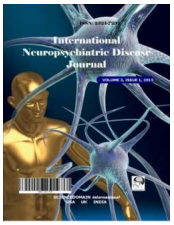

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Community Services for Psychiatric Adolescents: When Planning a Residential or Semi-residential Treatment

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Authors' contributions

This work was carried out in collaboration between all authors. Authors MG, PAB and PT designed the study. Author AS performed the statistical analysis. Authors PT and LDC wrote the protocol and wrote the first draft of the manuscript. Authors AS and PCT managed the analyses of the study. Authors LDC and PT managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Adolescence psychopathology often represents a challenge in regards of the way it is treated, due to the shortage of public mental health resources like Wellbeing Centers and daily Services, that differ from hospitals. From our experience in a daily Semi-residential Service for Children and Adolescents, part of the Public Neuropsychiatry Unit in Padua - Italy, we carried out a retrospective analysis in order to identify which factors could be the best indicators for the referral of a young person to a residential or a semi-residential placement.
Scope: We aimed to identify which variables, detectable at an early stage of treatment, may be

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good predictors for the referral of the young person, either to a daily semi-residential facility, or to recommend a more intensive treatment in a residential unit.
Methods: The sample consists of 102 adolescents referred to the daily Semi-residential Service. It was later on divided into two groups: one group stayed in the Semi-residential Service and the second group pursued a referral in a residential child care institution. All patients were assessed using the Youth Self Report Form YSR (11-18) and the Global Assessment of Functioning Scale (GAF) with a test – retest methodology. For each patient the following data were collected: personal and family details, schooling, diagnosis, therapeutic objectives, adolescent's level of cooperation, their families', and type of intervention submitted. All data were analyzed and compared to find out the most predictive factors towards the best placement for the patient.
Results: It emerged that residential child care institution was recommended for adolescents with the following features: aged under 14, living with single parent, affected by externalizing problems, displaying a poor therapeutic compliance and with non cooperative families.
Conclusions: This study showed the importance to identify which predictive factors are related to a better outcome in patients who used alternative services to hospitalization, considering these factors also necessary in terms of a better therapeutic intervention.

Keywords: Adolescence; psychopathology; outcome; residential and semi-residential treatment.

ABBREVIATIONS

DSM : IV Diagnostic and Statistical Manual of Mental Disorders IV
ADHD : Attention deficit hyperactivity disorder
SD : Standard Deviation
SRG : Semi-residential group
RG : Residential group
CG : Control group
YSR : Youth Self Report
GAF : Assessment Functioning Scale
DSM – IV – TR : Diagnostic and Statistical Manual of Mental Disorders IV Text Revision
WAI-O : Scale Working Alliance Inventory-Observer Scale
ICD : International Classification of Diseases
SPSS : Statistical Product and Service Solutions
χ^2 *: Pearson's chi-square test*
M : Media

1. INTRODUCTION

During adolescence, individuals may develop the early signs of severe psychopathological disorders, often displaying atypical symptoms, difficult to be recognized when referring to the international diagnostic classifications for adults [1-3].

In the case of moderate-to-severe psychopathology with behavioral symptoms, it is important not to overlook the adolescents' environment as well as recommending therapies oriented to a multi-professional intervention. The efficacy of a multimodal and multidisciplinary approach to the treatment of developmental psychological disorders has been acknowledged internationally [4] and proved as more appropriate than single-professional, single-modality treatments [5,6].

The multi modal intervention of severe psychiatric disorders is very often organized in the form of treatments at intermediate level, (i.e. in semi-residential or residential Centers), an indispensable alternative to hospitals, preventing this age group from being admitted to pediatric clinics or to adult psychiatric wards.

This involves considering numerous variables including the following: patients' conditions, diagnostic hypotheses, families' cooperation (from a social and educational point of view), as well as the availability of the social resources of the territory [7].

The assessment of an adolescent's family and their social environment is fundamental to the setting up of a treatment that involves the attempt to rehabilitate the patient and allows them go back to their routine [8].

A pathogenic and unreliable environment is better managed through the patient's transfer to a more protective, residential setting for treatment.

Where a semi-residential solution is available, a part apart from some common features similar to residential environment (usually, a residential treatment is temporary, oriented to the total recovery of the young person, age-appropriate and well coordinated with the other services involved on the territory), there are some other specific characteristics that feature the semi-residential treatment, such as a more 'naturalistic' approach to the patient, integrating the educational, rehabilitative and therapeutic aspects of the treatment, enhancing the abilities and social skills of the young person. Activity planning and timing must be very flexible. The work done with parents also plays a great part [9-11]. Nevertheless, adolescence residential communities still provide a good containment to young people, where significant interpersonal relationships are established outside the family circle, and more functional communications and activities take place. Community treatment is generally recommended for young people with major psychopathological conditions, often with a history of hospitalization [12] and/or for individuals with severe social and family problems. Abuse or delinquency are common in these families, as they suffer a psychopathological disorder [13] which include 53-73% of cases with one or more psychiatric diagnoses according to DSM-IV [14].

In fact, there are no specific diagnostic criteria for establishing a patient's eligibility for residential care [12], apart from very grave conditions making the home-based treatment unfeasible. Patients are often transferred from one type of service to another and their treatment may change in the process, proving stressful and upsetting [15,16]

For these reasons, early intervention, identifying good predictive variables, can be a successful element for a better outcome. With regards to that, the study of Piotrkowski and Baker [12], evaluating the influence of some variables for the good outcome of a residential treatment, showed that older age at the time of the referral, episodic juvenile delinquency, previous psychiatric hospitalization and serious emotional and secondary behavioral problems (due to the hospitalization) increased the risk of failure with the need to transfer the patient and change his care plan. This study emphasizes the difficulties and the burden of hopelessness of the young patients who are excerpt from their world of expectations, reference figures and peers, and this stress might lead, in the lack of adequate coping skills, to the expression of serious persistent emotional and behavioral problems. According to James et al. [17], previous multiple treatments would predict successful residential care when the family is at shortage of other therapeutic options

For our specific experience in Veneto (north-eastern Italy), a recent decree, dgr. Veneto 242 - 22/02/2012 [18], recommends, other than providing daybeds for psychiatric emergencies in children and adolescents, two types of residential care: educational communities (CER: comunità educative-riabilitative) and protected rehabilitative therapeutic communities (CTRP: comunità terapeutiche riabilitative protette) for children and adolescents. The first is defined as an educational service with the task of temporarily accommodate the child/adolescent in a state of evident psychosocial distress; this service is addressed to patients suffering of psycho - relational disorders and aim at stirring up their already present personal resources in a context of poor family conditions. The professional panel provided in these Centers is the following: psychologists/psychotherapists, nurses, professional educators and social health operators, usually in a 1:1 relationship with the young person. Besides, the CTRP is a community for patients affected by severe psychopathology and potentially serious behavioral problems, accompanied with very severe family situations. Only therapeutic work can trigger the personal resources within a programmed intensive rehabilitation. Its aim is to accept children/adolescents discharged from hospitals or, more broadly, feeling acute psychopathological conditions that requires protection and containment. Interventions must be tailored to the patient and defined within a specific treatment plan, followed up by a multi-professional and specialized team. In addition to the above-mentioned, it has to be added that the professional role of a child psychiatrist is very intense with a ratio 'operator / user' a of circa 1.25:1.

A third existing type of facility, located on a more intermediate level between the two mentioned earlier in the paragraph, is represented by the semi-residential Centre. Literature lacks information on the efficacy of the prognostic indicators of the effects of the different types of therapy. Actually, it is difficult to distinguish between the influence of the various components of the therapy (socio-educational measures, psychotherapy, family support and pharmacological therapy) and to predict their long-term effects. Some studies (albeit without a control group) have demonstrated the benefits of this type of treatment even in the medium and long-term [19,20] with improvements in patients' behavior and in the functioning of their families, and in their use of mental health services after the patient's discharge [21,22]. In Veneto there is only one public semi-residential Centre, located in Padua, which can welcome adolescents from different venetian towns and it is within its contest that the present research has taken place [23] enlarging previous ones we started with [24].

2. CASE – CONTROL STUDY

2.1 Aim

Drawing from our experience at the Semi-residential Service for Children and Adolescents, part of the Public Neuropsychiatry Unit in Padua – Italy, a retrospective analysis was conducted to identify early indicators, predictive of a better outcome, for a referral of the young person to a residential or to a semi-residential type of Service. A case-control study was thus conducted on a group of adolescents attending two age-appropriate therapeutic residential services in Veneto region (north-eastern Italy), where these adolescents had never taken part into any semi-residential care-plan, with a view to compare their outcome.

2.2 Treatment's Environment

2.2.1 The semi-residential adolescent psychopathology service

The study involved patients attending the Daily Semi-residential Service for Children and Adolescents, part of the Public Neuropsychiatry Unit in Padua - Italy. This facility aims at taking care and rehabilitate adolescents affected by severe psychopathological disorders (mood disorders, psychotic disorders, antisocial behavior and personality disorders), particularly enhancing their wellbeing and providing an integrated intervention with clinical and pedagogical support. Various professional figures cooperate on the therapeutic project, and the multidisciplinary team consists of: a developmental neuropsychiatrist, responsible for the Service, a psychologist-psychotherapist, four educators and a health coordinator.

The Service is also featured by trainee psychologists, trainee educators, and junior doctors in the course of their specialty school in developmental neuropsychiatry.

Adolescents attending the Center undergo an initial diagnostic process, leading to a psychiatric diagnosis formulated according to the ICD 10 [25] and to the decision of a therapeutic plan prescribing the attendance of the daily Center.

The Centre receives adolescents of both genders, from 12 to 18, with various moderate-to-severe types of psychiatric and behavioral disorders; the Service capacity for treatment is, overall, of 25-30 patients and can simultaneously accommodate up to eight adolescents, with 2:1 relationship between patients and operators at the Service. The adolescents attend from Monday to Friday from 9 am to 5 pm. Access to the facility is based on individual projects, prepared by the team, which establish the number of weekly visits and their duration. The educators can also put in place tailored and/or home-based interventions in situations where the adolescent suffers from significant social isolation, and is in acute distress requiring temporary hospitalization. The Service can also receive patients in emergency situations (moments of acute crisis, or when a "buffer intervention" is needed, while a patient is waiting to be transferred to a residential community). These latter interventions do not follow the normal enrolment protocol.

The general objectives of the Service are the following:

- To optimize the patient's care and supportive/practical measures in particularly extreme situations;
- To support the families in their educational role;
- To implement and synchronize the network on the territory providing clinical and pedagogical treatments;

- To improve the social involvement of the adolescent in their daily environment.

The parental couple is also followed up with regular meetings with a clinician (neuropsychiatrist or psychologist), possibly with the support of an educator.

This part of the Service, acting with families, needs to be supported and empowered to help parents establish a different image of their child from the one they had before, and make sense of the changes taking place in the child during the period spent in semi-residential care, as well as providing input on how the parents themselves need to respond to the child on a daily basis. A psychotherapeutic treatment for both young people and their families is often recommended and followed up at the Service.

The end of the therapeutic intervention can be decided in regards of different factors. The best outcome displays the achievement of the objectives and the discharge of the adolescent who can go back to their social and educational life, while they are still seen in therapy.

The attendance at the Centre may also be interrupted due to poor compliance on the part of the adolescent and/or their family (either with repeated or unexcused absence from appointments; for inadequate cooperation). The program may also be stopped by the need to include the patient in a more intensive treatment in a residential community. In each situation, the conclusion of the project is confirmed during the course of a final meeting attended by all the parties involved (the adolescent, the family, the reference educator, the psychologist and the neuropsychiatrist)

2.3 Case Samples

We considered 102 adolescents referred to the semi-residential Service for adolescents from January 2004 to December 2010. Out of the sample, 77 were males (75.5%) and 25 were females (24.5%), from 12 to 18 years old (with an average age equal to 14.4 y. o. and SD of 1.75), when they started to attend the semi-residential Center. We found that their clinical path was different: a group of them continued staying at the semi-residential Service (from January 2006 to December 2012) while a second group, at a certain moment, was referred to a residential care institution. We decided to study the sample divided into two groups: those who continued to be treated in the semi-residential setting (the "Semi-Residential Group", SRG) comprising 76 patients (74.5% of the sample), of whom 73.6% were boys and 26.3% girls; and those who subsequently joined a residential community (the "Residential Group", RG), consisting of 26 patients (25.4%), of whom 80.7% were males and 19.2% females. A "control group", CG, included 18 patients, 14 males (78%) and 4 females (22%), aged 12 to 17 (average age 14.7 years, SD: 1.87), living in two Community Rehabilitation Services in Veneto.

2.4 Materials

The subjects' personal, family and clinical information was obtained from their medical files held at the semi-residential Centre (diaries, minutes of team meetings, educational and therapeutic plans). In order to value the clinical material and the relationship with participants of the study, we used data from tests that were already part of the semi-residential intervention protocol. Written informed consent was obtained from the participants for taking part to the research, and a purpose-built form from our institution was used.

The patients' psychological and behavioural problems were assessed using the Youth Self Report Form for the age-range 11-18 (YSR 11-18) [26] at the baseline. This questionnaire for assessing young people's behaviour (YSR 11-18) is a self-reporting tool designed to obtain information directly from individuals about their skills and their behavioural and emotional problems. The questionnaire has also been standardized for the Italian population [27-30]. It generates "normal", "borderline" or "clinical" scores for specific syndrome scales grouped into: internalizing problems (anxiety, depression and withdrawal, somatization), externalizing problems (aggressiveness and antisocial behavior) and other problems (socialization issues, thought disorders, attention disorders).

According to the semi-residential intervention protocol, the patients' clinical general improvement during their stay at the semi-residential Center was monitored using the Global Assessment of Functioning Scale (GAF) [31], a tool used by the operators to assess a patient's psychosocial functioning and their activities on the level of their interpersonal relations, academic or professional occupations, hobbies and recreational activities, regardless the nature of their psychopathology. The GAF

corresponds to Axis V on the DSM IV-TR [32] and, during our study, it was filled in at the baseline and at regular intervals 6 months' worth. The GAF scale includes 10 levels of general functioning of the patient (for a total of 100 scores, where 0 = min and 100 = max) on which subjects are assessed by attributing them a score based on the educator's observation; the higher the score, the better the individual's psychosocial functioning.

To assess the therapeutic alliance with patients' parents, it was used the WAI-O scale (Working Alliance Inventory-Observer, short version) [33,34] which has been amply used to measure the working alliance between operators and patients or, as in our case, their parents. It measures the subject's ability to cooperate and the level of agreement with the proposed type of treatment and its goals. The scale consists of 12 items, 10 positive and 2 negative, scored from 1 (never) to 7 (always). These items are arranged in 3 subscales of 4 items each ("goal", agreement with the reasons for and the aims of the therapy; "task", agreement with the therapeutic goals of the treatment; and "bond", which assesses the trust between therapist and patient). It has been demonstrated that the WAI-O scale achieves a good level of reliability and validity, also in the Italian version [35]. In assessing parents' ability to cooperate with an adolescent's treatment, we chose the "task" subscale (items 1, 2, 8 and 12), completed during the first three months after the patient had joined the semi-residential program. The score (in the range from 0 to 28 points) was divided between "no alliance" (0-9 points), "partial alliance" (10-18 points), and "good alliance" (19-28 points).

2.5 Methods

For the SRG, we examined the following variables:

1. **Personal and family details:** gender, age, educational level of the family of origin (low, medium, high, based on each parent's education), situation of the parental couple (intact, separated), schooling (lower or higher secondary school), school attendance (regular, discontinuous, drop-out);
2. **Clinical features:** psychiatric diagnoses according to the ICD-10 criteria [24], YSR 11-18 scales (for competences, syndromes and internalizing, externalizing and total problems);
3. **Approach to the semi-residential Service:** reasons for attending the service (behavioral, affective-relational/family, or schooling problems), attendance expressed in the number of hours per week and total time spent at the semi-residential Center, working alliance with parents (good, partial, lacking; based on the scores obtained using the WAI-O scale; these scores were attributed by a trainee psychologist acting as a neutral observer in the interviews; in this context parents were given an update on the therapeutic project and about the first period of observation of their child), educational-therapeutic goals (self-esteem/independence, socialization, educational support, family support), type of therapeutic intervention (educational program with psychiatric monitoring or psychotherapy, or both), participation in semi-residential activities (active, passive, ambivalent, oppositional, based on the educators' assessment of the quality of their relationship with the patient and the latter's participation in the various activities), compliance with the therapeutic project (adequate, i.e. attending ≥ 60% of the scheduled appointments, discontinuous, i.e. attending < 60% of the appointments, abandoning the scheme without approval), any pharmacological therapy, outcome (assessed using the GAF scales at the baseline (T1) and 6 months after (T2).

The same variables were analyzed in the group of adolescents who were subsequently transferred to a residential community for further treatment (RG).

For the CG, we examined the following items:

1. **Personal and family details:** gender, age, cultural level of the family of origin, situation of the parental couple, schooling, school attendance;
2. **Clinical features:** psychiatric diagnoses according to the ICD-10 [24] criteria and any pharmacological therapy;
3. **Residential service:** relocation from another therapeutic or educational residential service, reasons for seeking help (behavioral, affective-relational/family, or schooling problems), permanence from the moment of admission, parental agreement to the admission (with parental

consent or legal decision for child protection), participation in activities (active, passive, ambivalent, oppositional - based on the educators' assessment of the quality of their relationship with the patient and the latter's participation in the residential activities).

All the data were collected through official forms by educators, according to the neuropsychiatrist's guidelines.

2.6 Statistics

The SPSS, rel. 17.0, was used to set up a database and conduct the statistical analyses. Data are showed as percentages. The variables were expressed as categorical ones, on nominal and ordinal scales. In order to test for statistical independence between pairs of variables, we used Pearson's chi-square test (χ^2), considering a value of $p < .05$, making comparisons between the values of the categorical variables and the critical value considered ($p < .05$). Changes in scores on the Global Assessment of Functioning (GAF) scale were examined using a general linear model with a repeated-measure design, considering: the type of treatment (SRG vs. CG) as a *between* variable, time (T1-T2) as a *within* variable and the GAF score as the *dependent* variable, on which observing changes in the groups.

3. RESULTS

3.1 The Semi-residential and Residential Groups

3.1.1 Descriptive statistics and statistical analysis

The statistical analysis was conducted on multiple variables, correlating the two groups (SRG and RG) to retrospectively identify whether any factors were statistically different between the groups considered ($p < .05$) and more often associated with the transfer of a patient to a residential community. Table 1 shows the frequencies and percentages for the individuals in the two groups.

The diagnoses based on the ICD-10 criteria were grouped into 5 macro-categories (Table 2).

Briefly, there was a substantial prevalence of "behavioural disorders and mixed emotional and behavioural disorders" and of "combined conditions" in the RG (30,7% and 34.6%) vs "affective disorders", more frequent in SRG.

When the diagnoses were divided by gender, the most common diagnosis among females in the SRG was "personality disorder" (40%), while among the males it was "affective disorder" (21%). In the RG, there was a higher prevalence

Table 1. Distribution (%) of personal and family variables in the semi-residential and residential groups

Variable		Semi-residential group	Residential group
Age group on arrival	12-14 years old	53%	81%
	15-18 years old	47%	19%
Schooling	Lower secondary school	46%	77%
	Higher secondary school	54%	23%
School attendance	Regular	34%	15%
	Drop-out	30%	42%
	Discontinuous	36 %	43%
Family's educational level	Medium-to-low	86 % (low: 30%)	86 % (low: 46%)
	High	14%	14%
Parental couple	Intact	76%	46%
	Single parent	24%	54%
Reason for assessment	Behavioural problems	41%	58%
	Affective relational/family problems	45%	23%
	Schooling problems	14%	19%

Table 2. Diagnosis according to ICD 10 in semi-residential and residential groups (percentage values)

Diagnoses based on the ICD-10 criteria	SRG	RG
(F 20-29, F70-89) psychoses Includes: psychotic disorders, impaired psychological development and retardation.	18,4%	15,3%
(F30-48) Affective disorders Includes: affective and emotional syndromes, phobias, stress-related disorders and somatization	27,6%	3,8%
(F90-98) Behavioural disorders	14,4%	30,7%
(F60-69) Personality disorders	23,6%	15,3%
Combined conditions (mainly involving personality disorders associated with psychotic or affective disorders)	15,7%	34,6%

of "behavioural disorders and mixed emotional and behavioural disorders" in males (38%), while 80% of the females suffered from personality disorders (as a single diagnosis in 50% of the cases) and from combinations of psychiatric conditions in 20% (whereas none of the girls in the SRG had more than one psychiatric condition).

When the SRG and RG were compared in terms of YSR scores (figure 1) there was a relative prevalence in the RG, especially for syndrome scales "delinquent/antisocial behaviour" (45% in the RG vs 12% in the SRG) and "aggressiveness" (41% in the RG vs 22% in the SRG). Transfer to a residential community scheme was associated ($\chi 2$ (2)=12.4; p<.05) with the clinical range of scores on the scale for "delinquent behaviour" and with the "total problems" scale (71% in the RG vs. 43% in the SRG) (χ^2 (2)=7.9; p<.05) (Figs. 2, 3).

As for gender, there were no statistical differences in the RG, whilst in the SRG, 66% of the girls had internalizing problems as opposed to 30% of the boys (χ^2 (2)=8.6; p<.05).

Variables regarding patients' treatment are outlined below in Table 3 regarding the two groups, SRG and RG.

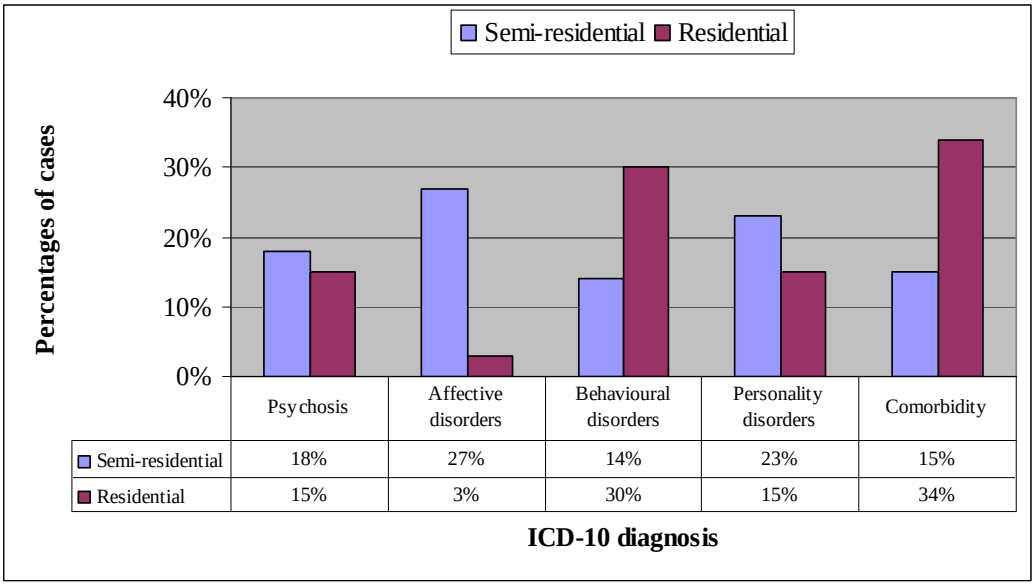

Fig. 1. ICD-10 diagnoses of the semi-residential (blue) and residential (red) groups

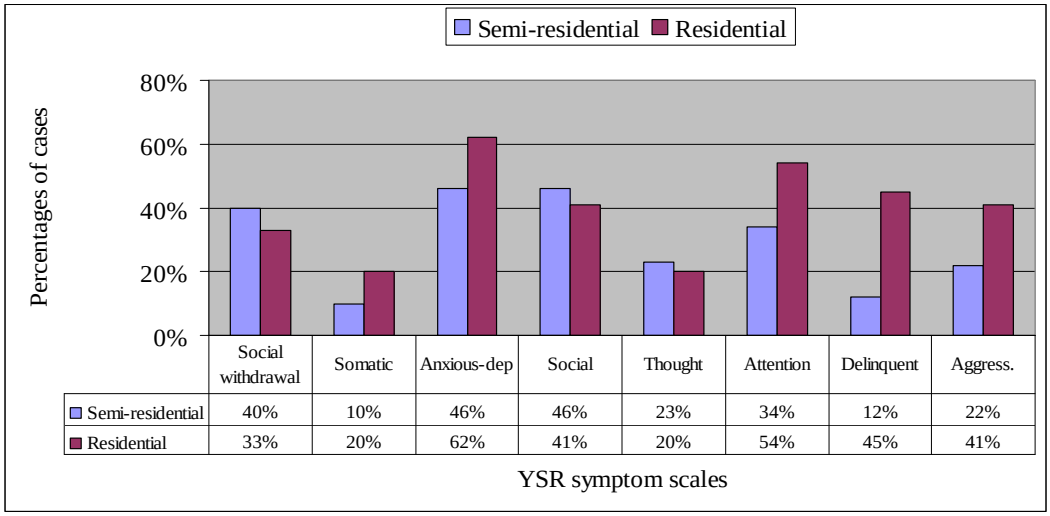

Fig. 2. YSR syndrome scales (borderline and clinical scores) for semi-residential (blue) and residential (red) groups (percentage values)

Table 3. Distribution (%) of variables relating to the therapeutic intervention in the semi-residential and residential groups

Variable		Semi-residential group	Residential group	χ^2 (df), p<.05
Alliance with parents	Good Partial Lacking	40% 51% 7%	34% 57% 7%	χ^2 (2)=.338 *ns*
Patient's participation	Active Passive Oppositional Ambivalent	31.5% 19.7% 10.5% 38.1%	23% 7.6% 11.5% 57.6%	χ^2(3)=3.894 *ns*
Adherence to therapeutic project	Continuous Discontinuous	55% 45%	27% 73%	χ^2(1)=6.233 p<.05
Hours per week at center	0 - 5 h 6-14 h > 15 h	39% 55% 6 %	4% 58% 38%	χ^2(2)=18,978 p<.05
Goal of intervention	Independence/self-esteem Adequate socialization Family support	50% 25% 12%	42% 31% 23%	χ^2(2)=1,69 *ns*
Type of intervention	Educational + psychiatric monitoring Educational + psychotherapeutic Educational + psychotherapeutic + psychiatric monitoring	10.5% 42% 47.3%	7.6% 30.7% 61.5%	χ^2(2)= 2,537 *ns*
Pharmacological therapy	Yes No	57.8% 42%	73% 27%	χ^2(1)=1,891 *ns*

Within the Semi-residential group, it is worth to emphasize a statistic relation of 'Alliance with parents' with other variables: it was adequate for 83% of the adolescents who routinely attended the semi-residential Center, but lacking for 83% of the adolescents who dropped out from their treatment (χ^2 (2)=10.1; p<.05). Similarly, the adolescents' participation in the semi-residential activities was active in 61% of the cases whose parents were cooperative, but oppositional or

ambivalent in 57% of the adolescents whose parents were only partially or not cooperative at all (χ^2 (6)=28.6; p<.05). Adherence to the therapeutic project was also adequate for 80% of the adolescents whose parents were cooperative, but discontinuous in 83% of those cases whose parents were not (χ^2 (2)=20.4, p<.05). Finally, 83% of the intact parental couples were adequately cooperative, as opposed to a partial or total lack of cooperation coming from 70% of the single parents (χ^2 (2)=8.7; p<.05).

3.1.2 GAF scales

The statistical analysis of the scores obtained at the GAF scales considered measures repeated at two different times. These were all about the first few months from the initial referral of the adolescent to the semi-residential Center, i.e. at the baseline (T1), when they were tested and assessed for admission to the Service, and 6 months after (T2). As shown in the graph (Fig. 4), the scores on the GAF scale improved to a statistically significant degree but evolved differently in the two groups, SRG and CG ($F_{1,87}$=4.575, p<.05; $F_{1,87}$= 26.115; p<.05).

3.2 The Control Group (CG)

The CG was composed of 18 patients, mainly boys (77%) aged between 12 and 17 (M=14, 72, SD 1,87), who had been living in a Community Rehabilitation Service for the time of the study.

Table 4 shows the percentages for the CG individuals.

We analysed the common variables in CG and RG (age on arrival, reason for assessment, schooling, ICD 10 diagnoses, pharmacological therapy, parental couple, family's educational level, collaboration with familiars): there were no significant statistical differences between RG and CG for all the variables but for "age on arrival" (χ2 (1)=8,3603; p=.003; in the CG, actually, 66% of the patients were older than 15 years old, if compared to 23% in the RG).

Table 4. Distribution (%) of personal, clinical and family variables in the control group

Variables		Percentage (%)
Previous location	Other residential service	61
	Family	39
Gender	Male	77
	Female	23
Age group at admission	12-14 years	33
	15-18 years	66
Reason for admission	Behavioral problems	83
	Affective relational/family problems	16
School attendance	Regular (44%); discontinuous (11%)	55 (lower secondary school), 40 (higher secondary school)
	Drop-out	45
Parental couple	Intact	27
	Single parent	72
Family's educational level	Medium-low	95 (low: 61%)
	High	5
Parental agreement to admission	Yes	39
	No (Social Service, Court decision)	61
Diagnosis ICD-10	Conduct disorders (F 90-98)	38,8
	Personality disorders (F 60-69)	38,8
	Psychoses (F 20-29)	11
	Combined conditions	11
Patient's participation	Active	33
	Passive	16
	Oppositional	16
	Ambivalent	33
Pharmacological therapy	Yes	77
	No	33

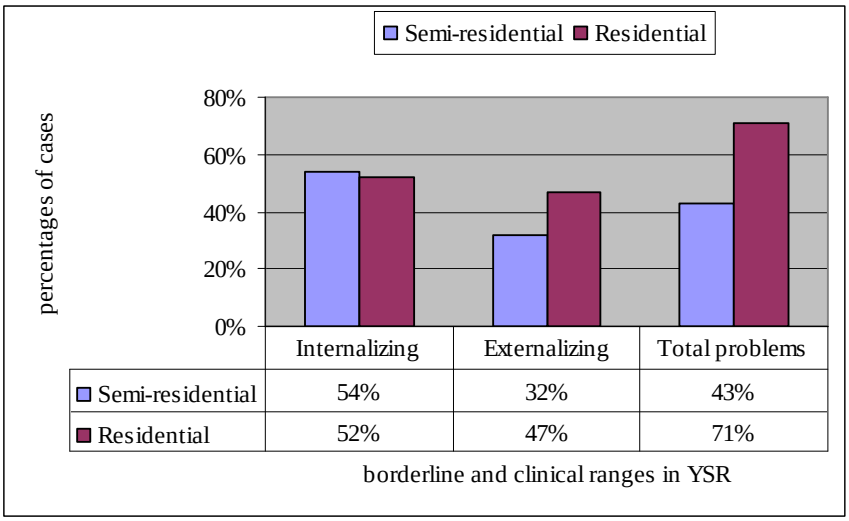

Fig. 3. YSR problems scales – internalizing, externalizing and total - (borderline and clinical scores) for semi-residential (blue) and residential (red) groups (percentage values)

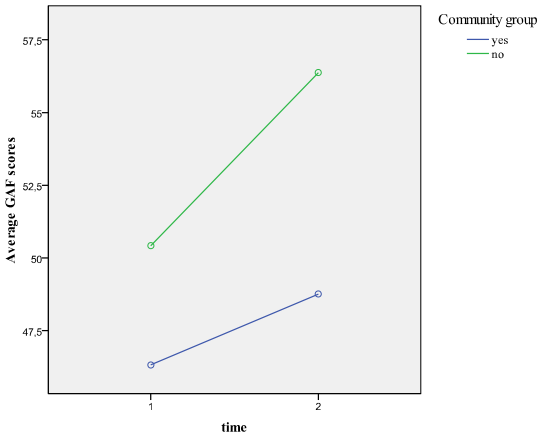

Fig. 4. Trend of the GAF scales (Yes: Residential group; No: Semi-residential group)

4. DISCUSSION

The purpose of seeking predictors of the type of patients that are most likely to be referred to a more containing facility, than to a semi-residential Center (e.g. a residential community), stems from the wish to enable the patient to embark on the most suitable, customized therapeutic project as soon as possible [36,37,17]; with a view to avoid what might turn into a "treatment failure" [12] or a "waste of time", also given how long it takes to organize a patient's admission to a residential service.

When we manage to get some of the early indicators and can, therefore, predict that the admission of some adolescents to a semi-residential Service will be followed up by their transfer to a community, the semi-residential Service represents the most functional, tailored and intensive treatment to be offered temporarily to the adolescent between their exiting the family contexts (often very conflicting) and the residential care.

4.1 The Semi-residential and Residential Groups

The average age of the patients was higher in the SRG than in the RG (average age 14.6 years, SD 1.73 vs. 13.6, SD 1.60, respectively) and there was a statistically significant association ($\chi^2(1)=6.380$, $p<.05$) between younger age (12-14 year-olds) and a referral to a residential service. The adolescents came from families where the parental couple was never intact (24% of adolescents in the SRG and 44% in the RG) and where their educational status was medium-to-low (86% of the sample as a whole, Table 1). This confirms the trend, identified in previous publications, of an inverse correlation between mental disorders and the socio-cultural level of the families of origin [38-41], while it also indicates that our model of intervention was readily accessible and non-discriminatory from the economic or cultural standpoints. We also surmise that the above results confirm the importance of community

intervention for cases that most need family support, in situations where there are presumably shortcomings in the parental functions. A residential treatment experience can more substantially take the place of these parental functions, offering adolescents the emotional-educational containment that their families are unable to provide. On the other hand, because the semi-residential Service is strictly structured and regulated, it requires a major contribution from the family, in terms of their time and their willingness to cooperate and to have their own behaviour questioned. If compared with the patients of semi-residential Services, young people admitted to residential communities display their psychopathology much earlier in the course of their life, proving the gravity of the mental illness.

In regards of the adolescent's schooling, 46% of those in our samples had left school and this applied to many young people in the residential group (42%) if compared to the semi-residential one (30%) (p=ns). School was attended regularly by 34% of the patients in the SRG and only by 15% in the RG. In Italy, for the year 2013, the proportion of young people who dropped out from their studies in the first years of secondary school (i.e. without completing their compulsory education) was 17% [42]. The higher school drop-out rate found in our sample was very likely linked to young people's mental problems, as explained in literature about early school refusers as usually troubled by externalizing problems [28, 43]. In addition to the presence of a relevant correlation of clinical data and psychiatric disorders in developmental age [44] these factors need to be considered at the moment to devise a psycho-rehabilitative intervention for both patients and their families [41].

Taken together, this data suggest that multifactorial aspects influence the individual's psycho-emotional and relational development right from early stages of life and thus they can give way to detrimental psychopathology in adolescence [45,46]. The symptoms would appear earlier, consequently implying the offer of a more radical and containing type of treatment [15] than in other cases with better family situations, affected by less severe symptoms and that are probably more resilient [47].

The prevalence of behavioral disorders and of statistically significant differences between the two groups for "delinquency problems" ($\chi^2(2)=12.438$, $p<.05$) and "total problems" ($\chi^2(2)=7.867$, $p<.05$), by comparing them with other adolescents of the same gender and age, brings to mind existing studies on developmental age. According to these studies, actually, young people who obtained clinical scores on the YSR scale for "total problems" had a higher rate of psychiatric diagnoses in adult age; the behavioural disorder would be a good predictor for males, whilst anxiety, mood disorders, or substance abuse would act as good ones for females [48]. According to McDermott, Mc Kelvey, Roberts and Davies [49] a more severe psychopathology, a more disturbed behaviour and a dysfunctional family make a more intensive treatment necessary, also in terms of the amount of time required (i.e. in day hospitals or longer hospital stays rather than in the outpatient setting or psychiatric counselling).

Moffit, Caspi, Harrington and Milne [50] pointed out that early antisocial behavior had a more severe outcome and the patients involved were more likely to be taken into care in a more containing structure like a residential community. Rey et al. [19], Stahlberg et al. [14]. Velez, Johnson and Cohen [51] found a significant association between unmarried or divorced parents and an oppositional defiant disorder in their offspring; parents separating also appeared to be a risk factor in the studies conducted by Clark, Caldwell, Power and Stansfled [52], Cherlin, Kiernan and Chase-Landsdale [53] and Roberts et al. [47]; a single-parent family was associated with externalizing problems according to Frigerio et al. [28] as well.

Concerning internalizing and externalizing problems, while there were no significant differences between the two genders in the RG, in the SRG there was a different distribution: among females there was a prevalence of internalizing problems (66% of the girls returned clinical scores on the scale for internalizing problems, as opposed to 30% of the boys) ($\chi^2(2)=8.614$, $p<.05$). According to various authors, girls are more likely to have internalizing problems than boys, while externalizing problems tend to prevail in the latter [54,47]. According to Ritakallio, Koivisto, Von der Pahlen, Pelkonen, Martutunen, et al. [55] depression could even act as a protective factor against the development of antisocial behavior in males. This is consistent with our results: in the RG there was a prevalence of behavioral disorder among the males, as opposed to the prevalence of affective disorder in the male population in the SRG. Similar problems in the female gender, possibly

an indicator of an underlying affective disorder [55] would become apparent less often with externalizing features and could be most often diagnosed as a personality disorder, frequently of emotionally unstable type, characterized by marked affective-relational difficulties.

Analyzing this findings in the light of the ICD-10 diagnoses, there was a prevalence of affective disorders in the SRG, whereas of behavioural and comorbid disorders in the RG ($\chi^2(4)=11.989$, $p<.05$). Considering gender, in the SRG the most common diagnosis among the females was "personality disorder" (40%), while for males it was "affective disorder" (21%); in the RG, 38% of the males had a diagnosis of behavioral disorder or a mixed emotional-behavioral disorder. This findings highlight a more complex behavioural psychopathology in adolescents accessing residential care service. This could be possibly linked to the need to contain better the adolescent in respect to their delinquent or aggressive behaviour.

Analyzing the variables, it is interesting to notice in semi-residential care a change in the scores on the GAF scale in the first 6 months from the start of therapy: overall, our adolescents' psycho-social functioning improved with time; this improvement performed much earlier in the semi-residential group (SRG), compared to the residential group (RG). The effect of an improvement in global functioning of patients in semi-residential programs had already emerged in previous follow-up studies [20,22,56], but in this case the trend was predictable from the early stages of treatment. "Behavioral problems" were most present in young people seeking help in 57.6% of the cases in the RG and in 40.7% of those in the SRG; furthermore 44.7% of the SRG suffered "affective-relational problems" (and only 23% in RG): this has to do with the prevalence of externalizing disorders in patients who were subsequently transferred to a community care program. Right from the start, these individuals embarked on a project that involved greater resources, also comprising educational intervention, psychotherapy and/or psychiatric monitoring (in 61.5% of RG cases, as opposed to 47.3% of the patients in the SRG), possibly with the addition of pharmacological therapy, which was provided for 73% of the RG cases and 45.78% of the SRG ones. The need for a more intensive intervention was also emphasized by the findings related to the association between the attendance of the service (in hours) (>15 h/week) and the subsequent transfer to a residential community, making reference to a group of more severe and worrying patients who, already at the baseline, would benefit from a more intensive and more structured treatment. A discontinuous attendance, indicative of a worse adherence to the therapeutic project, was positively associated with referral to a residential community, confirming that poor compliance is one of the elements most crucial to the efficacy of treatments [57,58].

Actually, various studies have shown that the diagnosis is neither a useful indicator of change (because it is categorical and fails to reflect the changes of the young person in development), nor a better predictor than other factors of the outcome of therapy and the patient's clinical outcome [30,59-61]. The quality of the patients' response to an integrated intervention and global taking into care - especially at this age, when people are so exposed to the influence of the environment - is more likely to be influenced by factors such as their adherence to the therapy, the quality of their environment, their family relations (also expressed by the working alliance with the parents), their social network and social functioning.

The semi-residential rehabilitation project and its success depend also on the alliance established with the parents and on the level of the adolescent's participation. In our SRG the variable "alliance with the parents" was statistically associated to both the "adherence to the therapeutic care-plan" (there was a good alliance in 61% of the cases whose compliance was continuous, while the parents were only partially, or not at all, cooperative in the case of 81% of adolescents whose compliance was erratic; there was a good working alliance with the parents in 83% of the adolescents who attended the service regularly), and with the patients' participation in the semi-residential activities (in 61% of the cases of adolescents who took an active part in the activities there was also a good working alliance with the parents). These findings confirm that parental cooperation is an important variable, strongly connected to the psycho-educational work taking place at the semi-residential Center. Relevant to say is that, in a semi-residential Centre, which enables adolescents to remain in their daily routine, cooperation with families is extremely important in terms of a good care-plane for the adolescent and a good outcome.

4.2 Control Group

Analysing the variables of 18 patients of two different therapeutic residential Services in Veneto we found that: there were more males (77%) than females (33%); the average age of patients was higher in CG than in RG (14,72 vs 13,57 years), and 77% of patients were older than 15 on the time of the admission to the residential service ($\chi^2(1)=8,3603$, $p<.05$).

All girls were between 16 and 17 years old, and their average age was higher than boys' (16,7 years ±0,5 and 14,1 years ±1,7 respectively), as in the RG (14,8 years ±2,5 in females and 13,6 years ±1,6 in males). Differently, in the SRG the average ages of females and males were similar (14,6 years ±1,7 and 14,5 years ±1,9 respectively).

The main reason for admission to a residential care service was the presence of severe behavioural problems (83% of patients) in according to literature [62]. It is worth to underline that most of the patients were transferred from a different residential service (61%), often delivering an educational type of intervention (81%): this enlightens the need for a more structured and containing therapeutic care for these patients. This findings show that patients with severe psychopathologies are often admitted in educational services even if they would need a more containing, psychiatric structure [63]. This problem can be due to the extreme lack of care services and the need to find urgently a placement for young people in other facilities, other than in hospitals, [64,48], but also due to an inadequate initial diagnosis and prognosis that can compromise the early treatment.

Crucial in this context the assessment of the family situation which, in CG participants, was studied using three variables: the presence of a parental couple or a single parent, the educational level of the family of origin and the family alliance at the time of admission (divided into "consensual ", by agreement between the family and the community health and social services, and "coercive", due to the Judicial or Social Services decision).

"Coercion" occurred in 61% of our population, of which 75% came from other residential facilities. Our data together with the ones from the Regional Childhood and Adolescence Observatory [65], according to which removals are facilitated thanks to the cooperation of the parents only in 21% of cases, could be interpreted as an indicator of the difficulties in the relationships between Public Health operators and the family members about their children's separation from families; furthermore, it could be an indicator of the severe level of social and family problems that are the foundation of many developmental issues needing appropriate rehabilitative and inclusive therapeutic treatment [63,43].

Moreover, even in this population, we found 72% of family disruptions. This finding confirms what has already been reported by the international literature, which sees conflicting parenting, or living with one parent, a risk factor for child psychopathology [52,47,66,38] that need a more structured and multidisciplinary therapeutic intervention [63]. Another important risk factor, found in patients with psychopathology, was also their educational situation, which we evaluated through the variable "schooling": 44% of the adolescents had stopped attending school at the time of admission, a percentage that remained stable even at the time of data collection. There was a slight improvement in terms of continuity in the attendance, which rose from 22% before the admission to 44%, with reduction of the discontinuity.

The observation of psychopathological diagnoses, again distributed into five groups, saw a prevalence of conduct disorder and mixed emotions and conduct and personality disorder, both present nearly in 40% of the sample.

It is relevant to notice that all the girls in the CG had a diagnosis of personality disorder-emotionally unstable type- that represented the principal diagnosis even among the girls in the RG (80%). Literature emphasizes that personality disorder in adolescence requires intensive long-term treatment, that can give rise to a "new cognitive and emotional experience" in a safe context [67] and this happens more often within a residential treatment.

In the sample considered, 77% of community's patients took medication, a percentage almost identical compared to the one of RG (73%), another factor that underlines the major psychopathological severity of these subjects and their need for a specialist clinical intervention. Comparing the two groups RG and CG, there were no statistically significant differences between the analyzed variables,

except for the variable "age group on arrival", older in CG group ($\chi 2(1)=8,3603$, $p<.05$). This latter finding depends certainly on both the history of previous admissions to other residential services (61% of the population) and the timing, even bureaucratic, necessary for the admission to occur. For the rest, despite the small size of the two populations considered, and given the comparisons conducted, it was possible to generalize the results to a broader population of young people.

5. CONCLUSIONS

With the aim to promptly identify the most suitable method for taking a patient adequately into care, this retrospective study focused on seeking variables, at the time of the assessment, that contribute to the process of the referral of the young person to a semi-residential or a residential type of treatment.

These variables may concern not only the adolescents and their psychopathological features (emerging from their psycho-diagnostic evaluation and the assessment scales administered), but also their families, or the type of treatment scheme available.

The following variables were found significantly associated with the need to transfer a patient from a semi-residential to a residential care institution:

- Age under 14;
- A single-parent family;
- Severe and complex psychopathological problems (global clinical problems emerging from the YSR), mostly expressed by externalizing problems, i.e. antisocial and/or delinquent behavior (clinically delinquent/antisocial behavior on the YSR);
- A psychiatric diagnosis of behavioral disorder, or combinations of psychiatric disorders, mainly in association with personality disorders;
- Little cooperation from the patient's parents;
- The patient's discontinuous attendance of the semi-residential Center;
- Unsatisfactory change in global functioning (GAF) during the first six months of therapy.

The findings of the present study may be biased due to the retrospective data collection, obtained from various sources (clinical records, consultant clinicians and educators working at the semi-residential Service). The study is also limited by the small number of cases in the Residential and Control groups, which restricted their within-group statistical analysis. Anyway, the paucity of literature on this particular topic [46,68,69] gives us good reasons to underline our preliminary findings to be taken into account, within an intervention plan, to identify more accurately which factors to consider for a timely recommendation.

Surely, further national and international researches in this field should be carried on taking a prospective and meta-analytic approach.

CONSENT

All authors declare that written informed consent was obtained from the patient and his parents for publication of this case report. Authors used a form from their own institution.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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