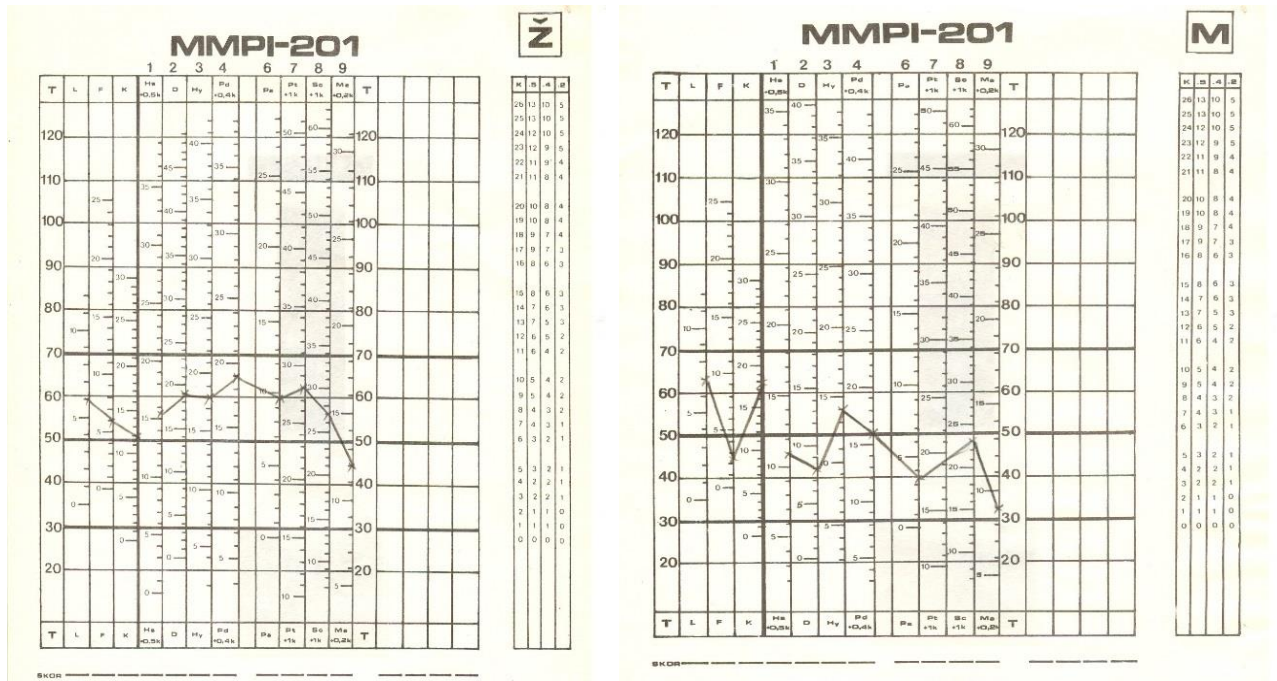


Figure 10 – Profiles for anorectic adolescents

In **anorectic boys** ($N = 7$), mean age 13.5 (SD 0.5) ages we obtained group's profiles with typical V on scales 1, 2 and 3, which corresponds to conversive tendencies, and other clinical scales in "normal" range, but peaks on **Hy-Sc** which can be the result of deep psychopathology confirmed in the follow-up of these boys. Namely, practically all of them after a few years manifested psychiatric problems.

Finally, a small group of females with **diabetic retinopathy** ($N = 5$) mean age 45.25 (SD 16.4) years shows MMPI profile presented on Figure 11. Obtained bimodal **D-Pa** profile corresponds to depressive paranoid reaction which is logical in this illness. Calculated Pearson correlation between age and D scores is very high ($r = 0.90$); between age and Pa is similarly high ($r = 0.98$); but opposite, the correlation between age and mania scores is highly negative ($r = -0.72$). These statistics confirms the validity of MMPI scales related to the disorder. ANOVA confirmed significant difference between obtained scores in patients and control ($t = 8, 467503$; $p = 0, 000002$).

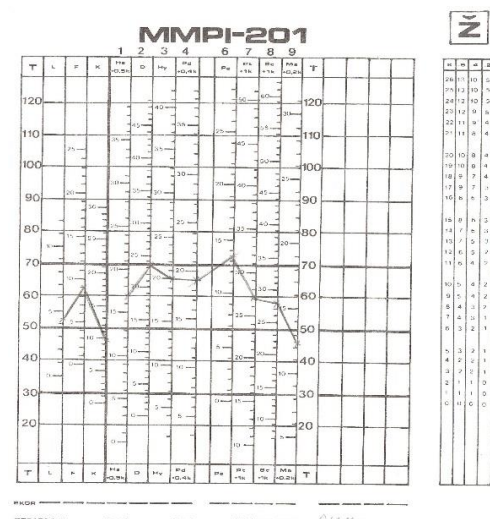


Figure 11 – Profile for diabetic retinopathy

Discussion

The Minnesota Multiphasic Personality Inventory is a broadband measure of psychopathology and personality that has a long tradition in assessment of medical patients. The MMPI have been extensively used for both, the assessment of the impact of medical illness on the emotional and psychological well-being of

the individual, but also to predict compliance with treatment and suitability for some planned interventions.

A major advantage to the use of the MMPI in medical settings is the utility of the instrument in identification of co-morbid psychiatric conditions. Scales associated with general distress and maladjustment, as well as scales associated with symptoms delineating specific conditions such as depression, anxiety, and psychosis are contained within the inventory. Both anxiety and thought disorder will also impact a patient's ability to participate in rehabilitation or comply with treatment recommendations and the assessment of those conditions through use of the MMPI is valuable in treatment planning with the medically ill patient.

In this context, a review of American empirical studies suggest that typical MMPI profiles of those with heroin dependencies show high levels of psychopathology, with particularly high elevations on the D, Pd, Pt and Sc scales (Craig, 1979a, 1979b, 1982; Shaffer *et al.*, 1988).

Over the years there have been mixed findings with respect to the utility of MMPI assessed personality factors in prediction of response to medical interventions. In support of the role of MMPI assessed personality dimensions, longitudinal studies have demonstrated that elevations on MMPI scale Hy are associated with poorer outcomes in treatment of chronic low back pain. In one study a specific subset of the items on scale Hy related to the report of lassitude and malaise was related to failure to return to work after participating in a chronic pain program in the Netherlands (Vendrig, 1999).

In a return to the early promise of the MMPI in the prediction of disease proneness, a renewed interest in personality factors that either directly or indirectly lend risk to the development of medical illness has developed over the last 15 years.

Coronary Artery Disease (CAD) has received the most attention and a number of personality factors and traits measured by the MMPI have been implicated in the development of CAD. These MMPI derived personality factors include Hostility, Anger, Type A personality, Depression, Dominance, and Opti-

misim/Pessimism and have all been shown to be related to longer term survival and the risk for the development of CAD (Siegmán, Kubzansky, Kawachi, Boyle, Vokonas, and Sparrow, 2000).

As a result of different studies, it can be concluded that the MMPI profile is very specific and sensitive for identifying personality structure and psychopathology in different people and in different health conditions. In general, the MMPI helps us to obtain a global, factual picture from the self-assessment of the patient, explained in a psycho-technical language. For easier distinction between the "normal" and the "abnormal", the sociopathic personality and psychiatric one, as well as between psychotic and neurotic personalities, Goldberg, 1968 has proposed a different formula that facilitates interpretation. For example, the distinction between psychotic and neurotic profiles is based on calculating the formula $(L+Pa+Sc-Hy-Pt)$ with a critical score of 45 (41, 42). In addition, MMPI scores allow some additional indexes to be calculated for the assessment of control mechanisms, aggressiveness, anxiety, or psychosomatics. The IR (internalization ratio) is calculated with the following formula: $IR = (Hs+D+Pt) / (Hy+Pd+Ma)$. Expressive-repressive index $ER = (L+K+Hy) - (Pd+Ma)$; frustration tolerance $FT = (Pd+Ma) / (D+Hy)$; active hostility $AHI = (Pd+Ma)$, while passive aggression $PAI = (Hy+100) - (Pd+2Pa)$. The anxiety index is calculated using the formula: $AI = 1.33D + 1.00Pt - 0.66Hs - 0.66Hy$. With these additional indexes, the interpretation of the resulting MMPI scores is more enlarged and gives an additional security.

In our sample of dialyzed patients, which is the most large in our research, the obtained internalization ratio ($IR = 1.47$) shows that patients on maintenance dialysis have relatively good emotional control. Similarly, the expressive-repressive index is quite satisfactory ($ER = 13.93$). It means that the patients can establish a balance between different emotional states. The index of frustration tolerance is relatively high ($FT = 0.58$) which means that patients can cope with many frustrations related to the dialysis treatment as well as with everyday life.

Two other indexes calculated from MMPI scores in dialyzed patients are: active hostility ($AHI = 6.08$); and passive aggression ($PAI = 80.1$). The results obtained are related to sup-

pressed hostility, but very high passive aggression in these patients. The life experience obtained through the aging process as well as long-term experience as chronic patients could be the reason for these personality characteristics. This observation is supported by a relatively high anxiety index calculated for the same scores: AI = 27.55. More precisely, high anxiety is suppressed and cognitively elaborated, reducing active hostility, but it provokes a passive aggression as a general emotional characteristic. The entire finding of these indexes correlates with general personality traits interpreted through the obtained profiles (Pop-Jordanova, 2013).

Interpretation of the MMPI profile also involves configural analysis of subsets of the validity and clinical scales. Groups of scales are examined at the same time, for example, the validity scales (L, F, K), the neurotic triad (Hs, D, Hy), and the psychotic tetrad (Pa, Pt, Sc, Ma). It is argued that the overall elevation of the clinical scales presents a reasonably accurate presentation of the degree of distress the client is experiencing (Greene, 2000).

Using clustering procedures, the MMPI profiles of patients with chronic low back pain form four groups: a depressed pathological group (multiple MMPI clinical scale elevations), a neurotic triad with elevations on the 1, 2, and 3 scales, a conversion V group with elevations on scales 1 and 3; and a within normal limits (WNL) group where no MMPI clinical scales are elevated above a T score of 65 (Keller and Butcher, 1991).

The MMPI have long been used to evaluate candidates' emotional and psychological suitability for organ transplant. The presence of significant emotional distress, emotional instability, certain personality traits, and ongoing substance dependence or abuse can influence quality of life, need for adjunctive treatments and medical compliance in patients awaiting organ transplants (Singer, Ruchinskis, Riley, Broschek, and Barth, 2001).

Another area of medical/health behavior research with the MMPI in international health care settings that has received broad attention has been research into eating disorders. According to MMPI profile anorectic patients are divided in two groups: one with depression and the other without depression (Biederman *et al.*,

1986). In a study of Blumenthal (1984) it was shown that in anorexics' two scales are the most important: depression and psychopathy which is not confirmed in our study.

In the assessment of glaucoma patients (Lim *et al.*, 2007) it was found significantly higher Hypochondriasis, Hysteria, and Health Concerns mean scores than in the control group, related to number of systemic medications used and to diagnostic procedures. In our article we present profile for diabetic retinopathy which is also very typical: D-Pa peaks related to depression. It is logical that patients with serious eyes problem manifest personality specifics related to fear of losing visual capacity.

Conclusions

In our presentation it can be seen some typical personality characteristics for patients with chronic conditions. These findings can be helpful for clinicians concerning treatment planning and follow-up of these patients. In some cases, obtained profiles could indicate the need for some psychological treatment. In others, psychopathological findings alarm on possible psychotic manifestations.

For testing with MMPI needed conditions are normal/over normal intelligence, reading ability and the ability to understand the questions. In this line, only age over 12 years is suitable for testing.

In general, the MMPI helps us to obtain a global, factual picture from the self-assessment of the patient, explained in a psycho-technical language. Group's profile could be used in clinical practice for planning treatment and to suppose the prognosis of the illness.

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Резиме

ММПИ ЗА ПСИХОЛОШКИТЕ РАЗЛИКИ КАЈ ПАЦИЕНТИ СО РАЗНИ ЗАБОЛУВАЊА

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Во психосоматската медицина многу е битен соодносот помеѓу психолошките фактори и болеста.

Цел на овој труд е истражување на групните карактеристики на личност со ММПИ и дискусија за евентуалните специфичности на овие профили кај разни групи хронични болни.

Сумирани се резултати добиени од психолошко тестирање кај следните групи пациенти: болни со терминална бубрежна болест, одржувани со хемодијализа; болни со дијабетична ретинопатија; генерализирана анксиозност, пациенти со панични напади; родители на деца со јувенилен ревматоиден артритис; како и адолесценти со цистична фиброза; ментална анорексија; дијабетес и леукемија.

Две контролни групи, адолесценти и адултни, без какви било здравствени симптоми, се селектирани по случаен избор.

Како психометриски инструмент е користен ММПИ-201. Статистичката обработка е изработена со пакетот Статистика 10.

Во нашата презентација можат да се забележат некои специфични карактеристики на профилите на личност кај болни со хронични болести. Овие резултати можат да бидат полезни во следењето на болните, како и при планирање на нивниот третман.

Генерално, ММРІ ни овозможува добивање на општа фактична слика на личноста добиена преку самопроценувачка техника, а искажана преку психотехнички јазик. Групните профили можат да се користат во планирање на

терапијата, како и во предвидување на прогнозата на болеста.

Клучни зборови: профили на личност, ММРІ-201, хронични болести.