

Title: Negative symptoms in schizophrenia: a study in a large clinical sample of patients using a novel automated method

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Supplementary material

eTable 1 - Multivariable ordinal logistic regression analysis of factors associated with negative symptoms in patients with schizophrenia								
Factor	Group	Number in sample	CRIS-NSS mean score (range 0-10)	Standard Deviation	Unadjusted		Adjusted model (n=7676)*	
					Odds ratio (95% CI)	P value	Odds ratio (95% CI)	P value
Age (years)	16-19	203	1.28	2.15	0.30 (0.22-0.40)	<0.001	0.46 (0.33-0.64)	<0.001
	20-29	1337	2.45	2.64	Reference		Reference	
	30-39	1775	1.97	2.21	0.77 (0.67-0.87)	<0.001	0.78 (0.68-0.89)	<0.001
	40-49	1983	1.66	1.95	0.62 (0.55-0.71)	<0.001	0.62 (0.55-0.71)	<0.001
	50-59	1137	1.43	1.79	0.53 (0.46-0.61)	<0.001	0.52 (0.45-0.61)	<0.001
	60-69	654	1.07	1.53	0.37 (0.31-0.44)	<0.001	0.36 (0.30-0.44)	<0.001
	70+	589	0.72	1.19	0.25 (0.21-0.30)	<0.001	0.25 (0.20-0.31)	<0.001
Gender	Male	4592	1.90	2.22	Reference		Reference	
	Female	3084	1.41	1.91	0.66 (0.60-0.71)	<0.001	0.79 (0.72-0.86)	<0.001
Marital status (most recent)	Single	5795	1.88	2.20	Reference		Reference	
	Married/cohabiting	785	1.16	1.61	0.57 (0.50-0.66)	<0.001	0.74 (0.64-0.86)	<0.001
	Divorced/separated	776	1.35	1.86	0.64 (0.56-0.74)	<0.001	0.86 (0.74-0.99)	0.040
	Widowed	208	0.85	1.39	0.40 (0.31-0.52)	<0.001	0.81 (0.60-1.09)	0.160
Employment (most recent)	Unemployed	4956	2.03	2.23	Reference		Reference	
	Employed	341	1.51	1.87	0.68 (0.56-0.83)	<0.001	0.64 (0.52-0.78)	<0.001
	In education	311	1.64	2.10	0.70 (0.57-0.86)	0.001	0.78 (0.63-0.97)	0.026
	Retired	7	0.57	0.79	0.33 (0.08-1.29)	0.110	0.68 (0.16-2.87)	0.599
ADL impairment	Absent	4700	1.73	2.09	Reference		Reference	
	Present	2283	1.97	2.23	1.21 (1.11-1.33)	<0.001	1.35 (1.22-1.49)	<0.001
Social impairment	Absent	4432	1.76	2.10	Reference		Reference	
	Present	2533	1.88	2.20	1.07 (0.98-1.17)	0.108	0.95 (0.86-1.05)	0.292
Delusions / hallucinations	Absent	3904	1.77	2.17	Reference		Reference	
	Present	3077	1.85	2.11	1.14 (1.05-1.24)	0.003	1.19 (1.09-1.30)	<0.001
Depression	Absent	4976	1.90	2.16	Reference		Reference	
	Present	2014	1.59	2.08	0.71 (0.65-0.79)	<0.001	0.69 (0.62-0.76)	<0.001

*Results adjusted for all the factors reported in this table; 2 cases with no recorded data on gender were dropped.

eTable 2 - Multivariable binary logistic regression analysis of factors associated with negative symptoms in patients with schizophrenia including cases with full covariate data only							
Factor	Group	Number in sample	Prevalence of two or more negative symptoms (%)	Association with two or more negative symptoms: odds ratio (95% CI), p-value			
				Unadjusted		Adjusted model (n=5316)*	
Age (years)	16-19	203	27.6	0.35 (0.25-0.49)	<0.001	0.44 (0.29-0.68)	<0.001
	20-29	1337	52.0	Reference		Reference	
	30-39	1775	47.0	0.82 (0.71-0.94)	0.006	0.80 (0.67-0.95)	0.012
	40-49	1983	42.6	0.69 (0.60-0.79)	<0.001	0.64 (0.54-0.76)	<0.001
	50-59	1137	37.2	0.55 (0.47-0.64)	<0.001	0.45 (0.37-0.55)	<0.001
	60-69	654	29.1	0.38 (0.31-0.46)	<0.001	0.32 (0.25-0.41)	<0.001
	70+	589	18.0	0.20 (0.16-0.26)	<0.001	0.13 (0.09-0.18)	<0.001
Gender	Male	4592	45.3	Reference		Reference	
	Female	3083	34.7	0.64 (0.59-0.71)	<0.001	0.74 (0.65-0.83)	<0.001
Marital status (most recent)	Single	5795	44.6	Reference		Reference	
	Married/cohabiting	785	31.6	0.57 (0.49-0.67)	<0.001	0.77 (0.63-0.94)	0.012
	Divorced/separated	776	33.4	0.62 (0.53-0.73)	<0.001	0.91 (0.75-1.12)	0.376
	Widowed	208	21.2	0.33 (0.24-0.47)	<0.001	0.85 (0.54-1.32)	0.466
Employment (most recent)	Unemployed	4956	47.9	Reference		Reference	
	Employed	341	39.6	0.71 (0.57-0.89)	0.003	0.65 (0.51-0.83)	<0.001
	In education	311	39.6	0.71 (0.56-0.90)	0.004	0.78 (0.61-1.02)	0.065
	Retired	7	14.3	0.18 (0.02-1.51)	0.114	0.51 (0.06-4.65)	0.547
ADL impairment	Absent	4700	41.9	Reference		Reference	
	Present	2283	46.3	1.20 (1.08-1.32)	<0.001	1.29 (1.13-1.47)	<0.001
Social impairment	Absent	4432	42.7	Reference		Reference	
	Present	2533	44.4	1.07 (0.97-1.18)	0.158	0.93 (0.82-1.05)	0.258
Delusions / hallucinations	Absent	3904	41.9	Reference		Reference	
	Present	3077	45.0	1.14 (1.03-1.25)	0.009	1.23 (1.10-1.38)	<0.001
Depression	Absent	4976	45.2	Reference		Reference	
	Present	2014	38.8	0.77 (0.69-0.85)	<0.001	0.69 (0.61-0.78)	<0.001

*Results adjusted for all the factors reported in this table.

eTable 3 - Percentage of patients admitted to hospital in 2011 by number of negative symptoms (n=7678)

Number of negative symptoms	Number of patients	Percentage admitted to hospital in 2011 (%)
0	3408	21.7
1	1121	18.9
2	974	22.7
3	717	27.2
4	492	28.1
5	382	32.5
6 or more	584	36.8

eTable 4 - Percentage of patients readmitted to hospital following discharge in 2011 by number of negative symptoms (n=1612)

Number of negative symptoms	Number of patients	Percentage admitted to hospital in 2011 (%)
0	612	29.9
1	195	34.4
2	213	40.4
3	176	44.9
4	131	43.5
5	119	47.1
6 or more	166	44.6

eTable 5 - Median duration of admission amongst mental health inpatients with schizophrenia in 2011 by number of negative symptoms (n=1,609)		
Number of negative symptoms	Number of patients	Median duration of admission (days)
0	696	30.0
1	200	37.5
2	194	46.0
3	165	40.0
4	116	48.0
5	110	51.5
6 or more	128	56.5

eTable 6 - Association between number of negative symptoms ascertained prior to 2011 and mental health hospital admission, re-admission and duration of admission in 2011 in patients aged under 40 years and patients aged over 40 years			
	Inpatient admission (odds ratio, 95% CI)*	Re-admission within 12 months of inpatient admission (odds ratio, 95% CI)*	Duration of inpatient admission (days; B-coefficient, 95% CI)**
<i>Associations with 2 or more negative symptoms (binary variable) in patients aged between 16 and 39 years.</i>	n=3315	n=792	n=785
Unadjusted	1.36 (1.17-1.59)	1.82 (1.36-2.43)	25.4 (6.2, 44.6)
1. Age and sex	1.40 (1.20-1.63)	1.88 (1.40-2.54)	20.8 (1.5, 40.1)
2. Model 1 plus marital status and employment	1.25 (1.06-1.46)	1.70 (1.24-2.31)	15.0 (-4.9, 34.9)
3. Model 2 plus delusions / hallucinations, and depression	1.22 (1.03-1.43)	1.68 (1.23-2.29)	14.5 (-5.5, 34.5)
<i>Associations with 2 or more negative symptoms (binary variable) in patients aged over 40 years.</i>	n=4361	n=820	n=805
Unadjusted	1.41 (1.20-1.65)	1.61 (1.21-2.16)	22.1 (5.2, 39.1)
1. Age and sex	1.33 (1.13-1.56)	1.56 (1.16-2.08)	26.7 (9.8, 43.6)
2. Model 1 plus marital status and employment	1.26 (1.07-1.49)	1.48 (1.10-1.99)	24.3 (7.2, 41.4)
3. Model 2 plus delusions / hallucinations, and depression	1.24 (1.05-1.45)	1.48 (1.10-1.99)	24.4 (7.5, 41.4)

*Logistic regression; **Linear regression

Age x negative symptoms (binary variable) interaction term p>0.05 for all models