



HAL
open science

Being parent is associated with suicidal history in people with serious mental illness enrolled in psychiatric rehabilitation

M. Dubreucq, J. Plasse, F. Gabayet, O. Blanc, I. Chereau, S. Cervello, G. Couhet, C. Demily, N. Guillard-Bouhet, B. Gouache, et al.

► To cite this version:

M. Dubreucq, J. Plasse, F. Gabayet, O. Blanc, I. Chereau, et al.. Being parent is associated with suicidal history in people with serious mental illness enrolled in psychiatric rehabilitation. *Journal of Psychiatric Research*, 2021, 140, pp.395-408. 10.1016/j.jpsychires.2021.06.003 . hal-03287446

HAL Id: hal-03287446

<https://hal.science/hal-03287446v1>

Submitted on 16 Jun 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

Being parent is associated with suicidal history in people with Serious Mental Illness enrolled in psychiatric rehabilitation

Running title: Parenthood and suicidal history in Serious Mental Illness

AUTHORS

Dubreucq M^{b,c}, Plasse J^{h,i}, Gabayet F^{b,c}, Blanc O^f, Chereau I^{c,f}, Cervello S^{a,h,i}, Couhet Gⁿ, Demily C^{a,j}, Guillard-Bouhet N^l, Gouache B^b, Jaafari N^l, Legrand G^g, Legros-Lafarge E^k, Mora G^g, Pommier R^e, Quilès C^m, Verdoux H^m, Massoubre C^e, REHABase network*, Franck N^{a,h,i} and Dubreucq J^{a,b,c,d}

^a Centre de Neurosciences Cognitive, UMR 5229, CNRS & Université Lyon, France 1

^b Centre Référent de Réhabilitation psychosociale et de Remédiation Cognitive (C3R), Centre Hospitalier Alpes Isère, Grenoble, France

^c Fondation FondaMental, Créteil, France

^d Réseau Handicap Psychique, Grenoble, France

^e REHALise, CHU de Saint-Etienne, France

^f CMP B, CHU, EA 7280 Faculté de Médecine, Université d'Auvergne, BP 69 63003 Clermont-Ferrand Cedex 1, France

^g Association Hospitalière Sainte Marie, Centre Hospitalier Sainte Marie de Clermont Ferrand, 33 rue Gabriel Péri, CS 9912, 63037 Clermont-Ferrand Cedex 1, France

^h Centre ressource de réhabilitation psychosociale et de remédiation cognitive, Hôpital Le Vinatier, UMR 5229, CNRS & Université Lyon 1, Université de Lyon, France

ⁱ Pôle Centre, centre hospitalier Le Vinatier, Lyon, France

^j Centre de référence maladies rares Génopsy, pôle ADIS, centre hospitalier Le Vinatier, UMR 5229, CNRS & Université Lyon 1, Université de Lyon, France

^k Centre Référent de Réhabilitation Psychosociale de Limoges C2RL, CH Esquirol, Limoges

^l CREATIV & URC Pierre Deniker, CH Laborit, Poitiers, France

^m Centre référent de réhabilitation psychosociale C2RP Nouvelle Aquitaine Sud, Pôle universitaire de psychiatrie adulte, centre hospitalier Charles Perrens, Bordeaux, Univ. Bordeaux, Inserm, Bordeaux Population Health Research Center, team pharmacoepidemiology, UMR 1219, F-33000 Bordeaux, France

ⁿ Centre référent de réhabilitation psychosociale C2RP Nouvelle-Aquitaine Sud, Pôle de réhabilitation psychosociale, Centre de la Tour de Gassies, Bruges, France

*** Correspondence should be sent to: Marine DUBREUCQ**

Centre Référent de Réhabilitation psychosociale et de Remédiation Cognitive (C3R), CH Alpes Isère, 8 place du Conseil National de la Résistance, 38400 Saint Martin d'Hères, France
Tel: (33 4) 56 58 88 00, e-mail: marine.bene@hotmail.fr

WORD COUNT

ABSTRACT: 248

WORD COUNT: 3228

Authors statement: The authors had full access to the data in the study and take the responsibility for the integrity of the data and the accuracy of the data analysis. Mrs Marine Dubreucq drafted the article. Mrs Marine Dubreucq and Dr Julien Dubreucq made the literature review. Mr Julien Plasse performed the statistical analysis. Dr Julien Dubreucq, Pr Nicolas Franck, Pr Catherine Massoubre and Franck Gabayet contributed to the interpretation of data and critically revised the article. All the authors were involved in the collection and analysis of the data. All authors contributed to and have approved the final manuscript.

I. Introduction

Most people with SMI consider parenting as a key social role promoting recovery (Dolman et al., 2013). Being parent has been positively associated with hope, self-esteem, satisfaction with life, social connectedness and insight into illness and treatment adherence in people with SMI (Cook and Mueser, 2014; Bonfils et al., 2014; Hine et al. 2018). While some parents describe parenting as a rewarding and meaningful life experience (Hine et al. 2018), others - especially mothers - report unique challenges relating to parenting and loss of parenting role (Dolman et al., 2013; Firmin et al., 2020). They report experiences of discrimination (one in four participants to a 2013 UK study experienced stigma when starting a family or in their role as parent; Jeffery et al., 2013), concerns over the illness impact on the child, fear of custody loss, feelings of guilt and social isolation, and lack of social support (Dolman et al., 2013).

Compared with the general population, parents with SMI are more often separated from each other (Incidence Rate Ratios (IRR))=2.98; 95% CI=2.80-3.17 for mothers with SSD; IRR=2.60; 95% CI=2.47-2.74 for fathers with SSD; Ranning et al., 2016) and face higher risk of custody loss at some point during their children's early years (IRR=23.75; 95% CI=20.94-26.93 for mothers with SSD; IRR=7.85; 95% CI=6.67-9.25 for fathers with SSD; IRR=5.76; 95% CI=4.50-7.36 for mothers with BD; Ranning et al., 2015). In the general population, custody loss has been associated with poor maternal mental health, higher suicidal risk and increased mortality (Wall-Wieler et al., 2018a; Wall-Wieler et al., 2018b). Among people with SMI, disruption in the parenting role can result in higher self-stigma, reduced self-esteem and a poorer quality of life (Lacey et al., 2015; Firmin et al. 2020). Its impact on other recovery-related outcomes (e.g. personal recovery, suicide, wellbeing and satisfaction with life) remain unclear.

Most of the existing research on parenting and SMI has focused on the experience of mothers or found no gender differences (Price-Robertson et al., 2015). Firmin et al. (2020) has reported gender differences in mental illness related disruption to a person's life. Gender social norms and expectations could influence the perception of people with SMI regarding the impact of their illness on their role as parent (providing for their children for men; assuming childcare responsibilities for women; Firmin et al., 2020). Gender differences have been found in perceived stigma and self-stigma (e.g. men report to be perceived as dangerous and women to be confronted to paternalism; higher self-stigma on parenting abilities for mothers with SMI; Lacey et al., 2015; Firmin et al., 2020).

Campbell et al. (2018) has reported that most of the parents with SMI (> 75% of the 696 parents participating in the 2010 2nd Australian national survey of psychosis) provide adequate parenting to their children. Several factors influence the quality of childcare. They include symptom severity, poor insight, cognitive impairments, poor psychosocial function and the use of maladaptive coping strategies (Mullick et al., 2001; Metha et al., 2014; Campbell et al., 2018; Malka et al., 2020). The child's first year of life is a critical period for delivering interventions supporting parents with SMI (Liu et al., 2015; Ranning et al. 2016). Parenting has been associated in middle-aged parents enrolled in psychiatric rehabilitation with both positive (e.g. increased motivation for seeking treatment) and negative outcomes (e.g. negative impact of their SMI on parenting and painful experiences related to custody loss; White et al. 2013). However, it is often overlooked in psychiatric rehabilitation and additional service provision targeting parenting-related skills remains limited (White et al., 2014). The inclusion of parenting goals in psychiatric rehabilitation action plans could support people with SMI in finding meaning in the experience of mental illness and mental illness-related disruption to the parenting role (Firmin et al., 2020).

Compared to parents with SMI and a preserved psychosocial function, those enrolled in psychiatric rehabilitation (i.e. presenting moderate to severe impairments in psychosocial function; Franck et al. 2019) may face additional challenges and report more negative experiences related to their parenting role (e.g. custody loss at least once for 88% of the participants; White et al. 2013). We made the hypothesis that parenting would be associated with both positive (i.e. satisfaction with life, treatment adherence and personal recovery) and negative outcomes (i.e. depression and suicide risk) in relatively low functioning people with SMI enrolled in psychiatric rehabilitation. We also hypothesized that compared to non-parents and to each other mothers and fathers with SMI would have unique characteristics and treatment needs (that could be each unique for mothers and fathers with schizophrenia, bipolar disorder and borderline personality disorder). Finally, according to the literature on insight and negative life experiences related to the parenting role (Mullick et al. 2001; Campbell et al. 2018; Lysaker et al. 2018; Firmin et al. 2020), we hypothesized that insight would moderate the relationship between being parent and suicidal history. The objectives of the present study were to identify the characteristics and needs for care of mothers and fathers with SMI enrolled in a multicentric psychiatric rehabilitation sample selected due to moderate to severe psychosocial impairment at hospital discharge or in the community.

2. Material and Methods

2.1 Study population

The REHABase cohort is made up of patients from nine French centers of psychiatric rehabilitation that has been extensively described in previous articles (Franck et al., 2019; Dubreucq et al., 2020). Patients are referred to these centers by their general practitioner or psychiatrist, or are self-referred. The inclusion criteria are: i) a diagnosis of serious mental illness according to the SAMHSA (2013) definition or autism spectrum disorder (DMS-5

criteria, APA, 2013); ii) a score of less than 61 on the Global Assessment of Functioning (GAF) scale. The present study was restricted to data collected at the baseline for patients diagnosed with schizophrenia-spectrum disorders, bipolar disorder and borderline personality disorder according to the DSM-5. This choice was made considering the small sample sizes for people with other SMI (n=121 for major depression, n= 100 for anxiety disorders, n= 107 for autism spectrum disorder). We included people with borderline personality disorder (n=243) because of their high level of parenting difficulties, parenting distress and needs for support (Petfield et al., 2015). A comprehensive clinical, functional and cognitive assessment is performed to establish the individual's strengths and weaknesses, autonomy, and occupational level. Therapeutic tools are selected based on the participant's personal life goals as part of an individualized psychiatric rehabilitation action plan. The action plan can include psychoeducation, joint crisis plans, cognitive remediation, cognitive behavior therapy, social skills training, peer-delivered interventions and supported employment (Franck et al., 2019). Two centers (Lyon and Grenoble) have implemented recovery-oriented interventions supporting the needs of future parents with SMI. They include strengths based case management by a trained midwife from preconception to post-partum care at Grenoble and parent-peer delivered interventions at Lyon and group-based interventions for future parents in both centers. Follow-up is planned to last for 2 to 3 years. Evaluations are scheduled at baseline, annually, and after the action plan is completed. The study obtained the authorizations required under French legislation (French National Advisory Committee for the Treatment of Information in Health Research, 16.060bis; French National Computing and Freedom Committee, DR-2017-268). All participants gave their informed consent.

2.2 Data collected

General information on education, marital status, parenting status, economic status, illness onset and trajectory and comorbidities was recorded. Satisfaction in four life dimensions (social, familial and intimate relationships, occupational status) was measured using visual analogue scales and a structured interview adapted from the Client Assessment of Strengths, Interests and Goals (CASIG; range 0 to 10; Wallace et al., 2001). Illness severity was assessed the Clinical Global Impression (CGI; mean score; Haro et al., 2003) scale. Insight and treatment adherence were measured with self-reported measures (Birchwood Insight Scale; BIS; mean total score and cut-off score > 9 to determine good insight; Cronbach's α (CA)= 0.78; Birchwood et al., 1994; Medication Adherence Rating Scale; MARS; mean total score; CA = 0.75; Thompson et al., 2000). Self-stigma was measured using the Internalized Stigma of Mental Illness scale (ISMI; mean total score; CA = 0.90; Boyd-Ritsher, et al., 2003). General Functioning was measured with the Global Assessment of Functioning scale (GAF; mean score; Startup et al., 2002). Quality of life (QoL) was evaluated with the self-reported Quality of Life scale (S-QoL; mean total score; CA = 0.72–0.90; Auquier et al., 2003) and wellbeing using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS; mean total score; CA=0.91; Tennant et al., 2007). Self-esteem was assessed with the Self-Esteem Rating Scale-Short Form (SERS-SF; mean total score; CA = 0.87–0.91; Lecomte et al., 2006) and personal recovery was measured using the self-reported Stages of Recovery Instrument (STORI; 50-item self-report instrument assessing the five stages of personal recovery described by Andresen in 2003: moratorium, awareness, preparation, rebuilding and growth. A score for each stage is calculated ranging from 0 to 50 and the participant is allocated to the stage with the highest score. CA = 0.88–0.94; Andresen et al., 2006). Baseline neuropsychological cognitive assessments include the Wechsler Adult Intelligence Scale-4th edition (WAIS-IV) subscale assessing short-term and working memory (Wechsler,

2011), the California Verbal Learning Test (CVLT; Woods et al., 2006) or RL/RI-16 (Van der Linden et al., 2004) for episodic verbal memory, d2-R for selective attention and speed of processing (Brickenkamp et al., 2015) and revised shopping test (Fournet et al., 2009) or Six Element Test (Garnier et al., 1998) for planning abilities. Theory of mind was assessed using the Movie for the Assessment of Social Cognition (MASC, correct attribution score; CA = 0.865; Dziobek et al., 2006; Martinez et al., 2017).

2.3 Statistical analysis

Data are presented as the mean and SD for continuous variables and number and percentage for categorical variables. For comparison between groups, Chi-square test was used for categorical variables and Student's t test for continuous variables. Univariate logistic regression adjusted for diagnostic, current age, education level, housing status and marital status was used to calculate OR with 95% CI to identify factors associated with motherhood, fatherhood, and to compare mothers and fathers, and to select variables for multivariate regression (variables with a significant p value at 0.1 were entered in multivariate analysis). We conducted subgroup analyses according to psychiatric diagnosis (i.e. factors associated with motherhood and fatherhood and differences between mothers and fathers in SSD, BD and BPD). However, given the small number of parents with BD and BPD (mothers, n=53, fathers, n=31; mothers, n=28, fathers, n=23) we could not conduct multivariate analyses on the correlates of being parent in these groups. We conducted moderation analyses using the Cochran-Mantel-Haenzel stratified Chi-square test to test whether insight (good vs. poor) moderated the relationship between being mother and a history of suicide attempt (total sample and mothers with BD). P-values <0.05 were considered significant. All statistical analyses were performed using R (R Foundation for Statistical Computing, Vienna, Austria; <https://www.R-project.org/>; R Core Team, 2015).

3. Results

One thousand four hundred and thirty-six clinically stabilized patients were recruited from the REHABase network. They had been included in this cohort study between January 2016 and November 2019. Sample characteristics with the differences according to participant's psychiatric diagnosis are shown in Table 1.

3.1 Frequency of parenthood

Of the 1436 participants, 264 (18.4%) had children of any age. Of the 943 men and 493 women respectively 127 (13.4%) were fathers and 137 (27.7%) were mothers. Among those who reported to be parents men were more likely to have SSD (n=73; 53.6%) and women to have BD (n=53; 63.1%).

3.2. Characteristics of those who reported to be mothers

Table 2 presents the results of the univariate analyses for the characteristics of those who reported to be mothers. Compared with non-mothers, mothers had a poorer insight and reported more frequently a history of suicide attempt. In subgroup analyses, we found the same pattern for mothers with BD (i.e. poorer insight and increased suicidal history; Supp. Table 1) but not for mothers with SSD (reduced satisfaction with vocational status; Supp. Table 2) and BPD (higher psychiatric comorbidities; Supp. Table 3).

3.3. Characteristics of those who reported to be fathers

Table 3 presents the results of the univariate analyses for the characteristics of those who reported to be fathers. Fathers had a later age of onset, had longer illness duration and had more impairment in executive function. They reported to be more satisfied with their familial relationships. In subgroup analyses, we found a similar pattern for fathers with SSD (i.e. older

age of onset, longer illness duration and a better satisfaction with family relationships; Supp. Table 4) but not for fathers with BD (better satisfaction with housing and family relationships but also more history of suicide attempt; Supp. Table 5) and BPD (more history of psychiatric hospitalization; Supp. Table 6).

3.4. Differences between mothers and fathers

Table 4 shows the univariate differences between mothers and fathers. Compared with fathers, mothers reported more often a history of suicide attempt and had less impairment in long-term memory. In subgroup analyses, we found no gender differences in SSD (Supp. Table 7) whereas mothers with BD had poorer insight, higher clinical severity and reduced psychosocial function (Supp. Table 8). Mothers with BPD reported reduced satisfaction with housing and daily life skills and more often a history of suicide attempt (Supp. Table 9).

3.5. Multivariate analysis

Table 5 presents the results of the multivariate analysis. Compared to non-mothers, being mother was associated with poorer insight into illness ($p < 0.015$, adjusted OR=0.76 [0.59 – 0.90]), older age at admission ($p < 0.001$, aOR=1.13 [1.07 – 1.21]), lower education ($p = 0.008$; aOR=0.12 [0.02 – 0.53]) and to housing status (family accommodation; $p = 0.046$, aOR=0.19 [0.03– 0.84]). Compared to non-fathers, being father was associated with higher suicidal history ($p = 0.005$, aOR=3.85 [1.51 – 10.10]), marital status (in relationship, $p < 0.001$; aOR=7.81 [2.73-23.84]), higher satisfaction with family relationships ($p = 0.032$, aOR=1.22 [1.02– 1.47]) and older age at admission ($p < 0.001$, aOR=1.16 [1.10– 1.23]). In subgroup analyses, we found significant associations with age at admission for mothers and fathers with SSD ($p = 0.005$, aOR=1.12 [1.04 – 1.22] and $p = 0.017$, aOR=1.09 [1.02 – 1.18]; Supp. Table 10). Other correlates of being mother with SSD were high school and tertiary education

($p=0.031$, $aOR=0.15$ [0.02 – 0.78] and $p=0.001$, $aOR=0.04$ [0.01-0.26]). Other correlates of being father with SSD were reduced clinical severity ($p=0.034$, $aOR=0.61$ [0.37 – 0.95]) and marital status (in relationship; $p<0.001$, $aOR=26.21$ [6.47 – 129.77]).

3.6. Moderation analyses

Table 6 presents the results of moderation analyses. Poor insight moderated the relationship between being mother and suicidal history (full sample, $p=0.004$, $OR=2.48$ [1.37 – 4.51]; mothers with BD, $p=0.007$, $OR=8.14$ [1.96 – 33.87]).

4. Discussion

4.1. Main findings

To our knowledge this study is the first to assess the characteristics and needs for care of mothers and fathers with SMI in a large multicentric non-selected psychiatric rehabilitation sample. The results partially supported our first hypothesis. Parenting in our sample was associated with a pattern including positive and negative outcomes (e.g. better satisfaction with life but also increased suicidal history) but only in fathers with SMI, SSD or BD. Conversely, being mother was negatively associated with recovery-related outcomes in the total sample and in the diagnostic subgroups. The present study is the first to date to report an association of parenting with suicidal history in mothers and fathers with SMI and BD (respectively $\times 1.78$ and $\times 3.24$ for mothers; $\times 3.85$ and $\times 4.35$ for fathers). Gender differences were found in the factors associated with parenting in SMI (insight, education and family accommodation for mothers; marital status and satisfaction with family relationships for fathers). Poor insight moderated the relationship between being mother and suicidal history in SMI and in BD (respectively $\times 2.48$ and $\times 8.14$ likelihood to report suicidal history in mothers with poor insight). This pattern of findings had not been described before

4.2. Interpretation of the results

4.2.1. Parenting and recovery-related outcomes

While parenting has been described as a central and meaningful life experience promoting recovery (Dolman et al., 2013), it was not associated with personal recovery in people with SMI enrolled in psychiatric rehabilitation. Several factors might explain this lack of association.

First, the age at birth of the first child is for more than half of the parents with SMI several years younger than the age of illness onset (65%; Nicholson, 2002). The positive effects of parenthood on hope concern parents of dependent children compared with those of older children (Bonfils et al., 2014). Second, while most of the parents with SMI provide good quality of care to their children, parenting can be a challenging experience in the absence of adequate support from mental health professionals (Campbell et al., 2018). Given the association between psychosocial function and parenting outcomes (Campbell et al. 2018), this might particularly be true for parents with SMI enrolled in psychiatric rehabilitation. Third, parents with SMI face high risks for child placement in care, a risk factor for suicide attempt in the general population (Wall-Wieler et al., 2018a).

4.2.2. Mothers with SMI and suicidal history

Mothers with SMI had lower insight, a risk factor for higher clinical severity, reduced psychosocial function and poor quality of childcare (Mullick et al., 2001; Lysaker et al., 2018). These factors increase the risk of custody loss and suicide attempt (Campbell et al., 2018; Wall-Wieler et al., 2018a). Poor insight has been found to protect against insight-related depression but could indirectly increase suicide risk through mental illness related disruption to a person's life (failed relationships or loss of parenting role; Latalova, 2012;

Ayasa-Arriola et al., 2018; Firmin et al., 2020). In support of this hypothesis, we found that poor insight moderated the relationship between being mother and suicidal history. Subgroup analyses showed that this pattern of outcome (i.e. poor insight and more suicidal history) was only present for mothers with BD. Compared to those with SSD, parents with BD report more experiences of discrimination in their parenting role (Lasalvia et al. 2021). Women with BD also face high risks for relapse, inpatient admission, depression and suicide attempt in the perinatal period (Jones et al. 2014; Wesseloo et al. 2016; Tebeka et al. 2016). Combined with socio-demographic factors (e.g. being single, less educated or unemployed), clinical and environment-related factors (e.g. poor insight, low treatment adherence, high clinical severity, impaired psychosocial function, experienced stigma and low social support; Campbell et al. 2018; Weller, 2019; Lasalvia et al. 2021) could contribute to the high risk for custody loss faced by mothers with BD during the child's first year of life (IRR 15.52 95% CI 10.46-23.01; Ranning et al. 2015).

While mothers with BD reported poorer mother-to-infant bonding than community controls, this could be more related to subjective factors (e.g. feelings of maternal inadequacy and negative cognitions) rather than to a relapse in post-partum (Boeckhorst et al. 2021). Haarmans et al. (2018) and Garcia-Mieres et al. (2020) have reported higher self-discrepancies (i.e. the perceived discrepancy between: actual self and ideal self; actual self and gender-role norms; actual self and others; ideal self and others) in women with SMI compared to the general population. Mothers describe mothering with SMI as a key social role that shapes personal identity (Dolman et al., 2013). Cognitive appraisals of not being able to live up to gender-related social expectations (e.g. assuming childcare responsibilities) could result in psychological distress, depression and increased risk of suicide attempt in mothers with SMI (Haarmans et al., 2018; Garcia-Mieres et al., 2020).

Mothers with SMI also reported gender-related perceived stigma (i.e. being confronted to paternalism in their relationships; Firmin et al., 2020). Lacey et al. (2015) reported higher self-stigma on parenting abilities in mothers with SMI who lived separated from their children. A longitudinal examination is needed to better understand the relationship between insight, self-stigma, parenting outcomes and suicide risk in mothers with SMI.

4.2.3. Fathers with SMI and suicidal history

The positive correlation between being father and satisfaction with life concurs with findings from qualitative research (e.g. source of meaning and purpose; Price-Robertson et al., 2015). This association remained significant in subgroup analyses for fathers with SSD and BD, suggesting that fatherhood could result in higher satisfaction with life regardless of psychiatric diagnosis (Price-Robertson et al. 2015).

Compared with non-fathers, fathers with SMI had a 4-fold risk of reporting a history of suicide attempt. Campbell et al. (2012) and Ranning et al. (2016) have reported that, compared to mothers, fathers with SMI were less likely to live with their dependent children and to be involved in childcare activities. Fathers with SMI described a sense of paternal inadequacy to the social norms and expectations relating to fathering (i.e. being able to provide financially for children; Galasinski, 2013; Firmin et al., 2020). They reported perceived stigma relating to their gender and mental illness (i.e. being perceived by others as a potential risk to their children; Price-Robertson et al., 2015; Firmin et al., 2020). Fathers with SMI also reported feelings of social isolation and feelings of guilt relating to the potential consequences of their illness on their children (Price-Robertson et al., 2015). These factors might have increased the risk of suicidal attempt in fathers with SMI, although this remains to be investigated.

The “insight paradox” described in schizophrenia posits that good insight improves objective outcomes while negatively affecting subjective outcomes (e.g. depression and suicide risk; Latalova 2012; Lysaker et al. 2018; Davis et al. 2020; Dubreucq et al. 2021). Compared to mothers, fathers with BD had better insight, reduced clinical severity and better psychosocial function. This suggests that there could be gender differences in the factors contributing to suicide attempt in parents with BD (i.e. consequences of poor insight on clinical, functional and parenting outcomes in mothers; insight-related depression in fathers). Future studies including parents with BD in functional remission are needed to determine whether this result could also be valid for this population.

4.2.4. Clinical implications

The present study has a number of potential clinical implications. First, mothers and fathers may have unique characteristics and treatment needs. Gains in insight during psychosocial treatment could be beneficial to the quality of childcare provided by mothers with SMI, through reduced clinical severity and improved psychosocial function (Campbell et al., 2018; Lysaker et al., 2018). Self-stigma predicts and compounds the effects of insight on depression and suicide risk (Dubreucq et al., 2021). The gender differences in the factors contributing to suicidal attempt in parents with BD might suggest that fathers with BD could benefit from recovery-oriented psychoeducation to reduce self-stigma and protect against insight-related depression (Latalova, 2012; Lysaker et al. 2018; Dubreucq et al. 2021). Metacognition refers to a spectrum of activities ranging from discrete mental experiences to the synthesis of intentions, thoughts and feelings in a complex and coherent representation of self and others (Lysaker and Dimaggio, 2014). Improving metacognitive abilities during psychiatric rehabilitation using specific approaches such as Metacognitive Reflection and Insight Therapy (MERIT) might in richer self-narratives, improved insight, less depression and reduced

suicide risk (Lysaker and Dimaggio, 2014; Ayesa-Arriola et al., 2018). Improved metacognition could facilitate recovery in parents with SMI by finding meaning in the experience of mental illness and mental illness-related disruption to a person's parenting role (Leonhardt et al., 2017; Firmin et al., 2020).

Parenting could be associated with improved recovery-related outcomes in fathers with SMI. In the unadjusted analyses, fathers with SMI had a 4-fold likelihood of being employed compared to non-fathers. Given the importance of work-related outcomes in shaping fathers' sense of personal identity, supported employment might improve indirectly recovery-related outcomes in fathers with SMI (e.g. through improved vocational satisfaction and reduced feeling of parental inadequacy to social norms and expectations; Price-Robertson et al., 2015; Bond et al., 2012). However, compared to non-fathers, fathers with SMI had more impairment in executive function - a domain related to psychosocial function and work-related outcomes (Lima et al., 2018; Green et al. 2019). A potential explanation is that other factors than cognitive impairments alone influence vocational outcomes (e.g. social cognition, defeatist beliefs, motivation and metacognition; Lima et al., 2018; Green et al. 2019). In support of this hypothesis, enhanced cognitive remediation - i.e. combined with supported employment - has shown moderate effectiveness on work-related outcomes while cognitive remediation alone has not (Van Duin et al. 2019). Thus, enhanced cognitive remediation could potentially benefit to fathers with SMI, although this remains to be investigated. Another possibility is that fathers, who are less involved in childcare activities than mothers (Ranning et al., 2016; Behson & Robbins, 2016), may be more able to look for a job despite having more cognitive impairments. Thus, higher involvement of fathers in childcare activities could increase their satisfaction with their fathering role and their mental health (i.e. reduced depression and suicide risk; Chan et al., 2017), while facilitating mothers' participation in paid employment

(Behson & Robbins, 2016). Family psychoeducation directed to the partners of fathers with SMI could improve social support and satisfaction in family relationships (Campbell et al., 2012).

Second, interventions targeting perceived stigma and self-stigma reduction should take into account gender-related factors (e.g. gender differences in stigma relating to parenting). Similarly, the inclusion of gender-role specific content relating to parenting in programs targeting dysfunctional attitudes or social skills could improve recovery-related outcomes in parents with SMI (Dubreucq M et al., 2021)

Third, different interventions could be proposed to parents with SMI according to their specific needs (Liu et al., 2015; Campbell et al., 2018). Interventions for future parents with SMI include strengths-based case management, recovery-oriented psychoeducation, empowered decision-making and shared action plans, family support, symptom reduction, stigma reduction, cognitive behavior therapy, cognitive and social cognitive remediation and supported parenting (David et al., 2011; Mehta et al. 2013; Liu et al., 2015). These interventions might improve insight and treatment adherence and reduce the fear of custody loss in parents with SMI (Bonfils et al., 2014; Liu et al., 2015). They could improve parenting and recovery-related outcomes and reduce the risk for suicide attempt (Liu et al., 2015; Campbell et al., 2018). The effectiveness of recovery-oriented interventions from preconception to post-partum care in improving parents and children' outcomes should be investigated in future studies (Dubreucq et al., in preparation). Older parents might benefit from interventions that help in finding meaning about negative experiences relating to parenting and loss of parenting role (e.g. metacognitive and peer-support interventions; Firmin et al., 2020). Reinvesting the parenting role during psychiatric rehabilitation could

facilitate recovery in parents with SMI (Leonhardt et al., 2017; Firmin et al., 2020). A longitudinal examination is needed to investigate whether psychiatric rehabilitation improves or not parenting and recovery-related outcomes in parents with SMI.

Limits: Although the REHABase network covers a large proportion of the French territory, it cannot be definitively asserted that its database constitutes a representative sample of the French population of SMI. The REHABase database is composed of participants enrolled in psychiatric rehabilitation and might therefore not be representative of all patients with SMI. However, some sample characteristics (including sex ratio, age at illness onset, comorbidities) suggest that the present sample is comparable to the general community-dwelling SMI population. However, the absence of parents in functional remission (i.e. with GAF score above 61, Jääskeläinen et al. in 2013) is a considerable limitation, as it cannot be asserted that our results are also valid for this population. This could contribute to the relatively lower proportion of parents with SMI compared to studies including also parents in functional remission (e.g. 18.5% vs. 38.1% in Campbell et al. 2012; 45% of mothers in Mehta et al. 2013; > 50% in Nicholson et al. 2002 and Kaplan et al. 2019). As functional remission contributes to better subjective recovery-related outcomes (e.g. wellbeing, personal recovery and quality of life; Van Eck et al. 2018; Chan et al; 2018), parents who are coping well may have unique characteristics and treatment needs (e.g. parenting support when needed; Campbell et al. 2012; 2018) that should be investigated in future studies. Second, the absence of information about custody status, the presence of dependent children living at home for whom parents may have or not single or joint responsibility, the age at the first child and the age of the children is a considerable limitation, as these variables are closely associated with recovery-related outcomes in parents with SMI. These factors might for example contribute to the positive association between being father and some recovery-related outcomes (e.g. better

satisfaction with family relationships or being employed). They should be included in future studies investigating the associations between parenting and recovery-related outcomes. Third, the cross-sectional nature of this study is a considerable limitation. Longitudinal examination will be needed to determine whether psychiatric rehabilitation improves or not parenting and recovery-related outcomes in parents with SMI. Fourth, the heterogeneity of the SMI group (SSD, BD and BPD) could also be a limitation, as some of the differences between parents and non-parents could be related to sampling issues. However, we adjusted the analyses for diagnostic, current age, education level, housing status and marital status to take into account potential confounding factors. Besides, we conducted subgroup analyses per diagnosis group and moderation analyses to investigate whether our results were related to sampling issues (i.e. differences between diagnostic groups) or to real differences between parents and non-parents. Fifth, though to our knowledge, this study was the first to investigate the correlates of being parent with SMI in a large non-selected sample of people enrolled in psychiatric rehabilitation, we could not conduct multivariate analyses on the correlates of being parent with BD and BPD, given the small number of parents in these groups (mothers, n=53, fathers, n=31; mothers, n=28, fathers, n=23) and the limited number of covariates significant at 10% level in univariate analyses.

In short, in our sample having been a parent was associated for both mothers and fathers with increased history of suicide attempt. This draws attention to the need for suicide prevention measures in this special group. Gender differences were found in the factors associated with having children (poor insight for mothers and poor recovery-related outcomes for fathers). This again speaks to the extra stress that parents are exposed to. Mothers and fathers with SMI and in each diagnostic group may have unique characteristics and treatment needs. This speaks to the need for individual determination of rehabilitative needs. The implementation of

individual treatment supporting the needs of parents with SMI in psychiatric rehabilitation services may facilitate recovery for parents and indirectly benefit their children. Effectiveness of such measures should be further investigated.

Funding: This work was funded by Auvergne-Rhône-Alpes and Nouvelle-Aquitaine regional health agencies. The funding source had no role in the database creation and the data analysis or interpretation.

Declarations of interest: none

Acknowledgements: The authors are grateful to the reviewers of a previous version of the manuscript for their helpful comments. This work was funded by Auvergne-Rhône-Alpes and Nouvelle-Aquitaine regional health agencies. The authors thank Emmanuel Gauthier and Mara Conil for data management, and the members of the REHABase Network (the following teams have all participated in developing the study and collecting the data: C2RL, Limoges; C2RP, Bordeaux; C3R, Grenoble; CL3R, Lyon; CREATIV & URC Pierre Deniker, Poitiers; CMP B CHU Clermont-Ferrand & CHS Saint Marie Clermont-Ferrand, CH Roanne; DSRP Bourg en Bresse and REHALise, Saint-Etienne).

References

- Andresen, R., Caputi, P., Oades, L., 2013. Development of a short measure of psychological recovery in serious mental illness: the STORI-30. *Australas. Psychiatry*. 21(3), 267–270. <https://doi.org/10.1177/1039856213476352>
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM5)*, 5th ed. Washington, DC: American Psychiatric Press.

- Auquier, P., Simeoni, M.C., Sapin, C., Reine, G., Aghababian, V., Cramer, J., Lançon, C., 2003. Development and validation of a patient-based health-related quality of life questionnaire in schizophrenia: the S-QoL. *Schizophr. Res.* 63(1-2), 137–149. [https://doi.org/10.1016/s0920-9964\(02\)00355-9](https://doi.org/10.1016/s0920-9964(02)00355-9)
- Ayesa-Arriola, R., Terán, J., Moríñigo, J., Rivero, M.C., Setién-Suero, E., Al-Halabi, S., Cuesta, M.J., David, A.S., Crespo-Facorro, B., 2018. The dynamic relationship between insight and suicidal behavior in first episode psychosis patients over 3-year follow-up. *Eur. Neuropsychopharmacol.* 28(10), 1161–1172. <https://doi.org/10.1016/j.euroneuro.2018.05.005>
- Behson, S., Robbins, N., 2016. The Effects of Involved Fatherhood on Families, and How Fathers can be Supported both at the Workplace and in the Home. Paper to be presented at the UNITED NATIONS Department of Economic and Social Affairs (UNDESA) Division for Social Policy and Development’s Expert Group Meeting on Family Policies and the 2030 Sustainable Development Agenda, New York, 12 – 13 May 2016. Available from: <https://www.un.org/esa/socdev/family/docs/egm16/BehsonRobbins.pdf>
- Birchwood, M., Smith, J., Drury, V., Healy, J., Macmillan, F., Slade, M., 1994. A self-report Insight Scale for psychosis: reliability, validity and sensitivity to change. *Acta Psychiatr. Scand.* 89(1), 62–67. <https://doi.org/10.1111/j.1600-0447.1994.tb01487.x>
- Boekhorst, M., Beerthuizen, A., Hillegers, M., Pop, V., Bergink, V., 2021. Mother-to-Infant Bonding in Women With a Bipolar Spectrum Disorder. *Front Pediatr.*, 9, 646985. <https://doi.org/10.3389/fped.2021.646985>
- Bond, G.R., Drake, R.E., Becker, D.R., 2012. Generalizability of the Individual Placement and Support (IPS) model of supported employment outside the US. *World psychiatry.* 11(1), 32–39. <https://doi.org/10.1016/j.wpsyc.2012.01.005>

- Bonfils, K.A., Adams, E.L., Firmin, R.L., White, L.M., Salyers, M.P., 2014. Parenthood and severe mental illness: relationships with recovery. *Psychiatr. Rehabil. J.* 37(3), 186–193. <https://doi.org/10.1037/prj0000072>
- Boyd Ritsher, J.B., Otilingam, P.G., Grajales, M., 2003. Internalized stigma of mental illness: psychometric properties of a new measure. *Psychiatry Res.* 121(1), 31–49. <https://doi.org/10.1016/j.psychres.2003.08.008>
- Brickenkamp, R., Schmidt-Atzert, L., Liepmann, D., 2015. D2-R : Test d’attention concentrée révisé. Paris: Editions Hogrefe.
- Campbell, L., Hanlon, M. C., Poon, A. W., Paolini, S., Stone, M., Galletly, C., Stain, H.J., Cohen, M., 2012. The experiences of Australian parents with psychosis: the second Australian National Survey of Psychosis. *Aust. N. Z. J. Psychiatry.* 46(9), 890–900. <https://doi.org/10.1177/0004867412455108>
- Campbell, L.E., Hanlon, M.C., Galletly, C.A., Harvey, C., Stain, H., Cohen, M., van Ravenzwaaij, D., Brown, S., 2018. Severity of illness and adaptive functioning predict quality of care of children among parents with psychosis: A confirmatory factor analysis. *Aust. N. Z. J. Psychiatry.* 52(5), 435–445. <https://doi.org/10.1177/0004867417731526>
- Chan, K.L., Emery, C.R., Fulu, E., Tolman, R.M., Ip, P., 2017. Association Among Father Involvement, Partner Violence, and Paternal Health: UN Multi-Country Cross-Sectional Study on Men and Violence. *Am J Prev Med,* 52(5), 671–679. <https://doi.org/10.1016/j.amepre.2016.12.017>
- Chan, R., Mak, W., Chio, F., Tong, A., 2018. Flourishing With Psychosis: A Prospective Examination on the Interactions Between Clinical, Functional, and Personal Recovery Processes on Well-being Among Individuals with Schizophrenia Spectrum Disorders. *Schizophr Bull,* 44(4), 778–786. <https://doi.org/10.1093/schbul/sbx120>

- Cook, J. A., Mueser, K. T., 2014. Improving services for parents with psychiatric disabilities: three new opportunities in the field of psychiatric rehabilitation. *Psychiatr. Rehabil. J.* 37(1), 1–3. <https://doi.org/10.1037/prj0000064>
- David, D. H., Styron, T., Davidson, L., 2011. Supported Parenting to Meet the Needs and Concerns of Mothers with Severe Mental Illness. *Am. J. Psychiatr. Rehabil.* 14(2), 137–153. <https://doi.org/10.1080/15487768.2011.569668>
- Davis, B.J., Lysaker, P.H., Salyers, M.P., Minor, K.S., 2020. The insight paradox in schizophrenia: A meta-analysis of the relationship between clinical insight and quality of life. *Schizophr Res*, 223, 9–17. <https://doi.org/10.1016/j.schres.2020.07.017>
- Dolman, C., Jones, I., Howard, L. M., 2013. Pre-conception to parenting: a systematic review and meta-synthesis of the qualitative literature on motherhood for women with severe mental illness. *Arch. Womens. Ment. Health.* 16(3), 173–196. <https://doi.org/10.1007/s00737-013-0336-0>
- Dubreucq, J., Plasse, J., Franck, N., 2021. Self-stigma in Serious Mental Illness: A Systematic Review of Frequency, Correlates, and Consequences. *Schizophr. Bull.* sbaa181. Advance online publication. <https://doi.org/10.1093/schbul/sbaa181>
- Dubreucq, J., Plasse, J., Gabayet, F., Faraldo, M., Blanc, O., Chereau, I., Cervello, S., Couhet, G., Demily, C., Guillard-Bouhet, N., Gouache, B., Jaafari, N., Legrand, G., Legros-Lafarge, E., Pommier, R., Quilès, C., Straub, D., Verdoux, H., Vignaga, F., Massoubre, C.; REHABase network, Franck, N., 2020. Stigma resistance is associated with advanced stages of personal recovery in serious mental illness patients enrolled in psychiatric rehabilitation. *Psychol. Med.* 16, 1-11.
- Dubreucq, M., Plasse, J., Gabayet, F., Blanc, O., Chereau, I., Cervello, S., Couhet, G., Demily, C., Guillard-Bouhet, N., Gouache, B., Jaafari, N., Legrand, G., Legros-Lafarge, E., Mora, G., Pommier, R., Quilès, C., Verdoux, H., Vignaga, F., Massoubre, C.; REHABase

- network, Franck, N., Dubreucq, J. 2021. Sex differences in recovery-related outcomes and needs for psychiatric rehabilitation in people with schizophrenia-spectrum disorder. *J. Clin. Psychiatry*. 82(4), 20m13732. <https://doi.org/10.4088/JCP.20m13732>
- Dziobek, I., Fleck, S., Kalbe, E., Rogers, K., Hassenstab, J., Brand, M., Kessler, J., Woike, J.K., Wolf, O.T., Convit, A., 2006. Introducing MASC: a movie for the assessment of social cognition. *J. Autism. Dev. Disord.* 36(5), 623–636. <https://doi.org/10.1007/s10803-006-0107-0>
- Firmin, R.L., Zalzal, A.B., Hamm, J.A., Luther, L., Lysaker, P.H., 2020. How psychosis interrupts the lives of women and men differently: a qualitative comparison. *Psychol. Psychother.* 10.1111/papt.12317. Advance online publication. <https://doi.org/10.1111/papt.12317>
- Fournet, N., Demazières-Pelletier, Y, Favier, S., Lemoine, L., Gros, C., 2009. Test des commissions révisé. GREMOIRE II Tests et échelles des maladies neurologiques avec symptomatologie cognitive. Paris : De Boeck-Solal
- Franck, N., Bon, L., Dekerle, M., Plasse, J., Massoubre, C., Pommier, R., Legros-Lafarge, E., Jaafari, N., Guillard-Bouhet, N., Quilès, C., Couhet, G., Verdoux, H., Gouache, B., Martin, B., Cervello, S., Demily, C., Dubreucq, J., 2019. Satisfaction and Needs in Serious Mental Illness and Autism Spectrum Disorder: The REHABase Psychosocial Rehabilitation Project. *Psychiatr. Serv.* 70(4), 316–323. <https://doi.org/10.1176/appi.ps.201800420>
- Galasinski, D., 2013. Fathers, fatherhood and mental illness: A discourse analysis of rejection. Houndmills, UK: Palgrave Macmillan
- García-Mieres, H., Montesano, A., Villaplana, A., Trujillo, A., Salla, M., Paz, C., Ochoa, S., Feixas, G., 2020. Common and differential dimensions of personal identity between psychosis and depression: The relevance of gender and depressive mood. *J. Psychiatr. Res.* 127, 48–56. <https://doi.org/10.1016/j.jpsychires.2020.05.015>

- Garnier, C., Enot-Joyeux, F., Jokic, C., Le Thiec, F., Desgranges, B., Eustache, F., 1998. Une evaluation des fonctions exécutives chez les traumatisés crâniens: l'adaptation du test des six elements. *Revue de Neuropsychologie*. 8(3), 385-414
- Green, M.F., Horan, W.P., Lee, J., 2019. Nonsocial and social cognition in schizophrenia: current evidence and future directions. *World psychiatry*, 18(2), 146–161. <https://doi.org/10.1002/wps.20624>
- Haarmans, M., McKenzie, K., Kidd, S.A., Bentall, R.P., 2018. Gender role strain, core schemas, and psychotic experiences in ethnically diverse women: A role for sex- and gender-based analysis in psychosis research? *Clin. Psychol. Psychother.* 25(6), 774–784. <https://doi.org/10.1002/cpp.2307>
- Haro, J. M., Kamath, S. A., Ochoa, S., Novick, D., Rele, K., Fargas, A., Rodríguez, M. J., Rele, R., Orta, J., Kharbeng, A., Araya, S., Gervin, M., Alonso, J., Mavreas, V., Lavrentzou, E., Lontos, N., Gregor, K., Jones, P.B., SOHO Study Group., 2003. The Clinical Global Impression-Schizophrenia scale: a simple instrument to measure the diversity of symptoms present in schizophrenia. *Acta Psychiatr. Scand. Suppl.* (416), 16–23. <https://doi.org/10.1034/j.1600-0447.107.s416.5.x>
- Hine, R. H., Maybery, D. J., Goodyear, M. J., 2019. Identity in Personal Recovery for Mothers With a Mental Illness. *Frontiers in psychiatry*, 10, 89. <https://doi.org/10.3389/fpsy.2019.00089>
- Jääskeläinen, E., Juola, P., Hirvonen, N., McGrath, J. J., Saha, S., Isohanni, M., Veijola, J., Miettunen, J., 2013. A systematic review and meta-analysis of recovery in schizophrenia. *Schizophr Bull*, 39(6), 1296–1306. <https://doi.org/10.1093/schbul/sbs130>
- Jeffery, D., Clement, S., Corker, E., Howard, L. M., Murray, J., Thornicroft, G., 2013. Discrimination in relation to parenthood reported by community psychiatric service users in

the UK: a framework analysis. *BMC psychiatry*. 13, 120. <https://doi.org/10.1186/1471-244X-13-120>

- Jones, I., Chandra, P.S., Dazzan, P., Howard, L.M., 2014. Bipolar disorder, affective psychosis, and schizophrenia in pregnancy and the post-partum period. *Lancet*, 384(9956), 1789–1799. [https://doi.org/10.1016/S0140-6736\(14\)61278-2](https://doi.org/10.1016/S0140-6736(14)61278-2)

- Kaplan, K., Brusilovskiy, E., O'Shea, A.M., Salzer, M.S., 2019. Child Protective Service Disparities and Serious Mental Illnesses: Results From a National Survey Psychiatr Serv, 70(3), 202–208. <https://doi.org/10.1176/appi.ps.201800277>

- Lacey, M., Paolini, S., Hanlon, M.C., Melville, J., Galletly, C., Campbell, L.E., 2015. Parents with serious mental illness: differences in internalised and externalised mental illness stigma and gender stigma between mothers and fathers. *Psychiatry Res*. 225(3), 723–733. <https://doi.org/10.1016/j.psychres.2014.09.010>

- Lasalvia, A., Bonetto, C., Miglietta, E., Giacco, D., Nicaise, P., Lorant, V., Moskalewicz, J., Welbel, M., Bauer, M., Pfennig, A., Ruggeri, M., Priebe, S., 2021. Comparing discrimination among people with schizophrenia, affective and anxiety disorders. A multilevel study in five European countries. *J Affect Disord*, 279, 191–202. <https://doi.org/10.1016/j.jad.2020.10.002>

- Látalová, K., 2012. Insight in bipolar disorder. *Psychiatr Q*, 83(3), 293–310. <https://doi.org/10.1007/s11126-011-9200-4>

- Lecomte, T., Corbière, M., Laisné, F., 2006. Investigating self-esteem in individuals with schizophrenia: relevance of the Self-Esteem Rating Scale-Short Form. *Psychiatry Res*. 143(1), 99–108. <https://doi.org/10.1016/j.psychres.2005.08.019>

- Leonhardt, B.L., Huling, K., Hamm, J.A., Roe, D., Hasson-Ohayon, I., McLeod, H.J., Lysaker, P.H., 2017. Recovery and serious mental illness: a review of current clinical and research paradigms and future directions. *Expert. Rev. Neurother*. 17(11), 1117–1130.

- Lima, I., Peckham, A.D., Johnson, S.L., 2018. Cognitive deficits in bipolar disorders: Implications for emotion. *Clin Psychol Rev*, 59, 126–136. <https://doi.org/10.1016/j.cpr.2017.11.006>
- Liu, C.H., Keshavan, M.S., Tronick, E., Seidman, L.J., 2015. Perinatal Risks and Childhood Premorbid Indicators of Later Psychosis: Next Steps for Early Psychosocial Interventions. *Schizophr. Bull.* 41(4), 801–816.
- Lysaker, P.H., Dimaggio, G., 2014. Metacognitive capacities for reflection in schizophrenia: implications for developing treatments. *Schizophr. Bull.* 40(3), 487–491. <https://doi.org/10.1093/schbul/sbu038>
- Lysaker, P. H., Pattison, M. L., Leonhardt, B. L., Phelps, S., Vohs, J. L., 2018. Insight in schizophrenia spectrum disorders: relationship with behavior, mood and perceived quality of life, underlying causes and emerging treatments. *World psychiatry.* 17(1), 12–23.
- Malka, T., Hasson-Ohayon, I., Goldzweig, G., Roe, D., 2020. Coping style is associated with parental distress beyond having a mental illness: A study among mothers with and without mental illness. *Psychiatr. Rehabil. J.* 43(2), 170–173. <https://doi.org/10.1037/prj0000381>
- Martinez, G., Alexandre, C., Mam-Lam-Fook, C., Bendjemaa, N., Gaillard, R., Gareil, P., Dziobek, I., Amado, I., Krebs, M.O., 2017. Phenotypic continuum between autism and schizophrenia: Evidence from the Movie for the Assessment of Social Cognition (MASC). *Schizophr Res.*, 185, 161–166. <https://doi.org/10.1016/j.schres.2017.01.012>
- Mehta, U.M., Bhagyavathi, H.D., Kumar, C.N., Thirthalli, J., Gangadhar, B.N., 2014. Cognitive deconstruction of parenting in schizophrenia: the role of theory of mind. *Aust. N. Z. J. Psychiatry.* 48(3), 249–258. <https://doi.org/10.1177/0004867413500350>

- Mullick, M., Miller, L.J., Jacobsen, T., 2001. Insight into mental illness and child maltreatment risk among mothers with major psychiatric disorders. *Psychiatr. Serv.* 52(4), 488–492. <https://doi.org/10.1176/appi.ps.52.4.488>
- Nicholson, J., 2002. The Prevalence of Parenthood in Adults with Mental Illness: Implications for State and Federal Policymakers, Programs, and Implications for State and Federal Policymakers, Programs, and Providers Provide. *Psychiatry Publications and Presentations*. <https://escholarship.umassmed.edu/cgi/viewcontent> (accessed 21 June 2020)
- Petfield, L., Startup, H., Droscher, H., Cartwright-Hatton, S., 2015. Parenting in mothers with borderline personality disorder and impact on child outcomes. *Evid. Based. Ment. Health.* 18(3), 67–75. <https://doi.org/10.1136/eb-2015-102163>
- Price-Robertson, R., Reupert, A., Maybery, D., 2015. Fathers' experiences of mental illness stigma: scoping review and implications for prevention. *Advances in Mental Health*, 13(2), 100-112, DOI: 10.1080/18387357.2015.1063746
- R Core Team. 2015. R: A Language and Environment for Statistical Computing, R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.
- Ranning, A., Munk Laursen, T., Thorup, A., Hjorthøj, C., Nordentoft, M., 2015. Serious mental illness and disrupted caregiving for children: a nationwide, register-based cohort study. *J. Clin. Psychiatry.* 76(8), e1006–e1014. <https://doi.org/10.4088/JCP.13m08931>
- Ranning, A., Munk Laursen, T., Thorup, A., Hjorthøj, C., Nordentoft, M., 2016. Children of Parents With Serious Mental Illness: With Whom Do They Grow Up? A Prospective, Population-Based Study. *J. Am. Acad. Child. Adolesc. Psychiatry.* 55(11), 953–961.
- Startup, M., Jackson, M. C., Bendix, S., 2002. The concurrent validity of the Global Assessment of Functioning (GAF). *Br. J. Clin. Psychol.* 41(Pt 4), 417–422. <https://doi.org/10.1348/014466502760387533>

- Substance Abuse and Mental Health Services Administration (SAMHSA), 2014. Results from the 2013 National Survey on Drug Use and Health: Mental Health Findings. NSDUH Series H-49, HHS Publication No. (SMA) 14-4887. Rockville, MD: Substance Abuse and Mental Health Services Administration.
- Tebeka, S., Strat, Y.L., Dubertret, C., 2016. Developmental trajectories of pregnant and postpartum depression in an epidemiologic survey. *J Affect Disord*, 203, 62–68. <https://doi.org/10.1016/j.jad.2016.05.058>
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., Stewart-Brown, S., (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health. Qual. Life. Outcomes*. 5, 63. <https://doi.org/10.1186/1477-7525-5-63>
- Thompson, K., Kulkarni, J., Sergejew, A. A., 2000. Reliability and validity of a new Medication Adherence Rating Scale (MARS) for the psychoses. *Schizophr. Res.*, 42(3), 241–247. [https://doi.org/10.1016/s0920-9964\(99\)00130-9](https://doi.org/10.1016/s0920-9964(99)00130-9)
- Van der Linden, M., Coyette, F., Poitrenaud, J., Kalafat, M., Calicis, F., Wyns, C., . . . Membres du GREMEM., 2004. L'épreuve de rappel libre/rappel indicé à 16 items (RL/RI-16). In M. Van der Linden, S. Adam, A. Ag-niel, & Membres du GREMEM (Eds.), *L'évaluation des troubles de la mémoire : présentation de quatre tests de mémoire épisodique avec leur étalonnage*. (pp. 25-47). Marseille: Solal.
- van Duin, D., de Winter, L., Oud, M., Kroon, H., Veling, W., van Weeghel, J., 2019. The effect of rehabilitation combined with cognitive remediation on functioning in persons with severe mental illness: systematic review and meta-analysis. *Psychol Med*, 49(9), 1414–1425. <https://doi.org/10.1017/S003329171800418X>
- Van Eck, R. M., Burger, T. J., Vellinga, A., Schirmbeck, F., & de Haan, L., 2018. The Relationship Between Clinical and Personal Recovery in Patients With Schizophrenia

Spectrum Disorders: A Systematic Review and Meta-analysis. *Schizophr Bull*, 44(3), 631–642. <https://doi.org/10.1093/schbul/sbx088>

- Wallace, C. J., Lecomte, T., Wilde, J., Liberman, R. P., 2001. CASIG: a consumer-centered assessment for planning individualized treatment and evaluating program outcomes. *Schizophr. Res.* 50(1-2), 105–119. [https://doi.org/10.1016/s0920-9964\(00\)00068-2](https://doi.org/10.1016/s0920-9964(00)00068-2)

- Wall-Wieler, E., Roos, L. L., Brownell, M., Nickel, N., Chateau, D., Singal, D., 2018a. Suicide Attempts and Completions among Mothers Whose Children Were Taken into Care by Child Protection Services: A Cohort Study Using Linkable Administrative Data. *Can. J. Psychiatry.* 63(3), 170–177. <https://doi.org/10.1177/0706743717741058>

- Wall-Wieler, E., Roos, L.L., Nickel, N.C., Chateau, D., Brownell, M., 2018b. Mortality Among Mothers Whose Children Were Taken Into Care by Child Protection Services: A Discordant Sibling Analysis. *Am. J. Epidemiol.* 187(6), 1182–1188. <https://doi.org/10.1093/aje/kwy062>

- Wechsler, D., 2011. WAIS IV Nouvelle version de l'échelle d'intelligence de Weschler pour adultes. 4th ed. Paris : Edition de Centre de Psychologie Appliquée.

- Weller P. 2019. Mothers and mental illness: Breaking the silence about child loss. *Int J Law Psychiatry.*, 67, 101500. <https://doi.org/10.1016/j.ijlp.2019.101500>

- Wesseloo, R., Kamperman, A. M., Munk-Olsen, T., Pop, V. J., Kushner, S. A., Bergink, V., 2016. Risk of Postpartum Relapse in Bipolar Disorder and Postpartum Psychosis: A Systematic Review and Meta-Analysis. *Am J Psychiatry*, 173(2), 117–127. <https://doi.org/10.1176/appi.ajp.2015.15010124>

- White, L.M., McGrew, J.H., Salyers, M.P., 2013. Parents served by assertive community treatment: parenting needs, services, and attitudes. *Psychiatric rehabilitation journal*, 36(1), 22–27. <https://doi.org/10.1037/h0094743>

- White, L.M., McGrew, J.H., Salyers, M.P., Firmin, R.L., 2014. Assertive community treatment for parents with serious mental illnesses: a comparison of "parent-sensitive" assertive community treatment teams versus other teams. *Psychiatr. Rehabil. J.* 37(3), 251–260. <https://doi.org/10.1037/prj0000050>
- Woods, S.P., Delis, D.C., Scott, J.C., Kramer, J.H., Holdnack, J. A., 2006. The California Verbal Learning Test--second edition: test-retest reliability, practice effects, and reliable change indices for the standard and alternate forms. *Arch. Clin. Neuropsychol.* 21(5), 413–420. <https://doi.org/10.1016/j.acn.2006.06.002>
- Wykes, T., Huddy, V., Cellard, C., McGurk, S.R., Czobor, P., 2011. A meta-analysis of cognitive remediation for schizophrenia: methodology and effect sizes. *Am. J. Psychiatry.* 168(5), 472–485. <https://doi.org/10.1176/appi.ajp.2010.10060855>

	Schizophrenia (N=965)	Bipolar disorders (N=228)	Personality disorder (N=243)	Total (N=1436)	p value
Gender					< 0.001 ¹
N	965	228	243	1436	
Male	712 (73.8%)	109 (47.8%)	122 (50.2%)	943 (65.7%)	
Female	253 (26.2%)	119 (52.2%)	121 (49.8%)	493 (34.3%)	
Age at the time of admission					< 0.001 ²
N	965	228	243	1436	
Mean (SD)	33.55 (9.23)	39.15 (11.07)	34.23 (10.33)	34.55 (9.93)	
Range	20.02 - 64.88	20.49 - 71.65	20.29 - 74.02	20.02 - 74.02	
Highest education level at the time of admission (ISCED)					< 0.001 ¹
N	947	223	239	1409	
Primary/Secondary school	192 (20.3%)	17 (7.6%)	52 (21.8%)	261 (18.5%)	
High school	483 (51.0%)	93 (41.7%)	110 (46.0%)	686 (48.7%)	
University	272 (28.7%)	113 (50.7%)	77 (32.2%)	462 (32.8%)	
Marital status					< 0.001 ¹
N	964	228	242	1434	
Single	845 (87.7%)	152 (66.7%)	203 (83.9%)	1200 (83.7%)	
In a couple	119 (12.3%)	76 (33.3%)	39 (16.1%)	234 (16.3%)	
Housing status					< 0.001 ¹
N	960	228	243	1431	
Personal accommodation	455 (47.4%)	169 (74.1%)	151 (62.1%)	775 (54.2%)	
Family accommodation	370 (38.5%)	51 (22.4%)	65 (26.7%)	486 (34.0%)	
Others (supervised apartment, homeless)	135 (14.1%)	8 (3.5%)	27 (11.1%)	170 (11.9%)	
Occupational status					< 0.001 ¹
N	885	178	215	1278	
Without income	158 (17.9%)	26 (14.6%)	49 (22.8%)	233 (18.2%)	
Competitvy/sheltered work	84 (9.5%)	41 (23.0%)	23 (10.7%)	148 (11.6%)	
Unemployment / Disability benefits	643 (72.7%)	111 (62.4%)	143 (66.5%)	897 (70.2%)	
Parenthood					< 0.001 ¹
N	965	228	243	1436	
Non-parents	836 (86.6%)	144 (63.2%)	192 (79.0%)	1172 (81.6%)	
Parents	129 (13.4%)	84 (36.8%)	51 (21.0%)	264 (18.4%)	
Number of children					0.043 ²
N	129	84	51	264	
Mean (SD)	1.81 (0.99)	1.90 (0.91)	1.59 (0.94)	1.80 (0.96)	
Range	1.00 - 6.00	1.00 - 5.00	1.00 - 5.00	1.00 - 6.00	

Table 1: Patients characteristics with differences according to psychiatric diagnosis

¹ Pearson's Chi-squared test

² Kruskal-Wallis rank sum test

Table 2: Association between socio-demographic factors, medical factors and quality of life with mothering status in adjusted logistic regression

Label	Levels	Non-mothers (n=356)	Mothers (n=137)	Total	Crude OR ¹	Adjusted Or ²
Occupational status (n=427)	Without income	60 (18.6)	8 (7.7)	68 (15.9)	-	-
	Competitvy/sheltered work	35 (10.8)	10 (9.6)	45 (10.5)	2.14 (0.77-6.10, p=0.143)	0.52 (0.14-1.89, p=0.321)
	Unemployment / Disability benefits	228 (70.6)	86 (82.7)	314 (73.5)	2.83 (1.37-6.63, p=0.009)	1.35 (0.5-3.63, p=0.557)
Age at onset of first episode (n=436)	Mean (SD)	21.2 (8.2)	26.0 (9.7)	22.5 (8.9)	1.06 (1.04-1.09, p<0.001)	1.02 (0.99-1.05, p=0.188)
Illness duration (years) (n=436)	Mean (SD)	12.1 (9.3)	16.7 (10.6)	13.4 (9.9)	1.05 (1.02-1.07, p<0.001)	0.98 (0.95-1.01, p=0.188)
Number of previous admissions (n=438)	Mean (SD)	3.7 (4.2)	5.5 (8.7)	4.2 (5.8)	1.05 (1.01-1.09, p=0.009)	1.04 (1-1.08, p=0.083)
Duration (in month) of hospitalization (n=395)	Mean (SD)	8.8 (15.2)	9.2 (15.0)	8.9 (15.2)	1.00 (0.99-1.02, p=0.814)	1 (0.98-1.02, p=0.98)
Psychiatric comorbidity (n=439)	No	241 (75.5)	91 (75.8)	332 (75.6)	-	-
	Yes	78 (24.5)	29 (24.2)	107 (24.4)	0.98 (0.60-1.59, p=0.951)	1.39 (0.76-2.52, p=0.285)
Suicide attempt (n=482)	No	206 (58.9)	59 (44.7)	265 (55.0)	-	-
	Yes	144 (41.1)	73 (55.3)	217 (45.0)	1.77 (1.18-2.66, p=0.006)	1.78 (1.09-2.92, p=0.021)
Legal guardianship (n=486)	Without	287 (81.8)	104 (77.0)	391 (80.5)	-	-
	With	64 (18.2)	31 (23.0)	95 (19.5)	1.34 (0.82-2.16, p=0.240)	1.05 (0.59-1.86, p=0.88)
Clinical Global Impression (n=382)	Mean (SD)	4.0 (1.1)	4.0 (1.0)	4.0 (1.1)	0.98 (0.80-1.20, p=0.853)	1.08 (0.84-1.39, p=0.549)
Global Assessment of Functioning (n=383)	Mean (SD)	57.8 (13.1)	58.3 (13.9)	58.0 (13.3)	1.00 (0.99-1.02, p=0.733)	0.99 (0.97-1.01, p=0.428)
MARS - Total score (n=232)	Mean (SD)	6.6 (2.1)	6.3 (2.1)	6.5 (2.1)	0.94 (0.82-1.08, p=0.388)	0.9 (0.76-1.07, p=0.242)
IS Birchwood - Total score (n=278)	Mean (SD)	9.0 (2.4)	8.6 (2.2)	8.9 (2.4)	0.93 (0.83-1.05, p=0.237)	0.81 (0.7-0.94, p=0.005)
SQOL18 - Total score (n=278)	Mean (SD)	49.1 (18.4)	49.1 (16.1)	49.1 (17.9)	1.00 (0.98-1.02, p=0.996)	1 (0.98-1.02, p=0.997)
WEMWBS - Total score (z-score) (n=302)	Mean (SD)	-1.3 (1.4)	-1.3 (1.4)	-1.3 (1.4)	1.04 (0.86-1.27, p=0.676)	0.96 (0.76-1.22, p=0.732)
STORI - Max of stages (n=224)	Moratorium	37 (21.4)	10 (19.6)	47 (21.0)	-	-
	Awareness	24 (13.9)	10 (19.6)	34 (15.2)	1.54 (0.55-4.31, p=0.404)	1.89 (0.54-6.58, p=0.318)
	Preparation	21 (12.1)	5 (9.8)	26 (11.6)	0.88 (0.25-2.84, p=0.836)	0.54 (0.11-2.53, p=0.433)
	Rebuilding	43 (24.9)	11 (21.6)	54 (24.1)	0.95 (0.36-2.51, p=0.911)	0.8 (0.24-2.67, p=0.716)
	Growth	48 (27.7)	15 (29.4)	63 (28.1)	1.16 (0.47-2.94, p=0.754)	1.48 (0.48-4.52, p=0.496)
SERS - Total score (n=248)	Mean (SD)	-2.4 (19.9)	3.1 (20.3)	-0.9 (20.1)	1.01 (1.00-1.03, p=0.055)	1.02 (1-1.03, p=0.095)
ISMI - Total score (n=250)	Mean (SD)	2.3 (0.5)	2.3 (0.4)	2.3 (0.4)	1.13 (0.58-2.22, p=0.715)	0.99 (0.45-2.2, p=0.981)
CASIG adaptation - Satisfaction level with housing (n=243)	Mean (SD)	6.6 (2.6)	6.6 (2.7)	6.6 (2.6)	1.00 (0.90-1.11, p=0.984)	0.99 (0.87-1.14, p=0.923)
CASIG adaptation - Satisfaction level with daily	Mean (SD)	6.1 (2.7)	6.1 (2.4)	6.1 (2.6)	1.00 (0.90-1.11, p=0.974)	1.03 (0.9-1.18, p=0.673)

¹ Univariate logistic regression

² Logistic regression adjusted by diagnostic, age at the time of admission, education level, housing status and marital status

life skills (n=243)						
CASIG adaptation - Satisfaction level with vocational status (n=235)	Mean (SD)	3.2 (2.9)	3.1 (2.9)	3.1 (2.9)	1.00 (0.90-1.10, p=0.927)	0.9 (0.79-1.02, p=0.095)
CASIG adaptation - Satisfaction level with interpersonal relationships (n=243)	Mean (SD)	5.4 (2.9)	6.0 (3.0)	5.6 (2.9)	1.07 (0.97-1.18, p=0.194)	1.06 (0.94-1.21, p=0.336)
CASIG adaptation - Satisfaction level with intimate relationships (n=240)	Mean (SD)	4.3 (3.4)	4.5 (3.6)	4.3 (3.5)	1.01 (0.94-1.10, p=0.719)	1.01 (0.9-1.14, p=0.818)
CASIG adaptation - Satisfaction level with family relationships (n=243)	Mean (SD)	6.3 (2.8)	6.2 (2.9)	6.2 (2.8)	0.99 (0.90-1.09, p=0.813)	0.98 (0.87-1.11, p=0.737)
Long term memory (CVLT/RLRI) (n=271)	Deficit level ³	51 (25.0)	10 (14.9)	61 (22.5)	-	-
	Normal level	153 (75.0)	57 (85.1)	210 (77.5)	1.90 (0.94-4.20, p=0.090)	1.4 (0.6-3.26, p=0.434)
Executing functioning (Digit span - Short term memory) (n=284)	Deficit level ³	16 (7.5)	4 (5.6)	20 (7.0)	-	-
	Normal level	197 (92.5)	67 (94.4)	264 (93.0)	1.36 (0.48-4.87, p=0.594)	1.26 (0.32-4.94, p=0.738)
Executing functioning (Digit span - Working memory) (n=283)	Deficit level ³	22 (10.4)	3 (4.2)	25 (8.8)	-	-
	Normal level	190 (89.6)	68 (95.8)	258 (91.2)	2.62 (0.87-11.33, p=0.127)	1.67 (0.42-6.59, p=0.464)
Attention (D2-R - Attention capacity) (n=209)	Deficit level ³	44 (28.0)	5 (9.6)	49 (23.4)	-	-
	Normal level	113 (72.0)	47 (90.4)	160 (76.6)	3.66 (1.48-11.07, p=0.010)	2.2 (0.75-6.45, p=0.149)
Attention (D2-R - Target processed/processing speed) (n=209)	Deficit level ³	64 (40.8)	16 (30.8)	80 (38.3)	-	-
	Normal level	93 (59.2)	36 (69.2)	129 (61.7)	1.55 (0.80-3.09, p=0.201)	1.29 (0.57-2.94, p=0.538)
Attention (D2-R - Errors and omissions) (n=207)	Deficit level ³	9 (5.8)	0 (0.0)	9 (4.3)	-	-
	Normal level	146 (94.2)	52 (100.0)	198 (95.7)	NA	NA
Planning abilities (Shopping test - Reaction time) (n=248)	Deficit level ³	45 (24.6)	12 (18.5)	57 (23.0)	-	-
	Normal level	138 (75.4)	53 (81.5)	191 (77.0)	1.44 (0.73-3.04, p=0.315)	1.96 (0.83-4.67, p=0.127)
Planning abilities (Shopping test - Error) (n=247)	Deficit level ³	50 (27.5)	15 (23.1)	65 (26.3)	-	-
	Normal level	132 (72.5)	50 (76.9)	182 (73.7)	1.26 (0.66-2.51, p=0.490)	1.52 (0.69-3.36, p=0.3)

³ Cognitive deficits class was performed by score <= 5th percentile or z-score <= -1.65

Table 3: Association between socio-demographic factors, medical factors and quality of life with fathering status in adjusted logistic regression

label	Levels	Non-fathers (n=816)	Fathers (n=127)	Total	Crude OR ¹	Adjusted OR ²
Occupational status (n=851)	Without income	156 (20.8)	9 (9.0)	165 (19.4)	-	-
	Competitvy/sheltered work	83 (11.1)	20 (20.0)	103 (12.1)	4.18 (1.87-10.03, p=0.001)	1.48 (0.54-4.02, p=0.446)
	Unemployment / Disability benefits	512 (68.2)	71 (71.0)	583 (68.5)	2.40 (1.24-5.26, p=0.016)	1.32 (0.55-3.12, p=0.534)
Age at onset of first episode (n=857)	Mean (SD)	21.2 (7.1)	27.7 (10.2)	22.0 (7.9)	1.11 (1.08-1.14, p<0.001)	1.04 (1.01-1.08, p=0.005)
Illness duration (years) (n=857)	Mean (SD)	11.2 (8.3)	14.8 (9.5)	11.7 (8.5)	1.05 (1.02-1.07, p<0.001)	0.96 (0.93-0.99, p=0.005)
Number of previous admissions (n=865)	Mean (SD)	3.0 (3.4)	4.2 (4.7)	3.2 (3.6)	1.07 (1.03-1.12, p=0.002)	1.04 (0.99-1.09, p=0.131)
Duration (in month) of hospitalization (n=755)	Mean (SD)	7.0 (13.4)	9.5 (25.3)	7.3 (15.5)	1.01 (1.00-1.02, p=0.153)	1.01 (0.99-1.02, p=0.348)
Psychiatric comorbidity (n=814)	No	520 (74.1)	80 (71.4)	600 (73.7)	-	-
	Yes	182 (25.9)	32 (28.6)	214 (26.3)	1.14 (0.73-1.77, p=0.555)	0.91 (0.53-1.56, p=0.729)
Suicide attempt (n=906)	No	592 (75.5)	79 (64.8)	671 (74.1)	-	-
	Yes	192 (24.5)	43 (35.2)	235 (25.9)	1.68 (1.11-2.51, p=0.012)	1.61 (0.99-2.6, p=0.053)
Legal guardianship (n=928)	Without	661 (82.3)	107 (85.6)	768 (82.8)	-	-
	With	142 (17.7)	18 (14.4)	160 (17.2)	0.78 (0.45-1.30, p=0.367)	0.66 (0.35-1.27, p=0.215)
Clinical Global Impression (n=711)	Mean (SD)	4.1 (1.1)	3.8 (1.3)	4.1 (1.1)	0.76 (0.62-0.92, p=0.006)	0.8 (0.64-1.01, p=0.056)
Global Assessment of Functioning (n=716)	Mean (SD)	56.2 (13.8)	61.4 (15.6)	56.9 (14.1)	1.03 (1.01-1.04, p=0.001)	1.01 (0.99-1.03, p=0.18)
MARS - Total score (n=476)	Mean (SD)	6.8 (1.9)	6.8 (2.0)	6.8 (1.9)	1.00 (0.87-1.16, p=0.986)	0.99 (0.83-1.18, p=0.933)
IS Birchwood - Total score (n=518)	Mean (SD)	8.5 (2.6)	9.0 (2.3)	8.6 (2.6)	1.08 (0.98-1.20, p=0.147)	0.97 (0.86-1.1, p=0.634)
SQOL18 - Total score (n=525)	Mean (SD)	52.6 (17.0)	51.3 (17.5)	52.4 (17.1)	1.00 (0.98-1.01, p=0.574)	1.01 (0.99-1.03, p=0.263)
WEMWBS - Total score (z-score) (n=591)	Mean (SD)	-1.1 (1.3)	-1.3 (1.3)	-1.1 (1.3)	0.89 (0.74-1.07, p=0.232)	1 (0.79-1.26, p=0.969)
STORI - Max of stages (n=463)	Moratorium	58 (14.8)	14 (20.0)	72 (15.6)	-	-
	Awareness	62 (15.8)	9 (12.9)	71 (15.3)	0.60 (0.23-1.48, p=0.274)	0.87 (0.28-2.72, p=0.813)
	Preparation	42 (10.7)	5 (7.1)	47 (10.2)	0.49 (0.15-1.40, p=0.206)	0.5 (0.12-2.08, p=0.338)
	Rebuilding	101 (25.7)	17 (24.3)	118 (25.5)	0.70 (0.32-1.54, p=0.363)	1.08 (0.41-2.82, p=0.878)
	Growth	130 (33.1)	25 (35.7)	155 (33.5)	0.80 (0.39-1.68, p=0.538)	0.93 (0.37-2.34, p=0.885)
SERS - Total score (n=502)	Mean (SD)	3.7 (19.5)	3.0 (18.9)	3.6 (19.4)	1.00 (0.99-1.01, p=0.761)	1.01 (0.99-1.03, p=0.292)
ISMI - Total score (n=508)	Mean (SD)	2.2 (0.5)	2.3 (0.4)	2.2 (0.4)	1.46 (0.81-2.67, p=0.208)	0.82 (0.39-1.74, p=0.612)
CASIG adaptation - Satisfaction level with housing (n=479)	Mean (SD)	6.7 (2.4)	6.8 (2.4)	6.7 (2.4)	1.02 (0.91-1.14, p=0.743)	1.07 (0.93-1.23, p=0.346)
CASIG adaptation - Satisfaction level with daily life skills (n=475)	Mean (SD)	6.3 (2.3)	6.6 (2.2)	6.4 (2.3)	1.05 (0.94-1.18, p=0.429)	1.09 (0.94-1.26, p=0.27)

¹ Univariate logistic regression

² Logistic regression adjusted by diagnostic, age at the time of admission, education level, housing status and marital status

CASIG adaptation - Satisfaction level with vocational status (n=464)	Mean (SD)	3.1 (2.8)	3.5 (2.8)	3.2 (2.8)	1.05 (0.96-1.15, p=0.306)	1.01 (0.9-1.14, p=0.809)
CASIG adaptation - Satisfaction level with interpersonal relationships (n=472)	Mean (SD)	6.0 (2.8)	6.1 (2.6)	6.0 (2.7)	1.02 (0.92-1.12, p=0.756)	1.06 (0.94-1.19, p=0.358)
CASIG adaptation - Satisfaction level with intimate relationships (n=471)	Mean (SD)	3.8 (3.0)	5.2 (3.3)	4.0 (3.1)	1.15 (1.06-1.26, p=0.001)	1.1 (0.98-1.22, p=0.094)
CASIG adaptation - Satisfaction level with family relationships (n=473)	Mean (SD)	6.7 (2.5)	7.1 (2.6)	6.8 (2.5)	1.06 (0.95-1.19, p=0.302)	1.22 (1.06-1.4, p=0.006)
Long term memory (CVLT/RLRI) (n=527)	Deficit level ³	152 (33.0)	22 (32.8)	174 (33.0)	-	-
	Normal level	308 (67.0)	45 (67.2)	353 (67.0)	1.01 (0.59-1.77, p=0.973)	0.79 (0.4-1.54, p=0.486)
Executing functioning (Digit span - Short term memory) (n=549)	Deficit level ³	10 (2.1)	5 (6.9)	15 (2.7)	-	-
	Normal level	467 (97.9)	67 (93.1)	534 (97.3)	0.29 (0.10-0.94, p=0.027)	0.26 (0.07-0.92, p=0.036)
Executing functioning (Digit span - Working memory) (n=549)	Deficit level ³	22 (4.6)	2 (2.8)	24 (4.4)	-	-
	Normal level	455 (95.4)	70 (97.2)	525 (95.6)	1.69 (0.48-10.71, p=0.483)	1.13 (0.16-7.83, p=0.901)
Attention (D2-R - Attention capacity) (n=447)	Deficit level ³	120 (30.8)	14 (24.6)	134 (30.0)	-	-
	Normal level	270 (69.2)	43 (75.4)	313 (70.0)	1.37 (0.74-2.67, p=0.341)	0.87 (0.37-2.04, p=0.753)
Attention (D2-R - Target processed/processing speed) (n=456)	Deficit level ³	182 (45.7)	22 (37.9)	204 (44.7)	-	-
	Normal level	216 (54.3)	36 (62.1)	252 (55.3)	1.38 (0.79-2.46, p=0.266)	1.41 (0.67-2.97, p=0.36)
Attention (D2-R - Errors and omissions) (n=452)	Deficit level ³	32 (8.1)	2 (3.4)	34 (7.5)	-	-
	Normal level	362 (91.9)	56 (96.6)	418 (92.5)	2.48 (0.72-15.54, p=0.222)	1.15 (0.22-6.06, p=0.872)
Planning abilities (Shopping test - Reaction time) (n=495)	Deficit level ³	94 (21.7)	14 (23.0)	108 (21.8)	-	-
	Normal level	340 (78.3)	47 (77.0)	387 (78.2)	0.93 (0.50-1.82, p=0.819)	1.08 (0.48-2.45, p=0.852)
Planning abilities (Shopping test - Error) (n=493)	Deficit level ³	118 (27.3)	12 (19.7)	130 (26.4)	-	-
	Normal level	314 (72.7)	49 (80.3)	363 (73.6)	1.53 (0.81-3.11, p=0.207)	1.85 (0.8-4.29, p=0.151)

³ Cognitive deficits class was performed by score <= 5th percentile or z-score <= -1.65.

Table 4: Demographic and medical characteristics of all parents (mothers and fathers) in adjusted logistic regression

label	levels	Father	Mother	Crude OR ¹	Adjusted Or ²
Occupational status (n=204)	Without income	9 (9.0)	8 (7.7)	-	-
	Competitivy/sheltered work Unemployment / Disability benefits	20 (20.0)	10 (9.6)	0.56 (0.16-1.91, p=0.354)	0.3 (0.08-1.19, p=0.088)
		71 (71.0)	86 (82.7)	1.36 (0.50-3.81, p=0.545)	1.24 (0.4-3.84, p=0.712)
Age at onset of first episode (n=238)	Mean (SD)	27.7 (10.2)	26.0 (9.7)	0.98 (0.96-1.01, p=0.194)	0.97 (0.94-1, p=0.098)
Illness duration (years) (n=238)	Mean (SD)	14.8 (9.5)	16.7 (10.6)	1.02 (0.99-1.05, p=0.159)	1.03 (1-1.06, p=0.098)
Number of previous admissions (n=237)	Mean (SD)	4.2 (4.7)	5.5 (8.7)	1.03 (0.99-1.08, p=0.177)	1.04 (1-1.09, p=0.08)
Duration (in month) of hospitalization (n=205)	Mean (SD)	9.5 (25.3)	9.2 (15.0)	1.00 (0.98-1.01, p=0.925)	1 (0.99-1.01, p=0.992)
Psychiatric comorbidity (n=232)	No	80 (71.4)	91 (75.8)	-	-
	Yes	32 (28.6)	29 (24.2)	0.80 (0.44-1.43, p=0.447)	0.74 (0.38-1.42, p=0.365)
Suicide attempt (n=254)	No	79 (64.8)	59 (44.7)	-	-
	Yes	43 (35.2)	73 (55.3)	2.27 (1.38-3.79, p=0.001)	2.18 (1.26-3.76, p=0.005)
Legal guardianship (n=260)	Without	107 (85.6)	104 (77.0)	-	-
	With	18 (14.4)	31 (23.0)	1.77 (0.94-3.42, p=0.080)	1.72 (0.86-3.46, p=0.127)
Clinical Global Impression (n=194)	Mean (SD)	3.8 (1.3)	4.0 (1.0)	1.22 (0.95-1.59, p=0.126)	1.27 (0.96-1.68, p=0.095)
Global Assessment of Functioning (n=195)	Mean (SD)	61.4 (15.6)	58.3 (13.9)	0.99 (0.97-1.00, p=0.147)	0.98 (0.96-1, p=0.073)
MARS - Total score (n=122)	Mean (SD)	6.8 (2.0)	6.3 (2.1)	0.89 (0.74-1.06, p=0.207)	0.86 (0.7-1.05, p=0.143)
IS Birchwood - Total score (n=138)	Mean (SD)	9.0 (2.3)	8.6 (2.2)	0.92 (0.79-1.06, p=0.262)	0.89 (0.75-1.05, p=0.174)
SQOL18 - Total score (n=134)	Mean (SD)	51.3 (17.5)	49.1 (16.1)	0.99 (0.97-1.01, p=0.439)	0.99 (0.97-1.01, p=0.331)
WEMWBS - Total score (z-score) (n=150)	Mean (SD)	-1.3 (1.3)	-1.3 (1.4)	1.03 (0.80-1.32, p=0.828)	0.92 (0.69-1.22, p=0.552)
STORI - Max of stages (n=121)	Moratorium	14 (20.0)	10 (19.6)	-	-
	Awareness	9 (12.9)	10 (19.6)	1.56 (0.46-5.34, p=0.475)	1.67 (0.42-6.67, p=0.466)
	Preparation	5 (7.1)	5 (9.8)	1.40 (0.31-6.35, p=0.656)	1.21 (0.21-6.94, p=0.831)
	Rebuilding	17 (24.3)	11 (21.6)	0.91 (0.30-2.77, p=0.862)	0.68 (0.18-2.56, p=0.565)
	Growth	25 (35.7)	15 (29.4)	0.84 (0.30-2.39, p=0.741)	0.86 (0.27-2.8, p=0.808)
SERS - Total score (n=138)	Mean (SD)	3.0 (18.9)	3.1 (20.3)	1.00 (0.98-1.02, p=0.965)	0.99 (0.97-1.01, p=0.44)
ISMI - Total score (n=120)	Mean (SD)	2.3 (0.4)	2.3 (0.4)	1.10 (0.47-2.59, p=0.834)	1.4 (0.53-3.72, p=0.502)
CASIG adaptation - Satisfaction level with housing (n=135)	Mean (SD)	6.8 (2.4)	6.6 (2.7)	0.97 (0.85-1.11, p=0.694)	0.88 (0.75-1.03, p=0.114)

¹ Univariate logistic regression

² Logistic regression adjusted by diagnostic, age at the time of admission, education level, housing status and marital status

CASIG adaptation - Satisfaction level with daily life skills (n=135)	Mean (SD)	6.6 (2.2)	6.1 (2.4)	0.91 (0.78-1.05, p=0.201)	0.86 (0.73-1.02, p=0.078)
CASIG adaptation - Satisfaction level with vocational status (n=131)	Mean (SD)	3.5 (2.8)	3.1 (2.9)	0.95 (0.84-1.07, p=0.413)	0.96 (0.83-1.11, p=0.591)
CASIG adaptation - Satisfaction level with interpersonal relationships (n=135)	Mean (SD)	6.1 (2.6)	6.0 (3.0)	0.99 (0.87-1.11, p=0.826)	0.95 (0.82-1.1, p=0.489)
CASIG adaptation - Satisfaction level with intimate relationships (n=134)	Mean (SD)	5.2 (3.3)	4.5 (3.6)	0.94 (0.85-1.04, p=0.243)	0.95 (0.85-1.07, p=0.426)
CASIG adaptation - Satisfaction level with family relationships (n=135)	Mean (SD)	7.1 (2.6)	6.2 (2.9)	0.89 (0.78-1.00, p=0.065)	0.88 (0.76-1.02, p=0.085)
Long term memory (CVLT/RLRI) (n=134)	Deficit level ³	22 (32.8)	10 (14.9)	-	-
	Normal level	45 (67.2)	57 (85.1)	2.79 (1.23-6.71, p=0.017)	2.76 (1.11-6.83, p=0.028)
Executing functioning (Digit span - Short term memory) (n=143)	Deficit level ³	5 (6.9)	4 (5.6)	-	-
	Normal level	67 (93.1)	67 (94.4)	1.25 (0.32-5.24, p=0.747)	1.31 (0.3-5.68, p=0.715)
Executing functioning (Digit span - Working memory) (n=143)	Deficit level ³	2 (2.8)	3 (4.2)	-	-
	Normal level	70 (97.2)	68 (95.8)	0.65 (0.08-4.02, p=0.640)	0.46 (0.06-3.43, p=0.452)
Attention (D2-R - Attention capacity) (n=109)	Deficit level ³	14 (24.6)	5 (9.6)	-	-
	Normal level	43 (75.4)	47 (90.4)	3.06 (1.07-10.12, p=0.047)	3.07 (0.87-10.8, p=0.081)
Attention (D2-R - Target processed/processing speed) (n=110)	Deficit level ³	22 (37.9)	16 (30.8)	-	-
	Normal level	36 (62.1)	36 (69.2)	1.37 (0.62-3.07, p=0.431)	1.25 (0.48-3.24, p=0.653)
Attention (D2-R - Errors and omissions) (n=110)	Deficit level ³	2 (3.4)	0 (0.0)	-	-
	Normal level	56 (96.6)	52 (100.0)	5346540.51 (0.00-NA, p=0.988)	9195097.84 (0-Inf, p=0.992)
Planning abilities (Shopping test - Reaction time) (n=126)	Deficit level ³	14 (23.0)	12 (18.5)	-	-
	Normal level	47 (77.0)	53 (81.5)	1.32 (0.55-3.17, p=0.534)	1.22 (0.47-3.15, p=0.684)
Planning abilities (Shopping test - Error) (n=126)	Deficit level ³	12 (19.7)	15 (23.1)	-	-
	Normal level	49 (80.3)	50 (76.9)	0.82 (0.34-1.92, p=0.642)	0.66 (0.26-1.68, p=0.384)

³ Cognitive deficits class was performed by score <= 5th percentile or z-score <= -1.65

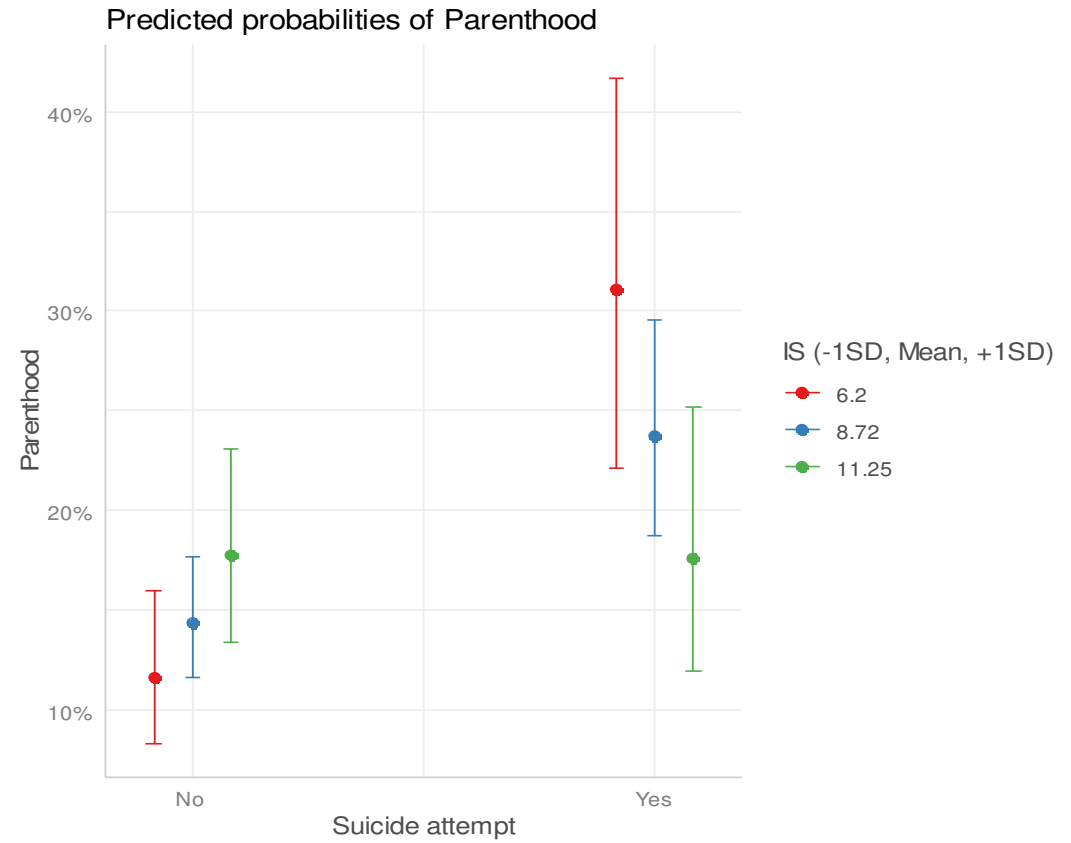
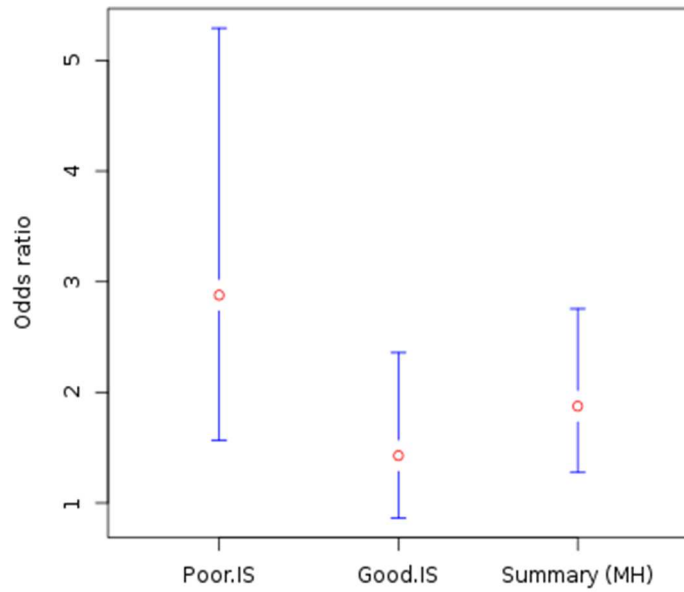
Table 5 : Multivariate logistic regression summary (with stepwise selection)

Predictors	Parenthood (Female)				Parenthood (Male)			
	Odds Ratios	CI	Statistic	p	Odds Ratios	CI	Statistic	p
First diagnoses class: Bipolar disorders	1.39	0.44 – 4.35	0.58	0.563	1.66	0.47 – 5.43	0.82	0.414
First diagnoses class: Personality disorder	0.51	0.08 – 2.52	-0.77	0.443	1.32	0.36 – 4.17	0.45	0.654
Age at the time of admission	1.13	1.07 – 1.21	3.78	<0.001	1.16	1.10 – 1.23	5.05	<0.001
Education level : High school (ref: Primary/Secondary school)	0.27	0.05 – 1.32	-1.59	0.112	0.38	0.12 – 1.25	-1.64	0.101
Education level : University (ref: Primary/Secondary school)	0.12	0.02 – 0.53	-2.65	0.008	0.42	0.12 – 1.55	-1.31	0.19
Marital status : In a couple	2.21	0.74 – 6.81	1.41	0.157	7.81	2.73 – 23.84	3.75	<0.001
Housing status : Family accommodation (ref: Personal accommodation)	0.19	0.03 – 0.84	-1.99	0.046	1.91	0.60 – 6.25	1.1	0.271
Housing status : Others (ref: Personal accommodation)	0.38	0.04 – 2.24	-0.98	0.329	1.05	0.20 – 4.32	0.06	0.95
IS Birchwood-Total score	0.76	0.59 – 0.90	-1.95	0.015				
CASIG adaptation-Satisfaction level with vocational status	0.85	0.70 – 1.01	-1.76	0.078				
Suicide attempt: Yes					3.85	1.51 – 10.10	2.81	0.005
Clinical Global Impression					0.78	0.55 – 1.09	-1.42	0.155
CASIG adaptation-Satisfaction level with family relationships					1.22	1.02 – 1.47	2.14	0.032
Observations				136				291
R ² Tjur				0.349				0.317
AIC				124.152				178.215

Table 6:

The result of the Cochran-Mantel-Haenszel test is $\chi^2(MH)=8.3$, 1 d.f., $p=0.004$. Significantly insight effect on the association between suicide attempt and parenthood.

	Chi-square statistic	P-value	Odds ratio	Lower 95% CL for odds ratio	Upper 95% CL for odds ratio
Poor.IS	8,3	0,004	2,48	1,37	4,51
Good.IS	1,6	0,206	1,43	0,86	2,36
Summary (MH)	8,34	0,004	1,78	1,22	2,61



The result of the Cochran-Mantel-Haenszel test is $\chi^2(MH)=6.1$, 1 d.f., $P=0.01$. Significantly insight effect on the association between suicide attempt and parenthood (Bipolar Disorder)

	Chi-square statistic	P-value	Odds ratio	Lower 95% CL for odds ratio	Upper 95% CL for odds ratio
Poor.IS	7,4	0,007	8,14	1,96	33,87
Good.IS	0,8	0,372	1,65	0,68	4
Summary (MH)	6,08	0,014	2,62	1,27	5,42

