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From Patients to Caregivers: Indirect Associations between Social Cognition, Patient Distress, and Caregiver Quality of Life in Schizophrenia

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This is a preliminary, unedited version of a manuscript that has been accepted for publication in the Brazilian Journal of Psychiatry. As a service to our readers, we are providing this early version of the manuscript. The manuscript will still undergo copyediting, typesetting, and review of the resulting proof before it is published in final form. The final version may present slight differences in relation to the present version.

From patients to caregivers: indirect associations between social cognition, patient distress, and caregiver quality of life in schizophrenia

Running Title: Social cognition and caregiver quality of life

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Abstract

Objective: To examine whether patients' social cognition (SC) is indirectly associated with caregivers' quality of life (S-CGQoL) through patients' psychological distress (PD), using a cross-sectional structural equation model (SEM).

Methods: Cross-sectional study of 175 outpatients with schizophrenia-spectrum disorders and their primary family caregivers, recruited from three public community mental-health centers in Chile. Patients completed the GEOPTE SC subscale and the Kessler-10 (PD); caregivers completed the S-CGQoL-25. A cross-sectional SEM with WLSMV tested the indirect association SC→PD→S-CGQoL, reporting standardized coefficients (STDYX), global fit indices, and R^2.

Results: Poorer SC was strongly associated with higher PD ($\beta \approx 0.79$; $p < .001$). In turn, higher PD was associated with poorer S-CGQoL across all domains ($\beta = -0.55$ to -0.82; all $p < .001$). Indirect effects of SC on each S-CGQoL domain were significant (all $p < .001$). Model fit was acceptable ($\chi^2/df \approx$

1.6; RMSEA ≈ 0.05; CFI ≈ 0.91; SRMR ≈ 0.06). The model explained 62% of PD variance and 30%–68% of S-CGQoL variance by domain.
Conclusions: Patients' SC difficulties were indirectly associated with poorer caregiver quality of life through increased patient distress. These findings are clinically actionable: brief screening and reduction of distress, alongside social-cognitive rehabilitation, may mitigate family impact.
Keywords: Caregivers; Quality of life; Social Perception; Psychotic Disorder; Psychological Distress.

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Introduction

Schizophrenia imposes a substantial burden on families, with productivity losses and indirect costs accounting for approximately 44% of total illness costs and caregivers' quality of life markedly reduced in national surveys[1,2]. Globally, around 23–24 million people are affected; in Latin America, persistent treatment gaps and hospital-centered spending shift much of the care burden onto families, and excess mortality remains high (standardized mortality ratio, SMR ≈ 2–3)[3–5]. Recent studies across diverse settings link this burden to poorer caregiver quality of life[2,6,7], and Latin American research has underscored the central role of families in community-based care[8,9].

The Wilson–Cleary model offers a framework linking symptoms and functioning to health-related quality of life[10,11]. Within this framework, social cognition (SC)—including emotion perception, theory of mind, attributional style, and social knowledge—is a determinant of everyday functioning and the need for supervision[12–15,16], whereas psychological distress (PD) is associated with poorer performance and greater service use[17–19]. Beyond quantifying "burden," a central clinical question is how patient attributes—particularly SC—translate into lower caregiver quality of life (S-CGQoL); consistent with this, caregiver burden and S-CGQoL tend to covary closely[7].

Social cognition is consistently associated with psychosocial functioning in both first-episode psychosis and established illness, partially mediating the link between neurocognition/cognitive reserve and social performance, and relating to socio-affective network characteristics[20–22]. SC deficits heighten interpersonal friction and supervision needs—plausible drivers of increased caregiver demand[8,9,15,23]. In Chile, poorer SC is associated with greater social

isolation and symptom severity[24], suggesting plausible pathways to family outcomes. Nevertheless, direct evidence linking patients' SC to caregiver quality of life (S-CGQoL) remains limited and is typically inferred indirectly through functioning and care requirements.

Psychological distress—a transdiagnostic construct encompassing stress, anxiety, and depressive symptoms—is associated with psychotic experiences, poorer functioning, and higher service utilization[18,19]. In schizophrenia, sustained stress and allostatic load are linked to greater clinical severity and poorer prognosis[25–27]. At the psychosocial level, PD reduces social participation, exacerbates interpersonal dysfunction, and increases care needs, thereby intensifying both objective and subjective caregiver burden[28]. Psychosocial interventions (e.g., family psychoeducation, mindfulness-based approaches) have demonstrated reductions in burden/distress and improvements in outcomes, albeit with heterogeneous effect sizes[29–31].

As a conceptual complement, phenomenological–enactive accounts of schizophrenia describe alterations in SC and PD as fissures in intersubjective coordination within the patient–caregiver dyad, consistent with embodied approaches to psychopathology and with the Wilson–Cleary framework[10,11,32]. Within a diathesis–stress formulation[33], PD can be conceptualised as the proximal mediator of the impact of SC on S-CGQoL: SC operates as a sociocognitive vulnerability that, when confronted with everyday stressors (e.g., misinterpretation of social cues, interpersonal friction, heightened need for supervision), activates stress systems and increases allostatic load, manifesting as PD; in turn, PD degrades relational functioning, elevates care demands, and reduces S-CGQoL[25–27].

The present study examined a cross-sectional statistical mediation model in which patients' social cognition was indirectly associated with schizophrenia-specific caregiver quality of life through psychological distress, using structural equation modeling (SEM). It was hypothesized that: H1 (SC→PD): poorer SC would be associated with greater PD[12,18,21]. H2 (PD→S-CGQoL): higher PD would be associated with poorer S-CGQoL across core domains[7,29]. H3 (indirect effect): patients' SC would show a negative indirect association with S-CGQoL mediated by PD, consistent with the Wilson–Cleary framework[10,11,33].

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Materials and Methods

Design and participants

A cross-sectional descriptive, correlational, and mediation study was conducted with 175 outpatients diagnosed with schizophrenia-spectrum disorders according to ICD-10 criteria. Participants were recruited via non-probability convenience sampling from three public community mental health centers in Arica, Chile. Exclusion criteria were comorbid neurological disorders, moderate-to-severe intellectual disability, or an active substance use disorder within the preceding month.

Patient Characteristics

Patients' mean age was 41.1 years (SD = 16.3); 58.3% were male, and 80.5% were not living with a partner. Most participants were receiving pharmacotherapy (99.4%), and 24.6% were attending psychotherapy. The mean age at illness onset was 22.1 years (SD = 9.4), and the mean age at treatment initiation was 24.2 years (SD = 9.6).

Caregiver Characteristics

Caregiver information was obtained from each patient’s primary family caregiver. Women comprised 71.3% of caregivers (men, 28.7%). Marital status was: 36.4% single, 34.7% married, 2.9% cohabiting, 14.5% separated, and 11.5% widowed. In total, 85% reported having children. Regarding mental health service use, 19.2% were receiving psychotherapy. Additional patient sociodemographic and clinical characteristics, as well as caregiver distributions, are summarized in Table 1.

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Table 1 Descriptive sociodemographic and clinical statistics

Variables (N = 175)	**n**	**%**	**Variables (N = 175)**	**n(M)**	**%(SD)**	**Variables**	**n**	**%**
Patient						*Caregiver*		
Sex			**Education**			**Sex**		
Male	102	58.3	No education	1	0.6	Male	50	28.7
Female	73	41.7	Basic Education	34	19.4	Female	124	71.3
Couple			Secondary Education	123	70.3	**Marital Status**		
Yes	34	19.5	Higher Education	17	9.7	Single	63	36.4
No	140	80.5	**Age at Onset of Disorder**	22.1	(9.4)	Married	60	34.7
Children			**Age at Onset of Treatment**	24.2	(9.6)	Cohabitant	5	2.9
Yes	46	26.4	**Duration of Untreated Psychosis**	2.1 Years		Separated	25	14.5
No	128	73.6				Widower	20	11.5
Occupation			**Pharmacological treatment**			**Children**		
Homemaker	13	7.6	Yes	167	99.4	Yes	147	85.0
Student	20	11.6	No	1	0.6	No	25	15.0
Disability Pensioner	100	58.1	**Psychotherapy**			**Pharmacological treatment**		
Retiree	1	0.6	Yes	41	24.6	Yes	169	99.3
Self-Employed	12	7	No	126	75.4	No	3	1.7
Employed	7	4.1	**Occupational Therapy**			**Psychotherapy**		
Unemployed	15	8.7	Yes	32	19	Yes	33	19.2
Other	4	2.3	No	136	81	No	139	80.8

M = mean; SD = Standard deviation

Procedures

The study adhered to the ethical principles of the Declaration of Helsinki[34] and received approval from the ethics committees of the participating public health institutions. All participants provided written informed consent; participation was voluntary and confidentiality was ensured. Under the supervision of the principal investigators, two clinical psychologists administered the assessment battery in outpatient mental health clinics immediately after the patients' medical appointments. Each assessment session lasted approximately 25–30 minutes. Data were collected between October 2020 and June 2021.

Instruments

Clinical and treatment data. Clinical and treatment data included age at illness onset, age at treatment initiation, duration of untreated psychosis (DUP), and the types of interventions received in the prior 12 months (pharmacotherapy, psychotherapy, and occupational therapy).

Independent variable. The Social Cognition Scale for Psychosis (GEOPTE[35]) is a 15-item instrument for people with psychosis that assesses two dimensions: (a) basic cognitive functions (items 1–8; learning, attention/vigilance, working memory, and problem-solving) and (b) social cognition (items 10–15), defined as the capacity to perceive, interpret, and respond appropriately to social cues. Items are rated on a 5-point Likert scale (1 = “not at all” to 5 = “very much”), with higher scores indicating greater functional impairment.

In the present study, only the Social Cognition subscale was used. This subscale assesses perceived difficulties in emotion recognition/decoding, interpretation and sensitivity to social cues, understanding others' intentions and beliefs (theory-of-mind inferences) in everyday contexts, interpersonal skills, and planning/participation in social activities (e.g., “When you are in a group, are you often told that you misinterpret others' attitudes, looks, or gestures?”). The GEOPTE has been adapted and validated for Latin American contexts and shows adequate psychometric properties[36]; it has also been used recently in Chilean patients to model mediational pathways between social cognition and symptom severity[24].

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Mediator variable. The Kessler Psychological Distress Scale (K-10[17]) is a brief, reliable, and valid instrument designed to assess the frequency of common cognitive, behavioral, emotional, and psychophysiological symptoms across a broad range of mental disorders[17]. It comprises 10 items rated on a 5-point Likert scale (1 = “Never” to 5 = “Always”). Example items include: “During the past 30 days, how often did you feel nervous?” and “During the past 30 days, how often did you feel that everything was an effort?” Its brevity and ease of administration allow completion in approximately 5 minutes. The K-10 has been validated in Argentina[37].

Dependent variable. The Schizophrenia Caregiver Quality of Life questionnaire (S-CGQoL-25[38]) is a self-administered measure of health-related quality of life among caregivers of people with schizophrenia[39]. It comprises 25 items across seven domains: Psychological and Physical Well-Being (PsPhW; 5 items; e.g., “I have felt sad/depressed”), Psychological Burden and Daily Life (PsBDL; 7 items; e.g., “I have felt that I am not free”), Relationship with Partner (RS; 3 items; e.g., “My partner supports and helps me”), Relationship with the Professional Team (RPT; 3 items; e.g., “I feel supported by mental health professionals”), Relationships with Family (RFa; 2 items; e.g., “My family listens to and understands me”), Relationships with Friends (RFr; 2 items; e.g., “My friends support and help me”), and Material Burden (MB; 3 items; e.g., “I have had financial difficulties”). Items are rated on a 5-point Likert scale, with higher scores indicating better quality of life. Evidence supporting its psychometric validity includes the original development/validation[38] and cross-cultural use in Chilean and French caregiver samples[39].

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Statistics

Analyses were conducted in three stages: (1) computation of descriptive indices and reliability; (2) examination of bivariate associations; and (3) confirmatory factor analysis (CFA) followed by structural equation modeling (SEM). All tests were two-tailed with $\alpha = .05$. Bivariate associations were estimated using Spearman's correlation (ρ). Structural paths are reported as standardized coefficients, β (STDYX). Effect sizes were interpreted following Cohen's guidelines[40]: $|\rho| \approx .10$ (small), $\approx .30$ (medium), and $\geq .50$ (large), treated

as heuristic benchmarks rather than rigid thresholds. Indirect effects are denoted as β_ind.

First, means and standard deviations (M ± SD) were computed for all variables, and univariate distributions were inspected using standardized skewness (S), standardized kurtosis (K), and the Shapiro–Wilk statistic (W). Internal consistency for each scale/latent construct was quantified with Cronbach's alpha and McDonald's omega (ω); coefficients ≥ .70 were deemed satisfactory[41].

Second, Spearman rank-order correlations (ρ) were computed among patient-reported social cognition (GEOPTE), psychological distress (Kessler-10), and caregiver quality of life (S-CGQoL-25). Effect sizes were interpreted using the previously described guidelines.

In the third step, because no missing data were recorded and the indicators were ordinal, both the confirmatory factor analyses (CFAs) and the SEM were estimated using the WLSMV estimator on a polychoric correlation matrix[42]. Model adequacy was evaluated via χ^2/df, the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) with its 90% confidence interval, and the Standardized Root Mean Square Residual (SRMR). Values of $\chi^2/df < 5$, RMSEA < .08, and CFI/TLI > .90 were deemed acceptable, whereas $\chi^2/df < 2$, RMSEA < .06, and CFI/TLI > .95 were considered excellent[43].

The SEM specified the pathway Social Cognition → Psychological Distress → Caregiver Quality of Life and was evaluated with the same fit indices as the CFAs. Indirect effects were computed following Stride[44] to determine their magnitude and statistical significance. All statistical analyses were conducted using IBM SPSS Statistics version 27[45], jamovi version 2.2.5, and Mplus version 8[46].

Results

Descriptive Statistics, univariate normality and reliability coefficients

Table 2 summarizes the descriptive indices for the study variables. Distributions showed moderate skewness and kurtosis (|S| ≤ 0.69; |K| ≤ 1.04). Shapiro–Wilk tests were significant for all three variables (W = 0.80–0.86, p < .001), indicating departures from univariate normality; accordingly, bivariate

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associations were estimated using Spearman's rank correlation (ρ). Internal consistency was satisfactory for all scales: GEOPTE (α = .88, ω = .88), Kessler-10 (α = .90, ω = .91), and S-CGQoL-25 (α = .81, ω = .81).

Table 2 Descriptive Statistics of the Variables

Dimensions	N	M (SD)	S	K	W	ω	α
GEOPTE-Social Cognition	175	2.43(0.85)	0.69	-0.66	0.80*	0.88	0.88
Kessler-10	175	2.49(0.97)	0.34	-1.04	0.86*	0.91	0.90
S-CGQoL-25	175	2.80(0.47)	0.16	-1.02	0.84*	0.81	0.81

M = means; *SD* = Standard Deviation; *S* = Standardised Skewness; *K* = Standardised Kurtosis; *W* = Shapiro-Wilk; * All W tests resulted in p < .001, confirming deviation from normality. *α* = Cronbach's Alpha Coefficient; *ω* = McDonald's Omega Coefficient.

Spearman Correlations

In bivariate analyses (N = 175; Table 3) using Benjamini–Hochberg FDR control (q = .05)[47], greater social-cognitive impairment (SC) correlated positively with higher psychological distress (PD) (ρ = .48, p < .01) and negatively with Psychological & Physical Well-Being (PsPhW; ρ = −.17, p < .05), Psychological Burden & Daily Life (PsBDL; ρ = −.18, p < .05), and Material Burden (MB; ρ = −.18, p < .05). Higher PD correlated with lower PsPhW (ρ = −.17, p < .05) and lower PsBDL (ρ = −.29, p < .01). Associations of SC and PD with Relationship with Partner (RS), Relationship with Psychiatric Team (RPT), Family Relationships (RFa), and Friend Relationships (RFr) did not survive FDR correction and are therefore not considered robust.

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Table 3 Spearman ρ correlations among Psychological Distress, Social Cognition, and Caregiver Quality of Life

Variables	SC	PD	PsPhW	PsBDL	RS	RPT	RFa	RFr	MB
Social Cognition (SC)	—	.48**†	−.17*†	−.18*†	−.10	−.05	−.05	−.15	−.18*†
Psychological Distress (PD)		—	−.17*†	−.29**†	−.06	−.11	−.02	−.11	−.14
Psychological & Physical Well-Being (PsPhW)			—	.62**†	.12	.13	.32**†	.20**†	.41**†
Psychological Burden & Daily Life (PsBDL)				—	−.05	.24**†	.26**†	.23**†	.50**†
Relationship with Partner (RS)					—	−.05	.22**†	.12	.03
Relationship with Psychiatric Team (RPT)						—	.20**†	.15*	.19*†
Relationship with Family (RFa)							—	.50**†	.16*
Relationship with Friends (RFr)								—	.06
Material Burden (MB)									—

N = 175. Entries are Spearman's ρ (two-tailed) among observed composites. Multiple-comparison control used the Benjamini–Hochberg false discovery rate (FDR, q = .05) applied across the 36 pairwise correlations in the matrix; cells marked with a dagger (†) remained significant after FDR, whereas unmarked cells did not. Asterisks reflect **uncorrected** p-values (** p < .01; * p < .05). Higher scores on **SC** indicate greater social-cognitive impairment; higher **PD** indicates greater distress; higher scores on **PsPhW, PsBDL, RS, RPT, RFa, RFr,** and **MB** indicate better quality of life. These are zero-order associations and are not directly comparable to latent paths from the SEM.

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The S-CGQoL domains showed coherent patterns: Psychological & Physical Well-Being (PsPhW) and Psychological Burden & Daily Life (PsBDL) were strongly associated (ρ = .62, p < .01), and PsBDL correlated moderately with Material Burden (MB; ρ = .50, p < .01). Family Relationships (RFa) related positively to PsPhW (ρ = .32, p < .01), PsBDL (ρ = .26, p < .01), Relationship with Psychiatric Team (RPT; ρ = .20, p < .01), and Friend Relationships (RFr; ρ = .50, p < .01). RPT correlated with MB (ρ = .19, p < .05). Relationship with Partner (RS) showed a weak association with RFa (ρ = .22, p < .01). These are zero-order correlations and are not directly comparable to the latent SEM paths.

Confirmatory Factor Analysis (CFA)

All three latent measurement models demonstrated adequate fit (Table 4). Social Cognition (GEOPTE): $\chi^2(88) = 133.81$, $\chi^2/df = 1.52$, RMSEA = .05 (90% CI [.035, .073]), CFI = .98, TLI = .97, SRMR = .05. Kessler-10: $\chi^2/df = 2.99$, RMSEA = .07, CFI = .97, TLI = .96, SRMR = .04. S-CGQoL-25: $\chi^2/df = 1.86$, RMSEA = .07 (90% CI [.058, .083]), CFI = .95, TLI = .94, SRMR = .06. In all models, standardized factor loadings were significant (p < .001) and ≥ .50, supporting convergent validity and internal consistency.

Table 4 Global Fit Indices for Confirmatory Factor Analysis & Structural equation models

Models	**Par**	**χ2**	**df**	**χ^2/df**	**RMSEA**	**90% IC**	**CFI**	**TLI**	**SRMR**
Kessler-10	54	92.81*	31	2.99	.07	[.065 - .093]	.97	.96	.04
S-CGQoL-25	132	302.12*	162	1.86	.07	[.058 - .083]	.95	.94	.06
GEOPTE	77	133.81*	88	1.52	.05	[.035 - .073]	.98	.97	.05
SEM Mediational ǂ	121	451.92*	278	1.62	.05	[.044 - .057]	.91	.90	.06

Par = Parameters; *χ2* = Chi-square; *df* = Degrees of Freedom; *RMSEA* = Root Mean Square Error of Approximation; *90% CI* = 90% Confidence Interval; *CFI* = Comparative Fit Index; *TLI* = Tucker-Lewis Index; *SRMR* = Standardised Root Mean Square Residual. ǂ = SEM specifying the route Social Cognition (GEOPTE) → Psychological Distress (Kessler-10) → Caregiver Quality of life in Schizophrenia (S-CGQoL-25).

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Structural Equation Modeling (SEM)

The hypothesised indirect-association model (SC → PD → S-CGQoL) showed adequate global fit: $\chi^2(278) = 451.92$, $\chi^2/df = 1.62$, RMSEA = .05 (90% CI [.044–.057]), CFI = .91, TLI = .90, SRMR = .06 (Table 4). As depicted in Figure 1, the path from SC to PD was positive and significant (β_STDYX = .786, SE = .058, $p < .001$), indicating that greater social-cognitive impairment was associated with higher psychological distress. In turn, PD showed robust negative direct associations with each S-CGQoL domain (all $p < .001$): Psychological & Physical Well-Being (PsPhW; β = −.663, SE = .065), Psychological Burden & Daily Life (PsBDL; β = −.551, SE = .071), Relationship with Partner (RS; β = −.720, SE = .067), Relationship with Psychiatric Team (RPT; β = −.570, SE = .087), Relationships with Family (RFa; β = −.694, SE = .080), Relationships with Friends (RFr; β = −.567, SE = .083), and Material Burden (MB; β = −.822, SE = .087). Given the scoring (higher SC = greater impairment; higher PD = greater distress; higher S-CGQoL = better quality of life), these negative coefficients indicate poorer caregiver quality of life as patient distress increases across interpersonal and burden-related domains.

Consistent with a pattern of indirect statistical associations, SC showed significant indirect associations with every S-CGQoL domain through PD (all $p < .001$): PsPhW (β_ind = −.521, SE = .063), PsBDL (β_ind = −.433, SE = .063), RS (β_ind = −.566, SE = .069), RPT (β_ind = −.448, SE = .079), RFa (β_ind = −.546, SE = .079), RFr (β_ind = −.446, SE = .074), and MB (β_ind = −.646, SE = .082). Thus, poorer patient social cognition was indirectly associated with lower caregiver quality of life through elevated psychological distress within this cross-sectional model.

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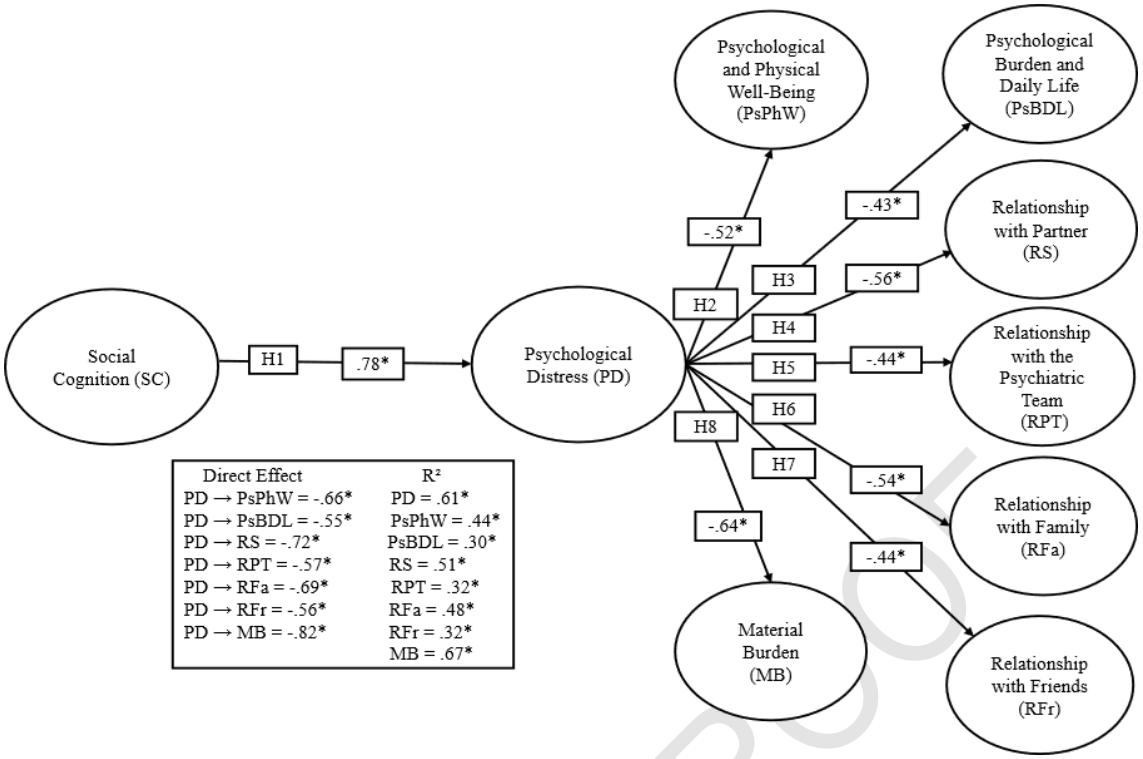


Figure 1 Indirect-association model between Social Cognition and Caregiver Quality of Life in Schizophrenia, with Psychological Distress as the intervening variable. Ovals represent latent variables. Arrows display standardized coefficients (STDYX); * = p < .001. The inset box reports the direct effects of PD on each subscale and the explained variance (R^2). An indirect-association model was specified (i.e., without direct SC→subscale paths). Therefore, the associations between SC and caregiver quality of life are represented as indirect through PD within this cross-sectional specification. In this coding, higher SC scores indicate poorer social cognition and higher PD scores indicate greater distress; negative PD→subscale coefficients indicate lower quality of life at higher levels of distress.

Finally, the coefficients of determination underscored the practical relevance: PD was well explained by SC (R^2 = .618). The S-CGQoL domains showed moderate-to-high explained variance—PsPhW R^2 = .440, PsBDL R^2 = .304, RS R^2 = .518, RPT R^2 = .325, RFa R^2 = .482, RFr R^2 = .321, and MB R^2 = .676.

Discussion

In a community outpatient sample, poorer patient social cognition (SC) was associated with higher psychological distress (PD) and, in turn, with lower caregiver quality of life (S-CGQoL) across all seven S-CGQoL-25 domains. Framed within an embodied/enactive perspective, these findings are consistent with accounts emphasizing disruption in intersubjective coordination within the

dyad[32]. This pattern of indirect associations suggests potentially actionable clinical leverage points: SC training and family psychoeducation may translate into family-relevant benefits in caregiver quality of life[30],[31],[48].

The latent mediation model showed acceptable global fit for ordinal indicators estimated with WLSMV (RMSEA ≈ .05; SRMR ≈ .06; CFI/TLI ≈ .90) and moderate-to-high explained variance across core domains (e.g., R^2 ≈ .30–.67), consistent with commonly used fit thresholds[42],[43]. The association between SC and S-CGQoL was statistically captured through PD, indicating a clinically meaningful indirect patient→caregiver pathway in this cross-sectional model. This interpretation aligns with previous evidence suggesting that distress is an important intervening correlate of caregiver quality-of-life outcomes in severe mental illness caregiving contexts[29],[49] and with the validated use of the S-CGQoL-25 as a multidimensional indicator of caregiver quality of life[38].

The findings bring together two traditions that have rarely been linked empirically: (a) evidence that social cognition (SC) is a robust determinant of psychosocial functioning in psychosis[12]–[15] and (b) caregiver research indicating that distress and negative affect predict caregiver quality-of-life outcomes[29],[49]. Within the Wilson–Cleary framework—extended here to a cross-dyadic patient→caregiver linkage—the pattern is consistent with a progression from symptoms/function (SC) → symptoms (PD) → functioning/perceptions → caregiver quality of life[10],[11]. Given the substantial burden of schizophrenia[3],[4] and the central role of families in care within structurally constrained contexts[50],[8],[9], mapping this association offers a practical guide for clinical decision-making and service planning.

The magnitude of the SC→PD link observed here (β ≈ .79) exceeds estimates often reported when social cognition is measured with performance-based tasks and affective states are controlled, which counsels caution and motivates the inclusion of performance batteries and informant reports in future studies[12],[23]. In turn, the cross-cutting role of PD as a proximal intervening factor associated with S-CGQoL converges with longitudinal evidence in first-episode samples where caregiver psychological morbidity predicts subsequent caregiver quality of life[49]. That the association also emerges for the material burden domain underscores the relevance of measuring economic/family outcomes alongside psychosocial domains.

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Beyond statistical fit, a parsimonious reading positions social cognition (SC) as an organizer of patient–caregiver coordination: when SC is impaired, uncertainty about others' intentions increases, interactive misattunements multiply, and regulatory effort within the dyad rises[32]. That overexertion can sustain stress-system activation and elevate allostatic load[25–27], whose proximal manifestation is psychological distress (PD); in turn, PD diminishes participation and performance, heightens the need for supervision, and is associated with lower caregiver quality of life across psychosocial and material domains.

The broad, negative association of PD with all S-CGQoL domains supports routine screening with the K-10[17] and the provision of scalable interventions in community mental health settings, including psychoeducation and psychosocial caregiver interventions[29–31]. As a second line of action, evidence syntheses indicate that social cognition (SC) training can improve social-cognitive domains; incorporating S-CGQoL and caregiver outcomes as co-primary endpoints will allow verification that benefits transfer to families[48]. Family psychoeducation and broader caregiver-focused interventions yield promising—albeit heterogeneous—effects on burden and coping[30,31].

Strengths include: (a) a dyadic approach using caregiver-reported quality of life as the primary criterion; (b) modeling of ordinal indicators with WLSMV[42]; and (c) measurement support for the S-CGQoL-25[38]. Limitations: (i) the cross-sectional design precludes causal inference; (ii) SC and PD were patient self-reports, raising risks of common-method variance and conceptual overlap—future work should add performance-based tasks and informant reports[23]; (iii) we did not adjust for global clinical severity or medication adverse effects; (iv) convenience sampling from three public community centers in a single region limits generalizability; and (v) although global fit was acceptable, CFI/TLI ≈ .90 suggests room to refine the structural specification[43]. Future priorities include testing measurement invariance of the S-CGQoL across subgroups.

The study recommends: (a) prospective dyadic designs (e.g., cross-lagged panels) to establish temporal precedence; (b) trials of SC training and PD reduction with S-CGQoL as a pre-specified co-primary outcome[30,31,48]; (c) stepped-care pathways with routine monitoring (K-10[17], S-CGQoL-25[38]) in community services; and (d) integration of physiological stress markers to bridge psychosocial and biological mechanisms[25–27].

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The findings indicate a pattern of indirect associations consistent with the sequence social cognition → distress → caregiver quality of life in outpatient settings. However, because the design was cross-sectional, temporal ordering cannot be established and causal mediation cannot be inferred. Accordingly, these results should be interpreted as statistical mediation consistent with the proposed framework rather than as evidence of causal pathways. This pattern nonetheless suggests clinically relevant hypotheses—systematic screening and management of distress, and evaluation of possible family-level benefits of social cognition rehabilitation—which require longitudinal and interventional confirmation, as well as regional replication. Importantly, recent longitudinal evidence from northern Chile underscores quality of life as a dynamic long-term outcome in schizophrenia-spectrum disorders over a 10-year follow-up, supporting the ongoing clinical relevance of QoL-focused dyadic research[51].

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Disclosure

The authors declare that they have no relevant financial or non-financial interests to disclose.

Data availability

The datasets generated and analysed during the current study are not publicly available due to local security protocols and privacy regulations but are available from the corresponding author on reasonable request (e-mail: acaqueo@academicos.uta.cl).

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Ethics approval

The study was approved by the Research Ethics Committee of the Universidad de Tarapacá and by the Ethics Committee of the Arica Health Service. All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki[34].

Author contributions

Alejandra Caqueo-Urízar: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. J. Francisco Santibáñez-Palma: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Formal analysis, Data curation. Sara Fernandes: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Methodology, Formal analysis. Dominique Lemus-Bugueño: Writing – review & editing, Writing – original draft. Laurent Boyer: Writing – original draft, Visualization, Methodology, Formal analysis.

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