

Research Article

Attachment Styles, Quality of Life and Service Satisfaction Outcomes in People with Schizophrenia in Israel

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Abstract

Aim: To test the hypothesized associations among satisfaction with psychiatric rehabilitation services, health-related quality of life (HRQoL), psychopathology and attachment styles in inpatients with schizophrenia.

Methods: One hundred-one patients with International Classification on Diseases, Tenth Edition (ICD-10) diagnosis of schizophrenia and duration of rehabilitation program no less than six months were recruited from the rehabilitation wards of the Sha'ar Menashe Mental Health Center, Hadera, Israel. The outcome variables and attachment styles were assessed with the standardized questionnaires, and psychopathology severity with the Positive and Negative Syndrome Scale (PANSS). Univariate and multivariate analyses were performed to examine the study hypotheses.

Results: Attachment anxiety, dissatisfaction with rehabilitation services and the severity of general psychopathology predicted poorer HRQoL, accounting for 8.7%, 13.9%, and 5.4%, respectively, of the total variance ($R^2=.30$; Adjusted $R^2=0.26$; $F_{4,100}=7.98$, $p<0.001$). In turn, the HRQoL was the only predictor of service satisfaction, accounting for 17% of the variance ($R^2=.17$; Adjusted $R^2=0.13$; $F_{4,101}=3.95$, $p<0.01$).

Conclusion: The results confirmed the hypothesized association between HRQoL and satisfaction with rehabilitation services. Despite this relation, attachment anxiety predicted only poorer HRQoL and more severe general psychopathology, but not service dissatisfaction. The results could contribute to the development of innovative rehabilitation strategies to improve both HRQoL and service satisfaction among inpatients with schizophrenia.

Keywords: Attachment Patterns; Satisfaction with Services; Quality of Life; Psychopathology Severity; Schizophrenia

Abbreviations

SMI: Severe Mental Illness; HRQoL: Health-Related Quality of Life; MHC: Mental Health Center; ICD-10: International Classification of Mental and Behavioral Disorders, Tenth Edition; MHCSS-H: Mental Health Client Satisfaction Scale; Q-LES-Q: Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form; RQ: Relational Questionnaire; PANSS: Positive and Negative Syndrome Scale; ANOVA: Analysis Of Variance.

Introduction

In recent decades, there is increasing interest in the systematic consideration of outcomes other than control of symptoms in the evaluation of long-term treatment effectiveness and rehabilitation for people with severe mental illness (SMI). Among others, satisfaction with health-related quality of life (HRQoL) and satisfaction with services are considered to be valuable outcome measures that contribute to the improvement of both quality of life and quality assurance procedures among clients of mental health centers (MHCs) [1,2]. Because many people with SMI have insecure attachment styles that are considered to be risk factors for development and persistence

of psychopathology [3-9], we explored to what extent attachment styles are associated with satisfaction with rehabilitation services, HRQoL and severity of psychopathology among inpatients with schizophrenia.

The two recently published systematic reviews of the literature on attachment and psychosis [10,11] demonstrated clinical relevance of attachment style construct to development, course and treatment of psychosis: insecurely attached people have more severe positive, negative and affective symptoms [4], maladaptive coping strategies [12], showed poorer quality of therapeutic alliance [13] and engagement with services [14-15], and recovery style [16-18]. Clients attending MHCs are in contact with multiple professionals and may therefore develop attachments to psychiatric teams or services in general [19-20]. This tendency may be increased by recent mental health policies which allocate people to teams of staff rather than key workers [15]. Attachment to MHC in turn may influence the appraisal of satisfaction with the received service and be closely associated with users' HRQoL in general. A recent study [21] examined the extent to which individuals' appraisal of satisfaction with the received service was influenced by their own attachment style and found that clients

with a more insecure attachment style indicated lower levels of attachment to services, independent of psychotic symptom severity. No analogical study has been conducted in Israel.

In this study we will focus on inpatient rehabilitation services for several reasons. First, these services provide a number of interventions to teach users social skills necessary for further daily living in the community and improving quality of their lives. The sense of attachment security facilitates engagement in exploration [22], whereas attachment insecurity impairs acquiring of the skills. Second, users of these services are separated from primary attachment figures for extended time periods and that alone may cause feeling of insecurity and activating their attachment needs. Under such conditions, only mental health personnel may play a role of attachment figures for rehabilitation service users [15,20,23]. Third, MHC users' attachment styles would affect their satisfaction with services and quality of their lives, if the severity of psychopathological symptoms could be controlled for [24].

Satisfaction with services is a subjective condition that results from the comparison between clients' expectations about health care provision and their actual experiences [25,26]. From the service perspective, satisfaction with service can be seen as a result of the ability of the service to provide a standard of care above a certain quality threshold, and the perception of each patient that the care received has been tailored to the patient's own problems [27]. By assessing client satisfaction, clinicians and health managers can learn the client's opinion regarding the services received, and also obtain a quality indicator of the centers' functioning [28]. Assessment of patients' satisfaction with MHCs has been recommended for improving the quality of services [29].

Clinical trials across many areas of medicine characteristically include HRQoL as an important outcome variable [30-33]. Several researchers have recommended that HRQoL be part of any outcome evaluation of treatment of patients with SMI [24,34,35]. A considerable body of studies [24,36,37] had shown that HRQoL in schizophrenia is substantially impaired, independent of stage of the illness, with positive, negative and depressive symptoms and side-effects of medication as well as dissatisfaction with social relationships as the major determinants of this impairment. Although several studies regarding HRQoL as the outcome variable in assessing effectiveness of treatment among people with SMI have been performed during the last decade in Israel [30-40], a survey addressing satisfaction with services along with HRQoL is lacking. Such information is needed to improve both quality assurance procedures and HRQoL of the MHCs' users.

The attachment theory proposes that attachment is the base upon which emotional health, social relationships, and one's worldview are built [22,41]. The ability to trust and form reciprocal relationships with the primary caregiver during the first two years of a child's life will affect the emotional health, security, and safety of the child, as well as the child's development and future interpersonal relationships [42]. Although there are different ways of conceptualizing adult attachment [43], based on the notion that attachment style can be determined by a person's model of self (positive or negative) and of others (positive or negative), Bartholomew and Horowitz [44] proposed a four-category attachment style model and this is the model

used in this study. Specifically, individuals with a "secure" attachment style (self and other are both positive) are characterized by a sense of self-worth and a trust that others will be available and supportive in times of stress and adversity; they are comfortable seeking and expecting support from others. Individuals with a "preoccupied" attachment style (negative self, positive other) are preoccupied by attachment needs and depend on others for personal validation, acceptance, and approval. Those with "fearful" attachment (self and other both negative) regard others as uncaring and unavailable and themselves as unlovable. "Dismissing" individuals (positive self, negative other) remove themselves from others, regarding themselves as self-sufficient and invulnerable to abandonment by others.

Most investigators who use self-report measures of adult attachment style [43-45] agree that two primary dimensions are involved—attachment anxiety and attachment avoidance—and that "these two dimensions represent different ways of regulating the distress and insecurities resulting from a failure to find external or internal sources of comfort and support" [46]. The anxiety dimension assesses the degree to which individuals worry about being rejected, abandoned, or unloved by significant others and reflects underlying negative self-model and positive other-model [44]. The avoidance dimension evaluates the degree to which individuals limit intimacy and interdependence with others and reflects underlying positive self-model and negative other-model [44]. In adult attachment research, there is growing consensus that individual differences are best measured in terms of the attachment anxiety and avoidance dimensions that underlie the four attachment prototypes [46,47].

The present study aimed: 1) to evaluate satisfaction with inpatient psychiatric rehabilitation services and HRQoL outcomes among people with schizophrenia at a conventional state-funded MHC in Israel, and 2) to examine the relations between attachment styles and both outcomes, controlling for potentially confounding effects of psychopathology severity. We hypothesized that 1) satisfaction with services is positively related to life satisfaction; and 2) insecure attachment styles are negatively related to satisfaction with services and quality of life, whereas positively to the current psychopathology.

Materials and Methods

Setting

The setting for this study was the state-funded Sha'ar Menashe Mental Health Center that is the greatest psychiatric institution in both Israel and Middle East. The center has 420 beds distributed as follows: 130 acute, 90 chronic, 35 geriatric, 40 rehabilitation and 125 maximum high security beds. The hospital serves a catchment area with a mixed Arab-Jewish, lower and middle-income population of 830,000.

Participants

One hundred-one patients from rehabilitation and partly chronic wards were recruited for this study during 2012 according to the following inclusion criteria: 1) ICD-10 diagnosis of schizophrenia [48]; 2) duration of treatment no less than six months, and 3) sufficient comprehension skills to provide written informed consent for participation in the study. Patients with comorbid serious medical illnesses and organic brain syndromes were not enrolled. The rationale

of the selection criteria was to create a homogeneous cohort of typical users of inpatient rehabilitation services. After explanation of the study aims and procedure all participants provided written informed consent for participating in the study as approved by the Institutional Review Boards for Human Studies.

Measures

The main outcome variables were measured with the Mental Health Client Satisfaction Scale [49,50], adapted for use with inpatient rehabilitation services, and Quality of Life Enjoyment and Satisfaction Questionnaire-Short Form [51]. The predictor variables were measured with the Relational Questionnaire [44] and the Positive and Negative Syndrome Scale [52].

Mental health client satisfaction scale

The MHCSS-H is a validated Hebrew version of the Charleston Psychiatric Satisfaction Scale [50]. This is self-report multidimensional questionnaire is designed to measure satisfaction with mental health services. Sixteen items describe five service domains (Availability/Accessibility, Quality of care, Explanation/Participation, Staff's attitude, and Facilities conditions) of satisfaction, including two anchor items ("Overall quality of the care provided" and "Would you recommend this clinic to a friend or relative?"). Responses are rated on a 5-point Likert scale ranging from 1 ("very dissatisfied") to 5 ("very satisfied"). For this sample, internal consistency of the MHCSS-H was excellent (Cronbach's alpha = 0.94) [50].

Quality of life enjoyment and satisfaction questionnaire

The Q-LES-Q is a self-report form composed of 16 items, each rated on a 5-point scale that indicates the degree of enjoyment or satisfaction experienced over the past week. A total score of 1 to 15 items is computed. The items evaluated each subject's satisfaction with: their physical health; social relations; ability to function in daily life; ability to get around physically; mood; family relations; sexual drive and interest; ability to work on hobbies, work, leisure time activities; economic status; household activities; living/housing situation; medication and overall sense of well-being. To avoid augmenting scores, global item 16, 'life satisfaction and contentment over the last week', was not included in the total score. The Q-LES-Q was validated in Hebrew elsewhere [24]; for the present sample, Cronbach's alpha was 0.91.

Relational questionnaire

The RQ is used to assess adult attachment styles: they are described by 4 brief statements and participants are asked to endorse the statement that is most self-descriptive (they are described in the Introduction section). In addition to the categorical forced-choice approach we also applied the dimensional approach, asking participants to indicate how much each description corresponded to their general relationship style. Responses were rated on a 7-point Likert-type scale ranging from 1 ("Not at all like me") to 7 ("Very much like me"). Completing the forced-choice section first serves to counterbalance and minimize order effects when participants rank the degree to which each prototype characterizes them. The attachment anxiety dimension was calculated as (fearful plus preoccupied scores) minus (secure plus dismissing scores) and the attachment avoidance dimension was computed as (fearful plus dismissing scores) minus (secure plus preoccupied scores) [53]. The validity of this attachment

classification has been demonstrated by its empirical relationships to self-concept and interpersonal functioning [44] and to psychological wellbeing and social functioning [54].

To ensure completion of the self-reported questionnaires, the researcher (MA) did read the items to the participants. In the end of the session, the researcher used the PANSS for assessing the severity of positive, negative and general psychopathological symptoms. Its 30 symptom items are scored from absent (1) to extreme problem (7). The Cronbach's α for the present sample was 0.70 for the positive scale, 0.92 for the negative scale, and 0.87 for both general psychopathology scale and PANSS as a total.

Statistical analyses

Pearson product moment correlations were calculated to test the relationships among all measures. To test our hypotheses, firstly, univariate analyses comparing intergroup measurements were performed using ANOVA with Tukey HSD post-hoc single comparisons. Then multiple regression analyses on linear models were performed to predict service satisfaction and quality of life outcomes from insecure attachment dimensions (anxiety and avoidance), controlling for the severity of positive, negative and general symptomatology. For all analyses, the level of statistical significance was established at $p < .05$. Statistical analyses were performed with SPSS version 17 for Windows (SPSS Inc., Chicago, IL) (Table 1).

Results

Sample characteristics

Basic sociodemographic and clinical characteristics of the participants show in Table 1. The vast majority of patients was men with the diagnosis of paranoid schizophrenia (ICD-10: F20.0) and typical age of onset in young adulthood. The severity of psychopathology, as measured by PANSS total and subscale scores, was moderate. Forced-choice one of the four RQ attachment styles resulted in 30 patients with secure, 20 patients with fearful-avoidant, 11 patients with preoccupied and 37 patients with dismissing-avoidant patterns (Table 2).

Sample characteristics by attachment style

Table 2 presents and compares the sociodemographic and clinical characteristics, as well as MHCSS and Q-LES-Q mean scores across the four RQ attachment styles. ANOVA with post-hoc tests showed no significant differences in all variables studied, except for earlier onset ($F=2.80$, $df=3$, $p<.05$) and longer duration ($F=3.13$, $df=3$, $p<.05$) of the disorder in patients with the preoccupied attachment style versus securely attached patients, and a greater number of psychiatric admissions in those with preoccupied attachment compared to patients with other attachment styles ($F=4.12$, $df=3$, $p<.01$) (Table 3).

Correlation analysis

Table 3 presents correlations among the parameters of interest. We found that satisfaction with services was positively and moderately correlated to HRQoL ($r=.39$, $p<.01$), but not with other variables. Attachment anxiety was negatively correlated to HRQoL ($r=-.33$, $p<.01$) and positively to PANSS total score ($r=.24$, $p<.05$), positive syndrome ($r=.23$, $p<.05$) and general psychopathology ($r=.31$, $p<.01$) scores. Conversely, Attachment avoidance demonstrated significant

Table 1: Basic characteristics of the sample (n=101).

Characteristic	n	%
Gender		
Male	91	90.1
Female	10	9.9
RQ attachment styles		
Secure	30	30.6
Fearful-avoidant	20	20.4
Preoccupied	11	11.2
Dismissing-avoidant	37	37.8
	Mean	SD
Age at examination (yr.)	37.5	11.1
Age at first psychiatric contact (yr.)	23.3	7.2
Duration of disorder (yr.)	13.8	10.1
Number of hospitalizations	10.3	11.0
Duration of last hospitalization (mo.)	26.7	37.4
PANSS total score	63.8	12.6
Positivesyndrome	13.2	4.2
Negative syndrome	20.0	4.9
General psychopathology	30.5	5.8
Quality of life (Q-LES-Q)	3.73	.75
Satisfaction with services (MHCSS)	3.67	.75

RQ= the Relationship Questionnaire [44]

PANSS = the Positive and Negative Syndrome Scale [52]

Q-LES-Q = the Quality of Life Enjoyment Satisfaction Questionnaire[51]

MHCSS = Mental Health Client Satisfaction Scale [49]

Table 2: Demographic and clinical characteristics, quality of life and satisfaction with services across the RQ attachment patterns.

Variable	A. Secure (n=30)		B. Fearful-avoidant(n=20)		C. Preoccupied (n=11)		D. Dismissing-avoidant(n=37)		ANOVA (df=3,101) F-value	Tukey HSD post-hoc comparisons
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Age (yr.)	35	7.8	35.5	11.2	39.6	13.1	39.1	12.1	1.12	A=B=C=D
Education (yr.)	11.5	1.8	9.7	3.8	10.9	2.7	10.8	2.8	1.64	A=B=C=D
Age at first psychiatric contact (yr.)	25.1	7.3	21.6	6	18.7	4.7	24.3	8	2.80*	A=B=D>C
Duration of disorder (yr.)	10.4	7	13.3	11.05	20.5	12.5	14.2	9.3	3.13*	A<C
Number of hospitalizations	7.1	9.5	9.8	8.3	20.3	19.7	10.2	8.9	4.12**	A=B=D<C
Duration of last hospitalization (mo.)	21.3	18.1	20	25.7	10.8	12.9	35.3	49.7	1.97	A=B=C=D
Q-LES-Q	3.9	0.7	3.5	0.9	3.6	0.5	3.69	0.6	1.11	A=B=C=D
MHCSS	3.8	0.8	3.8	0.8	3.6	0.4	3.6	0.6	0.5	A=B=C=D
PANSS, total score	59.3	8.7	68.2	11.1	62.6	10.2	63.5	13.4	2.5	A=B=C=D
POSITIVE syndrome	11.6	2.5	14.7	4.7	13.2	2.8	13.4	4.8	2.51	A=B=C=D
NEGATIVE syndrome	19.1	4.1	21	4.9	19.3	5.6	19.8	5	0.7	A=B=C=D
GENERAL psychopathology	28.6	4.06	32.5	4.9	30.2	4.6	30.1	6	2.32	A=B=C=D

Note: ^aQ-LES-Q = the Quality of Life Enjoyment Satisfaction Questionnaire [51]

^bMHCSS = Mental Health Client Satisfaction Scale [49]

^cPANSS = the Positive and Negative Syndrome Scale [52]

^dRQ = the Relationship Questionnaire [44]

*p <.05, ** p<.01, *** p<.001

Table 3: Correlation matrix for continuous variables (n=101).

Variable	1	2	3	4	5	6	7	8
1. Attachment anxiety ^a	-							
2. Attachment avoidance ^a	-.183	-						
3. PANSS ^b total	.239*	-.263**	-					
4. Positive syndrome ^b	.227*	-.215*	.753**	-				
5. Negative syndrome ^b	.070	-.200*	.817**	.359**	-			
6. General psychopathology ^b	.305**	-.231*	.919**	.589**	.650**	-		
7. Q-LES-Q ^c	-.333**	.078	-.217*	-.066	-.140	-.314**	-	
8. MHCSS ^d	-.069	.086	-.178	-.072	-.187	-.178	.389**	-

Note: * - p<0.05, ** - p< 0.01.

^aRQ= the Relationship Questionnaire [44]

^bPANSS = the Positive and Negative Syndrome Scale [52]

^cQ-LES-Q = the Quality of Life Enjoyment Satisfaction Questionnaire [51]

^dMHCSS = the Mental Health Client Satisfaction Scale [49]

Table 4: Regression models for predicting quality of life^a and satisfaction with services^c from insecure attachment styles ^band psychopathology dimensions^d.

<i>Quality of life outcome</i>	β	t-value ($\beta=0$)	p	Total % variance accounting for
Predictors				
Attachment anxiety	-.23	2.48	.015	8.7%
Satisfaction with services	.34	3.88	<.0001	13.9%
PANSS general psychopathology	-.38	2.75	.007	5.4%
Excluded variables				
PANSS positive syndrome	.19	1.75	.083	--
Model properties: R ² = 0.30; Adjusted R ² =0.26; F(4,101)=7.98; p < .0001				
<i>Satisfaction with services outcome</i>	β	t-value ($\beta=0$)	p	Total % variance accounting for
Predictors				
Quality of life	.403	3.88	<.0001	17%
Excluded variables				
Attachment anxiety	-.065	.623	.535	--
PANSS positive syndrome	-.034	.286	.755	--
PANSS general psychopathology	.054	.342	.733	--
Model properties: R ² = 0.17; Adjusted R ² =0.13; F(4,101)=3.95; p = .003				

Note: ^aQ-LES-Q = the Quality of Life Enjoyment Satisfaction Questionnaire [51]

^bRQ [44]

^cMHCSS = Mental Health Client Satisfaction Scale [49]

^dPANSS = the Positive and Negative Syndrome Scale [52]

negative associations with all PANSS subscale and total scores. In addition, a significant negative correlation between HRQoL and PANSS general psychopathology scores was noted (r=-.31, p<.01) (Table 4 and Figure 1).

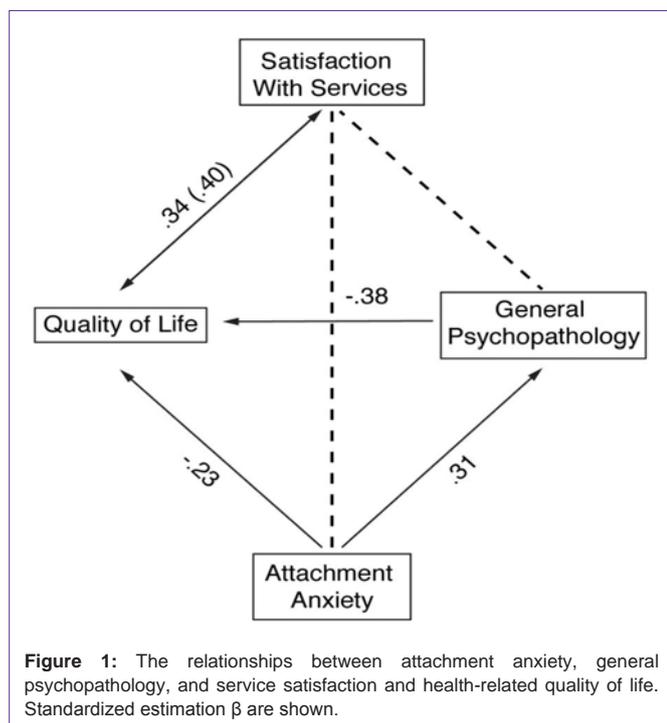
Predicting HRQoL and service satisfaction

Table 4 summarizes the results of regression analyses testing our hypotheses about associations between attachment dimensions and satisfaction with HRQoL (model 1) and between attachment dimensions and service satisfaction (model 2), and controlling for the severity of psychopathological symptoms. In the first model, the HRQoL outcome was predicted by attachment anxiety, satisfaction with services and PANSS general psychopathology, which accounted for 8.7%, 13.9%, and 5.4% of the total variance, respectively(R²=.30;

Adjusted R²=0.26; F_{4,101}=7.98, p<0.001). In the second model, the service satisfaction was predicted by only HRQoL, accounting for 17% of the total variance (R²=.17; Adjusted R²=0.13; F_{4,101}=3.95, p=<0.01). Figure 1 illustrates the obtained results.

Discussion

To our knowledge, this is the first study that examined associations among attachment styles, psychopathology, and satisfaction with inpatient rehabilitation services and quality of life among individuals with schizophrenia. The results confirmed our hypotheses only in part. As expected (hypothesis 1), there was a significant positive association between HRQoL and satisfaction with services. However, contrary to our assumption (hypothesis 2), only attachment anxiety was associated with HRQoL but not with service satisfaction,



whereas attachment avoidance was not linked to either. The findings suggest that interventions reducing both attachment anxiety and general psychopathology could improve the users' HRQoL and thus satisfaction with rehabilitation services.

In the present study we used both dimensional and categorical approaches, each of which had an advantage resulting in specific findings. While the head-to-head comparisons of the attachment styles failed to find an association with both satisfaction with HRQoL and services, the dimensional approach revealed a significant negative association between attachment anxiety and HRQoL. The categorical approach, in turn, enabled revealing a positive association between the preoccupied attachment style and the indicators of the severe course of disorder (early onset, longer duration and numerous psychiatric admissions), whereas the current levels of positive, negative and general symptoms were comparable across the individual attachment styles. In contrast, the dimensional approach demonstrated the associations of attachment anxiety with the current levels of positive and general symptoms, whereas attachment avoidance correlated with all types of symptom severity.

Although we found a significant positive association between HRQoL and satisfaction with services and a negative association between HRQoL and anxiety attachment as well, both anxiety and avoidance insecure dimensions were not directly linked to service satisfaction. The latter finding contrasts with Blackburn et al.'s study [21] which found an association between insecure attachment styles and poor attachment to mental health services. Our findings could be explained from the perspective of attachment-related affect regulation strategies [43,55]. According to this theory, people with anxiety attachment (preoccupied by attachment needs and dependent on others for personal validation, acceptance, and approval) use a hyperactivating strategy of affect regulation to reduce their distress in threatening situations by proximity seeking to an attachment

figure. In the context of service satisfaction, it means that being more dependent on therapeutic relationships and more sensitive to any clues of neglect and abandonment, they are often dissatisfied with the relationships created in response to their engagement. Conversely, people with avoidant types of attachment over-regulate their affect and avoid relational situations that are likely to be distressing; attachment avoidance is associated with fear of intimacy and low levels of emotional involvement in close relationships [56-58]. Using affect regulation deactivating strategies, patients with avoidant attachment are more likely to have difficulties in engagement and developing a therapeutic alliance, in help seeking, and in adhering to treatment and services.

Although both dimensions of attachment insecurity (anxiety and avoidance) were significantly related to the current levels of psychopathology, the prototypical approach revealed that only the preoccupied attachment style was associated with the indicators of the severe course of the illness. The results lend support to previous findings which demonstrated that individuals with schizophrenia who have the preoccupied and fearful-avoidant attachment styles were most symptomatic and distressed [59], and had earlier onset of the illness and longer durations of psychiatric hospitalizations [5]. These findings are also consistent with studies that demonstrated the positive association of insecure attachment styles with emotional dysregulation and with symptoms of both depression and generalized anxiety in a non-clinical sample [60] and in "situational depression" [61] and schizophrenia, as well [61,62], suggesting that insecure attachment styles promote ineffective emotion regulation and increases the risk for these disorders. Interestingly, out of all the PANSS dimensions, only the current level of general psychopathology (i.e. mainly, depressive and anxiety symptoms) was a significant predictor of HRQoL (5.4% of the total variance) but not satisfaction with services. The findings suggest that although non-specific psychopathology and attachment anxiety play defined roles in HRQoL appraisal, their role in the user's subjective evaluation of satisfaction with inpatient services seems negligible. Interestingly, however, our predictors of HRQoL are consonant with the factors that Blackburn et al [21] found to be correlated with client attachment to mental health services. That study found that patients from psychiatric rehabilitation units with more insecure attachment styles and greater severity of depression demonstrated lower levels of attachment to services. Taken together, these findings lend support to the meaningful inter-correlation between HRQoL and satisfaction with services, which was found in our study.

Strengthens and limitations

The relatively large sample size enhances robustness of the study findings. The use of the complementary approaches to attachment conceptualization (categorical vs. dimensional) appeared to be productive and enabled the important accessory findings. Although the overall sample size is reasonable, there are relatively small numbers of patients in each insecure group, which precluded controlling for other variables, and might impact on the validity of the findings of our inter-category comparisons. However, these findings were validated by regression analysis using the dimensional approach as a better way of investigating the associations among attachment, quality of life, service satisfaction and the severity of general psychopathology. Another limitation is that the study's participants were self-selected

people with schizophrenia in inpatient rehabilitation setting and, hence, generalization of the study findings to people from other psychiatric settings and diverse populations should be considered with great caution.

Clinical implications

Our findings that insecure attachment dimensions are differentially linked to HRQoL and service satisfaction provides useful information for clinical interventions. For example, they suggest that if the desired outcome is to improve an individual's mental health-related quality of life, interventions fostering increased security could be useful for only anxiously attached patients. The simplest way to achieve this goal is reduction of general psychopathological symptoms (depression and anxiety) with antidepressant drug treatment. There are many other treatment options relevant to attachment styles and affect regulation (e.g., cognitive-behavioral, interpersonal and individual therapies, stress management, enhancement of coping skills, etc.), a more nuanced discussion of which remain beyond the scope of the current study. If the patient scores high on attachment anxiety, lowering the general symptoms and raising HRQoL could indirectly result in more satisfaction with services received. Another possibility is therapeutic interventions focusing on improving the quality of interpersonal relationships that may have an indirect effect of increasing attachment security. A study that demonstrated a significant change from insecure to secure attachment style over the course of time-limited individual therapy [63] supports this therapeutic option. Proposed effects of oxytocin (a neurohypophysial hormone) on social emotions and relationships (increasing trust and reducing fear) in healthy samples [64] and individuals with schizophrenia [65,66] present a new treatment option, which warrants further investigation. In the framework of a cognitive interpersonal approach [67], identification of certain attachment styles could help in the choice of primary and secondary forms of therapy in early phases of the development of morbid processes. For example, a prospective study showed that attachment styles predicted improvement in pre-psychotic symptoms and functioning during six-month psychosocial need-adapted treatment among persons with at-risk mental states for psychosis [68]. Finally, knowledge of the patient's attachment style can predict recovery style and, hence, therapeutic outcome. For instance, it may help to understand why insecurely attached patients use sealing-over instead of integrating recovery strategies. As a previous study showed, 'sealers' had a history of insecure attachment and vulnerable self-esteem and were unable to face up to the personal impact of a psychosis [16]. Understanding of the relationship between recovery style and engagement will be a step forward in designing interventions to enhance engagement with services [14].

In conclusion, the results confirmed the hypothesized association between HRQoL and satisfaction with rehabilitation services. However, attachment anxiety predicted dissatisfaction only with HRQoL. This information could contribute to the development of innovative rehabilitation strategies to improve both HRQoL and service satisfaction among inpatients with schizophrenia.

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