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Sex Differences in Recovery-Related Outcomes and Needs for Psychiatric Rehabilitation in People With Schizophrenia Spectrum Disorder

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ABSTRACT

Background: Female sex/gender has been associated with better longitudinal outcomes in schizophrenia spectrum disorders (SSDs). Few studies have investigated the relationships between female gender and recovery-related outcomes. Women's specific psychiatric rehabilitation needs remain largely unknown.

Objective: The objectives of the present study are to investigate sex differences in (1) objective and subjective aspects of recovery and (2) psychiatric rehabilitation needs in a multicenter non-selected psychiatric rehabilitation SSD sample.

Methods: 1,055 outpatients with SSD (*DSM-5*) were recruited from the French National Centers of Reference for Psychiatric Rehabilitation (REHABase) cohort between January 2016 and November 2019. Evaluation included standardized scales for quality of life, satisfaction with life, and well-being and a broad cognitive battery. Socially valued roles at enrollment were recorded. Functional recovery was measured using the Global Assessment of Functioning scale (GAF) and personal recovery with the Stages of Recovery Instrument (STORI).

Results: Female sex was the best predictor of having more than 2 socially valued roles in the multivariate analysis ($P < .001$; OR [95% CI] = 5.42 [2.34–13.06]). No sex differences were found for functional recovery or personal recovery. Female gender was positively associated with self-stigma ($P = .036$) and suicidal history ($P < .001$) and negatively correlated with quality of life ($P = .004$) and satisfaction with interpersonal relationships ($P = .029$), an area in which women reported more unmet needs ($P = .004$).

Conclusions: The present study found that women had poorer subjective recovery-related outcomes and more unmet needs than men. It would therefore be beneficial to develop recovery-oriented interventions addressing women's specific needs and implement these in psychiatric rehabilitation services.

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Later age at onset, higher premorbid functioning, better treatment adherence, better responses to pharmacologic and psychosocial treatments, and more favorable longitudinal clinical and functional outcomes are characteristics often associated with the female sex in schizophrenia spectrum disorders (SSDs).[1] Sex-related (ie, genetic, biological, or developmental) as well as gender-related factors (ie, sociocultural gender norms, pressures, and expectations) might explain some of these differences.[1]

Recovery is a multidimensional construct that encompasses both subjective (eg, well-being, satisfaction with life, self-esteem) and objective outcomes (eg, independent living, interpersonal and intimate relationships, work).[2] Recovery can be defined either from a clinical perspective (ie, clinical and functional remission) or from a consumer-focused one, as a self-broadening process aimed at living a meaningful life beyond mental illness.[3]

Despite growing research interest, the relationship between sex/gender and recovery remains unclear.[1] Albert et al[4] and Álvarez-Jiménez

Clinical Points

- Women with schizophrenia spectrum disorder may experience unique challenges related to their social roles and relationships.
- Women had more social roles at enrollment in psychiatric rehabilitation but also poorer subjective recovery-related outcomes.
- Women may have unique age-related needs for psychosocial treatment that should be considered in clinical practice.

et al[5] reported an increased likelihood of clinical and functional remission in women compared to men after 5 years or more of follow-up (OR = 2.4; 95% CI, 1.0–5.8 in the OPUS cohort[4]; OR = 2.85; 95% CI, 1.20–6.77 in the EPPIC cohort[5]). These results were not supported by the meta-analysis by Jääskeläinen et al[6] of 50 studies. Seeman[1] added the caveat that gender differences in clinical recovery may depend on age and cultural factors. One of the most frequently reported gender differences is that women hold more socially valued roles (eg, independent living, working, living in relationship or living with children[1]). As reported by Seeman,[1] these social roles often precede the onset of illness in women with SSDs and might not be an adequate marker of their current psychosocial functioning. Thorup et al[7] found that while women had higher psychosocial functioning and held more significant social roles than men on their enrollment in early intervention services, they also had poorer self-esteem.

Few studies have investigated gender differences in personal recovery, recovery-related outcomes, and needs for care.[1,8] Female gender has been positively associated with increased depressive symptoms,[9,10] increased feelings of guilt,[11] reduced self-esteem,[7] and more unmet needs.[9,12] Ho et al[13] found an association between female gender and increased self-stigma after 3 years of follow-up. Song[14] reported a positive association with personal recovery. Caqueo-Urízar et al[15] found higher satisfaction with intimate relationships in women, but Mayston et al[16] reported the opposite. The relationship between gender and recovery-related outcomes remains unclear. Thorup et al[7] found that women might benefit more from early intervention services. Similar findings could also apply to patients with a longer duration of illness enrolled in psychiatric rehabilitation.

Caqueo-Urízar et al[15] found that women received less psychosocial treatment than men, but Carpiniello et al[17] reported the opposite. The assumption that women need to be referred to these services less often could influence their access to psychosocial treatment.[15,17] Women's reduced access to psychosocial treatment could also be attributed to the relative lack of services targeting their age-specific needs (eg, reproductive health counseling or supported parenting for young women[1,8]). Gender differences in access to psychiatric rehabilitation and care need remain unclear.

We hypothesized that there would be gender differences in the pattern of recovery-related outcomes (ie, better objective outcomes but poorer subjective outcomes and more unmet needs in women with SSD compared with men). The objectives of this study are to investigate gender differences in (1) recovery-related outcomes and (2) psychiatric rehabilitation needs in a multicenter non-selected psychiatric rehabilitation SSD sample.

METHODS

Study Population

The French National Centers of Reference for Psychiatric Rehabilitation (REHABase) cohort is made up of patients from a French network of 9 psychiatric rehabilitation centers described in previous articles.[18,19] Patients are referred to these centers by their general practitioner or psychiatrist, who remains in charge of routine care and treatment, or are self-referred. Therapeutic tools are selected according to the participant's personal life goals as part of an individualized psychiatric rehabilitation action plan. The action plan can include a wide range of recovery-oriented interventions.[18,19] Follow-up is planned to last for 2 to 3 years. Evaluations are scheduled at baseline, annually, and after the action plan is completed.

Patients are included in the REHABase cohort if they have a diagnosis of serious mental illness (ie, schizophrenia, bipolar disorder, borderline personality disorder, major depression, or severe anxiety disorders, according to the SAMHSA[20] definition). The present study was restricted to data collected at baseline for patients diagnosed with SSDs (schizophrenia, schizoaffective disorder, schizophreniform disorder, delusional disorder, unspecified psychotic disorder) according to *DSM-5*.[21] 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.

Data Collected

Functional recovery. General functioning was measured using the Global Assessment of Functioning scale (GAF).[22] The cutoff scores proposed by Jääskeläinen et al[6] (GAF score ≥ 61) were used to define functional recovery.

Personal recovery. Personal recovery was measured using the Stage of Recovery Instrument[23] (STORI). The STORI is a 50-item self-report instrument assessing the 5 stages of personal recovery described by Andresen et al.[23] The first stage of personal recovery (moratorium) is characterized by a profound sense of loss and hopelessness. The second stage (awareness) corresponds to the first glimmer of hope for a better life and that recovery is possible. During the third stage (preparation), the person resolves to start working on recovery (eg, by taking stock of their personal resources, values, and limitations). The fourth stage, rebuilding, corresponds to the active stage of

personal recovery by redefining a positive identity, setting meaningful goals, and taking control of one's life. The fifth stage, growth, is characterized by living a full and meaningful life beyond mental illness. Ten themes are assessed, each with 6 items ranging from 0 "Not at all true" to 5 "Completely true" mapping into the 5 stages of personal recovery. A score for each stage is calculated ranging from 0 to 50, and the participant is allocated to the stage with the highest score. In case of equal scores in two stages, the participant is allocated to the higher stage. The STORI has good internal consistency (α range, .88–.94).[23] We created a new variable, personal recovery, corresponding to the late stages of recovery (combination of rebuilding and growth) for the purposes of the present study.

Socially valued roles. Four major social roles were recorded: being a student/employed, having his/her own accommodation, living in relationship, and being a parent. We created a variable, defined as currently having 2 or more socially valued roles.

Secondary outcomes. General information on education, marital status, parenting status, economic status, illness onset and trajectory and comorbidities was recorded. Illness severity was assessed using the Clinical Global Impression scale (CGI).[24] The severity of psychotic symptoms was not recorded in the present study. Insight and treatment adherence were measured via self-reported measures (Birchwood Insight Scale [BIS][25] and Medication Adherence Rating Scale [MARS][26]). Self-stigma was measured using the Internalized Stigma of Mental Illness scale (ISMI).[27] Self-esteem was assessed with the Self-Esteem Rating Scale–Short Form (SERS-SF).[28] Satisfaction in 4 life dimensions was measured using visual analog scales adapted from the Client Assessment of Strengths, Interests, and Goals (CASIG).[29] Quality of life was evaluated with the self-reported Quality of Life scale (S-QoL)[30] and well-being using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS).[31] Baseline neuropsychological cognitive assessments included the Wechsler Adult Intelligence Scale 4th edition (WAIS-IV) subscale assessing short-term and working memory,[32] the California Verbal Learning Test (CVLT)[33] or RL/RI-16[34] for episodic verbal memory, the d2-R for selective attention and speed of processing,[35] and the revised Shopping Test[36] or Six Element Test[37] for planning abilities. Theory of mind was assessed using the Movie for the Assessment of Social Cognition (MASC)[38] and attribution style with the Ambiguous Intentions and Hostility Questionnaire (AIHQ).[39]

Statistical Analysis

Data are presented as the mean and SD for continuous variables and number and percentage for categorical variables. To compare sex differences, the χ^2 test was used for categorical variables and Pearson correlation test, Kruskal-Wallis rank sum test, or linear model analysis of variance for continuous variables. A sensitivity analysis restricted to women under 40 years old was conducted to investigate potential age-specific sex differences in patients' outcomes and care needs. A multivariate analysis adjusted for sex, current age, education level, and global assessment of functioning was carried out on the correlates of having 2 or more socially valued roles. *P* values < .05 were considered significant. All statistical analyses were carried out using R.[40]

RESULTS

One thousand fifty-five clinically stabilized patients with SSD were recruited from the REHABase network. They had been included in this cohort study between January 2016 and November 2019. The participants were mostly men (n = 785; 74.4%) with mean (SD) illness duration of 10.93 (8.61) years. Most of the women included were under 40 years old (n = 191; 70.7%). The baseline sample characteristics with sex differences are presented on Tables 1 and 2.

Differences Between Men and Women

Compared with women, men were younger and had a lower level of education. Men were more likely to have comorbid psychiatric and substance use disorders. They had better short-term memory and fewer inpatient admissions. Women were more likely to have 2 or more socially valued roles and be under legal protection. They were more likely to take antidepressants and to have a history of suicide attempts, and they had higher levels of self-stigma and a lower quality of life. Women were less satisfied with their interpersonal relationships and more often identified this area as an unmet need to be addressed during psychiatric rehabilitation.

Age-Specific Differences Between Men and Women

When restricting the analysis to women under 40 years old, the gender differences in education, inpatient admission, legal protection, satisfaction with interpersonal relationships, self-stigma, and quality of life became nonsignificant. The other gender differences (ie, in the proportion of people reporting 2 or more socially valued roles and in short-term memory, antidepressant use, addiction, history of suicide attempts, and unmet needs regarding interpersonal relationships) remained significant. Compared to men, women < 40 years old were younger, had a shorter duration of illness, and reported more unmet needs in housing. The results are presented in Supplementary Tables 1 and 2.

Correlates of Having Two or More Social Roles

Table 3 presents the results of the multivariate analysis on the correlates of having 2 or more socially valued roles. This variable was best predicted by female gender (*P* < .001; OR = 5.42 [95% CI, 2.34–13.06]), satisfaction with intimate relationships (*P* = .018; OR = 1.18 [95% CI, 1.03–1.36]), vocational status (*P* = .04; OR = 1.16 [95% CI, 1.01–1.35]), and a duration of less than 2 years since the person's first contact with psychiatric services (*P* = .02; OR = 0.12 [95% CI, 0.02–0.61]). Social roles correlated positively with overall function (*P* = .022; OR = 1.03 [95% CI, 1.01–1.06]) and negatively with well-being (*P* = .036; 0R = 0.71 [95% CI,

Table 1. Sex Differences in Sociodemographic and Clinical Characteristics[a]

Variable	Schizophrenia Male (n = 785)	Female (n = 270)	Total (N = 1,055)	*P* Value
Occupational status				.221[b]
n	716	242	958	
Without income	167 (23.3)	47 (19.4)	214 (22.3)	
Competitive/ sheltered work	68 (9.5)	18 (7.4)	86 (9.0)	
Unemployment/ disability benefits	481 (67.2)	177 (73.1)	658 (68.7)	
Marital status				**<.001[b]**
n	771	267	1,038	
Single	703 (91.2)	216 (80.9)	919 (88.5)	
In a couple	68 (8.8)	51 (19.1)	119 (11.5)	
Parenthood				**<.001[b]**
n	758	266	1,024	
Non-parents	685 (90.4)	210 (78.9)	895 (87.4)	
Parents	73 (9.6)	56 (21.1)	129 (12.6)	
Current age				**<.001[c]**
n	785	270	1,055	
Mean (SD)	31.98 (9.08)	34.85 (10.76)	32.71 (9.62)	
Range	16.26–61.86	17.60–64.88	16.26–64.88	
Education level				**.002[b]**
n	766	265	1,031	
Primary/ secondary school	167 (21.8)	52 (19.6)	219 (21.2)	
High school	414 (54.0)	119 (44.9)	533 (51.7)	
University	185 (24.2)	94 (35.5)	279 (27.1)	
Protection				**.046[b]**
n	756	263	1,019	
Without	623 (82.4)	202 (76.8)	825 (81.0)	
With	133 (17.6)	61 (23.2)	194 (19.0)	
Illness duration (years)				.166[c]
n	701	246	947	
Mean (SD)	10.56 (8.12)	11.97 (9.81)	10.93 (8.61)	
Range	0.00–43.79	0.00–46.45	0.00–46.45	
No. of previous admissions				**.013[c]**
n	698	243	941	
Mean (SD)	3.22 (3.63)	4.27 (6.34)	3.49 (4.51)	
Range	0.00–40.00	0.00–64.00	0.00–64.00	
Duration of hospitalization, mo				**.013[c]**
n	607	217	824	
Mean (SD)	8.08 (17.03)	10.59 (18.67)	8.74 (17.50)	
Range	0.00–250.00	0.00–156.00	0.00–250.00	
Duration from the first psychiatric contact, y				.222[b]
n	728	258	986	
< 2	139 (19.1)	39 (15.1)	178 (18.1)	
2–5	136 (18.7)	48 (18.6)	184 (18.7)	
6–10	158 (21.7)	49 (19.0)	207 (21.0)	
> 10	295 (40.5)	122 (47.3)	417 (42.3)	
Suicide attempt				**<.001[b]**
n	744	265	1,009	
No	568 (76.3)	174 (65.7)	742 (73.5)	
Yes	176 (23.7)	91 (34.3)	267 (26.5)	
Addiction				**<.001[b]**
n	749	263	1,012	
≥ 1 Addiction	306 (40.9)	41 (15.6)	347 (34.3)	
No addiction	443 (59.1)	222 (84.4)	665 (65.7)	
Psychiatric comorbidity				**.003[b]**
n	663	234	897	
No	509 (76.8)	201 (85.9)	710 (79.2)	
Yes	154 (23.2)	33 (14.1)	187 (20.8)	
Somatic comorbidity				.841[b]
n	664	233	897	
No	520 (78.3)	181 (77.7)	701 (78.1)	
Yes	144 (21.7)	52 (22.3)	196 (21.9)	
Anxiolytics treatment				.129[b]
n	783	268	1,051	
Yes	230 (29.4)	92 (34.3)	322 (30.6)	
No	553 (70.6)	176 (65.7)	729 (69.4)	
Antidepressant treatment				**.001[b]**
n	783	268	1,051	
Yes	177 (22.6)	87 (32.5)	264 (25.1)	
No	606 (77.4)	181 (67.5)	787 (74.9)	
Mood stabilizers treatment				.601[b]
n	783	268	1,051	
Yes	90 (11.5)	34 (12.7)	124 (11.8)	
No	693 (88.5)	234 (87.3)	927 (88.2)	
Neuroleptics treatment				.064[b]
n	783	268	1,051	
Yes	737 (94.1)	260 (97.0)	997 (94.9)	
No	46 (5.9)	8 (3.0)	54 (5.1)	
Charge of drug treatment				**.008[b]**
n	783	268	1,051	
0 or 1 class	418 (53.4)	118 (44.0)	536 (51.0)	
≥ 2 classes	365 (46.6)	150 (56.0)	515 (49.0)	

[a]Values are shown as n (%) unless otherwise noted. Boldface indicates statistical significance.
[b]Pearson χ^2 test.
[c]Kruskal-Wallis rank sum test.

0.51–0.97]). Age and education level were not significant correlates of having 2 or more socially valued roles in the multivariate model.

DISCUSSION

To our knowledge, this study is the first to assess sex/gender differences in recovery-related outcomes in a multicentric non-selected psychiatric rehabilitation SSD sample. The results supported our initial hypothesis. Compared with men, women have more socially valued roles and a similar level of psychosocial function, but also poorer subjective recovery-related outcomes (eg, self-stigma, depression, suicidal history, and quality of life) and more unmet needs. This pattern of findings was more pronounced in women aged 40 years or older than in their younger counterparts.

Sex Differences in the General Population and in SSD

Many of the observed sex differences in people with SSD mirror those found in the general population.[1,41,42] This is the case for the pattern of sex differences found in

Table 2. Sex Differences in Cognition and Recovery-Related Outcomes[a]

Variable	Schizophrenia Male	Schizophrenia Female	Schizophrenia Total	*P* Value
GAF score				.600[b]
n	582	213	795	
Mean (SD)	55.49 (13.89)	56.08 (13.78)	55.65 (13.86)	
Range	10.00–95.00	20.00–90.00	10.00–95.00	
CGI score				.643[b]
n	576	213	789	
Mean (SD)	4.20 (1.10)	4.17 (1.07)	4.19 (1.09)	
Range	1.00–7.00	1.00–7.00	1.00–7.00	
MARS total score				.713[b]
n	402	129	531	
Mean (SD)	6.82 (1.96)	6.75 (1.99)	6.80 (1.97)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
BIS total score				.183[b]
n	439	160	599	
Mean (SD)	8.41 (2.65)	8.78 (2.38)	8.51 (2.59)	
Range	0.00–12.00	1.50–12.00	0.00–12.00	
$SQoL_{18}$ total score				**.004**[c]
n	415	148	563	
Mean (SD)	54.22 (17.25)	49.32 (18.61)	52.93 (17.73)	
Range	4.16–100.00	0.00–93.75	0.00–100.00	
WEMWBS total score (*z* score)				.063[c]
n	480	165	645	
Mean (SD)	−1.05 (1.28)	−1.27 (1.45)	−1.11 (1.33)	
Range	−7.79	−7.37	−7.79	
STORI, maximum stage				.247[d]
n	385	134	519	
Moratorium	50 (13.0)	27 (20.1)	77 (14.8)	
Awareness	59 (15.3)	24 (17.9)	83 (16.0)	
Preparation	43 (11.2)	12 (9.0)	55 (10.6)	
Rebuilding	98 (25.5)	28 (20.9)	126 (24.3)	
Growth	135 (35.1)	43 (32.1)	178 (34.3)	
SERS-SF total score				.056[c]
n	418	137	555	
Mean (SD)	5.24 (19.82)	1.46 (20.85)	4.31 (20.13)	
Range	−99	−108	−108	
ISMI total score				**.036**[b]
n	426	149	575	
Mean (SD)	2.19 (0.46)	2.27 (0.45)	2.21 (0.46)	
Range	1.07–3.80	1.10–3.31	1.07–3.80	
CASIG adaptation score				
Satisfaction level with housing				.720[b]
n	393	129	522	
Mean (SD)	6.84 (2.38)	6.74 (2.49)	6.82 (2.40)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
Help needed with housing				.059[d]
n	374	125	499	
No	239 (63.9)	68 (54.4)	307 (61.5)	
Yes	135 (36.1)	57 (45.6)	192 (38.5)	
Satisfaction level with daily life skills				.746[b]
n	389	128	517	
Mean (SD)	6.48 (2.38)	6.34 (2.55)	6.45 (2.42)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
Help needed with daily life skills				.185[d]
n	373	122	495	
No	271 (72.7)	81 (66.4)	352 (71.1)	
Yes	102 (27.3)	41 (33.6)	143 (28.9)	
Satisfaction level with vocational status				.886[b]
n	375	122	497	
Mean (SD)	3.42 (2.91)	3.49 (2.95)	3.44 (2.92)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
Help needed with vocational status				.294[d]
n	362	124	486	
No	74 (20.4)	20 (16.1)	94 (19.3)	
Yes	288 (79.6)	104 (83.9)	392 (80.7)	
Satisfaction level with interpersonal relationships				**.029**[b]
n	386	129	515	
Mean (SD)	6.20 (2.71)	5.53 (3.00)	6.03 (2.80)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
Help needed with interpersonal relationships				**.004**[d]
n	370	124	494	
No	216 (58.4)	54 (43.5)	270 (54.7)	
Yes	154 (41.6)	70 (56.5)	224 (45.3)	
Satisfaction level with intimate relationships				.870[b]
n	384	126	510	
Mean (SD)	4.09 (3.09)	4.12 (3.43)	4.10 (3.17)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
Help needed with intimate relationships				.163[d]
n	369	124	493	
No	214 (58.0)	63 (50.8)	277 (56.2)	
Yes	155 (42.0)	61 (49.2)	216 (43.8)	
Satisfaction level with family relationships				.383[b]
n	389	129	518	
Mean (SD)	7.01 (2.44)	6.74 (2.65)	6.94 (2.50)	
Range	0.00–10.00	0.00–10.00	0.00–10.00	
Help needed with family relationships				.173[d]
n	374	125	499	
No	238 (63.6)	71 (56.8)	309 (61.9)	
Yes	136 (36.4)	54 (43.2)	190 (38.1)	
Having ≥ 2 socially valued roles				**< .001**[d]
n	700	239	939	
Yes	103 (14.7)	68 (28.5)	171 (18.2)	
No	597 (85.3)	171 (71.5)	768 (81.8)	
Personal recovery, STORI score				.127[d]
n	385	134	519	
Moratorium/ awareness/ preparation	152 (39.5)	63 (47.0)	215 (41.4)	
Rebuilding/growth	233 (60.5)	71 (53.0)	304 (58.6)	
Functional recovery, GAF score				.141[d]
n	582	213	795	
< 61	427 (73.4)	145 (68.1)	572 (71.9)	
≥ 61	155 (26.6)	68 (31.9)	223 (28.1)	
Long term memory, CVLT or RL/RI-16 score				.141[d]
n	446	150	596	
Deficit level	154 (34.5)	42 (28.0)	196 (32.9)	
Normal level	292 (65.5)	108 (72.0)	400 (67.1)	
Executing functioning, digit span: short-term memory				**.008**[d]
n	458	157	615	
Deficit level	59 (12.9)	34 (21.7)	93 (15.1)	
Normal level	399 (87.1)	123 (78.3)	522 (84.9)	

(continued)

Table 2 (continued).

Variable	Schizophrenia Male	Female	Total	*P* Value
Executing functioning, digit span: working memory				.060[d]
n	458	156	614	
Deficit level	75 (16.4)	36 (23.1)	111 (18.1)	
Normal level	383 (83.6)	120 (76.9)	503 (81.9)	
Attention, d2-R: attention capacity				.738[d]
n	377	109	486	
Deficit level	117 (31.0)	32 (29.4)	149 (30.7)	
Normal level	260 (69.0)	77 (70.6)	337 (69.3)	
Attention, d2-R: target processed/processing speed				.733[d]
n	383	110	493	
Deficit level	174 (45.4)	52 (47.3)	226 (45.8)	
Normal level	209 (54.6)	58 (52.7)	267 (54.2)	
Attention, d2-R: errors and omissions				.512[d]
n	380	108	488	
Deficit level	32 (8.4)	7 (6.5)	39 (8.0)	
Normal level	348 (91.6)	101 (93.5)	449 (92.0)	
Planning abilities, shopping test: reaction time				.313[a]
N	413	136	549	
Deficit level	83 (20.1)	22 (16.2)	105 (19.1)	
Normal level	330 (79.9)	114 (83.8)	444 (80.9)	
Planning abilities, shopping test: error				.790[d]
n	411	136	547	
Deficit level	116 (28.2)	40 (29.4)	156 (28.5)	
Normal level	295 (71.8)	96 (70.6)	391 (71.5)	

[a]Values are shown as n (%) unless otherwise noted. Boldface indicates statistical significance.
[b]Kruskal-Wallis rank sum test.
[c]Linear model analysis of variance.
[d]Pearson χ^2 test.
Abbreviations: BIS = Birchwood Insight Scale; CASIG = Client Assessment of Strengths, Interests, and Goals; CGI = Clinical Global Impressions scale; CVLT = California Verbal Learning Test; GAF = Global Assessment of Functioning scale; ISMI = Internalized Stigma of Mental Illness scale; MARS = Medication Adherence Rating Scale; RLRI = 16-item Free and Cued Recall; SERS-SF = Self-Esteem Rating Scale–Short Form; $SQoL_{18}$ = 18-item self-reported Quality of Life scale; STORI = Stage of Recovery Instrument; WEMWBS = Warwick-Edinburgh Mental Well-being Scale.

antidepressant use, suicidal risk, addiction, and quality of life, for example.[1,41–43]

Sex/Gender Differences in Objective Outcomes

Albert and colleagues[4] and Thorup and colleagues[7] reported that women had lower clinical severity, higher treatment adherence, and higher psychosocial functioning. The present study does not support these findings but concurs with Jääskeläinen et al.[6] Women had a 5.4-fold greater likelihood of having 2 or more social roles at enrollment. They were more often married and parents.[1] Seeman[1] outlined that being married or a parent is not a reliable marker of recovery as it can result in increased negative experiences (eg, unstable relationships, domestic abuse, or loss of custody), emotional distress, and suicide risk.

The negative correlation between the number of socially valued roles and well-being could indicate that although for many having meaningful social roles contributes to personal recovery,[2] some patients may find it challenging.[44] Recovery is influenced by the subjective appraisal of one's life circumstances and the subjective experience of oneself as a unique human being.[3] This process, relatively independent of objective outcomes such as symptom remission, involves finding meaning in the experience of psychosis and psychosis-related disruption to a person's life.[3]

Gender Impact on the Experience of Psychosis

Gender differences have been reported in psychosis-related interruptions to the social roles and relationships that shape identity (ie, failed relationships and challenges relating to parenting and the loss of parenting roles for women; social isolation and loss of employment for men).[45]

Haarmans et al[46] and García-Mieres et al[47] reported higher self-discrepancies (ie, the perceived discrepancy between actual self and ideal self, actual self and gender-role norms, actual self and others, and ideal self and others)

Table 3. Multivariate Analysis of the Correlates of Having 2 or More Socially Valued Roles[a]

Predictor	Having ≥ 2 Socially Valued Roles Odds Ratios	95% CI	Statistic (*df* = 229)	*P*
Gender: female	5.42	2.34–13.06	3.88	**<.001**
Age at the time of admission	1.03	0.98–1.09	1.21	.226
Education level at the time of admission: high school	0.62	0.20–2.04	−0.82	.413
Education level at the time of admission: university	0.84	0.24–3.03	−0.27	.791
Global Assessment of Functioning	1.03	1.01–1.06	2.29	**.022**
Protection: with	0.25	0.06–0.81	−2.13	**.033**
Duration from the first psychiatric contact: < 2	0.12	0.02–0.61	−2.32	**.02**
Duration from the first psychiatric contact: 2–10 y	0.39	0.13–1.06	−1.81	.07
WEMWBS total score (*z* score)	0.71	0.51–0.97	−2.1	**.036**
CASIG adaptation-satisfaction level with vocational status	1.16	1.01–1.35	2.06	**.04**
CASIG adaptation-satisfaction level with intimate relationships	1.18	1.03–1.36	2.36	**.018**
Observations	241			
Tjur R^2	0.285			
AIC	183.75			

[a]Logistic regression adjusted by gender, current age, education level, and global assessment functioning. Boldface indicates statistical significance.
Abbreviations: AIC = Akaike information criterion; CASIG = Client Assessment of Strengths, Interests, and Goals; WEMWBS = Warwick-Edinburgh Mental Well-being Scale.

in women with SSD compared with non-clinical participants. Haarmans et al[46] found that perceived discrepancy between actual self and gender-role norms was associated with more psychotic symptoms, with the mediation of increased negative self, and other core beliefs. Cognitive appraisals of not being able to live up to gender-related social expectations (eg, being in a stable relationship, caring responsibilities) might contribute to residual psychotic symptoms and increase psychological distress.[46] García-Mieres et al[47] reported positive associations between self-discrepancies (actual self/ideal self; actual self/other) and depression in women with psychosis. Self-discrepancies could contribute to self-stigma through the increased use of avoidant coping strategies (eg, social withdrawal).[47]

García-Mieres et al[47] found that compared to men, women with psychosis had higher insight, but also more depressive symptoms. The "insight paradox" posits that high insight could have a detrimental effect on depression and quality of life.[48] Female sex positively correlated with self-stigma, depression, history of suicide attempts, and the number of inpatient admissions as previously reported.[1,13,49]

Gender differences have been found in perceived stigma (ie, men reported being perceived as "dangerous" by other people because of their mental illness, whereas women reported being confronted with paternalism in relationships).[45] The interaction between gender and mental illness stereotypes may influence reactions to public stigma (anticipated stigma in social relationships and social isolation for men; experienced stigma in the parenting role for women).[45] Female gender has been associated with higher perceived stigma, experienced stigma, and anticipated stigma.[50–52] In a mostly female sample, Jeffery et al[53] reported that 1 in 4 people with SSD experienced discrimination when starting a family or in their role as parent. Lacey et al[54] reported increased self-stigma regarding parenting abilities in mothers with serious mental illness compared with fathers. Perceived stigma, experienced stigma, and anticipated stigma are risk factors for self-stigma.[19] Gender-related social expectations and interruptions to valued social roles that shape personal identity (eg, loss of parenting role) might increase the risk of self-stigma in women with SSD.[1,11,50]

Age-Related Gender Differences in Recovery-Related Outcomes

Age has been identified as a potential moderator of the relationship between gender and recovery-related outcomes.[8] In people with SSD, as in the general population, youth is considered to be a social asset for women with SSD, whereas age is a social asset for men.[1,8]

The present study found significant gender differences in recovery-related outcomes. Most of these associations (including with legal protection, self-stigma, antidepressant use, satisfaction with life, and quality of life) became nonsignificant when women aged over 40 years old were omitted from the analyses. Older women may have experienced significant losses in terms of their socially valued roles (eg, loss of personal autonomy and loss of parenting role[8]). These losses may contribute to increased self-stigma and depression and to reduced satisfaction with life and quality of life.[8,16,45]

Gender and Psychiatric Rehabilitation

Research has shown that women have more favorable long-term outcomes than men after attending early intervention programs.[4,7,55] Villeneuve et al[56] reported a negative association between female sex and the rate of dropout from psychosocial treatment. Women may benefit more than men from psychiatric rehabilitation interventions, such as recovery-oriented psychoeducation.[1,8]

Carpiniello et al[17] reported higher well-being in middle-aged women with SSD who also achieved clinical recovery. This concurs with Song,[14] who found higher personal recovery in middle-aged women with SSD using psychiatric rehabilitation services. The present study found no such associations with enrollment in psychiatric rehabilitation. Female gender could be associated with successful aging in middle-aged women who receive adequate support from recovery-oriented mental health professionals.[14] A longitudinal examination is needed to investigate whether psychiatric rehabilitation improves recovery-related outcomes not only in young women, but also in middle-aged women with SSD.

Although a recent systematic review by Charlson et al[57] found no sex differences in the prevalence of SSDs, the present study found that the patients enrolled in psychiatric rehabilitation were predominantly male. Caqueo-Urízar et al[15] formulated the hypothesis that women need to be referred to psychosocial treatment less often because they experience fewer negative symptoms and less cognitive impairment. The relatively higher level of executive function impairment and the higher unmet needs in social function for women compared to men in the present sample do not support this hypothesis.[12] Dubreucq et al[58] reported several barriers to accessing psychiatric rehabilitation. These include health care professionals' lack of knowledge about psychosocial treatment and the difficulties in identifying patients who require intervention. Ferrari et al[59] reported that women with SSD seeking help often felt that their symptoms were underestimated by their families and mental health providers. It is also possible that all men are referred for psychiatric rehabilitation, as they are presumed to have poorer clinical and functional outcomes, whereas for women only those with severe symptoms and cognitive impairments are referred.[1,15,17] The higher executive dysfunction in women compared to men regardless of age concurs with this hypothesis and a number of previous studies.[60,61] Gender-related biases relating to women's reduced needs for psychiatric rehabilitation may reduce their access to psychosocial treatment and should be further investigated.

Seeman and Gupta[8] reported that women with SSD have distinct age-related needs. For young women, these include contraceptive counseling, sexual abuse prevention,

recovery-oriented interventions from pre-conception to postpartum care, and the prevention of psychosis-related interruptions to valued social roles. For older women, they include reinvesting valued social roles (eg, parenting) and addressing menopausal symptoms or potential unmet physical health care needs to improve quality of life.[8,45] These issues are still only rarely addressed in psychiatric rehabilitation, with the possible consequence of reducing referrals of women.

Engaging in meaningful social roles (eg, paid employment, intimate relationships, or becoming a parent) during psychiatric rehabilitation contributes to personal recovery.[2] Early intervention cohorts have found a limited proportion of patients engaging in meaningful social roles after 10 years of follow-up.[62,63] Recovery-oriented interventions supporting SSD patients when dating or deciding to start a family, could improve these outcomes. Hache-Labelle et al[64] have developed an intervention targeting romantic relationships for men with early psychosis. To our knowledge, there are no such interventions for women with SSD. A family early preventive intervention has been developed in Denmark to support young parents with SSD and their children.[65] These interventions might improve parents' and children's outcomes and the quality of parenting experiences in patients with SSD.[65]

Clinical Implications

The present study has a number of potential clinical implications. Women with SSD may be found to have unique treatment needs when the subjective aspects of recovery are considered. Improvements in other more subjective outcomes beyond clinical or functional remission should be targeted, while taking into account gender-related factors.[1,3] García-Mieres et al[47] reported a more complex identity structure in women with SSD, a concept related to metacognition. *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.[66] Impaired metacognition has been associated with poorer recovery-related outcomes.[66] Improving metacognitive abilities during psychiatric rehabilitation using specific approaches such as Metacognitive Reflection and Insight Therapy (MERIT)[66] might result in richer self-narratives, improved insight, and less insight-related depression.[67] The inclusion of gender role–specific content in existing programs targeting dysfunctional attitudes (eg, gender-related cognitive biases), self-stigma (eg, self-stigma on parenting role or abilities), or social skills (eg, dating/intimate relationships or parenting abilities) and the development of gender-sensitive recovery-oriented interventions could address the unmet needs of women with SSD.

Limitations

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 patients with SSD. Women enrolled in psychiatric rehabilitation may also not be representative of all women with SSD, which is a limitation. However, some of the sample characteristics suggest that the present sample is comparable to the general community-dwelling SSD population. Considering the operational criteria (eg, the persistence-over-time criterion) for defining the objective aspects of recovery, the cross-sectional nature of this study is also a limitation. However, the subjective aspects of recovery refer to a process rather than to an outcome and thus may vary over time.[3] Longitudinal examination will be needed to determine whether sex differences influence the effectiveness of psychiatric rehabilitation and to investigate the effectiveness of gender-sensitive recovery-oriented interventions. There was no measure of symptom severity (eg, Positive and Negative Syndrome Scale), which may have limited the sensitivity of the analyses.

In short, the present study found that women had more social roles at enrollment but poorer subjective outcomes. This finding suggests that women experience unique challenges relating to their social roles (eg, parenting and loss of parenting). Women with SSD may have unique age-related psychiatric rehabilitation treatment needs that should be taken into consideration in clinical practice (eg, including gender-related content in cognitive-behavioral therapy, preventing the interruption of valued social roles for young women, reinvesting valued social roles, reducing self-stigma, and improving quality of life in older women).

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Editor's Note: We encourage authors to submit papers for consideration as a part of our Focus on Women's Mental Health section. Please contact Marlene P. Freeman, MD, at mfreeman@psychiatrist.com.

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Supplementary Material

Article Title: Sex Differences in Recovery-Related Outcomes and Needs for Psychiatric Rehabilitation in People With Schizophrenia-Spectrum Disorder

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1. Table 1 — Sex differences in socio-demographic and clinical characteristics when women aged 40 years or older were omitted from the analyses
2. Table 2 — Sex differences in cognition and recovery-related outcomes when women aged 40 years or older were omitted from the analyses

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Supplementary table 1: Sex differences in socio-demographic and clinical characteristics when women aged 40 years or older were omitted from the analyses

	Schizophrenia			
	Male (N=785)	**Female <= 40 years (N=191)**	**Total (N=976)**	**p value**
Occupational status				0.340[a]
N	716	177	893	
Without income	167 (23.3%)	46 (26.0%)	213 (23.9%)	
Competitvy/sheltered work	68 (9.5%)	11 (6.2%)	79 (8.8%)	
Unemployment / Disability benefits	481 (67.2%)	120 (67.8%)	601 (67.3%)	
Marital status				**< 0.001**[a]
N	771	189	960	
Single	703 (91.2%)	153 (81.0%)	856 (89.2%)	
In a couple	68 (8.8%)	36 (19.0%)	104 (10.8%)	
Parenthood				**0.014**[a]
N	758	189	947	
Non-parents	685 (90.4%)	159 (84.1%)	844 (89.1%)	
Parents	73 (9.6%)	30 (15.9%)	103 (10.9%)	
Current age				**0.001**[b]
N	785	191	976	
Mean (SD)	31.98 (9.08)	29.13 (6.27)	31.42 (8.68)	
Range	16.26 - 61.86	17.60 - 39.98	16.26 - 61.86	
Education level				0.163[a]
N	766	188	954	
Primary/Secondary school	167 (21.8%)	36 (19.1%)	203 (21.3%)	
High school	414 (54.0%)	94 (50.0%)	508 (53.2%)	
University	185 (24.2%)	58 (30.9%)	243 (25.5%)	
Protection				0.962[a]
N	756	186	942	
Without	623 (82.4%)	153 (82.3%)	776 (82.4%)	
With	133 (17.6%)	33 (17.7%)	166 (17.6%)	
Illness duration (years)				**0.001**[b]
N	701	177	878	
Mean (SD)	10.56 (8.12)	8.10 (6.19)	10.07 (7.83)	
Range	0.00 - 43.79	0.00 - 27.55	0.00 - 43.79	
Number of previous admissions				0.294[b]
N	698	177	875	
Mean (SD)	3.22 (3.63)	3.58 (5.40)	3.29 (4.05)	
Range	0.00 - 40.00	0.00 - 64.00	0.00 - 64.00	
Duration (in month) of hospitalization				0.405[b]
N	607	160	767	
Mean (SD)	8.08 (17.03)	8.53 (14.35)	8.18 (16.50)	
Range	0.00 - 250.00	0.00 - 100.00	0.00 - 250.00	
Duration from the first psychiatric contact				0.402[a]
N	728	182	910	
<2 years	139 (19.1%)	36 (19.8%)	175 (19.2%)	
2-5 years	136 (18.7%)	41 (22.5%)	177 (19.5%)	
5-10 years	158 (21.7%)	43 (23.6%)	201 (22.1%)	
>10 years	295 (40.5%)	62 (34.1%)	357 (39.2%)	
Suicide attempt				**0.009**[a]
N	744	188	932	
No	568 (76.3%)	126 (67.0%)	694 (74.5%)	
Yes	176 (23.7%)	62 (33.0%)	238 (25.5%)	
Addiction				**< 0.001**[a]
N	749	187	936	

No addiction	306 (40.9%)	32 (17.1%)	338 (36.1%)	
One or more addiction(s)	443 (59.1%)	155 (82.9%)	598 (63.9%)	
Psychiatric comorbidity				0.065[a]
N	663	163	826	
No	509 (76.8%)	136 (83.4%)	645 (78.1%)	
Yes	154 (23.2%)	27 (16.6%)	181 (21.9%)	
Somatic comorbidity				0.304[a]
N	664	161	825	
No	520 (78.3%)	132 (82.0%)	652 (79.0%)	
Yes	144 (21.7%)	29 (18.0%)	173 (21.0%)	
Anxiolytics treatment				0.287[a]
N	783	189	972	
Yes	230 (29.4%)	63 (33.3%)	293 (30.1%)	
No	553 (70.6%)	126 (66.7%)	679 (69.9%)	
Antidepressant treatment				0.332[a]
N	783	189	972	
Yes	177 (22.6%)	49 (25.9%)	226 (23.3%)	
No	606 (77.4%)	140 (74.1%)	746 (76.7%)	
Mood stabilizers treatment				0.324[a]
N	783	189	972	
Yes	90 (11.5%)	17 (9.0%)	107 (11.0%)	
No	693 (88.5%)	172 (91.0%)	865 (89.0%)	
Neuroleptics treatment				0.074[a]
N	783	189	972	
Yes	737 (94.1%)	184 (97.4%)	921 (94.8%)	
No	46 (5.9%)	5 (2.6%)	51 (5.2%)	
Charge of drug treatment				0.367[a]
N	783	189	972	
Zero or one classe	418 (53.4%)	94 (49.7%)	512 (52.7%)	
Two and more classes	365 (46.6%)	95 (50.3%)	460 (47.3%)	

a. Pearson's Chi-squared test

b. Kruskal-Wallis rank sum test

Supplementary table 2: sex differences in cognition and recovery-related outcomes when women aged 40 years or older were omitted from the analyses

	Schizophrenia			
	Male (N=785)	**Female <= 40 years (N=191)**	**Total (N=976)**	**p value**
Global Assessment of Functioning				0.747[b]
N	582	153	735	
Mean (SD)	55.49 (13.89)	55.87 (14.24)	55.57 (13.96)	
Range	10.00 - 95.00	20.00 - 90.00	10.00 - 95.00	
Clinical Global Impression				0.686[b]
N	576	153	729	
Mean (SD)	4.20 (1.10)	4.17 (1.12)	4.19 (1.10)	
Range	1.00 - 7.00	1.00 - 7.00	1.00 - 7.00	
MARS - Total score				0.915[b]
N	402	101	503	
Mean (SD)	6.82 (1.96)	6.80 (1.96)	6.81 (1.96)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
IS Birchwood - Total score				0.339[b]
N	439	123	562	
Mean (SD)	8.41 (2.65)	8.71 (2.43)	8.48 (2.61)	
Range	0.00 - 12.00	1.50 - 12.00	0.00 - 12.00	
SQOL18 - Total score				0.198[c]
N	415	109	524	
Mean (SD)	54.22 (17.25)	51.81 (17.70)	53.72 (17.35)	
Range	4.16 - 100.00	7.81 - 93.22	4.16 - 100.00	
WEMWBS - Total score (z-score)				0.122[c]
N	480	126	606	
Mean (SD)	-1.05 (1.28)	-1.25 (1.42)	-1.09 (1.32)	
Range	-7,79	-7,37	-7,79	
STORI - Max of stages				0.406[a]
N	385	102	487	
Moratorium	50 (13.0%)	19 (18.6%)	69 (14.2%)	
Awareness	59 (15.3%)	17 (16.7%)	76 (15.6%)	
Preparation	43 (11.2%)	8 (7.8%)	51 (10.5%)	
Rebuilding	98 (25.5%)	20 (19.6%)	118 (24.2%)	
Growth	135 (35.1%)	38 (37.3%)	173 (35.5%)	
SERS - Total score				0.320[c]
N	418	105	523	
Mean (SD)	5.24 (19.82)	3.06 (21.16)	4.80 (20.10)	
Range	-99	-108	-108	
ISMI - Total score				0.384[b]
N	426	115	541	
Mean (SD)	2.19 (0.46)	2.23 (0.43)	2.20 (0.45)	
Range	1.07 - 3.80	1.10 - 3.10	1.07 - 3.80	
CASIG adaptation - Satisfaction level with housing				0.934[b]
N	393	96	489	
Mean (SD)	6.84 (2.38)	6.79 (2.57)	6.83 (2.41)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
CASIG adaptation - Help needed with housing				**0.029[a]**
N	374	93	467	
No	239 (63.9%)	48 (51.6%)	287 (61.5%)	
Yes	135 (36.1%)	45 (48.4%)	180 (38.5%)	

CASIG adaptation - Satisfaction level with daily life skills				0.814[b]
N	389	95	484	
Mean (SD)	6.48 (2.38)	6.53 (2.41)	6.49 (2.38)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
CASIG adaptation - Help needed with daily life skills				0.316[a]
N	373	92	465	
No	271 (72.7%)	62 (67.4%)	333 (71.6%)	
Yes	102 (27.3%)	30 (32.6%)	132 (28.4%)	
CASIG adaptation - Satisfaction level with vocational status				0.818[b]
N	375	92	467	
Mean (SD)	3.42 (2.91)	3.33 (2.81)	3.40 (2.89)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
CASIG adaptation - Help needed with vocational status				0.015[a]
N	362	94	456	
No	74 (20.4%)	9 (9.6%)	83 (18.2%)	
Yes	288 (79.6%)	85 (90.4%)	373 (81.8%)	
CASIG adaptation - Satisfaction level with interpersonal relationships				0.077[b]
N	386	96	482	
Mean (SD)	6.20 (2.71)	5.61 (2.92)	6.08 (2.76)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
CASIG adaptation - Help needed with interpersonal relationships				**0.044[a]**
N	370	94	464	
No	216 (58.4%)	44 (46.8%)	260 (56.0%)	
Yes	154 (41.6%)	50 (53.2%)	204 (44.0%)	
CASIG adaptation - Satisfaction level with intimate relationships				0.643[b]
N	384	93	477	
Mean (SD)	4.09 (3.09)	4.35 (3.50)	4.14 (3.17)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
CASIG adaptation - Help needed with intimate relationships				0.305[a]
N	369	94	463	
No	214 (58.0%)	49 (52.1%)	263 (56.8%)	
Yes	155 (42.0%)	45 (47.9%)	200 (43.2%)	
CASIG adaptation - Satisfaction level with family relationships				0.781[b]
N	389	96	485	
Mean (SD)	7.01 (2.44)	6.92 (2.52)	6.99 (2.46)	
Range	0.00 - 10.00	0.00 - 10.00	0.00 - 10.00	
CASIG adaptation - Help needed with family relationships				0.195[a]
N	374	94	468	
No	238 (63.6%)	53 (56.4%)	291 (62.2%)	
Yes	136 (36.4%)	41 (43.6%)	177 (37.8%)	
Having two or more socially valued roles				**0.004[a]**
N	700	177	877	
No	597 (85.3%)	135 (76.3%)	732 (83.5%)	
Yes	103 (14.7%)	42 (23.7%)	145 (16.5%)	

Personal recovery				0.503[a]
N	385	102	487	
STORI - Moratorium/Awareness/Preparation	152 (39.5%)	44 (43.1%)	196 (40.2%)	
STORI - Rebuilding/Growth	233 (60.5%)	58 (56.9%)	291 (59.8%)	
Functional recovery				0.072[a]
N	582	153	735	
EGF <= 61	427 (73.4%)	101 (66.0%)	528 (71.8%)	
EGF >= 61	155 (26.6%)	52 (34.0%)	207 (28.2%)	
Long term memory (CVLT/RLRI)				0.237[a]
N	446	115	561	
Deficit level	154 (34.5%)	33 (28.7%)	187 (33.3%)	
Normal level	292 (65.5%)	82 (71.3%)	374 (66.7%)	
Executing functioning (Digit span - Short term memory)				**0.008[a]**
N	458	120	578	
Deficit level	59 (12.9%)	27 (22.5%)	86 (14.9%)	
Normal level	399 (87.1%)	93 (77.5%)	492 (85.1%)	
Executing functioning (Digit span - Working memory)				**0.010[a]**
N	458	120	578	
Deficit level	75 (16.4%)	32 (26.7%)	107 (18.5%)	
Normal level	383 (83.6%)	88 (73.3%)	471 (81.5%)	
Attention (D2-R - Attention capacity)				0.886[a]
N	377	88	465	
Deficit level	117 (31.0%)	28 (31.8%)	145 (31.2%)	
Normal level	260 (69.0%)	60 (68.2%)	320 (68.8%)	
Attention (D2-R - Target processed/processing speed)				0.495[a]
N	383	89	472	
Deficit level	174 (45.4%)	44 (49.4%)	218 (46.2%)	
Normal level	209 (54.6%)	45 (50.6%)	254 (53.8%)	
Attention (D2-R - Errors and omissions)				0.887[a]
N	380	88	468	
Deficit level	32 (8.4%)	7 (8.0%)	39 (8.3%)	
Normal level	348 (91.6%)	81 (92.0%)	429 (91.7%)	
Planning abilities (Shopping test - Reaction time)				0.175[a]
N	413	105	518	
Deficit level	83 (20.1%)	15 (14.3%)	98 (18.9%)	
Normal level	330 (79.9%)	90 (85.7%)	420 (81.1%)	
Planning abilities (Shopping test - Error)				0.792[a]
N	411	105	516	
Deficit level	116 (28.2%)	31 (29.5%)	147 (28.5%)	
Normal level	295 (71.8%)	74 (70.5%)	369 (71.5%)	

a Pearson's Chi-squared test

b Kruskal-Wallis rank sum test

c Linear Model ANOVA