Assessment of needs and clinical parameters in forensic patients in low and medium security wards

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Summary

Aims: The aim of the study was to compare patients treated in "court psychiatric wards" of low and medium security in terms of their needs, severity of psychopathological symptoms, subjective assessment of quality of life and satisfaction with treatment.

Method: The study was conducted at the Regional Mental Hospital in Lubiąż, Poland. It involved patients interned at two low security forensic psychiatric wards and one medium security ward. 93 male patients were assessed. The following research tools were used: Camberwell Assessment of Need – Forensic Version (CAN-FOR), a sociodemographic and clinical data questionnaire, Brief Psychiatric Rating Scale (BPRS), Client's Assessment of Treatment (CAT) scale, and the Manchester Short Assessment of Quality of Life (MANSA) scale.

Results: Patients at the medium security ward reported greater overall needs and a greater number of unmet needs. The overall severity of psychopathology, including deficits and positive symptoms, was higher among patients in low security wards.

Discussion: Results indicate that medical care on wards with low and medium security is at a similar level. Individuals are committed to medium security wards based not on their mental disorder but rather on the nature of the offense they had committed, which in this case is more serious than that of individuals directed to low security wards.

Conclusions: The services provided in forensic psychiatric wards, especially in medium security wards, do not sufficiently meet the needs of patients.

forensic psychiatry, patients' needs, mental disorders

Mental disorders are associated with the greatest adverse effect on the social functioning and quality of life of patients. The patient's mental state as well as their needs is influenced not only by their mental condition, but also by factors they have to cope with at the hospital. As part of psychiatric hospital treatment in Poland, medical services may be provided in day hospitals, stationary or forensic wards. Daily and stationary psychiatric wards differ in many respects from forensic psychiatric wards. Wards which implement security measures are organized as psychiatric units with low, medium and high security.

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Forensic psychiatric wards conduct forensic/psychiatric observations and manage the treatment of patients under the provisions of court rulings. The decision to treat patients in a forensic ward is taken by the trial court – the so-called detention on the basis a psychiatric committee's opinion concerning security. The court may order a detention in a locked facility only when it is necessary to prevent the patient from committing an offense related to their mental illness, mental handicap or drug or alcohol addiction; before ruling on such detention, the court hears the opinion of psychiatrists and a psychologist. If the person had committed a crime of significant social harm when mentally ill, as stipulated in Article 31 §1 of the Polish Penal Code, and there is a high probability that they might commit such an act again, the court shall commit them to an appropriate psychiatric institution. This is usually a much longer stay than the average 45 days that agitated and aggressive patients are sent to a standard psychiatric ward [1].

Forensic psychiatric units operate on the basis of the Regulation of the Minister of Health from 10 August 2004 that covers a list of psychiatric and drug treatment facilities intended as security facilities, and the composition, appointment and tasks of psychiatric committees concerning security measures [2]. There are differences between low secure and medium secure psychiatric wards. In medium security, patients are supervised more closely, often sent there on account of their aggressive, dangerous behaviour; such a ward is also more focused on resocialization; patients have cleaning duties, take care of personal hygiene, and may undergo searches.

Due to the steadily increasing number of court rulings sending perpetrators of offenses of significant social harm to locked psychiatric institutions as a preventive measure, and also because of a growing number of offenders with mental disorders and alcohol addiction, in 2007 the Ministry of Health in Poland introduced the National Health Program. Continuing the program in subsequent years, the importance of forensic psychiatric wards was further stressed, as lack of new low and medium secure places of detention and lack of facilities result in non-execution of final court rulings, which constitutes a material breach of the law. Waiting too long

to begin detention and implement the appropriate treatment after the court ruling on the application of preventive measures also poses a potential risk of reoffending [3]. A review of the professional literature in Poland from the past decade (*Psychiatria Polska*, *Progress in Psychiatry and Neurology*, *Post-graduate Psychiatry*, *Forensic Psychiatry and Psychology*) indicates extensive gaps in patients' quality of life and satisfaction with the treatment they receive as well as with psychiatric conditions in forensic wards. Therapeutic treatment of offenders with mental disorders is usually a lengthy process, which should involve the latest in therapeutic developments, especially those that have a community impact and are based on open, community out-patient systems of mental healthcare [4]. The current law in Poland does not promote most of the methods used in social and environmental psychiatry, in an attempt to limit the therapeutic treatment of offenders to treatment in locked facilities. On the other hand, detention itself arouses a lot of controversy among specialists, for instance regarding the duration of hospitalization and the adequacy of treatment duration to the social harm of the offence committed; discussions involve the issue of "overprotective or prolonged detention" [5,6]. In terms of forensic psychiatric wards, long-term cooperation between staff and patient is crucial to achieving patient acceptance of the often difficult requirements of therapy. Satisfaction with treatment, the severity of general psychopathology and the quality of life of treated individuals may contribute to therapy effectiveness and also have an impact on creating a support system for patients in detention.

The needs of people with mental disorders

There are many definitions of need. In the context of healthcare, a need is most commonly associated with lack of health, welfare or lack of access to care [7]. Modern tools to assess needs determine in what areas the help of healthcare and social care services is required. The level of need is determined on the basis of more or less standardized assessments of problems in several areas or aspects of psychopathology, functioning, basic skills, use of healthcare etc., and then

identifying the therapeutic intervention received or requested by the patient and support of family or social care, and finally – on the basis of the assessment of need and the degree of satisfaction in the opinion of the professional and the patient [8].

Satisfaction with medical care

The definition of patient "satisfaction" with medical care was given by Pascoe in 1983 [9]. He described patient satisfaction as a response of the recipient of health services to the most important aspects of the treatment process and the experience of the staff. He explains that "satisfaction" reflects the cognitive and emotional estimate of the medical service received. Patient satisfaction during a hospital stay is influenced by many factors: contact with the patient, conditions of stay on the ward, work of the medical staff, nursing care, the behaviour of other health professionals [10,11]. Satisfaction with treatment is directly related to the severity of psychopathological symptoms and the quality of life. The greater the severity of psychopathological symptoms and the lower the quality of life, the lower the evaluation of treatment [12].

Quality of life

There are many definitions of quality of life. Research in this area draws from mathematics, statistics, economics, sociology, psychology and philosophy, but the term is widely used mainly in medicine ("health-related quality of life"). Typing the term "quality of life" into a search engine will yield documents mainly from the medical field. According to the definition by the World Health Organization (WHO), quality of life is a subjective assessment made by an individual of their living situation with regard to the culture in which the person lives, their system of values, objectives, expectations and interests [13]. To evaluate the quality of life, it is necessary to take into account both the objective and subjective factors, the majority of which include the patient's needs and satisfaction with treatment [14].

AIM

The aim of the study was to assess the general unsatisfied and unfulfilled needs, the severity of psychopathological symptoms, and subjective assessment of quality of life and satisfaction with treatment of patients in forensic psychiatric wards with low and medium security. Furthermore, we aimed to check to what extent the above parameters are influenced by the degree of security in forensic psychiatric wards.

METHOD

The study was conducted at the Regional Mental Hospital in Lubiąż. It involved patients detained at two low security forensic psychiatric wards (a male ward with 45 beds and a mixed ward, also with 45 beds; due to a small and statistically insignificant number of women (4 beds), they were not assessed in the study) and one medium security forensic ward (60 beds). The study included 93 male patients. Two groups were distinguished:

- group I – men on a low security ward
- group II – men on a medium security ward.

Inclusion criteria for the study: age ≥18 years of age, male, written informed consent to participate in the study issued by the patient or, in case of incapacitation, by his legal guardian; the patient had to be staying in a forensic psychiatric ward with low or medium security, stay at the ward under court detention, for the duration of at least 3 months.

Exclusion criteria: severe somatic illness preventing further stay at a forensic psychiatric ward, inability to speak.

The study was approved by the Bioethics Committee of the Medical University in Wroclaw.

RESEARCH TOOLS

The study used the following research tools: Camberwell Assessment of Need – Forensic Version (CANFOR), sociodemographic and clinical data questionnaire, Brief Psychiatric Rating Scale (BPRS), Client's Assessment of Treatment (CAT)

scale and the Manchester Short Assessment of Quality of Life (MANSA) scale.

CANFOR

The CANFOR scale has three versions: clinical (CANFOR-C), research (CANFOR-R) and short version (CANFOR-S). In order to assess their needs, patients in the study completed CANFOR-R. This scale comprises a partially structured interview composed of 6 areas and 25 subscales. The 6 areas include specific needs, namely:

- the "basic" needs area: accommodation and meals/food
- the "social" needs area: social contacts, close relationships, sex life
- the "functioning" needs area: taking care of the house, self-service, daily activities, childcare, basic education
- the "health" area: physical health, psychotic symptoms, psychological stress, personal safety, security of others, alcohol, drugs/medication
- the "health and social care" area: information on the state of health and treatment, telephone, transport, money, state benefits
- the "treatment and criminal behavior" area: treatment, sexual offenses, arson.

Each of the 25 subscales in specific areas is subject to assessment; if the answer is "0" (no problem), then the researcher moves on to assess the next need. A rating of "1" (none/moderate problem) or "2" (serious problem) prompts them to move on to ask specific questions.

The CANFOR scale was developed jointly by the Section of Social Psychiatry at the Institute of Psychiatry in London and the Oxleas NHS Foundation Trust [15].The scale was translated into Polish at the Department and Clinic of Psychiatry in Wroclaw (compliance from good to ideal). The accuracy and reliability of the CANFOR scale was also assessed for adaptation in Portugal [16], Spain [17] and Italy [18].

THE BRIEF PSYCHIATRIC RATING SCALE (BPRS)

Initially, the scale contained 16 items and was used to assess psychopathology in schizophre-

nia [19]. It was gradually expanded to 18 and then 24 points by Ventura et al., with high reliability [20]. Assessment of the severity of psychopathological symptoms concerns the last week before the study [21]. The assessment of symptoms is carried out on a scale of 1 to 7. BPRS items are divided into four subscales: mania/agitation, deficit symptoms, positive symptoms, depression/anxiety. The study results were developed using the average value of 24 points and the average of the individual subscales.

CLIENT'S ASSESSMENT OF TREATMENT (CAT)

The scale is used to measure patient satisfaction with treatment; it was developed at the Department of Social Psychiatry at the University of Berlin [22]. It consists of seven closed questions (the patient selects an answer on a scale of 0, "absolutely not" to 10, "absolutely yes") and four standardized open-ended questions (e.g. "How do you feel about staying at the ward?"). The current study used the closed-questions part of the scale (items 1–7). The assessment covered the last month of stay on the ward and the results were calculated as average values.

MANCHESTER SHORT ASSESSMENT OF QUALITY OF LIFE (MANSA)

The scale is used to subjectively assess quality of life in the general population [23]. It consists of 16 questions, 12 of which refer to subjective evaluation on a 7-point scale (1, "could not be worse" to 7, "could not be better"). The four remaining questions are objective, yes/no questions. It is short and simple in design, which is helpful when studying patients with diagnosed mental disorders. The MANSA scale is also used in studies evaluating subjective quality of life among patients on forensic psychiatry wards [24].

Statistical methods

The research material was subjected to statistical analysis, taking into account its diversity, using the Statistica 10 software (StatSoft Poland).
Dependent variables:

- the number (percentage) of needs satisfied, needs unsatisfied, and the total number of needs.

Independent variables:

- sociodemographic characteristics:
- age (continuous variable)
- level of education (categorized variable)
- marital status (categorized variable)

Clinical parameters:

- diagnosis according to ICD-10 (nominal variable)
- number of diagnoses (psychiatric, somatic and addictions)
- duration (time in contact with psychiatric healthcare)
- number of prior hospitalizations (including detentions)
- severity of psychopathological symptoms (BPRS) – overall score and 4 subscales
- satisfaction with treatment (CAT) – overall score
- subjective quality of life (MANSA) – overall score

Missing observations were not taken into account in calculating the average. Determining the strength of the association between two continuous variables involved Spearman's rank correlation coefficient. If continuous variables did not differ significantly from normal distribution and had a similar variance (verified using the Shapiro–Wilk and Bartlett tests), comparison between their average values in the two groups involved the Student's t-test. If the assumptions of normality were not satisfied, we used the non-parametric Mann–Whitney U-test. Statistical hypotheses were verified on both sides with a significance level α=0.05.

RESULTS

Characteristics of patient groups

The study was conducted at the Regional Mental Hospital in Lubiąż. It included 93 patients aged 24 to 85 years (mean 44.7 years; SD=13.7). Patients were broken down into two groups, with the degree of ward security as the criterion for division. Group I comprised 50 patients from a low security ward and group II comprised 43 patients from a medium security ward. Basic statistics of the patients' characteristics are summarized in Table 1.

Table 1. Basic characteristics of patients

Variable	Sum	Group I	Group II	Gr. I vs. Gr. II
Age [year of life]:	n = 93	n = 50	n = 43	p = 0,009[a]
M±SD	44,7 ± 13,7	48,1 ± 14,1	40,7 ± 12,2	
Me (Q$_1$; Q$_3$)	44 (32; 54)	49 (35; 59)	37 (31; 49)	
Min÷Max	24 ÷ 85	24 ÷ 85	24 ÷ 73	
Diagnosis ICD				p = 0,649[b]
Gr 1 – schizophrenia	56 (60,2%)	30 (60,0%)	26 (60,5%)	
Gr 2 – Delusional disorders	13 (14,0%)	7 (14,0%)	6 (14,0%)	
Gr 3 – mood disorders	4 (4,3%)	1 (2,0%)	3 (7,0%)	
Gr 4 – organic mental disorders	20 (21,5%)	12 (24,0%)	8 (18,6%)	
The length of contact with mental health care [years]:	n = 92	n = 49	n = 43	p = 0,829[a]
M±SD	11,2 ± 7,8	11,4 ± 8,7	11,0 ± 6,9	
Me (Q$_1$; Q$_3$)	10 (6,5; 14)	10 (6; 15)	10 (7; 14)	
Min÷Max	1 ÷ 45	1 ÷ 45	2 ÷ 33	

Education:				p = 0,857[b]
Lack of education	2 (2,2%)	1 (2,0%)	1 (2,3%)	
Primary	20 (21,5%)	12 (24,0%)	8 (18,6%)	
Vocational	46 (49,5%)	23 (46,0%)	23 (53,5%)	
Secondary	21 (22,6%)	11 (22,0%)	10 (23,3%)	
High	4 (4,3%)	3 (6,0%)	1 (2,3%)	
Length of stay [months]:	n = 93	n = 50	n = 43	p = 0,101[a]
M±SD	25,1 ± 19,3	28,1 ± 22,9	21,5 ± 13,4	
Me (Q$_1$; Q$_3$)	20 (10; 34)	21,5 (9; 40)	20 (12; 29)	
Min÷Max	4 ÷ 85	4 ÷ 85	4 ÷ 69	
Previous hospitalizations:	n = 93	n = 50	n = 43	p = 0,758[c]
M±SD	3,9 5,5	4,1 ± 5,5	3,8 ± 5,6	
Me (Q$_1$; Q$_3$)	2 (0; 5)	2 (1; 6)	2 (0; 5)	
Min÷Max	0 ÷ 32	0 ÷ 30	0 ÷ 32	
Marital status				p = 0,488[b]
Single	62 (66,7%)	31 (62,0%)	31 (72,1%)	
Married	14 (15,1%)	9 (18,0%)	5 (11,6%)	
Divorced	12 (12,9%)	6 (12,0%)	6 (13,9%)	
Widow	5 (5,4%)	4 (8,0%)	1 (2,3%)	
Number of previous forensic stays				p = 0,001[b]
0	67 (72,0%)	28 (56,0%)	39 (90,7%)	
1	22 (23,7%)	19 (38,0%)	3 (7,0%)	
2	4 (4,3%)	3 (6,0%)	1 (2,3%)	

The needs of patient groups

CANFOR-R results were assessed from the perspective of patients, using a general number of needs as well as of satisfied and unsatisfied needs. Table 2 presents the needs in both patient groups.

Table 2. Basic characteristics of the patient's needs (CANFOR-R)

Descriptive statistics of needs	Sum	Group I	Group II	Gr. I vs. Gr. II
Needs met	n = 93	n = 50	n = 43	p = 0,473[a]
N	209	108	101	
M ± SD	2,25 ± 1,26	2,16 ± 1,27	2,35 ± 1,25	
Me (Q$_1$; Q$_3$)	2 (1; 3)	2 (1; 3)	2 (1; 3)	
Min ÷ Max	0 ÷ 6	0 ÷ 6	1 ÷ 5	
Needs unmet				p = 0,009[a]
N	105	40	65	
M ± SD	1,13 ± 1,32	0,80 ± 1,03	1,51 ± 1,52	
Me (Q$_1$; Q$_3$)	1 (0; 2)	0 (0; 1)	1 (1; 2)	
Min ÷ Max	0 ÷ 7	0 ÷ 4	0 ÷ 7	

Total needs				p = 0,037[a]
N	314	148	166	
M ± SD	3,38 ± 2,08	2,96 ± 1,69	3,86 ± 2,40	
Me (Q$_1$; Q$_3$)	3 (2; 4)	3 (2; 4)	3 (2; 5)	
Min ÷ Max	0 ÷ 12	0 ÷ 7	1 ÷ 12	

M – mean, *SD* – standard deviation, *Me* – median, *Q*$_1$ – lower quartile (25-th percentile),

Q$_3$ – upper quartile (75 – percentile), *Min* – lowest value, *Max* – highest value, a *t*-Student test; b Pearson's Chi-Quadrat-Test,; c Mann–Whitney U test;

In the study population, a total of 0 to 12 needs were reported. Most patients (n=35) reported 3–4 needs. A range of 0 to 6 satisfied needs were reported and most patients (n=32) reported 2 satisfied needs. With regard to unsatisfied needs, a range of 0 to 7 were reported and most patients (n=36) did not report any unsatisfied needs.

Severity of psychopathological symptoms

The overall severity of psychopathology was significantly higher (p< 0.001) among patients at the low security ward (group I). The severity of psychopathological symptoms in the deficits (p<0.001) and positive symptoms (p<0.001) BPRS subscales was also statistically higher in group I. These results are shown in Table 3.

Table 3. Basic characteristics of the severity of psychopathological symptoms of patients

Variable	Sum N = 93	Group I N = 50	Group II N = 43	Gr. I vs. Gr. II
Overall rating (BPRS)	n = 93	n = 50	n = 43	p< 0,001[a]
M±SD	2,19 ± 0,52	2,41 ± 0,46	1,93 ± 0,48	
Me (Q$_1$; Q$_3$)	2,2 (1,7; 2,6)	2,4 (2,1; 2,7)	1,8 (1,5; 2,3)	
Min÷Max	1,2 ÷ 3,3	1,2 ÷ 3,3	1,2 ÷ 3,0	
Mania/agitation				p = 0,118[a]
M±SD	2,01 ± 0,85	2,14 ± 0,92	1,86± 0,75	
Me (Q$_1$; Q$_3$)	1,8 (1,3; 2,5)	1,9 (1,3; 3,0)	1,7 (1,3; 2,3)	
Min÷Max	1,0 ÷ 3,8	1,0 ÷ 3,8	1,0 ÷ 3,8	
Deficit symptoms				p< 0,001[a]
M±SD	2,96 ± 0,77	3,26 ± 0,76	2,62 ± 0,64	
Me (Q$_1$; Q$_3$)	2,8 (2,5; 3,5)	3,2 (2,5; 3,8)	2,5 (2,2; 3,0)	
Min÷Max	1,5 ÷ 4,8	1,7 ÷ 4,8	1,5 ÷ 4,3	
Positive symptoms				p< 0,001[a]
M±SD	2,33 ± 0,62	2,60 ± 0,60	2,01 ± 0,48	
Me (Q$_1$; Q$_3$)	2,2 (2,0; 2,8)	2,6 (2,2; 3,0)	2,0 (1,8; 2,4)	
Min÷Max	1,2 ÷ 4,0	1,4 ÷ 4,0	1,2 ÷ 3,2	
Depression/anxiety				p = 0,319[a]
M±SD	1,39 ± 0,62	1,45 ± 0,66	1,32 ± 0,59	
Me (Q$_1$; Q$_3$)	1,0 (1,0; 1,5)	1,0 (1,0; 2,0)	1,0 (1,0; 1,5)	
Min÷Max	1,0 ÷ 4,0	1,0 ÷ 3,3	1,0 ÷4,0	

M – mean, *SD* – standard deviation, *Me* – median, *Q*$_1$ – lower quartile (25-th percentile),

Q$_3$ – upper quartile (75 – percentile), *Min* – lowest value, *Max* – highest value, a *t*-Student test; b Pearson's Chi-Quadrat-Test,; c Mann–Whitney U test;

Satisfaction with treatment

Treatment satisfaction among patients was evaluated using the CAT scale. Patients from group II expressed lower satisfaction with treatment, but the difference was not statistically significant (p=0.536). Statistics for both groups are shown in Table 4.

Table 4. Basic characteristics of patients satisfaction with the care

Variable	Sum	Group I	Group II	Gr. I vs. Gr. II
Overall result (CAT)	n = 93	n = 50	n = 43	p = 0,536[a]
M±SD	7,18 ± 2,22	7,32 ± 1,99	7,03 ± 2,47	
Me (Q_1; Q_3)	7,7 (5,7; 9,0)	7,8 (5,7; 9,0)	7,6 (5,3; 9,1)	
Min÷Max	0,7 ÷ 10,0	2,9 ÷ 10,0	0,7 ÷ 10,0	

M – mean, *SD* – standard deviation, *Me* – median, Q_1 – lower quartile (25-th percentile), Q_3 – upper quartile (75 – percentile), *Min* – lowest value, *Max* – highest value, [a] *t*-Student test; [b] Pearson's Chi-Quadrat-Test,; [c] Mann–Whitney U test;

Quality of life

The assessment of the quality of life was conducted among patients using the MANSA scale. Patients in both groups did not differ significantly in terms of their quality of life (p=0.441) (Table 5).

Table 5. Basic characteristics of the quality of life of patients

Variable	Sum	Group I	Group II	Gr. I vs. Gr. II
Overall result (MANSA)	n = 93	n = 50	n = 43	p = 0,441[a]
M±SD	3,92 ± 0,43	3,95 ± 0,40	3,88 ± 0,46	
Me (Q_1; Q_3)	4,0 (3,7; 4,2)	4,0 (3,8; 4,2)	3,9 (3,5; 4,2)	
Min÷Max	2,6 ÷ 4,8	2,7 ÷ 4,6	2,6 ÷ 4,8	

M – mean, *SD* – standard deviation, *Me* – median, Q_1 – lower quartile (25-th percentile), Q_3 – upper quartile (75 – percentile), *Min* – lowest value, *Max* – highest value, [a] *t*-Student test; [b] Pearson's Chi-Quadrat-Test,; [c] Mann–Whitney U test;

DISCUSSION

This study is the first attempt in Poland to assess needs and other clinical parameters of patients with mental disorders in detention in forensic psychiatric wards with varying degrees of security. Patients at the medium security ward reported greater needs and a greater number of unmet needs. However, the overall severity of psychopathology, including the BPRS subscales concerning deficits and positive symptoms, was higher among patients on the low security ward. These patients were older and had been in detention more often in the past than patients on the medium security ward. Importantly, people are placed on medium security wards depending not on their psychiatric diagnosis but on the nature of the offense they had committed, which in this case is more serious than for those directed to low security wards.

The study groups did not differ in terms of their satisfaction with treatment. This indicates that medical care on the wards with low and medium security is at a similar level. Patients in both groups did not differ significantly in terms of their self-assesssed quality of life. A similar result was obtained by Ruggeri et al. [25].

According to their study, the degree of security on a forensic psychiatric ward has no effect on such parameters as the subjective assessment of quality of life and satisfaction with treatment. Literature provides evidence that patients on forensic psychiatric wards report many more general needs and unmet needs than patients accessing psychiatric care outside of forensic wards [26]. Psychotic patients held in prison and those remaining under the care of forensic psychiatrists also report significantly more unmet needs than psychotic patients remaining in out-patient psychiatric care [27]. These studies share one more particular aspect. In the era of de-institutionalization of psychiatry progressing in Western Europe since the 1990s, the process of re-institutionalization has been noted and subjected to intensive scrutiny, with a growing number of beds on forensic psychiatric wards and a growing number of individuals with mental disorders residing in prisons. The exact relationship between these trends remains unclear. This area requires reliable data, information about the characteristics of the patients in various institutions, and long-term assessment of institutional policies in the field of mental health [28]. Research results suggest that the issue of the needs of people with mental conditions may affect these trends, which requires further extended analysis.

CONCLUSIONS

The results of our study indicate that the services provided at forensic psychiatric wards do not sufficiently meet the needs of patients in medium security as compared with patients in low security. These differences did not translate to the patients' quality of life and satisfaction with treatment. This may be relevant to the patients' future and prognosis, which would require a detailed and planned analysis.

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