

This is the accepted manuscript of the following article:

Vázquez-Reyes, A., Ángeles Pérez-San-Gregorio, M., Martín-Rodríguez, A., & Vázquez-Morejón, A. J. (2021). Ten-year follow-up of social functioning and behaviour problems in people with schizophrenia and related disorders. *International Journal of Social Psychiatry*, 68(7), 1324–1335.

<https://doi.org/10.1177/00207640211023083>.

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Ten-year follow-up of social functioning and behavior problems in people with schizophrenia and related disorders

Journal:	<i>International Journal of Social Psychiatry</i>
Manuscript ID	Draft
Manuscript Type:	Original Research Article
Date Submitted by the Author:	n/a
Complete List of Authors:	Vázquez-Reyes, Antonio; Virgen del Rocio University Hospital,
Keywords:	schizophrenia, psychotic disorders, bipolar disorders, social functioning, behavior problems, gender
Abstract:	<p>Background: In recent years, several variables in the course of schizophrenia and related psychotic disorders have been studied. However, an instrumental analysis of the evolution of social functioning and behavior problems has scarcely been explored.</p> <p>Aim: To analyze the evolution of social functioning and behavior problems and find any diagnosis or gender differences.</p> <p>Method: The Social Functioning Scale (SFS) and the Behavior Problems Inventory (BPI) were administered in Stages I (2003-2007) and II (2014-2017) to 100 close relatives of patients under treatment at a Community Mental Health Unit. A related samples t-test, analysis of variance and multivariate analysis of variance were performed to study the evolution and differences in social functioning and behavior problems. Then a stepwise multiple linear regression analysis was done to predict the evolution of social functioning.</p> <p>Results: No deterioration in the evolution of social functioning or behavior problems was observed, and schizophrenia patient scores were lower. Women scored higher in withdrawal/social engagement, interpersonal behavior, independence-performance, independence-competence and total social functioning, with no significant differences in behavior problems. Previous social functioning, underactivity/social withdrawal and education are predictive factors in the evolution of social functioning.</p> <p>Conclusion: The results show the need for implementing psychosocial intervention programs that promote functional recovery and keep problems from becoming chronic.</p>

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3 **Ten-year follow-up of social functioning and behavior problems in people with**
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5 **schizophrenia and related disorders**
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For Peer Review

Introduction

Schizophrenia and related psychotic disorders, which make up most of the severe mental disorders and are a public health problem, have been associated with significant deterioration in social functioning (Grove et al., 2016), an increase in disability (World Health Organization, 2011) and considerable socioeconomic cost (Chong et al., 2016; Knapp et al., 2004).

Having surpassed the classic view of progressive deterioration and poor course, and reductionist attention to clinical symptoms (Bleuler, 1950; Kraepelin, 1919), the functional area emerges as a core dimension of recovery (Best et al., 2020; Correll, 2020). Studies have emphasized achievement in psychosocial domains as indicators of favorable evolution (Buonocore, 2018; Liberman et al., 2002; Morin & Franck, 2017). Thus, social functioning has become a strategic area in the study of severe mental disorders, and there is agreement on its consideration as a robust marker of treatment success ahead of clinical symptoms (Burns & Patrick, 2007; Liberman et al., 2002; Peer et al., 2007), making it an essential factor for community adaptation (Johnstone et al., 1990) and evolution of the illness (Rajkumar & Thara, 1989).

Social functioning is a multidimensional construct referring to personal skills for everyday social tasks and an adequate social life (Birchwood et al., 1990; Hirschfeld et al., 2000). It can be analyzed on three levels: 1) social achievements, with global measures such as education, marital status or occupation (Hambrecht et al., 1990), 2) social roles, referring to the execution of certain roles, and 3) instrumental behavior, which involves specific analysis of functioning in different areas and dimensions (Mueser & Tarrier, 1998). Nevertheless, most studies have analyzed global aspects or social achievements, ignoring instrumental analysis of social functioning and impeding identification of specific patient needs.

Among other factors, behavior problems, understood as the behavioral manifestation of underlying psychopathology (Wykes & Sturt, 1986), are closely linked to adaptation and social

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3 adjustment (Brewin et al., 1987). However, even though there are studies relating behavior
4 problems with autonomy (Vázquez-Morejón & Jiménez-García-Bóveda, 1994; Wykes, 1982),
5 family burden (Bellido-Zanin, Vázquez-Morejón, Pérez-San-Gregorio & Martín-Rodríguez,
6 2017; Othman & Salleh, 2008) or family coping (Vázquez-Morejón et al., 2013), they are
7 limited to analyzing their course and possible relationship between behavior problems and
8 social functioning.
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12 In addition to behavior problems, diagnosis is a variable related to differences in the
13 evolution of social functioning. Despite studies having found stability and even recovery during
14 the course of schizophrenia (Lieberman & Kopelowicz, 2002; Lieberman et al., 2002; Strauss et
15 al., 2010), there is a consensus that social functioning is more deteriorated in it than in other
16 psychotic disorders or bipolar disorder that have a more favorable prognosis (Gee et al., 2016;
17 Harrow et al., 2005; Robinson et al., 2004). However, studies have focused mainly on analysis
18 of global social functioning, impeding identification of specific dimensions that are more
19 affected, and therefore, need more clinical attention.
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24 Gender is also a factor related to heterogeneity in premorbid social functioning as well as
25 during the course of the illness (Andia et al., 1995). Some studies have found better results in
26 women, both premorbid and during the course of illness (Haas & Sweeney, 1992; Leung &
27 Chue, 2000; Thorup et al., 2007). In this sense, the best social adjustment during the course of
28 the illness has been associated with more premorbid social functioning, better cognitive
29 functioning and late age of onset (Castle et al., 2000; Lieberman et al., 2002). However, again,
30 most gender studies do not analyze the social functioning dimensions, so it cannot be known
31 whether better social functioning in women is due to higher performance in all areas or in some
32 of them, or whether there are specific gender needs (Jiménez-García-Bóveda et al., 2000; Haas
33 et al., 1990).
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38 Our objective was to study the evolution of social functioning and behavior problems, and
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3 find any diagnosis or gender differences during a ten-year follow-up in patients with
4 schizophrenia and related psychotic disorders.
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8 9 **Method**

10 11 *Participants*

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14 The study sample consisted of 100 patients diagnosed with schizophrenia and related psychotic
15 disorders: schizophrenia (ICD-10 F.20, n=55), other psychotic disorders (ICD-10 F.21-F.29,
16 n=28) and bipolar type I disorder (ICD-10 F.31, n=17). All of them were in treatment at a
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19 Community Mental Health Unit (CMHU, Virgen del Rocío University Hospital, Seville, Spain)
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22 in two different periods: 2003-2007 (Stage I) and 2014-2017 (Stage II).
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26 Evaluation tests were completed by close relatives who had frequent contact with the
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28 patient. Of the original number of participants, 15 would not let their close relative fill in the
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30 evaluation, 14 had no close relative available and 44 had been transferred to another healthcare
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32 district, leaving a total of 100 patients who completed the follow-up period (Figure 1). Of these,
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34 64 were men (64%) and 36 women (36%). The mean age of participants in Stage I was 38.26
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36 ($SD=10.65$; range=18-65), while in Stage II it was 51.42 ($SD=10.51$; range=30-77). The
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38 distribution by marital status was 77 single (77%), 13 married (13%), 9 separated (9%), and
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40 one widow (1%) in Stage I, while in Stage II 77 were single (77%), 12 married (12%), 10
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42 separated (10%) and one widow (1%).
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47 Close relatives in Stage I were: 60 mothers (60%), 16 fathers (16%), 8 spouses (8%), 12
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49 siblings (12%), 4 other family members (4%). Of these, 74 (74%) were women and 26 (26%)
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51 were men. In Stage II, 48 (48%) were mothers, 5 fathers (5%), 10 spouses (10%), 29 siblings
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53 (29%), and eight other family members (8%). Of the total, 71 (71%) were women and 29 (29%)
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55 men.
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59 The inclusion criteria were: 1) be of legal age, 2) have been diagnosed with schizophrenia
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or related psychotic disorders, 3) agree to participate in the study. Inclusion criteria for close

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3 relatives were voluntary participation in the study and have been selected by the patient as the
4 person knowing most about their condition. The exclusion criteria were having a severe organic
5 disease or abuse or dependence on toxic substances.
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9 10 *Instruments and measures*

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12 *Social Functioning Scale (SFS, Birchwood et al., 1990)*: This scale evaluates the most
13 significant facets of social functioning in schizophrenia patients. It has 77 items divided in
14 seven dimensions: withdrawal/social engagement, scored from 0 to 15, interpersonal behavior
15 scored from 0 to 9, prosocial activities, scored from 0 to 66, recreation, scored from 0 to 45,
16 independence-performance scored from 0 to 39, independence-competence scored from 13 to
17 39 and employment/occupation scored from 0 to 10. Higher scores show higher level
18 functioning in each dimension. A total score classifies the social functioning level as low (<96
19 points), medium (96-106) or high (>106).
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31 The scale has a self-report version (SFS-SR) to be filled out by the patient and an informant-
32 report (SFS-IR) filled in by a relative who knows the patient well. For this study, we used the
33 SFS-IR because it has demonstrated more sensitivity in evaluating social functioning than the
34 SFS-SR, which has a higher tendency to self-evaluation bias (Jiménez-García-Bóveda et al.,
35 2000).
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42 Studies of the psychometric properties of both the English version of this instrument
43 (Birchwood et al., 1990) and its Spanish adaptation (Vázquez-Morejón & Jiménez-García-
44 Bóveda, 2000) have supported its validity and reliability, and internal consistency (Cronbach's
45 alpha) of $\alpha=.85$, and three-month temporal reliability $\alpha=.84$. The internal consistency in our
46 sample for Stage I was: withdrawal/social engagement $\alpha=.55$, interpersonal behavior $\alpha=.58$,
47 prosocial activities $\alpha=.84$, recreation $\alpha=.70$, independence-performance $\alpha=.83$, independence-
48 competence $\alpha=.87$, employment/occupation $\alpha=.37$, and total $\alpha=.91$. In Stage II it was:
49 withdrawal/social engagement $\alpha=.57$, interpersonal behavior $\alpha=.68$, prosocial activities $\alpha=.86$,
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3 recreation $\alpha=.79$, independence-performance $\alpha=.87$, independence-competence $\alpha=.89$,
4 employment/occupation $\alpha=.31$, and total $\alpha=.93$. We selected this instrument because it can
5 evaluate specific areas of social functioning, and furthermore, its items refer to observable
6 quantifiable behaviors, reducing possible evaluation bias.
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12 *The Behavior Problem Inventory (BPI*, Vázquez-Morejón et al., 2005; Vázquez-Morejón et al.,
13 2018): Was designed to evaluate behavior problems in patients with psychotic disorders. It has
14 14 items and three dimensions: underactivity/social withdrawal (scored from 0 to 15), active
15 problems (scored from 0 to 15) and lack of impulse control (scored from 0 to 12). Two more
16 indices can be found: moderate behavior problems (MBP, number of items with scores equal
17 to or over 2, scored from 0 to 14) and severe behavior problems (SBP, number of items with
18 score equal to 3, scored from 0 to 14). Higher scores indicate worse behavior problems. The
19 answers refer to observable behavior during the three last months on a Likert-type scale:
20 0=never, 1=a few times, 2= sometimes and 3=often.
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33 Internal consistency in our sample in Stage I was: underactivity/social withdrawal $\alpha=.75$,
34 active problems $\alpha=.84$, lack of impulse control $\alpha=.70$, total $\alpha=.87$; and in Stage II:
35 underactivity/social withdrawal $\alpha=.78$, active problems $\alpha=.82$, lack of impulse control $\alpha=.64$,
36 total $\alpha=.88$.
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42 *Procedure*

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44 The 173 patients were selected from a census of patients with schizophrenia and related
45 psychotic disorders as diagnosed by a clinical psychologist or psychiatrist based on
46 psychopathological exploration and clinical history at a Virgen del Rocío University Hospital
47 CMHU. As shown in Figure 1, 100 patients were selected; all of them were in treatment in
48 2003-2007 (Stage I) and 2014-2017 (Stage II).
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56 In Stage I of psychological evaluation, during the programmed checkups at the center, a
57 member of the team (who had the most contact with and/or knew the family) requested the
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3 participation of close relatives and informed them that it was voluntary, and if they agreed,
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5 gave them the evaluation instruments to be filled out.
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8 At the end of Stage I evaluation and the ten-year follow-up, Stage II of the psychometric
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10 evaluation began. Contextualized within the follow-up checkups and as a normal part of the
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12 psychological evaluation, a member of the team again asked the close relatives of each patient
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14 for their voluntary participation in the study, and if they wanted to participate, they were given
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16 the evaluation scales to be filled out. In this second evaluation period, the close relative might
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18 not have been the same one who participated in Stage I, because that person either had an
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20 organic disease, was deceased or not available for exceptional reasons. However, those who
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22 were different from Stage I were a minority and met the criterion of knowing the current state
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24 of the patient well.
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29 *Statistical analysis*

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32 The analyses were done using SPSS v.24. First, multiple analyses of variance were done to
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34 measure the influence of two independent factors (each one with two levels: Stage [Stage I and
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36 Stage II] and gender [men and women]) on social functioning and behavior problems in severe
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38 mental disorders. The evolution and differences in social functioning and behavior problems
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40 were also studied by diagnosis (related samples *t*-test and analysis of variance). Data had
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42 previously been tested with the Kolmogorov-Smirnov test and found to follow a normal
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44 distribution, and the Levene test checked that the homoscedasticity criterion was met. The
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46 effect size was calculated with Cohen's *d*, interpreted as: $d < 0.20 = \text{null}$; $d \geq 0.20 < 0.50 =$
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48 small ; $d \geq 0.50 < 0.80 = \text{medium}$; $d \geq 0.80 = \text{large}$ (Cohen, 1988).
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53 Finally, a stepwise linear regression analysis was done to predict the evolution of total social
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55 functioning in Stage II (criterion or dependent variable) through the following predictor or
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57 independent variables: total social functioning in Stage I, behavior problems
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59 (underactivity/social withdrawal, active problems and lack of impulse control), education, age
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3 and diagnosis, and Stage II means. It was previously confirmed that statistical assumptions for
4 multiple linear regression analysis had been met (linearity, residual independence,
5 homoscedasticity and non-multicollinearity).
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10 11 **Results**

12 13 *Descriptive analysis*

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16 Table 1 shows the mean, median, Q1 and Q3, and the minimum and maximum scores on the
17 social functioning dimensions and behavior problems in Stages I and II.
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20 21 *Social Functioning, Behavior Problems and diagnosis*

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24 Patients with other psychotic disorders showed a significant increase in the evolution of their
25 social functioning in independence-performance ($p=.035$, $d= -0.314$, small effect size), while
26 there were no significant differences in schizophrenia or bipolar disorder patients. Moderate
27 behavior problems also diminished significantly in the group with other psychotic disorders
28 ($p=.031$, $d= 0.542$, moderate effect size), but no significant differences were found in
29 schizophrenia or bipolar disorder patients either (Table 3).
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39 With regard to differences between diagnostic categories, in Stage I patients with
40 schizophrenia had significantly lower scores than patients with bipolar disorder in interpersonal
41 behavior ($p=.007$, $d= -0.991$, large effect size). They also had a lower score in
42 employment/occupation than other psychotic disorders ($p=.008$, $d= -0.733$, moderate effect
43 size) or bipolar disorder ($p=.012$, $d= -0.794$, moderate effect size), and social functioning
44 compared to psychotic disorders ($p=.044$, $d= -0.560$, moderate effect size) and bipolar disorder
45 ($p=.023$, $d= -0.793$, moderate effect size). Patients with other psychotic disorders had a higher
46 score than patients with bipolar disorder in active problems ($p=.038$, $d= 0.775$, moderate effect
47 size). Furthermore, schizophrenia patients scored lower than those with psychotic disorders in
48 recreation with important effect sizes ($d= -0.515$, moderate effect size) and those with bipolar
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3 disorder in prosocial activities ($d = -0.526$, moderate effect size), recreation ($d = -0.565$,
4 moderate effect size) and independence-performance ($d = -0.588$, moderate effect size), while
5 they had higher scores than those with bipolar disorder in active problems ($d = 0.767$, moderate
6 effect size) and severe behavior problems ($d = 0.507$, moderate effect size). Patients with other
7 psychotic disorders scored lower than those with bipolar disorder in interpersonal behavior ($d =$
8 -0.597 , moderate effect size) and higher in moderate behavior problems ($d = 0.681$, moderate
9 effect size) and in severe behavior problems ($d = 0.557$, moderate effect size) (Table 4).

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12 In Stage II, schizophrenia patients scored lower than those with other psychotic disorders in
13 prosocial activities ($p = .022$, $d = -0.611$, moderate effect size), recreation ($p = .002$, $d = -0.783$,
14 moderate effect size), independence-performance ($p = .023$, $d = -0.618$, moderate effect size),
15 independence-competence ($p = .031$, $d = -0.597$, moderate effect size), employment/occupation
16 ($p = .000$, $d = -0.902$, large effect size), and total social functioning ($p = .001$, $d = -0.817$, large
17 effect size). Differences between schizophrenia patients and those with bipolar disorder were
18 also unfavorable to schizophrenia in interpersonal behavior ($p = .002$, $d = -1.162$, large effect
19 size), employment/occupation ($p = .000$, $d = -1.125$, large effect size), active problems ($p = .010$,
20 $d = 1.000$, large effect size) and moderate behavior problems ($p = .015$, $d = 0.928$, large effect
21 size). In addition, schizophrenia patient scores were higher than those of psychotic disorder
22 patients, also with important effect sizes, in underactivity/social withdrawal ($d = 0.507$,
23 moderate effect size) and in moderate behavior problems ($d = 0.506$, moderate effect size),
24 while they had lower scores than bipolar disorder patients in independence-competence ($d = -$
25 0.662 , moderate effect size) and in total social functioning ($d = -0.634$, moderate effect size),
26 and higher scores in lack of impulse control ($d = 0.527$, moderate effect size). Lastly, other
27 psychotic disorders scored lower than bipolar disorder patients in interpersonal behavior ($d = -$
28 0.603 , moderate effect size) and higher in active problems ($d = 0.513$, moderate effect size)
29 (Table 4).

Social Functioning, Behavior Problems, gender and stage

Tables 5 and 6 show the results of multivariate analysis of variance and associated effect sizes. No statistically significant interaction effects were found in the social functioning variables or behavior problems. The only statistically significant main effect was the influence of gender on social functioning, where women had higher scores regardless of stage in the withdrawal/social engagement ($p=.009$, $d= 0.472$, small effect size), interpersonal behavior ($p=.017$, $d= 0.452$, small effect size), independence-performance ($p=.000$, $d= 0.837$, large effect size), independence-competence ($p=.003$, $d= 0.550$, moderate effect size) and total social functioning ($p=.002$, $d= 0.603$, moderate effect size) dimensions.

Predictors of Social Functioning

The results of multiple linear regression analysis with total social functioning in Stage II as the dependent variable and as independent variables, total social functioning in Stage I, behavior problems (underactivity/social withdrawal, active problems and lack of impulse control) education, age and diagnosis (measured in Stage II), are shown in Table 7. The final model [$F_{(3,99)}=34.85$, $p=.000$] identified three predictor variables: Stage I social functioning ($p=.000$), underactivity/social withdrawal ($p=.000$) and education ($p=.016$). On the contrary, active problems, lack of impulse control, age and diagnosis were not significant and were eliminated by the model. This model explained 51.2% ($R^2=0.512$) of the variance observed in total social functioning in Stage II.

Discussion

Overall, our results reinforce studies on schizophrenia and related psychotic disorders that emphasize stability and functional recovery during its course, surpassing the classical view of progressive functional deterioration.

In agreement with previous research (Lieberman et al., 2002; Strauss et al., 2010; Häfner et

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2
3 al., 1995), our findings on the evolution of the social functioning dimensions and behavior
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5 problems show a period of stability in patients with schizophrenia. This stability seems to
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7 reflect the efficacy of intervention applied to contain possible functional deterioration, but
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9 insufficient to stimulate recovery, so a need emerges to develop psychosocial treatments that
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11 strengthen the functional area (Lieberman & Kopelowicz, 2002; Ventriglio et al., 2020). Major
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13 studies with at least 20 years of follow-up of chronic schizophrenia patients in rehabilitation
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15 programs have found social recovery of 50% to 68% of the participants (Harding et al., 1987a;
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17 Harding et al., 1987b; Harding et al., 1992). Therefore, our results demonstrate the need for
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19 developing and ensuring access to psychosocial intervention based on evidence in the early
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21 stages that promote recovery through training in social skills, supporting employment,
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23 prosocial community training or family intervention, to facilitate community adaptation and
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25 integration and avoid chronicity (Armijo et al., 2013; Leopold et al., 2020; Norman et al., 2017;
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27 Rummel-Kluge & Kissling, 2008).

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33 The results for other psychotic disorders coincide with previous studies which have shown
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35 recovery of social functioning (Gee et al., 2016; Harrow et al., 2005; Robinson et al., 2004),
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37 significantly increasing skills related to independence-performance and their consequent
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39 community adaptation. In agreement with Tohen et al. (2000), there were no differences from
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41 bipolar disorder patients after follow-up. However, even though schizophrenia evolved
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43 favorably, it would be important to include these patients in psychosocial treatment programs
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45 that stimulate overall functional recovery.

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49 Gender differences, supporting previous studies, showed that women had better total social
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51 functioning throughout the course of the illness (Leung & Chue, 2000; Morgan et al., 2008;
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53 Thorup et al., 2007). An instrumental analysis identified differences favorable to women in
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55 four dimensions: withdrawal/social engagement, interpersonal behavior, independence-
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57 performance and independence-competence. Coinciding with the results found by Jiménez-
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3 García-Bóveda et al. (2000), the differences in independence-performance and independence-
4 competence may be motivated by cultural discrepancies in gender roles (Goldstein & Tsuang,
5 1990; Mayston et al., 2020), since the items refer to tasks related to performance in the home,
6 which are mostly associated with women. Withdrawal/social engagement and interpersonal
7 behavior are both dimensions reflecting a deficit in social skills that could impede community
8 integration of men, also therefore justifying from a gender perspective the need to develop
9 psychosocial rehabilitation programs based on evidence and adapted to individual needs. With
10 regard to behavior problems, contrary to previous studies that show higher intensity and
11 persistence of psychopathology in men (Chang et al., 2011; Hui et al., 2014; Segarra et al.,
12 2012), the results did not show any significant gender differences in behavior problems.

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26 In line with earlier studies, previous social functioning and underactivity/social withdrawal
27 problems are powerful variables for explaining the evolution of social functioning (Castle et
28 al., 2000; Liberman et al., 2002). Thus, deterioration in social functioning and presence of
29 underactivity/social withdrawal problems are related to a poor course and heavier use of
30 healthcare resources (Bellido-Zanín, Vázquez-Morejón, Martín-Rodríguez & Pérez-San-
31 Gregorio, 2017; Raudino et al., 2014), and both factors become priority targets of treatment to
32 avoid evolution toward chronicity. Of the sociodemographic variables, social isolation has been
33 associated as a factor in poor prognosis (Harvey et al., 2007), so it was expected for a higher
34 level of education to exert a protective role, probably explained by greater social and cognitive
35 skills required in higher education.

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49 Among the limitations, it should be mentioned that social functioning and behavior problem
50 evaluation was done by a single family member who had frequent contact with the patient, and
51 this person could have been different in Stages I and II, so it would be recommendable to
52 include other sources of evaluation (other clinical psychology, psychiatry or nursing
53 professionals) who could provide the psychometric assessment with greater objectivity and
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3 avoid any bias (Sabbag et al., 2011). Moreover, the participants were selected from a single
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5 CMHU, and inclusion of patients from other healthcare centers would have been more
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7 representative.
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10 Future research could study what psychotherapeutic intervention and what associated
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12 characteristics (intensity, frequency, group or individual, and so forth) contribute to promoting
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14 recovery of social functioning and behavior problems. It would also be of interest to study what
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16 other factors are involved in recovery of social functioning beyond behavior problems and
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18 education, and which contribute to explaining gender differences.
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21 In conclusion, our study reinforces the need for attention to the functional area in
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23 schizophrenia and related disorders. The results confirm the importance of previous social
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25 functioning and problems related to underactivity/social withdrawal during the course of social
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27 functioning. Therefore, there is a need to include psychosocial treatment programs in the early
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29 stages that contribute to improving the course and favor recovery.
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32 33 **Acknowledgements**

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35 We thank all the professionals at the Guadalquivir Community Mental Health Unit for their
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37 work.
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40 41 **Conflict of interest**

42
43 The author(s) declared no potential conflicts of interest with respect to the research, authorship
44
45 and/or publication of this article.
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48 49 **Funding**

50
51 The author(s) received no financial support for the research, authorship and/or publication of
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53 this article.
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For Peer Review

Table 1. Descriptive Analysis of Social Functioning and Behavior Problems (N=100).

	Stage I (n= 100)						Stage II (n=100)					
	Minimum	Q1	Median	Mean	Q3	Maximum	Minimum	Q1	Median	Mean	Q3	Maximum
Withdrawal/social engagement	0	8	10	9.47	11	14	3	7	10	9.43	11	15
Interpersonal behavior	0	4	6	5.80	8	9	0	4	6	5.82	8	9
Prosocial activities	3	19	24	23.97	29	39	5	20	24	25.03	33.75	39
Recreation	3	11	15	15.07	19	32	2	10	15	15.12	20	36
Independence-performance	0	8	13	15.22	22	42	0	6	12	14.85	22	46
Independence-competence	13	30	34	32.94	37	39	16	29	34	32.92	37	39
Employment/occupation	0	2	4	5.02	9	10	0	2	5	4.77	8	10
Total SF	33	87.25	109.50	107.49	129	170	31	88.25	105.50	107.94	132.75	182
Underactivity/social withdrawal	0	3	6	6.02	9	14	0	2	6	5.85	9	14
Active problems	0	1	3	3.96	7	15	0	1	3	3.90	5.25	15
Lack of impulse control	0	0	0	0.93	1	12	0	0	0	0.84	1	9
MBP	0	1	3	3.78	6	14	0	1	3	3.46	5	12
SBP	0	0	0	1.15	1	10	0	0	0	1.20	1.25	12

Total SF: Total social functioning; MBP: Moderate behavior problems; SBP: Severe behavior problems.

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Table 2. Total Social Functioning, Moderate and Severe Behavior Problems.

	Schizophrenia (n=55)		Other psychotic disorders (=28)		BAD (n=17)		Men (n=64)		Women (n=36)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Stage I										
Total SF	99.65	26.53	115.25	29.12	120.06	24.91	100.42	27.71	120.06	24.68
MBP	3.73	2.68	4.63	3.52	2.38	3.07	3.97	3.03	3.44	3.14
SBP	1.18	1.69	1.52	2.49	.44	1.03	1.38	2.04	0.74	1.48
Fase II										
Total SF	97.98	27.44	122.82	33.12	115.65	28.30	102.91	32.92	116.89	25.62
MBP	4.14	2.85	2.93	2.69	2.19	1.47	3.56	2.75	3.26	2.77
SBP	1.24	1.79	1.33	2.76	.69	1.01	1.31	2.16	1.00	1.67

BAD: Bipolar affective disorder; SD: Standard deviation; Total SF: Total social functioning; MBP: Moderate behavior problems; SBP: Severe behavior problems.

Table 3. Evolution of Social Functioning and Behavior Problems by diagnosis.

	Schizophrenia (n=55)						Other psychotic disorders (n=28)						BAD (n=17)					
	M I	SD I	M II	SD II	<i>p</i>	<i>d</i>	M I	SD I	M II	SD II	<i>p</i>	<i>d</i>	M I	SD I	M II	SD II	<i>p</i>	<i>d</i>
11 Withdrawal/social engagement	9.05	2.84	9.31	3.02	.575	-0.089 N	10.00	2.82	9.68	2.96	.739	0.111 N	9.94	2.05	9.41	3.12	.275	0.201 S
12 Interpersonal behavior	5.27	2.26	5.16	2.28	.747	0.048 N	5.93	2.68	6.07	2.93	.433	-0.050 N	7.29	1.79	7.53	1.77	1.000	-0.135 N
13 Prosocial activities	13.45	9.57	12.44	8.81	.438	0.110 N	16.96	10.53	18.93	12.18	.269	-0.173 N	18.06	7.89	15.94	10.84	.331	0.224 S
14 Recreation	13.62	5.62	13.16	6.54	.616	0.075 N	16.64	6.09	18.68	7.51	.180	-0.298 S	17.18	6.91	15.59	6.65	.382	0.234 S
15 Independence-performance	22.15	7.40	23.09	8.78	.432	-0.116 N	25.82	8.44	28.54	8.87	.035	-0.314 S	26.82	8.46	25.53	7.54	.424	0.161 N
16 Independence-competence	32.20	4.72	31.42	5.81	.326	0.147 N	33.64	5.90	34.71	5.19	.468	-0.193 N	34.18	6.45	34.82	4.35	.480	-0.116 N
17 Employment/occupation	3.91	3.28	3.40	3.03	.280	0.162 N	6.25	3.10	6.21	3.20	1.000	0.013 N	6.59	3.47	6.82	3.05	.526	-0.070 N
17 Total SF	99.65	26.53	97.98	27.44	.652	0.062 N	115.25	29.12	122.82	33.12	.138	-0.243 S	120.06	24.91	115.65	28.30	.526	0.165 N
19 Underactivity/social withdrawal	6.20	3.40	6.63	3.71	.494	-0.121 N	6.26	3.68	4.96	3.78	.113	0.349 S	4.88	3.95	5.00	3.58	.905	-0.032 N
20 Active problems	4.14	3.35	4.67	3.73	.358	-0.150 N	4.74	4.50	3.48	3.74	.186	0.305 S	1.81	2.88	2.00	1.63	.819	-0.081 N
21 Lack of impulse control	.82	1.37	1.02	1.71	.446	-0.129 N	1.30	2.55	.74	1.83	.253	0.252 S	.62	1.54	.38	.89	.609	0.191 N
22 MBP	3.73	2.68	4.14	2.85	.365	-0.148 N	4.63	3.52	2.93	2.69	.031	0.542 M	2.38	3.07	2.19	1.47	.814	0.079 N
22 SBP	1.18	1.69	1.24	1.63	.866	-0.036 N	1.52	2.49	1.33	2.76	.742	0.072 N	.44	1.03	.69	1.01	.534	-0.245 S

BAD: Bipolar affective disorder; M I: Mean Stage I; M II: Mean Stage II; SD I: Standard deviation Stage I; SD II: Standard deviation Stage II; N: Null effect size; S: Small effect size; M: Medium effect size; L: Large effect size; Total SF: Total social functioning; MBP: Moderate behavior problems; SBP: Severe behavior problems.

Table 4. Differences in Social Functioning and Behavior Problems by diagnosis.

			Mean difference	Error	Stage I p	Cohen's d	Mean difference	Error	Stage II p	Cohen's d
Withdrawal/social engagement	Schizophrenia	Other psychotic	-.95	.63	.413	-0.336 S	-.37	.70	1.000	-0.120 N
		BAD	-.89	.75	.729	-0.359 S	-.10	.84	1.000	-0.033 N
	Other psychotic	BAD	.06	.63	.413	0.024 N	.27	.93	1.000	0.085 N
Interpersonal behavior	Schizophrenia	Other psychotic	-.66	.54	.679	-0.265 S	-.91	.56	.322	-0.347 S
		BAD	-2.02	.64	.007	-0.991 L	-2.37	.67	.002	-1.162 L
	Other psychotic	BAD	-1.37	.71	.176	-0.597 M	-1.46	.74	.155	-0.603 M
Prosocial activities	Schizophrenia	Other psychotic	-3.51	2.23	.355	-0.346 S	-6.49	2.37	.022	-0.611 M
		BAD	-4.60	2.66	.261	-0.526 M	-3.50	2.83	.655	-0.354 S
	Other psychotic	BAD	-1.09	2.95	1.000	-0.118 N	2.99	3.13	1.000	0.259 S
Recreation	Schizophrenia	Other psychotic	-3.02	1.39	.096	-0.515 M	-5.14	1.59	.002	-0.783 M
		BAD	-3.56	1.66	.104	-0.565 M	-2.42	1.90	.613	-0.368 S
	Other psychotic	BAD	-.53	1.84	1.000	-0.082 N	3.09	2.10	.435	0.436 S
Independence-performance	Schizophrenia	Other psychotic	-3.68	1.83	.142	-0.462 S	-5.44	2.00	.023	-0.618 M
		BAD	-4.68	2.19	.105	-0.588 M	-2.43	2.39	.931	-0.298 S
	Other psychotic	BAD	-1.01	2.42	1.000	-0.118 N	3.01	2.65	.778	0.366 S
Independence-competence	Schizophrenia	Other psychotic	-1.44	1.25	.753	-0.270 S	-3.30	1.26	.031	-0.597 S
		BAD	-4.60	2.66	.261	-0.350 S	-3.41	1.51	.078	-0.662 S
	Other psychotic	BAD	-1.09	2.95	1.000	-0.087 N	-.11	1.67	1.000	-0.023 N
Employment/occupation	Schizophrenia	Other psychotic	-2.34	.76	.008	-0.733 S	-2.81	.72	.000	-0.902 L
		BAD	-2.68	.91	.012	-0.794 S	-3.42	.86	.000	-1.125 L
	Other psychotic	BAD	-.34	1.01	1.000	-0.103 N	-.61	.95	1.000	-0.195 N

Total SF	Schizophrenia	Other psychotic	-15.60	6.27	.044	-0.560 M	-24.84	6.79	.001	-0.817 L
		BAD	-20.40	7.50	.023	-0.793 M	-17.66	8.12	.096	-0.634 M
	Other psychotic	BAD	-4.81	8.31	1.000	-0.177 N	7.17	8.99	1.000	0.233 S
Underactivity/social withdrawal	Schizophrenia	Other psychotic	-0.01	.85	1.000	-0.002 N	1.91	.87	.089	0.507 M
		BAD	1.38	1.02	.543	0.372 S	1.76	1.03	.277	0.489 S
	Other psychotic	BAD	1.38	1.13	.666	0.362 S	-.155	1.14	1.000	-0.041 N
Active problems	Schizophrenia	Other psychotic	-.53	.87	1.000	-0.133 N	1.47	.82	.232	0.388 S
		BAD	2.40	1.04	.072	0.767 M	2.95	.98	.010	1.000 L
	Other psychotic	BAD	2.93	1.15	.038	0.775 M	1.47	.824	.232	0.513 M
Lack of impulse control	Schizophrenia	Other psychotic	-.47	.43	.825	-0.230 S	.34	.37	1.000	0.200 S
		BAD	.20	.52	1.000	0.138 N	.70	.45	.370	0.527 M
	Other psychotic	BAD	.67	.57	.722	0.318 S	.36	.50	1.000	0.255 S
MBP	Schizophrenia	Other psychotic	-.86	.71	.690	-0.275 S	1.40	.62	.074	0.506 M
		BAD	1.39	.86	.323	0.482 S	2.11	.73	.015	0.928 L
	Other psychotic	BAD	2.25	.95	.058	0.681 M	.70	.81	1.000	0.323 S
SBP	Schizophrenia	Other psychotic	-.35	.44	1.000	-0.164 N	.05	.47	1.000	0.022 N
		BAD	.74	.53	.513	0.507 M	.69	.56	.654	0.477 S
	Other psychotic	BAD	1.08	.58	.208	0.557 M	.64	.62	.908	0.313 S

BAD: Bipolar affective disorder; Total SF: Total social functioning; MBP: Moderate behavior problems; SBP: Severe behavior problems; N: Null effect size; S: Small effect size; M: Medium effect size; L: Large effect size.

Table 5. Evolution of Social Functioning by Gender and Stage.

	Means		SD		Main Effects		Cohen's <i>d</i>		Interaction effects
	Gender Men Women	Stage I II	Gender Men Women	Stage I II	Gender $F_{(1,98)}$ (<i>p</i>)	Stage $F_{(1,98)}$ (<i>p</i>)	Gender	Stage	$F_{(1,98)}$ (<i>p</i>)
Withdrawal/social engagement	8.99 10.27	9.47 9.43	3.03 2.35	2.73 2.99	7.036 (.009)	0.132 (.717)	0.472 S	0.014 N	0.765 (.384)
Interpersonal behaviour	5.43 6.50	5.80 5.82	2.56 2.16	2.41 2.54	5.863 (.017)	0.027 (.869)	0.452 S	-0.008 N	0.087 (.769)
Prosocial activities	14.19 16.55	15.22 14.85	9.99 10.21	9.70 10.49	2.147 (.146)	0.000 (.997)	0.234 S	0.036 N	0.046 (.831)
Recreation	14.50 16.17	15.07 15.12	6.81 6.32	6.14 7.18	1.662 (.200)	0.244 (.622)	0.254 S	-0.007 N	0.244 (.622)
Independence-performance	22.19 28.61	23.97 25.03	8.29 6.98	8.07 8.85	22.325 (.000)	0.489 (.486)	0.837 L	-0.125 N	2.564 (.113)
Independence-competence	31.90 34.77	32.94 32.92	5.63 4.77	5.39 4.32	9.540 (.003)	0.045 (.833)	0.550 M	0.004 N	0.409 (.524)
Employment/occupation	4.49 5.63	5.02 4.77	3.49 3.77	3.46 3.42	3.54 (.063)	0.497 (.482)	0.313 S	0.073 N	0.014 (.907)
Total SF	101.67 118.48	107.49 107.94	30.32 25.16	28.18 31.10	10.45 (.002)	0.014 (.905)	0.603 M	-0.015 N	0.990 (.322)

SD: Standard deviation; Total SF: Total social functioning; N: Null effect size; S: Small effect size; M: Medium effect size; L: Large effect size.

Table 6. Evolution of behavior problems by gender and stage.

Psychosocial variables	Means		SD		Main effects		Cohen's <i>d</i>		Interaction effects
	Gender Men Women	Stage I II	Gender Men Women	Stage I II	Gender $F_{(1,98)}$ (<i>p</i>)	Stage $F_{(1,98)}$ (<i>p</i>)	Gender	Stage	$F_{(1,98)}$ (<i>p</i>)
Underactivity/social withdrawal	6.35 5.15	5.99 5.87	3.58 3.73	3.57 3.76	3.620 (.060)	0.006 (.940)	0.328 S	0.033 N	1.190 (.278)
Active problems	3.90 3.88	3.91 3.87	3.75 3.56	3.75 3.58	0.001 (.972)	0.037 (.847)	0.005 N	0.011 N	0.114 (.737)
Lack of impulse control	0.95 0.76	0.93 0.83	1.83 1.53	1.81 1.64	.376 (.541)	0.155 (.694)	0.112 N	0.058 N	1.035 (.312)
MBP	3.74 3.36	3.76 3.46	2.87 2.95	3.07 2.71	.560 (.456)	.366 (.547)	0.131 N	0.222 S	.366 (.547)
SBP	1.32 0.88	1.15 1.17	2.06 1.60	1.89 1.94	1.876 (.174)	.104 (.748)	0.239 S	-0.010 N	.663 (.417)

SD: Standard deviation; MBP: Moderate behavior problems; SBP: Severe behavior problems; N: Null effect size; S: Small effect size; M: Medium effect size; L: Large effect size.

Table 7. Prediction of Total Social Functioning in Stage II.

Predictor Variables	B	SE	β	$t(p)$	R^2	ΔR
Step 1					.337	.330
Social Functioning Stage I	.641	.092	.580	6.982 (p=.000)		
Step 2					.496	.486
Social Functioning Stage I	.538	.083	.488	6.523 (p=.000)		
Underactivity/social withdrawal	-3.391	.618	-.410	-5.484 (p=.000)		
Step 3					.527	.512
Social Functioning Stage I	.465	.086	.422	5.433 (p=.000)		
Underactivity/social withdrawal	-3.295	.604	-.398	-5.459 (p=.000)		
Education level	4.704	1.909	.188	2.465 (p=.016)		

Figure 1. Flow chart for selection of participants in the study.

