Overlap and Mutual Distinctions Between Clinical Recovery and Personal Recovery in People With Schizophrenia in a One-Year Study

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Recovery is a multidimensional construct that can be defined either from a clinical perspective or from a consumer-focused one, as a self-broadening process aimed at living a meaningful life beyond mental illness. We aimed to longitudinally examine the overlap and mutual distinctions between clinical and personal recovery. Of 1239 people with schizophrenia consecutively recruited from the FondaMental Advanced Centers of Expertise for SZ network, the 507 present at one-year did not differ from those lost to follow-up. Clinical recovery was defined as the combination of clinical remission and functional remission. Personal recovery was defined as being in the rebuilding or in the growth stage of the Stages of Recovery Instrument (STORI). Full recovery was defined as the combination of clinical recovery and personal recovery. First, we examined the factors at baseline associated with each aspect of recovery. Then, we conducted multivariable models on the correlates of stable clinical recovery, stable personal recovery, and stable full recovery after one year. At baseline, clinical recovery and personal recovery were characterized by distinct patterns of outcome (i.e. better objective outcomes but no difference in subjective outcomes for clinical recovery, the opposite pattern for personal recovery, and better overall outcomes for full recovery). We found that clinical recovery and personal recovery predicted each other over time (baseline personal recovery for stable clinical recovery at one year; $P = .026$, OR = 4.94 [1.30–23.0]; baseline clinical recovery for stable personal recovery at one year; $P = .016$, OR = 3.64 [1.31–11.2]). In short, given the interaction but also the degree of difference between clinical recovery and personal recovery, psychosocial treatment should target, beyond clinical recovery, subjective

aspects such as personal recovery and depression to reach full recovery.

Key words: clinical recovery/personal recovery/full recovery/schizophrenia/psychosocial treatment

Introduction

Recovery is a multidimensional construct that encompasses both subjective (e.g. wellbeing, quality of life, self-esteem) and objective outcomes (e.g. independent living, interpersonal and intimate relationships, work). It can be defined either from a clinical perspective (i.e. sustained symptom and functional remission, referred to as clinical recovery) or from a consumer-focused one, as a self-broadening process aimed at living a meaningful life beyond mental illness (i.e. personal recovery[1]).

Clinical recovery concerns roughly one in five people with schizophrenia-spectrum disorders (SSD) and has long been the focus of therapeutic interventions.[1,2] Late age of onset, high insight into illness, low negative symptoms and self-stigma, and high social support are characteristics often associated with stable clinical recovery.[1] A small to moderate overlap has been found between clinical recovery and personal recovery in a 2018 meta-analysis.[3] Personal recovery is associated with reduced depression and better psychosocial function.[3,4] It has been found to be unrelated to cognitive function and psychotic symptoms.[3] It is associated with metacognitive abilities, social support, socially valued roles, and other recovery-related outcomes (i.e. quality of life, self-esteem, low self-stigma, stigma resistance, hope, and wellbeing).[1,5–7] Personal recovery could protect against insight-related depression, self-stigma, and suicidal ideation.[8,9]

Personal recovery involves redefining a positive identity extending beyond mental illness and finding meaning in psychosis-related disruption to a person's life.[1] Gender differences have been reported in psychosis-related interruptions to the social roles and relationships that shape a person's identity (i.e. loss of employment for men; failed relationships and loss of parenting role for women).[10] This might contribute to gender differences in the pattern of recovery (i.e. association of female gender to higher clinical recovery in some studies but not others[2,11,12]; to higher personal recovery in Song, 2017[13]; to more socially valued roles but also poorer recovery-related outcomes[14]).

According to an emerging consensus, recovery-oriented treatment should be integrative and focus on both objective and subjective outcomes.[1] Full recovery in SSD (i.e. clinical and personal recovery/clinical recovery and high wellbeing or satisfaction with life)[6,15] remain rare (1.3% of 1421 participants)[15] and its characteristics largely unknown. Although symptom and functional remission have been associated with better long-term clinical recovery and quality of life,[12,16–18] their impact on personal recovery or wellbeing remains limited.[3,4,6] On the contrary, treating depression and supporting personal recovery during treatment could contribute to stable clinical recovery and to optimal outcome in SSD.[4,19,20]

While a number of cross-sectional studies have investigated the relationship between clinical recovery and personal recovery, how they relate to each other over time remains largely unclear.[3] Given the role of time in recovery, the lack of longitudinal research on this topic may be a substantial limitation to the current body of evidence.[3] Besides and to our knowledge, all the longitudinal studies that reported on the relationship between clinical recovery and personal recovery used a follow-up period ranging from 6 months to one year.[3,6,15] This might be another limitation as the trajectories of people with SSD tend to unfold over many years.[1,2] However, study quality and the duration of follow-up did not affect the rates of clinical recovery in a 2013 meta-analysis of 50 studies.[2] Besides, study quality, rated as moderate to high in Van Eck et al. 2018 meta-analysis,[3] did not moderate the relationship between clinical recovery and personal recovery.

The objective of the present longitudinal study was to examine the overlap and mutual distinctions between clinical and personal recovery in a large non-selected multicentric sample of people with SSD. In support of conceptual distinction between clinical and personal recovery, we hypothesized that distinct patterns of objective and subjective outcomes would be found at baseline depending on which aspect of recovery is considered (i.e. no recovery, clinical recovery only; personal recovery only; clinical recovery and personal recovery). On the contrary, in support of mutual relationship between both facets of recovery, we also hypothesized that personal recovery at baseline would be associated with stable clinical recovery after one year of follow-up and that clinical recovery at baseline would be associated with stable personal recovery at one year. Finally, according to the literature reviewed above[4,19] we hypothesized that depression and psychosocial function at baseline (correlates of both clinical and personal recovery) would mediate these longitudinal relationships between clinical recovery and personal recovery.

Material and Methods

Study Population

One thousand two hundred and thirty-nine clinically stabilized persons with schizophrenia-spectrum disorder (SSD) were consecutively recruited from the FACE-SZ network between 2010 and July 2019. The FACE-SZ cohort is based on an ongoing French national network of schizophrenia Expert Centers that has been extensively described in a previous article.[21] 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. A comprehensive clinical, functional, and cognitive

assessment is performed to establish the individual's strengths and weaknesses, autonomy, and occupational level. Follow-up is planned to last for 3 to 5 years. At the end of each evaluation, a detailed evaluation report is sent to the patient and the referrer along with a personalized care program multifaceted and including the rationale for psychosocial treatment recommendation. The appraisal protocol was approved by the relevant Ethical Review Board (CPP-Ile de France IX) on January 18, 2010. All participants gave their written informed consent.

Data Collected

Clinical Recovery.   Clinical recovery (CR) was defined as the association of clinical remission and functional remission during a period of one year. Clinical remission was defined using Andreasen's criteria[22] on Positive and Negative Symptoms Scale (PANSS).[23] Functional remission was defined using the cut-off scores proposed by Jääskeläinen et al. in 2013[2]: Global Assessment of Functioning (GAF)[24] score > 61 or Personal and Social Performance (PSP)[25] score > 61. This multidimensional definition combining symptom remission and functional remission corresponds to the operational criteria for clinical recovery proposed by R.P Liberman et al. in 2002[26] and revised in Jääskeläinen et al. meta-analysis in 2013[2]. However, we used a shorter timeframe compared with these studies (usually 2 years or more[2,26]). This limitation will be discussed later.

Personal Recovery.   Personal recovery (PR) was measured using the Stage of Recovery Instrument (STORI).[27] The STORI is a 50-item self-report instrument assessing the five stages of personal recovery described by Andresen in 2003[27]. 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 (e.g. by taking stock of 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 five items ranging from 0 "Not at all true" to 5 "Completely true" mapping onto the five 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 (alpha 0.88–0.94).[27] Personal recovery was defined as being classified in the rebuilding or in the growth stage.

Full Recovery.   Full recovery was defined as the association of clinical recovery and personal recovery during a period of one-year.

Other Collected Data.   General information on education, illness onset and trajectory, and comorbidities was recorded. Illness severity was assessed with the Clinical Global Impression (CGI)[28] scale. Current depressive symptoms were evaluated using the Calgary Depression rating Scale for Schizophrenia (CDSS).[29] Insight was measured both with a self-reported measure (Birchwood Insight Scale; BIS)[30] and with the clinician-rated Scale to assess Unawareness of illness in Mental Disorders (SUMD).[31] Adherence into treatment was self-reported with the Medication Adherence Rating Scale (MARS).[32] Quality of life (QoL) was evaluated with the self-reported Quality of Life scale (S-QoL).[33] Neuropsychological cognitive assessments included Wechsler Adult Intelligence Scale-4th edition (WAIS-IV)[34] Matrix and Similarities subscales for respectively non-verbal logical reasoning and verbal abstraction and WAIS-IV subscales assessing short-term and working memories.[34]

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 linear model ANOVAs for continuous variables. Univariate significance p-values were computed, and covariates significant at the 10% level were included in multivariable logistic regression models. The first question was to examine the overlap and mutual distinctions between four aspects of recovery at baseline (no recovery; clinical recovery without personal recovery; personal recovery without clinical recovery; full recovery). Association between these different aspects of recovery and several outcomes were performed using analysis of variance (ANOVA). Supplementary Table 1 presents for each covariate a boxplot and the results of an ANOVA on different aspects of recovery at baseline. The second question was a longitudinal examination of the correlates at baseline of respectively stable clinical recovery, stable personal recovery, and stable full recovery. Clinical recovery at one year was retained as the predictor for the first multivariate analysis. Based on univariable analysis, the values at baseline of fifteen variables of interest were considered as covariates: age, gender, education level, personal autonomy, vocational status, marital status, age of onset, insight, treatment adherence, depressive symptoms, quality of life, non-verbal logical reasoning, verbal abstraction, working memory, and short-term memory. Personal recovery at one year was retained as the predictor for the second multivariate analysis. Eight variables were considered as covariates: age, gender, marital status, general psychopathology, depressive symptoms, psychosocial

function, treatment adherence, and quality of life. Full recovery at one year was retained as the predictor for the third multivariate analysis. Ten variables were considered as covariates: age, gender, education level, age of onset, insight, depressive symptoms, quality of life, verbal reasoning, working memory, and short-term memory for full recovery. Exhaustive variable selection determined the best model in the sense of adjusted R-squared. The third question was to detect potential mediating effects of psychosocial function, depression, and quality of life in the longitudinal relationships between clinical recovery and personal recovery. A path analysis was conducted following the procedure described by Baron and Kenny.[35] The first step was to test for correlations between the predictor (clinical recovery or personal recovery at baseline) and the variable to be explained (stable clinical recovery or stable personal recovery at follow-up). The second step was to test the effect of the predictor (clinical recovery or personal recovery at baseline) on the potential mediating variables (psychosocial function, depression, or quality of life). The third step was to test for indirect effects mediated by the potential mediators and to see whether the relationship between the predictor and the variable to be explained remained or not significant after controlling for stigma resistance (partial or full mediation). *P*-values <.05 were considered significant. All statistical analyses were performed using R (R Foundation for Statistical Computing, Vienna, Austria; https://www.R-project. org/).[36]

Results

The sample consisted of 1239 clinically stabilized persons with schizophrenia-spectrum disorder (SSD) consecutively recruited from the FACE-SZ network. They had been included in this cohort study between 2010 and July 2019. Participants were mostly men (923; 74.5%) with mean illness duration of 10.23 (SD = 8.07) years. Baseline (V0) sample characteristics are presented on Table 1. After one year of follow-up (V1), 507 patients (40.9%) were examined again. They did not differ from those lost to follow-up regarding our variables of interest (i.e. clinical recovery, personal recovery, and full recovery; see table 1).

Overlap and Mutual Distinctions Between Clinical and Personal Recovery at Baseline

Supplementary table 1 presents the overlap and mutual distinctions between four aspects of recovery at baseline (no recovery; clinical recovery without personal recovery; personal recovery without clinical recovery; full recovery). Clinical recovery, personal recovery, and full recovery were associated with verbal reasoning and working memory. Compared to people who did not meet the criteria for clinical or personal recovery, we identified

three distinct patterns of outcome: i) better objective outcomes (e.g. psychotic symptoms, insight, and psychosocial function) but no differences in subjective outcomes (e.g. depression and quality of life) for people meeting the criteria only for clinical recovery; ii) similar objective outcomes but better subjective outcomes for people meeting the criteria only for personal recovery; iii) better objective and subjective outcomes for those in full recovery.

Recovery in the FACE-SZ Network

After one-year of follow-up, 84 patients (16.6%) met the criteria for stable clinical recovery (i.e. clinical recovery during a period of one year) and 61 patients (46.9%) were classified in the stable personal recovery group. Twenty patients met the criteria for stable full recovery (4.8%). Table 2 shows the rates of the different aspects of recovery after one-year.

Baseline Correlates of Stable Recovery After One-Year of Follow-up

Table 3 presents the results of three multivariate analyses on the baseline correlates of stable clinical recovery, personal recovery, and full recovery after one-year of follow-up. Female gender, depressive symptoms, insight, verbal reasoning, and personal recovery best predicted clinical recovery at one year. Clinical recovery and quality of life at baseline best predicted personal recovery at one year. Female gender, depressive symptoms, verbal reasoning and working memory best predicted full recovery at one-year.

Moderation/Mediation Analyses

Table 4 presents the results of mediation analyses. The effects of clinical recovery at baseline on stable personal recovery at follow-up were partially mediated by depression (beta = 0.06; *P* = .018) and quality of life (beta = 0.11; *P* = .015). Depression (beta = 0.03; *P* = .026) and psychosocial function (beta = 0.13; *P* = .002) partially mediated the effects of personal recovery at baseline on stable clinical recovery at follow-up.

Discussion

Main Findings

To our knowledge, this study is the first to: i) assess longitudinally the overlap and mutual distinctions between clinical and personal recovery in a large non-selected multicentric SSD sample; ii) test for potential mediating effects of depression, psychosocial function, and quality of life on the mutual longitudinal relationships between clinical recovery and personal recovery. The results supported our research hypotheses. We found that, while related, clinical recovery and personal recovery were distinct constructs characterized by different patterns of

Table 1. Sample characteristics and differences with lost-to follow-up

	Lost to follow-up (N = 730)	Present to follow-up (N = 509)	Total (N = 1239)	P value
Age				.258[1]
Mean (SD)	31.456 (9.376)	32.084 (9.934)	31.714 (9.610)	
Range	16.000–70.000	15.000–85.000	15.000–85.000	
Gender				.089[2]
F	199 (27.3%)	117 (23.0%)	316 (25.5%)	
M	531 (72.7%)	392 (77.0%)	923 (74.5%)	
Education level (years)				.336[1]
Mean (SD)	12.211 (2.534)	12.359 (2.632)	12.275 (2.577)	
Range	0.000–20.000	1.000–20.000	0.000–20.000	
Vocational status (employed)				.686[2]
No	504 (84.3%)	396 (83.4%)	900 (83.9%)	
Yes	94 (15.7%)	79 (16.6%)	173 (16.1%)	
Marital status (in a couple)				.127[2]
No	529 (89.2%)	425 (92.0%)	954 (90.4%)	
Yes	64 (10.8%)	37 (8.0%)	101 (9.6%)	
Parents				.279[2]
No	554 (91.1%)	419 (89.1%)	973 (90.3%)	
Yes	54 (8.9%)	51 (10.9%)	105 (9.7%)	
PANSS Positive				.487[1]
Mean (SD)	14.556 (6.013)	14.792 (5.300)	14.656 (5.721)	
Range	7.000–45.000	7.000–34.000	7.000–45.000	
PANSS Negative				.140[1]
Mean (SD)	19.840 (7.196)	20.467 (7.157)	20.105 (7.183)	
Range	7.000–44.000	7.000–42.000	7.000–44.000	
PANSS General Psychopathology				.601[1]
Mean (SD)	34.873 (10.488)	35.190 (9.815)	35.008 (10.205)	
Range	16.000–75.000	16.000–71.000	16.000–75.000	
Calgary Depression Scale for Schizophrenia				.207[1]
Mean (SD)	3.881 (4.174)	4.193 (4.219)	4.013 (4.194)	
Range	0.000–21.000	0.000–21.000	0.000–21.000	
Subjective Quality Of Life (S-QOL)				**.017**[1]
Mean (SD)	52.750 (18.353)	50.131 (17.736)	51.628 (18.130)	
Range	1.560–100.000	0.000–100.000	0.000–100.000	
Global Assessment of Functioning				.081[1]
Mean (SD)	50.159 (13.205)	48.791 (13.226)	49.580 (13.225)	
Range	15.000–91.000	11.000–89.000	11.000–91.000	
Personal and Social Performance scale (PSP)				.454[1]
N-Miss	403	365	768	
Mean (SD)	55.648 (15.546)	54.514 (14.129)	55.301 (15.121)	
Range	9.000–95.000	18.000–81.000	9.000–95.000	
IS Birchwood - Total score				.433[1]
Mean (SD)	8.699 (2.956)	8.838 (2.892)	8.759 (2.929)	
Range	0.000–12.000	0.000–12.000	0.000–12.000	
SUMD1				.437[1]
Mean (SD)	1.648 (0.765)	1.613 (0.737)	1.633 (0.754)	
Range	0.000–3.000	0.000–3.000	0.000–3.000	
Medication Adherence Rating Scale - Total score				.145[1]
Mean (SD)	6.139 (2.218)	6.335 (2.215)	6.223 (2.218)	
Range	0.000–10.000	0.000–10.000	0.000–10.000	
WAIS-IV Similarities				.480[1]
Mean (SD)	9.551 (3.330)	9.700 (3.550)	9.617 (3.428)	
Range	1.000–18.000	1.000–18.000	1.000–18.000	
WAIS-IV Matrix				.306[1]
Mean (SD)	8.147 (3.188)	8.350 (3.250)	8.237 (3.216)	
Range	1.000–17.000	1.000–17.000	1.000–17.000	
WAIS-IV short term memory				.557[1]
Mean (SD)	9.060 (2.096)	8.985 (2.033)	9.027 (2.068)	
Range	4.000–16.000	4.000–16.000	4.000–16.000	
WAIS IV- working memory				**.006**[1]
Mean (SD)	6.940 (2.160)	6.573 (2.178)	6.778 (2.175)	
Range	2.000–15.000	2.000–15.000	2.000–15.000	

Table 1. Continued

	Lost to follow-up (N = 730)	Present to follow-up (N = 509)	Total (N = 1239)	P value
Symptomatic remission				.283[2]
No	566 (84.6%)	429 (86.8%)	995 (85.6%)	
Yes	103 (15.4%)	65 (13.2%)	168 (14.4%)	
Functional remission				.222[2]
No	182 (48.7%)	88 (43.3%)	270 (46.8%)	
Yes	192 (51.3%)	115 (56.7%)	307 (53.2%)	
Clinical Recovery				.221[2]
No	580 (89.6%)	437 (91.8%)	1017 (90.6%)	
Yes	67 (10.4%)	39 (8.2%)	106 (9.4%)	
Personal recovery (STORI stage IV and V)				.054[2]
No	117 (42.9%)	69 (53.1%)	186 (46.2%)	
Yes	156 (57.1%)	61 (46.9%)	217 (53.8%)	
Age of onset				.132[1]
Mean (SD)	21.096 (6.245)	21.667 (6.540)	21.339 (6.375)	
Range	5.000–61.000	5.000–63.000	5.000–63.000	
Illness duration (years)				.502[1]
Mean (SD)	10.098 (7.940)	10.420 (8.252)	10.235 (8.072)	
Range	–7.000 to 45.000	–13.000 to 58.000	–13.000 to 58.000	
Body Mass Index				.132[1]
Mean (SD)	21.096 (6.245)	21.667 (6.540)	21.339 (6.375)	
Range	5.000–61.000	5.000–63.000	5.000–63.000	

[1]Linear Model ANOVA
[2]Pearson's Chi-squared test

Table 2. Rates of Recovery at Baseline and After 1 y of Follow-up

	Clinical Recovery (n/N_{tot} (%))	Personal Recovery (n/N_{tot} (%))	Full Recovery (n/N_{tot} (%))
At baseline	106/1123 (9.4)	270/403 (67)	66/1002 (6.6)
After 1 y of follow-up	84/507 (16.6)	61/130 (46.9)	20/416 (4.8)

outcome when separately considered and compared to the absence of recovery (i.e. better objective outcomes but no difference in subjective outcomes for clinical recovery only and the opposite for personal recovery only). We extended the findings of previous cross-sectional research[3] with a longitudinal examination and found that clinical recovery and personal recovery predicted each other over time (5-fold likelihood of remaining in clinical recovery after one year for those in the advanced stages of personal recovery at baseline; 3-fold likelihood to remain in the advanced stages of personal recovery after one year for those being in clinical recovery at baseline). We found partial mediating effects of depression, psychosocial function, and quality of life on the longitudinal relationships between clinical recovery and personal recovery.

Interpretation of the Results

Overlap and Mutual Distinctions Between Clinical Recovery and Personal Recovery After One-Year of Follow-up. We found distinct patterns of outcomes at baseline when separately considering clinical recovery and personal recovery. This could be related to several factors. First, clinical recovery involves the perception of others about wellness, and personal recovery is the perception of wellness by the persons themselves.[1] Thus, some interaction but also some degree of difference between clinical recovery and personal recovery is expected.[1,3] Second, this result could be explained by the "insight paradox," which posits that good insight improves objective outcomes (e.g. psychotic symptoms, treatment adherence, and psychosocial function) while negatively affecting subjective outcomes (e.g. depression, quality of life, and personal recovery).[1,9,37,38] Similarly, poor insight is often associated with poor objective outcomes but also protects against subjective aspects such as self-stigma and insight-related depression.[9,37,39]

Several factors might also contribute to the finding that clinical recovery and personal recovery could predict each other over time. First, personal recovery could reduce psychotic symptoms and protect against their detrimental effects on emotional distress, capacity for social relatedness, and social function.[1,40,41] Personal recovery also helps to protect against self-stigma, insight-related depression, and their negative effects on the objective and subjective aspects of recovery (e.g. higher psychotic symptoms, impaired psychosocial function; depression; reduced self-esteem, stigma resistance, and quality of life).[1,6,9,42] The partial mediating effects of psychosocial function in the relationship between personal recovery at baseline and stable clinical recovery at follow-up partially supports this hypothesis.

Table 3. Multivariate Analyses

Predictors	Clinical Recovery				Personal Recovery				Full Recovery			
	Odds Ratios	CI	Statistic	P	Odds Ratios	CI	Statistic	P	Odds Ratios	CI	Statistic	P
Gender (Female)	11.00	2.51–64.5	2.95	**<.001**					6.67	1.24–40.29	2.20	**.027**
Age of onset	0.23	0.05–0.76	−2.18	**.029**					0.89	0.76–1.02	−1.43	.150
SUMD unawareness												
Clinical Recovery					3.64	1.31–11.2	2.39	**.016**				
CDSS	0.68	0.49–0.88	−2.60	**<.001**					0.37	0.17–0.65	−2.91	**.003**
S-QoL	4.94	1.30–23.0	2.24	**.026**	1.06	1.03–1.09	4.02	**<.001**				
Personal recovery (STORI IV&V)									1.52	1.03–2.32	2.12	**.033**
WAIS IV Working Memory									1.50	1.19–2.03	3.10	**.001**
WAIS IV Similarities standard note	1.59	1.26–2.13	3.52	**<.001**								
Observations	107				123				378			
R^2 Tjur	0.48				0.23				0.18			
AIC	74.69				145.21				64.68			

Note: CDSS, Calgary Depression Scale for schizophrenia; CI, confidence interval; GAF, Global Assessment of Functioning; S-QoL, Subjective Quality of Life; STORI, Stage of Recovery Instrument; SUMD, Scale to Assess Unawareness of Mental Disorder. This table presents the results of three multivariate analyses on respectively the correlates of clinical recovery, personal recovery and full recovery. Exhaustive variable selection determined the best model in the sense of adjusted R^2. Logistic regression (restricted model vs full model: $\chi^2 = 2.41$, $P = .66$ for clinical recovery; restricted model vs full model: $\chi^2 = 0.76$, $P = .38$ for personal recovery; restricted model vs full model: $\chi^2 = 0.76$, $P = .38$ for full recovery).

Table 4. Mediation Analyses

Outcome (y)	Predictor (x)	Mediator (m)	Total effect (c) (P-value)		Direct effect (c') (p-value)		Indirect effect (ab) (ab, ab[95%CI])	R^2
- Stable PR (V1)	- CR (V0)	- CDSS	- 0.40	- <.01	- 0.34	<.01	0.06 [0.01-0.11]; P = .018	0.14
- Stable CR (V1)	- PR (V0)	- CDSS	- 0.23	- <.01	- 0.21	<.01	0.03 [0.01-0.05]; P = .026	0.11
- Stable PR (V1)	- CR (V0)	- S-QoL	- 0.40	- <.01	- 0.29	<.01	0.11 [0.06-0.18]; P = .015	0.22
- Stable CR (V1)	- PR (V0)	- GAF	- 0.23	- <.01	- 0.11	<.01	0.13 [0.04-0.19]; P = .002	0.49

• Clinical recovery (V0)- Calgary Depression Scale- Stable personal recovery (V1)

Mediation

RC0 — CALGAR — STbin45V1; -2.31; -0.02; c = 0.4; c' = 0.34

• Personal recovery (V0)- Calgary Depression Scale- Stable clinical recovery (V1)

Mediation

STbin45 — CALGAR — RCV1; -2.22; -0.01; c = 0.23; c' = 0.21

• Clinical recovery (V0)- Subjective quality of life- Stable personal recovery (V1)

Mediation

RC0 — SQOL — STbin45V1; 10.8; 0.01; c = 0.4; c' = 0.29

• Clinical recovery (V0)- Psychosocial function- Stable personal recovery (V1)

Mediation

STbin45 — EGF — RCV1; 6.63; 0.02; c = 0.23; c' = 0.11

Note: c, total effect; c', direct effect; ab, indirect effect; PR, personal recovery; CR, clinical recovery; CDSS, Calgary Depression Scale; GAF, Global Assessment of Functioning; S-QoL, Subjective Quality of Life.

Second, some studies[6,43,44] reported that symptom reduction could contribute to personal recovery through reducing emotional distress associated to positive symptoms while other showed that having stable symptom remission contributes to long-term functional remission and better personal recovery outcome such as wellbeing and quality of life.[6,12,16,18] In contrast, Van Eck et al.[3] reported a positive but small association between psychosocial function and personal recovery. Our results showed a partial mediating effect of quality of life in the relationship between clinical recovery at baseline and stable personal recovery at follow-up. This might rather support the hypothesis that functional remission contributes more than symptom remission to personal recovery. Previous studies suggested that this effect might be either direct or indirect through engagement in meaningful social roles and adaptive coping strategies.[1,3,5,45,46] The fact that socially valued roles at baseline did not correlate with personal recovery at one year (this aligning with Tew et al. and Dubreucq et al.)[14,47] rather supports a direct effect of functional remission on personal recovery. Quality of life taps a range of resources related to both aspects of recovery (e.g. physical wellbeing, psychological wellbeing, self-esteem, self-stigma, family relationships, friendships, intimate relationships, autonomy, and resilience)[33,42] and mediates the relationship between social support and personal recovery.[48] It may therefore also be hypothesized that some of these resources are needed to translate clinical recovery into the experience of personal recovery.[6,48] However, while one could expect that poverty is associated with reduced quality of life in people with SSD, recent research from the FACE-SSD network has reported the opposite.[49]

Apart from psychotic symptoms, depression was also found to contribute to the relationships between clinical and personal recovery. Depression affects on-third of people with SSD (35% in the present sample) and is known to impact negatively both physical and mental health.[3,19,50] Previous studies also reported poorer objective and subjective recovery-related outcomes (i.e. clinical recovery, self-stigma, wellbeing, and quality of life)[3,4,16,19,20,50] associated with depression in SSD participants. Finally, we found a positive association between clinical recovery and two domains related to executive functions (working memory and verbal reasoning) in contrast to Morrison et al (2016)[51] who failed to find similar association. As executive functions contribute to the use of adaptive coping strategies and to improve both stigma resistance and functional outcomes,[9,52] it seems reasonable to posit that cognitive function could indirectly contribute to personal recovery.[53] All in all, these results support an integrative definition of recovery that could be defined as the combination of both objective and subjective outcomes.[1]

Clinical Implications. The present study has several potential clinical implications. First, our results support and extend previous findings indicating that depression and personal recovery should be targeted during psychosocial

treatment to improve the objective and subjective aspects of recovery.[3,4,6,41] While psychosocial treatment improves some of the objective aspects of recovery (i.e. psychotic symptoms, insight, treatment adherence, cognition, and psychosocial function), its effectiveness on socially valued roles, depression, wellbeing, and quality of life remains limited.[54–57]

The development of recovery-oriented practices (i.e. person-centered, strengths-based, and supporting hope, empowerment, and goal-striving behaviors)[58] in mental health facilities should be encouraged.[59] Peer-supported self-management interventions as well as recovery-oriented psychoeducation and family psychoeducation help to reduce self-stigma and protect against insight-related depression[7,39,60,61] and therefore facilitate personal recovery in people with SSD.[59] In addition, cognitive remediation could indirectly contribute to personal recovery and full recovery through improved executive functioning, improved stigma resistance, and increased use of adaptive coping strategies.[53]

More specifically, treating depression seems a crucial target in order to facilitate personal recovery and full recovery.[3,4,20,42,50,62] Besides antidepressants, interventions targeting physical health can also improve depression and recovery-related outcomes and should be further developed.[62–65] Finally, given that engaging in meaningful social roles (e.g. paid employment, intimate relationships, or becoming a parent) during psychosocial treatment contributes to personal recovery,[45] Individual Placement and Support strategies should be encouraged to improve clinical, functional, and vocational outcomes in people with SSD[66,67] and therefore facilitate personal recovery.[68] In addition, recovery-oriented interventions supporting people with SSD when dating or deciding to start a family are also likely to improve personal recovery, although this remains to be investigated.[14,69]

Recovery implies finding meaning in the experience of psychosis and psychosis-related disruption to a person's life (i.e. loss of employment, failed relationships, and loss of parenting role).[10] Preventing psychosis-related interruptions to valued social roles or reinvesting valued social roles during psychosocial treatment could contribute to personal recovery.[10,14] Research on metacognition (i.e. the 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)[70] has suggested that improving metacognitive abilities during psychosocial treatment could contribute to personal recovery, through richer self-narratives, improved meaning-making, reduced self-stigma, and less insight-related depression.[1,70,71] The potential effectiveness of specific approaches targeting metacognition such as Metacognitive Reflection and Insight Therapy (MERIT)[70] on personal recovery remains however to be investigated.[9]

The pattern of recovery associated with female gender (i.e. higher clinical recovery but no difference in personal recovery) concurs with previous studies.[11,12,14,72] Firmin et al (2020)[10] and Dubreucq et al (2021)[14] found that women with SSD could have unique treatment needs when the subjective aspects of recovery are considered. Future research should investigate whether gender-sensitive recovery-oriented interventions contribute to full recovery in women with SSD.[14]

Limits

The present study has several limitations. First, although the FACE-SSD 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. However, some of the sample characteristics suggest that the present sample is comparable to the general community-dwelling SSD population. Second, although the male to female ratio in the present sample is comparable to those reported in non-epidemiological and psychiatric rehabilitation cohort studies (66% of males in Longenecker et al. 2010[73] meta-analysis of 220 studies; 74.5% of males of the 1055 participants from the REHABase cohort[14]), a recent systematic review by Charlson et al[74] found no sex differences in the prevalence of SSD. The predominance of males in the present sample is, therefore, a limitation. Future research with more balanced samples will be needed to replicate or extend these findings. Third, a high proportion of patients (59.1%) were lost to follow-up between V0 and V1. However, the patients present at follow-up did not differ at baseline from follow-up patients regarding our variables of interest and may therefore be considered representative of the original sample. Fourth, personal recovery was measured with a self-report measure, which is particularly suitable for large cohort studies. Nevertheless, since personal recovery is an individualized and deeply subjective process, it is best measured with a self-reported instrument[75] or using qualitative methods.[1] Future research using a mixed-methods design may therefore be needed to better understand the overlap and mutual distinctions over time between clinical recovery and personal recovery. Besides, as metacognition facilitates the kind of meaning making needed in personal recovery, the inclusion of a scale measuring metacognition such as the Metacognition Assessment Scale–Abbreviated (MAS-A)[76] in the FACE-SSD database could allow a longitudinal investigation of its relations with clinical recovery and personal recovery. Fifth, clinical recovery is often defined as clinical and functional remission lasting at least two years.[2] The one-year follow-up period of this study is, therefore, a substantial limitation. However, the subjective aspects of recovery refer to a process rather than to an outcome and thus may vary over time.[1] Future studies with a longer follow-up period will be needed to replicate or extend these findings. Sixth,

the high proportion of people with co-occurring depression (35%) could contribute to the low ratings of quality of life.[50] However, the frequency of co-occurring depression in the present sample is comparable to those reported in a recent meta-analysis.[77] Besides, while depression was negatively associated with quality of life, its inclusion as a covariate in an analysis of covariance (ANCOVA) did not change the pattern of associations at baseline between quality of life and the different aspect of recovery (the results are presented in Supplementary table 2).

In short, the present study has shown that clinical recovery and personal recovery predicted each other in a longitudinal examination. This suggests that, beyond targeting clinical recovery, psychosocial treatment should also focus on depressive symptoms and personal recovery to achieve full recovery. The implementation of recovery-oriented practices in mental health facilities could contribute to recovery and should be encouraged. Future psychosocial treatments should also be integrative and target both objective and subjective aspects of recovery.

Supplementary Material

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