Research Article

The Combined Application of MMPI-2 and OQ-45 to Detect and Measure the Effectiveness of Psychological University Counselling

Valeria Biasi

Conny De Vincenzo

Nazarena Patrizi

Mauro Mosca

Sabrina Fagioli

Department of Education,
"Roma Tre" University, Italy

Doi: 10.36941/jesr-2020-0041

Abstract

The main aim of the present study concerns the analysis of the evolution of psychological distress during university counselling treatment, taking into account the initial mental health conditions of the students involved by means of standardized clinical measures. During a preliminary interview, we collected socio-demographic information, academic problems and health conditions of 110 university students who had requested psychological counselling. We applied the MMPI-2 questionnaire prior to the treatment, and we detected the evolution of distress by administering the OQ-45 scale at pre-treatment, post-treatment and 3-months follow-up. Results indicate that all OQ-45 dimensions register a statistically significative reduction during the counselling treatment. Moreover, the high correlations between the OQ-45 scale and MMPI-2 questionnaire underline the consistency of the evolution of OQ-45 scores starting from the valid initial mental health assessment carried out by the MMPI. In addition, we explored the predictive role of MMPI-2 dimensions on the OQ-45 scale: only the Psychopathic Deviation (PD) dimension appeared predictive of the positive evolution of the treatment. This is relevant considering a non-clinical sample of university students in which social maladjustment, self-alienation, and social alienation can represent a real high risk for academic success. In conclusion, data analysis shows the appropriateness of the combined use of MMPI-2 and OQ-45 questionnaires in psychological counselling in the academic setting to evaluate, firstly, the validity of the individual clinical profile and, consequently, the response to the treatment offered.

Keywords: *Assessment, Psychological counselling, MMPI-2, OQ-45 2, University students*

1. Introduction and Previous Empirical Study

Students' mental health is a growing problem and an emerging topic of interest. Several empirical studies showed that psychological impairment is associated with higher rates of drop-out among university students. It has been demonstrated that promoting students' wellbeing improves the learning process and academic success (Biasi, Patrizi, Mosca, & De Vincenzo, 2016; Biasi, De

Vincenzo, & Patrizi, 2018a, b). Indeed, the concept of "individual well-being" has often been referred to the broader notion of quality of life (WHOQOL Group, 1995), which considers several dimensions of the human experience including physical, social and psychological conditions. Accordingly, it may be hypothesized that the subjective perception of well-being is influenced by numerous variables such as self-esteem (Bandura, 2000) and self-efficacy (Grembowski *et al*., 1993), social support, self-regulation strategies (Lockwood, Jordan, & Kunda, 2002) and coping (Endeler & Parker, 1990).

Entry into the university world is considered one of the most stressful moments of a student's life and implies critical issues such as separation from the family, the formation of new social relationships, the prospect of an adult life, long-term goals, financial issues and commitment to higher study; these are some of the aspects that could affect new identity development (Ghilardi, Buizza, Carobbio & Lusenti, 2017).

This process of growth and change can develop anxiety and insecurity in young adults. Consistently with the scientific literature, the capability of positively coping with the crisis will affect the levels of self-perception, increasing one's self-esteem and self-efficacy (Hyun, Quinn, Madon & Lustig, 2007) and therefore improving one's own level of individual well-being. As perceived by students, distress can provoke dysphoric emotions and decrease behavioural skills, social isolation and psychological conflicts.

Emotional health has a significant effect on the average grade, reducing the risk of leaving the course. Megivern, Pellerito and Mowbray (2003) showed that 38% of students had reduced the amount of time spent in studying due to emotional problems, suggesting that the ability to successfully deal with emotional distress is a very important factor for students who decide to stay at the university. Given these considerations, *counselling services can be considered as a key academic service* acting as a *front line* for identifying and handling students' mental health issues. Consistently, there has been a significant increase in students' help requests over the years and this has intensified the use of counselling services (Biasi, 2019). As a result, there has been increased use of evaluation procedures that make the interventions more efficient, both in terms of time and financial costs (Bishop, 1990; Dworkin & Lyddon, 1991).

One way to significantly increase the efficiency of this process is to use instruments that can provide a measure of the overall level of student distress. Measuring distress can help university decisions on the most appropriate therapeutic approach for counselling centers and on the nature of the more beneficial services for a student (Barthlow, Graham, Ben-Porath & McNulty, 2004). In this respect, the *Minnesota Multiphasic Personality Inventory - 2 (MMPI-2)* is usually administered and interpreted in clinical settings with the main aim of making a diagnosis in order to choice a specific treatment for different levels of mental distress or psychiatric symptoms (Graham, Barthlow, Stein, Ben-Porath & McNulty, 2002).

Graham (2000) specified that two important components of psychological maladjustment can be considered in MMPI. One concerns the severity of symptoms and the amount of discomfort and anxiety a person is experiencing, and another concerns difficulty in daily functioning. Scale and indices of the MMPI-2 are sensitive to both components of maladjustment, such as, for example, the "Mt-College Maladjustment", able to identify problematic students, characterizing them on the basis of the profiles emerging as ineffective, pessimistic, procrastinators, anxious or worried (Merker & Smith, 2001). The construct validity of the College Maladjustment (Mt) scale of the MMPI-2 was examined in a study with a sample of 376 students in a university psychological center. As highlighted by Barthlow, Graham, Ben-Porath and McNulty in 2004: "A principal components analysis and correlations of Mt scale scores with clients' and therapists' ratings of symptoms and functioning showed that the Mt scale identifies the presence of maladjustment as defined in terms of depressive and anxious symptoms".

Although the tool is mainly used among the clinical population, there are several studies that have used MMPI-2 in a sample of university students (i.e., Newman & Greenway, 1997; Filippi, Valdarnini, & Burla, 2001; Sirigatti, Casale & Giangrasso, 2011; Sirigatti & Stefanile, 2011). Indeed, some of the MMPI-2 scales could be useful in predicting therapy outcome for a variety of conditions.

Another tool widely used for evaluating the effectiveness of university counseling treatment is the *Outcome Questionnaire-45 (OQ-45)*. This scale evaluates client symptoms during psychotherapy treatment and at follow-up. It is considered a reliable index of treatment outcome and previous studies have demonstrated its reliability in a sample of undergraduate students (Lambert & Hill, 1994; Lambert, Hansen, Umpress, Lunnen, Okiishi, Burlingame, Heufner & Reisinger, 1996; Lambert & Ogles, 2004; Lambert *et al*., 2004; Biasi, Cerutti, Mallia, Menozzi, Patrizi &Violani, 2017; Biasi, 2019).

Recently, Ilagan, Vinson, Sharp, Ilagan and Oberman (2015) applied the OQ-45.2 to assess counselling outcomes in a sample of university students and its association to motivation. The results indicated that participants' level of motivation was significantly associated with counselling outcomes.

Interestingly, the study conducted by Michael, Furr, Masters, Collett, Spielmans, Ritter, Veeder, Treiber and Cullum (2009) involved the combined administration of both the MMPI-2 questionnaire and the OQ-45 scale in a clinical sample. In this way, it was possible to identify potential MMPI-2 predictors of psychotherapy outcomes. This study showed that specific MMPI-2 scales - such as L, F, Pd, Pa, Sc, and the so-called Trt "Negative Treatment Indicator" - appear predictive of the patient's initial levels of suffering, while Hs, D and Hy clinical scales seem are significantly associated to the symptom reduction.

Considering these previous studies and taking into account the clinical status of students before starting counselling treatment, we are presenting a survey based on the combined administration of the MMPI-2 questionnaire and OQ-45 scale to a sample of university students who had requested psychological counselling, in order to measure the real effectiveness of the treatment offered them.

2. Method, Participants, Procedure, Instruments

2.1 Aim of the study

The first aim of this study concerned the analysis of the evolution of psychological distress during university counselling treatment, taking into account the initial mental health conditions of the students involved. In order to pursue this goal, we applied standardized clinical measures, able to describe specific pathologies and various levels of suffering. In addition, through statistical analyses, we aimed at identifying – in this non-clinical sample – putative MMPI-2 predictors of counselling treatment outcome, as measured by the OQ-45 scale.

2.2 Participants

Participants were 110 university students (61.8% female) involved in psychological counselling treatment in a university of central Italy (mean age 24 years and 6 months; SD = 5.97). The 110 students came from different university degrees, such as Law (20.9%), Engineering (12.7%), Philosophy, Communication and the Performing Arts (12.7%), Education (11.8%), Humanities (9.1%), Economics (8.2%), Political Science (6.4%), Architecture (6.4%), Sciences (5.5%), Foreign Languages, Literatures and Cultures (3.6%), and Math and Physics (2.7%). At the time of data collection, the students were attending a three-year degree course (48.2%), a master's degree course (31.8%) or a single-cycle degree course (17.3%), while 0.9% of them were already graduates and 1.8% were PhD students. About 30.9% of the students were off course.

Forty students (36.4%) declared that they had undergone psychotherapy treatment in the past. The main problems reported by the students referred to the university context. In particular, twenty-seven students (24.5%) reported difficulties in their studies, twelve students (10.9%) referred difficulty in exams, twenty-two students (20%) stated difficulty in completing the university course, three students (2.7%) had a difficulty in choosing the university. Finally, forty-six students (41.8%) reported personal problems that interfered with their studies.

All of the 110 students underwent the clinical assessment before initiating the treatment and,

among them, 82 students completed a four-session psychological counselling treatment and a three-month follow-up session. The procedure included a preliminary clinical interview with the administration of MMPI-2 Questionnaire and a first compilation of OQ-45 Scale.

Table **1** shows the main problems reported by the group of 110 students involved in counselling treatment.

Table 1: The main problems reported by the group of 110 students involved in counselling treatment (see the text for a detailed description)

Problems reported (N=110)	No.	%
Difficulties with studies (difficulty to prepare for exams or complete the course of study, etc.)	64	58.2
Others personal problems	46	41.8

2.3 Procedure

All students involved in the psychological counselling treatment were made aware of the procedures of the study and signed an informed consent. As in a previous study (Biasi, 2019), the university counselling treatment included a total of 5 sessions (4 clinical colloquia and a follow-up colloquium) plus an initial clinical interview. The MMPI-2 was completed during the initial interview, whereas the OQ-45 scores were registered during either the initial interview or fourth session, or in the follow-up session. Thus, in detail, after the first session, the treatment included 4 successive sessions centered on a clinical colloquium, and a final follow-up session to be held three months' later.

2.4 Instruments

2.4.1 The MMMPI-2 questionnaire

The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) is the most widely self-administered personality questionnaire used to assess adult psychopathology.

As wellknown, Hathaway and McKinley published in 1940 the first version of MMPI and, in 1989, Butcher, Dahlstrom, Graham, Tellegen, & Kreammer developed a second revised version called the MMPI-2 that included 567 true-false items.

We briefly describe the 10 clinical scales as summarized by Abbate and Roma (2014):

The ***Hypochondriac scale (Hs)*** scale concerns the tendency to develop severe anxiety and bodily symptoms in the absence of organic problems.

The ***Depression (D)*** scale assesses symptoms of clinical depression, which is characterized by deflected mood, hopelessness, and general dissatisfaction with one's life.

The ***Hysteria (Hy)*** scale primarily evaluates five components, namely poor physical health, shyness, cynicism, headaches and neuroticism.

The ***Psychopathic Deviate (Pd)*** scale assesses general social maladjustment and absence of strongly pleasant experiences, describing a condition that include complaints about family and authority figures, self-alienation, social alienation and boredom.

The ***Masculinity/Femininity (M/F)*** scale evaluates interests in vocations and hobbies, activity-passivity and personal sensitivity, assessing conformity to very stereotypical masculine or feminine roles.

The ***Paranoia (Pa)*** scale measures interpersonal sensitivity and suspiciousness and assesses the existence of paranoid thoughts.

The ***Psychasthenia (Pt)*** scale concerns anomalous forms of anxiety that can produce inability to concentrate, strong self-criticism and a tendency to be guilty.

The ***Schizophrenia (Sc)*** scale evaluates the presence of bizarre thoughts and peculiar

perceptions, social alienation and poor familial relationships.

The ***Hypomania (Ma)*** scale describes a condition of excitement, characterized by unstable mood and psychomotor excitement.

The ***Social Introversion (Si)*** scale, finally, measures the social introversion and extroversion of a person.

The MMPI-2 Questionnaire includes four validity scales called: "Lie" scale aimed at detecting the veracity of the answers provided, the "F" and the "Back F" scales which concern the presence of highly infrequent answers, and the "K" scale that assesses the possible level of defensive self-control.

The tool was also used to identify problems in the university field; as indicated by Sirigatti, Casale and Giangrasso (2011), in 1960 the "Mt-College Maladjustment" scale was inserted, starting from the original items of the questionnaire. This scale, in particular, allowed the identification of problematic and classifiable students as ineffective, pessimistic, procrastinators, anxious and worried. An update of the Italian adaptation of the MMPI-2 was performed by Sirigatti and Stefanile in 2011.

2.4.2 The OQ-45 scale

The Outcome Questionnaire 45.2 (OQ-45) (Lambert & Hill, 1996; Italian adaptation by Lo Coco *et al.*, 2008) is a self-report questionnaire including 45 items evaluating the clients' changes following treatment. It include three subscales: the ***Symptomatic Distress (SD)***, the ***Interpersonal Relations (IR)*** and the ***Social Role (SR)***. In addition, a total score can be obtained, and some studies indicate that the total score is the most reliable index of treatment outcome (Vermeersch, Lambert, & Burlingame, 2000; Lambert *et al.*, 2004).

Items included in the ***Symptomatic Distress (SD)*** domain "were derived from 1988 National Institute of Mental health (NIMH) epidemiological survey which identified the most prevalent types of mental disorders across five catchment areas [...]. These data suggest that the most prevalent intrapsychic symptoms are depression and anxiety based. Therefore, the OQ is heavily loaded with such items. Following affective and anxiety disorders, substance abuse problems were the next most frequent occurring diagnoses, and thus relevant items were included in the symptomatic distress subscale of the OQ" (Lambert, Burlingame, Umphress, Hansen, Vermeersch, Clouse & Yanchar, 1996; pag.250).

Interpersonal Relations (IR) domain includes "items dealing with friendships, family, family life, and marriage. These included attempts to measure friction, conflict, isolation, inadequacy, and withdrawal, which are all common complaints addressed in therapy sessions" (Lambert, Burlingame, Umphress, Hansen, Vermeersch, Clouse & Yanchar, 1996; pag. 250-251).

Social Role (SR) domain includes items about "patient's level of dissatisfaction, conflict, distress, and inadequacy in tasks related to their employment, family roles and leisure life" (Lambert, Burlingame, Umphress, Hansen, Vermeersch, Clouse & Yanchar, 1996; pag. 251).

The answer to each item is given on a 5-point scale (from 0 'Never' to 4 'nearly always'), and the total score is in a range from 0 to 180 points, where the highest score indicates serious and disturbed psychological functioning. Generally, the total score is considered an indicator of the subject's overall functioning. The cut-off score that divides the non-clinical population from the clinical population is estimated based on the value of 64 (Lo Coco *et al.*, 2008): scores above this threshold indicate a pathological condition.

2.5 Statistical analysis and results

Means and standard deviations of the MMPI-2 and OQ-45 scores collected in the initial session are presented in Table 2 and Table 3, respectively.

First of all, we computed crude correlations between the MMPI-2 and OQ-45 scores collected during the first combined administration. Then, in order to verify the effectiveness of the counselling treatment, we performed models of Analysis of Variance (ANOVAs) comparing the OQ-45 scores in

the pre-treatment, post-treatment and follow-up sessions. Finally, we used linear multiple regression models to explore putative MMPI-2 predictors of counselling outcome.

Table 2: Means scores and standard deviations of MMPI-2 clinical scales

N=110	Hs	D	Hy	Pd	M_F	Pa	Pt	Sc	Ma	Si
Mean scores	**69,36**	**67,83**	**61,54**	**63,14**	48,56	**64,92**	**66,35**	**64,12**	56,68	59,58
St. Dev.	14,28	11,28	12,04	10,64	12,36	8,13	9,57	11,14	9,97	10,45

Table 3: Means scores and standard deviations of OQ-45 scale and sub-scales

N=110	OQ Total score	OQ SD	OQ IR	OQ SR
Mean scores	**77.25**	**44.65**	**16.85**	**15.75**
St. Dev.	23.12	14.73	6.33	5.05

2.5.1 Correlations between MMPI-2 and OQ-45 dimensions

Table **4** illustrates significant correlations between the OQ-45 scales and the clinical dimensions of MMPI-2, indicating that these tools are valid and reliable for carrying out a diagnosis (the MMPI-2 questionnaire) and for detecting the progress of a counselling or short psychotherapy intervention (the OQ-45 scale).

Table 4: Correlation matrix including MMPI-2 and OQ-45 (First session; N =110 (significant correlations in the Bonferroni corrected p-values (0.05/40=0.00125) are highlighted in bold).

	OQ-Total score	**OQ-SD**	**OQ-IR**	**OQ-SR**
OQ-Total score	1			
OQ-SD	**.966** .000	1		
OQ-IR	**.790** .000	**.659** .000	1	
OQ-SR	**.772** .000	**.679** .000	**.441** .000	1
Hs	**.617** .000	**.631** .000	**.440** .000	**.432** .000
D	**.716** .000	.707 .000	**.514** .000	**.572** .000
Hy	**.411** .000	**.426** .000	.300 .001	.265 .005
Pd	**.725** .000	**.694** .000	**.685** .000	**.436** .000
M/F	-.104 .280	-.123 .201	.015 .878	-.136 .156
Pa	**.610** .000	**.597** .000	**.572** .000	**.336** .000
Pi	**.750** .000	**.761** .000	**.577** .000	**.490** .000
Sc	**.737** .000	**.725** .000	**.660** .000	**.433** .000
Ma	.264 .005	.279 .003	.292 .002	.029 .766
Si	**.436** .000	**.398** .000	**.418** .000	**.313** .001

As we can see in Table **4**, The correlations between the OQ-45 dimensions and MMPI clinical scales showed a strong and positive association between the OQ total score and almost all the clinical scales of MMPI-2 Questionnaire, except for M/F and Ma scales. Similarly, the three other subscales of OQ-45 (i.e., SD, SR, IR) correlated positively with the MMPI-2 clinical dimensions (except for M/F and Ma scales).

These results revealed a strong association between the two instruments in measuring psychological distress and appear adequate for pursuing our research objectives.

2.5.2 Efficacy of university counselling treatment detected by the OQ-45 scale

With regard to the efficacy of university counselling treatment, we are able to show data of 82 students who have so far concluded the treatment including the follow-up. The efficacy of psychological counselling treatment, detected with the OQ-45 scale, is shown in Table **5**.

Table 5: Average scores and standard deviations (in brackets) recorded by the total OQ-45 scale and subscales in correspondence of the first interview, the fourth session and the follow-up

(n=82)	First interview	Fourth session	Follow-up (FU)	Anova test	Statistical significance
OQ-45	**76.62** (22.81)	**64.80** (22.81)	**57.41** (24.83)	$F_{(2, 162)} = 48.19$	***p< 0.001***
OQ-45 SD	**44.02** (14.24)	**36.39** (14.58)	**32.09** (15.83)	$F_{(2, 162)} = 47.24$	***p< 0.001***
OQ-45 IR	**16.61** (6.45)	15.30 (6.36)	**14.39** (8.15)	$F_{(2, 162)} = 4.67$	***p< 0.05***
OQ-45 SR	**15.99** (5.09)	**13.11** (4.69)	**11.55** (4.96)	$F_{(2, 162)} = 45.81$	***p< 0.001***

Table **5** shows the results of the repeated measure ANOVA test on the OQ-45 dimensions for three time points (first session, fourth session and follow up session). The difference between time points was investigated with pairwise t-test comparisons using the Bonferroni correction for statistical significance.

There is a statistically significative reduction in the total score of the OQ-45 between the three time points; in particular, there is a significative reduction between the first and the fourth interview session ($p<0.001$), between the fourth and the follow up session ($p<0.001$) and between the first and the follow up session ($p<0.001$).

Regarding the Symptom Distress dimension of the OQ-45, the analysis shows a significative reduction between the first and the fourth interview session ($p<0.001$), between the fourth and the follow up session ($p<0.001$) and between the first and the follow up session ($p<0.001$).

Concerning the Interpersonal Relations dimension of the OQ-45, instead, we can see a significant reduction only between the first and the follow up session ($p<0.05$); whereas the observed reductions between the first and the fourth session and between the fourth and the follow up session are not significant.

Finally, regarding the Social Role dimension, there is a significative reduction between the first and the fourth interview session ($p<0.001$), between the fourth and the follow up session ($p<0.001$) and between the first and the follow up session ($p<0.001$).

As we can see, in all the dimensions of the OQ-45, there are statistically significative reductions of symptoms between the first interview session and the fourth session, and between the first session and follow-up session. Hence, we can confirm that, as shown in previous studies (Biasi, 2019; Biasi, Patrizi, Mosca, & De Vincenzo, 2016; Biasi, Patrizi, De Vincenzo, & Mosca, 2017; Biasi, De Vincenzo, Fagioli, Mosca, & Patrizi, 2019), the OQ-45 scale is very sensitive in detecting the evolution of a psychological counselling treatment.

Importantly, the strong correlation between the OQ-45 scale and the MMPI-2 questionnaire prior to the initiation of the counselling treatment (Table **4**) gives support to the reliability of the OQ-45 as a measure not only of treatment outcome, but also as a clinical tool for initial mental health assessment.

2.5.3 The application of MMPI-2 to predict symptom reduction during counselling university treatment

In order to investigate putative MMPI-2 predictors of treatment outcome, we regressed the OQ-45 scores on the 10 MMPI-2 dimensions.

First, we computed the Reliable Change (RC) index as outlined by Jacobson and Truax (1991). This measurement establishes whether changes of individual scores over time (i.e., the difference between the clinical assessment of symptoms at post-test *versus* pre-test) can be considered statistically significant, and – as indicate by DuPaul, Power, Anastopoulos and Reid (2016, 2020[2]) - it is calculated dividing the difference between pre- and post-treatment scores by the standard error of the difference between the two scores. Accordingly, we computed the Reliable Change (RC) index by taking into consideration the OQ-45 scores collected immediately after completing the counselling intervention (i.e., in the fourth session, T1) and those collected during the first clinical interview, which we considered as the baseline measurement (To).

As an improvement of the students' clinical condition was reflected by decreased OQ-45 scores over time, we considered negative RC scores as an index of reliable improvement after the completion of the counselling intervention.

For this analysis, we did not consider scores in the follow-up session due to the inhomogeneity of the temporal collection of data. Second, we computed crude correlations (Pearson r) of the relationship between the RC score and the MMPI-2 dimensions. As reported by Spalletta, Piras, Caltagirone and Fagioli (2014) the third, variables which resulted statistically significant at this stage ($p<0.05$) were entered as predictors in a multiple regression analysis (probability of F to enter < 0.05).

Crude correlation analysis between RC index and the MMPI-2 dimensions revealed that a reliable change of the OQ-45 total score was negatively associated with HS ($r=-0.238$; $p<0.05$) , D ($r=-0.308$; $p<0.01$), Pd ($r=-0.385$; $p<0.001$), Pt ($r=-0.321$; $p<0.01$), Sc ($r=-0.330$; $p<0.01$) and Si ($r=-0.262$; $p<0.02$).

Reliable change of the OQ-45 SD score was negatively associated with HS ($r=-0.215$; $p<0.05$), D ($r=-0.234$; $p<0.05$), Pd ($r=-0.317$; $p<0.01$), Pt ($r=-0.276$; $p<0.01$) and Sc ($r=-0.271$; $p<0.01$).

Reliable change of the OQ-45 IR score was negatively associated with D ($r=-0.287$; $p<0.01$), Pd ($r=-0.350$; $p<0.01$), Pt ($r=-0.264$; $p<0.02$) and Sc ($r=-0.277$; $p<0.01$).

Finally, reliable change of the OQ-45 SR score was negatively associated with D ($r=-0.251$; $p<0.02$), Pd, ($r=-0.260$; $p<0.02$), Pt ($r=-0.226$; $p<0.05$), Sc ($r=-0.258$; $p<0.02$) and Si ($r=-0.270$; $p<0.01$).

In other words, higher scores on these MMPI-2 dimensions were associated with greater Reliable Change (RC) scores in the specific OQ-45 scales, suggesting that the counselling treatment had an effect on reducing symptoms that correlated with those MMPI dimensions.

A model of multiple regression analysis performed on the OQ-45 Total Score RC explained 17% of the variance ($R^2=0.174$; $F_{6,91}=2.991$; $p<0.02$) and showed that higher Pd MMPI scores predicted greater change of the OQ-45 total score (Beta=-0.331; $p<0.03$).

A similar model on the OQ-45 IR RC explained 13% of the variance ($R^2=0.134$; $F_{4,91}=3.362$; $p<0.02$) and revealed that higher Pd MMPI scores predicted a similar change of the OQ-45 IR score (Beta=-0.283; $p=0.055$).

No other regression model reached statistical significance, demonstrating that specifically the PD MMPI-2 dimension was effective in predicting a greater benefit of counselling treatment as measured by the OQ-45 scale.

In summary, the *Psychopathic Deviate (PD)* dimension of the MMPI-2 was very effective in predicting a greater benefit of counselling university treatment. This result seems interesting considering that it concerns a non-clinical sample of university students in which risky behaviours such as psychopathic and transgressive ones can be frequent

3. Conclusions

In conclusion, the results of this study indicate that a university counselling protocol that includes

the evaluation of MMPI-2 profiles, with reference to clinical scales, is useful for making a reliable clinical diagnosis (see also American Psychiatric Association, 2013): this represents a first step to detect the outcomes of counselling treatment as measured by the reduction of symptom severity. Indeed, our data support the idea that the advantage of using both MMPI-2 and OQ-45 scales during counselling in an academic setting is twofold. On the one hand, it allows the formulation of a reliable clinical diagnosis before initiating the counselling protocol. In addition, it allows us to more accurately evaluate the outcome of the treatment on mental wellness.

Finally, the *Psychopathic Deviate (PD)* dimension of the MMPI-2 resulted effective in predicting a greater benefit of university counselling treatment, detected also by the OQ-45 scale. This result appears very relevant considering that it concerns a non-clinical sample of university students in which social maladjustment, self-alienation, and social alienation can represent a real high risk for academic success. Hence, our findings suggest that the combined use of the MMPI-2 questionnaire and the OQ-45 scale in university psychological counselling treatment is strongly recommended.

4. Acknowledgement

This paper is the result of the joint work of the five authors. In detail V. Biasi wrote paragraphs 2.1 and 2.3; C. De Vincenzo paragraphs 2.4., 2.5,1 and 2.5.2; N. Patrizi wrote paragraphs 1 and 2.2; S. Fagioli wrote paragraph 2.5.3. The paragraphs 3 was written in cooperation by V. Biasi and M. Mosca. This survey was funded in 2020 by the Department of Education of "Roma Tre" University.

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