Hilari, K., Northcott, S., Roy, P., Marshall, J., Wiggins, R. D., Chataway, J. & Ames, D. (2010). Psychological distress after stroke and aphasia: the first six months. Clinical Rehabilitation, 24(2), 181 - 190. doi: 10.1177/0269215509346090 <http://dx.doi.org/10.1177/0269215509346090>

Psychological distress after stroke and aphasia: the first six months

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Acknowledgments

This study was supported by a grant from the Consortium for Healthcare Research of the Health Foundation. We would like to thank Ms Alcina

Amorim for facilitating the data collection of this project. The people with stroke and the Stroke Units' teams of the London Hospitals of St Mary's and the Royal Free made this study possible.

Conflicts on interest disclosures: None.

Key words: mood disorder; depression; stroke outcome; rehabilitation; aphasia

Abstract

Objective: We explored the factors that predicted psychological distress in the first six months post-stroke in a sample including people with aphasia.
Design: Prospective longitudinal observational study
Setting and subjects: participants with a first stroke from two acute stroke units were assessed while still in hospital (baseline) and at three and six months post-stroke.
Main measures: Distress was assessed with the General Health Questionnaire-12. Other measures included: NIH Stroke Scale, Barthel Index, Frenchay Aphasia Screening Test, Frenchay Activities Index, MOS Social Support Scale and Social Network indicators. Logistic regression was used to identify predictors of distress at each stage post-stroke; and to determine what baseline factors predicted distress at six months.
Results: 87 participants were able to self-report on measures used, of whom 32 (37%) had aphasia. 71 (82%) were seen at six months, including 11 (16%) with aphasia. Predictors of distress were: stroke severity at baseline; low social support at three months; and loneliness and low satisfaction with social network at six months. The baseline factors that predicted distress at six months were psychological distress, loneliness and low satisfaction with social network (Nagelkerke R^2=.49). Aphasia was not a predictor of distress at any time point. Yet, at three months post-stroke 93% of those with aphasia experienced high distress, as opposed to 50% of those without aphasia (χ^2 (1) = 8.61, p<.01).
Conclusions: Factors contributing to distress after stroke vary across time. Loneliness and low satisfaction with one's social network are particularly important and contribute to long-term psychological distress.

We explored predictors of distress in a cohort of stroke survivors that included people with aphasia. Mood disorders after stroke are common and persistent. A conservative estimate is that depressive symptoms are present in 33% of stroke patients at any time during follow-up(1). Such symptoms affect stroke patients' response to rehabilitation and long-term functional outcomes and quality of life. For people with aphasia, depression is particularly high, reported for 62-70%(2) and severely compromises long-term quality of life(3).

Identifying what factors predict low mood post-stroke is important in order to detect those at risk for depression and target intervention appropriately. In a recent review(4), the most consistent variables associated with depressive symptoms were physical disability (in 9 of 11 studies), stroke severity (5 of 5) and cognitive impairment (4 of 5). Fewer studies explored social factors, but when considered together –living alone, place of residence, social support and social isolation- were also important. People with aphasia were excluded in most of the studies included in this review (17 of 20). The authors acknowledged that conclusions were limited by the methodological heterogeneity and variable quality of the studies.

People with aphasia are typically excluded from studies due to their assumed inability to complete self-report mood scales or psychiatric interviews. Yet people with aphasia can and have been included in depression assessments post stroke by using adaptive methods: clinical observation, use of informants, modifying measures and use of visual analogue scales(5). The latter was used in a recent study(6) which explored predictors of emotional distress at one and six months post-stroke, in a sample including people with aphasia. The Visual Analogue Self-Esteem Scale(7) was used as a measure of distress. Expressive aphasia and dependence in personal activities of daily living (ADL) predicted distress at one month post-stroke. Stroke severity, expressive aphasia and distress at one month post-stroke predicted distress at six months.

Like Thomas and Lincoln(6), we explored predictors of distress in the first six months post stroke in stroke survivors including people with aphasia. However, we also included a range of social factors as independent variables. We addressed the following research questions:

1. What factors are associated with and predict psychological distress when people are still in hospital after a stroke (baseline) and at three months and six months post-stroke?
2. What baseline factors predict long-term psychological distress (six months) after stroke?

METHODS

This study was part of a larger study that assessed the psychometric properties of the Stroke and Aphasia Quality of Life scale -39 in a generic stroke sample (SAQOL-39g)(8). The dependent variable in this study was psychological distress and the independent variables comprised: demographics (age, sex, marital status, ethnic group), number of co-morbid conditions, stroke-related variables (stroke type, class, severity, aphasia, activities of daily living (ADL) and extended ADL and social network and social support.

The study was approved by the relevant National Health Service (NHS) Local Research Ethics Committees. Participants were recruited from two acute stroke units based in teaching hospitals and were followed for six months. People over 18 years of age who were admitted with a first ever stroke and stayed in hospital at least three days because of the stroke were eligible to take part. People were excluded if they: did not live at home or had a known history of mental health problems (including anxiety and depression) or cognitive decline prior to the stroke; had other severe or potentially terminal co-morbidity, e.g. severe Parkinson's disease, terminal cancer; were too unwell to give informed consent; did not speak English pre-morbidly (according to self and/or family reports). Participants' aphasia was screened with the Frenchay Aphasia Screening Test (FAST)(9) to identify those able to self-report on the questionnaires used. People with any severity of expressive aphasia and moderate or mild receptive aphasia were able to self-report. Those scoring <7/15 on the receptive domains of the FAST (n=9) were classified as having severe receptive aphasia(10;11). We used proxy respondents for them and their results are not reported here.

Participants were interviewed while still in hospital (baseline), three months and six months (± one week) post-stroke. They all completed a range of measures, in the same order, in an interview format. We modified measures' presentation and administration to make them accessible to people with aphasia. We did not modify

the content of any scale, to avoid considerably affecting their psychometric properties. We used methods that have been suggested and tested in previous studies.(5;10;12) Each scale was reproduced and printed in an aphasia-friendly format: large font was used (minimum 14), key words were printed in bold, few items were presented per page, and where appropriate pre-prepared pictures were used[1]. Participants were interviewed by an aphasia-specialist Speech and Language Therapist able to facilitate the communication of people with aphasia. Practice items were introduced to ensure participants understood the format of each questionnaire and its response options; and respondents only had to point to their response option which was recorded by the interviewer.

Measures

Psychological distress was assessed using the General Health Questionnaire–12 item (GHQ-12).(13) The GHQ is a measure of distress that has been extensively used as a screening tool for psychiatric disorders, in particular depression and anxiety. It has been used with people with stroke and compared to other similar scales it has superior specificity, sensitivity and predictive validity with this group(14). Given that participants had a stroke and tended to be older, a cut-off score of three (range 0-12), rather than two, was used to identify those with high psychological distress (1). GHQ-12 was used as a categorical variable throughout (0= no or low distress; 1= high distress).

Stroke types were ischaemic and haemorrhagic. We used the Oxford stroke classification system(15) of total anterior circulation (TAC), partial anterior circulation (PAC), posterior circulation (POC) and lacunar (LAC) strokes. Stroke severity was determined using the National Institute for Health Stroke Scale (NIHSS).(16) Scores on the NIHSS range from 0-31 and higher scores reflect more severe strokes.

Aphasia was assessed with the FAST, as indicated above, and presence of aphasia was determined using its cut-off scores. When these were not available (two blind participants, and two, four and three participants with missing data at baseline, three months and six months, respectively), the NIHSS aphasia item was used. Scores on the FAST range from 0-30 and higher scores indicate better language skills.

[1] Modified scales are available from the first author on request.

Activities of daily living were measured with the Barthel Index (BI).(17) Scores on the BI range from 0-100 and higher scores indicate better functioning. At three months and six months post-stroke the BI scores were skewed with high ceiling effects. Scores were therefore transformed to categories, with participants scoring 0-90 classified as 'ADL dependent' and 95-100 as 'ADL independent' (scores 91-94 are not possible). Extended ADL – only applicable at three and six months – were measured with the Frenchay Activities Index (FAI).(18) Scores on the FAI range from 0-45, with higher scores indicating better functioning.

Lastly indicators of social network comprised size of network (spouse/partner, children, close friends, close relatives), satisfaction with social network (Likert scale ranging from 0 'very dissatisfied' to 5 'very satisfied') and frequency of feeling lonely (Likert scale ranging from 0 'lonely all the time' to 4 'never lonely'). Perceived social support was measured with the Medical Outcomes Studies Social Support Survey (SSS).(19) Scores on the SSS range from 1-5 and higher scores indicate better perceived support. The timeframe for satisfaction with social network, loneliness and social support is 'the past month' and at baseline people were asked to think about the month before their stroke.

Data analysis

Descriptive statistics were used to summarise the data. We used exploratory correlation analysis (Pearson's) to identify potential redundancy among variables and to determine variables to be entered in the regression models. We carried out logistic regression to evaluate what factors at different stages post stroke (baseline, three months and six months) explained psychological distress at that stage (explanatory models). Logistic regression was also used to explore what baseline variables could predict psychological distress at six months (predictive model). Regression assumptions, including absence of multicollinearity, were met for all models.

RESULTS

Respondent characteristics

The sample in this study is the same as that reported in Hilari et al., 2009(8). Of 126 eligible people, 96 (76%) agreed to take part. We were unable to see whether those not consenting were different from those taking part, as we were separate from their clinical team and did not have their consent to look at their medical records. Nine of

the 96 participants had severe receptive aphasia requiring proxy respondents; their results are not reported here. Table 1 presents the characteristics of the remaining 87 (69%) participants. The majority were white (75%), male (60%) and married/have a partner (52%). They ranged in age from 18-91 (mean 69.7± 14.1) and 73% had two or more co-morbid conditions. 76 (87%) were followed-up at three months and 71 (82%) at six months post-stroke and their characteristics were similar to the original sample.

Table 1

Table 2 details the respondents' stroke-related characteristics and their performance in terms of psychological distress and social variables. The majority had an ischaemic stroke (86%) and the most common stroke class was PAC (30%). Early post-stroke, respondents were more affected (67% dependent on ADL) than at six months (32% dependent on ADL). Similarly, 37% had aphasia at baseline, which dropped to 16% at six months (16 people recovered and six were lost to follow-up). Psychological distress levels were high early post stroke (66%) and although they reduced with time they remained high at six months (45%). Feelings of loneliness and perceived social support remained relatively stable post stroke, whereas size of and satisfaction with social network significantly decreased from baseline to six months [$t(69) = 2.05$, $p<.05$; $t(70) = 2.32$, $p<.05$ respectively). Extended ADL significantly increased between three and six months [$t(70) = -2.03$, $p<.05$].

Table 2

Explanatory models

Psychological distress was predicted using logistic regression for three distinct periods of time: immediately following the stroke (baseline), three months and six months post-stroke.

<u>Predictors of psychological distress at baseline</u>

In exploratory correlation analysis, the factors significantly associated with psychological distress were younger age ($r=-.24$, $p<.05$), stroke severity ($r=.30$, $p<.01$) and loneliness ($r=-.23$, $p<.05$). These variables were entered in a logistic regression model to evaluate their relative contribution to distress (table 3). Stroke severity (Wald's $\chi^2 = 7.95$, $p<.01$) was a significant predictor of psychological distress. Age ($p=.050$) and loneliness ($p=.052$) approached significance. The model

was significant [χ^2 (3) = 20.34, p<.001] and explained 29% of the variance in distress (Nagelkerke R^2 =.29). Its sensitivity was 80.4%, its specificity 56.7% and 72.1% of the cases were correctly classified.

Predictors of psychological distress at three months

In exploratory correlation analysis, stroke severity (r=.28, p<.05), presence of aphasia (r=.34, p<.01), dependence on ADL (r=-.27, p<.05), loneliness (r=-.37, p=.001), low satisfaction with social network (r=-.24, p<.05) and low perceived social support (r=-.30, p<.01) were significantly associated with distress. In logistic regression (table 3), low social support was significant (Wald's χ^2 = 4.66, p<.05). Overall, the model was significant [χ^2 (6) = 28.75, p<.001] and explained 45% of the variance in psychological distress (Nagelkerke R^2 =.45). Its sensitivity was 82.5%, its specificity 76.7% and 80% of the cases were correctly classified. Presence of aphasia did not reach significance in logistic regression (p=.07), but increased the odds of high distress by 8.73. Of those with aphasia at three months, 13 of the 14 (93%) experienced high distress, as opposed to 31(50%) of the 62 without aphasia (χ^2 (1) = 8.61, p<.01).

Table 3

Predictors of psychological distress at six months

In exploratory correlation analysis, stroke severity (r=.28, p<.05), dependence on ADL as measured by the BI (r=-.32, p<.01), loneliness (r=-.48, p<.001), low satisfaction with social network (r=-.32, p<.01) and low perceived social support (r=-.34, p<.01) were significantly associated with distress. In logistic regression (table 3), loneliness (Wald's χ^2 = 5.32, p<.05) and low satisfaction with social network (Wald's χ^2 = 4.16, p<.05) were significant. The overall model was significant [χ^2 (5) = 31.05, p<.001] and explained 51% of the variance in psychological distress (Nagelkerke R^2 =.51). Its sensitivity was 69.0%, its specificity 83.3% and 76.9% of the cases were correctly classified.

Predictive model

Baseline predictors of psychological distress at six months

On exploratory correlation analysis, the baseline variables that were significantly associated with distress at six months were: psychological distress (r=.45, p<.001), loneliness (r=-.50, p<.001) and low satisfaction with social network (r=-.29 p<.05). These variables were entered into a logistic regression model (table 4).

Table 4

Psychological distress at baseline (Wald's $\chi^2 = 6.66$, p=.01), feeling lonely (Wald's $\chi^2 = 9.32$, p<.01) and low satisfaction with one's social network (Wald's $\chi^2 = 4.00$, p<.05) were all significant predictors of distress at six months post stroke. In terms of the likelihood of being distressed at six months, the odds ratio suggests that those with high psychological distress at baseline were 6.46 times more likely to be distressed at six months (95% CI=1.57-26.63). The model was significant [χ^2 (3) = 32.74, p<.001] and explained 49% of the variance in psychological distress at 6 months (Nagelkerke $R^2 = .49$). Its sensitivity was 62.5%, its specificity 84.6% and 74.6% of the cases were correctly classified.

Discussion

Stroke severity was the strongest predictor of distress at baseline, whereas social factors predicted distress at three and six months post-stroke. The baseline factors that predicted distress at six months were psychological distress, loneliness and low satisfaction with one's social network. The main strength of our study was the inclusion of people with aphasia. Yet people with very severe receptive aphasia had to be excluded as they were unable to complete the measures used. We discuss our findings in detail, present the main strengths and limitations of the study and draw implications for clinical practice and research.

As expected stroke severity, which has been consistently associated with distress,(20-23) was the strongest predictor of distress early on. At three and six months, dependence on ADL was associated with high distress, but did not reach significance in the logistic regression models. The timing of the assessment may be an important factor.(24) For example, Thomas and Lincoln(6) found dependence in ADL measured with the BI to be a significant predictor of distress at one month, but not at six months post stroke. Other studies also indicate that in the longer term

post-stroke (>3 months) functional outcome is not related to depression.(23;25) Our finding may suggest that at the later stages post-stroke other factors, rather than stroke-related disability, may become increasingly important in determining whether people will be distressed or not.

Similarly, in this study, aphasia was associated with distress at three months but was not predictive of distress at any stage. The evidence on the effect of aphasia on post-stroke distress is conflicting, with some studies reporting an effect(6;26) and others finding no relation.(27;28) This may be partly due to the different ways of measuring distress/depression and also aphasia. For example, Thomas and Lincoln(6) used the Visual Analogue Self-Esteem Scale(7) as an indicator of emotional distress and a screening test for aphasia; whereas Berg et al.(27) used the Diagnostic and Statistical Manual of Mental Disorders-III-R(29) to diagnose depression and the Western Aphasia Battery(30) for a full aphasia assessment. It was of interest in our results, that the trend identified at three months of people with aphasia being more likely to suffer psychological distress did not continue at six months. Our finding is limited by having only 11 people with aphasia at six months. Still, this finding may also point to the importance of other factors, such as social factors in relation to distress. Social factors have often been neglected in studies exploring post-stroke distress.

In our study loneliness was associated with psychological distress at all three time points and predicted distress at six months, suggesting that this subjective sense of isolation is an important part of the jigsaw in explaining post-stroke distress. Although the association between loneliness and depression is well established for the general population,(31;32) this finding confirms the relationship in the stroke population as well.

Perceived social support was associated with distress in the longer term and predicted distress at three months. This may suggest that support became more significant to the individual when they had been discharged from hospital or were at a more advanced stage of adapting to their life post-stroke. Other studies have also found perceived social support to be associated with mood disorder and depression in the first three months post stroke.(33;34)

Size of network was not associated with psychological distress at any time point, whereas satisfaction with one's network was, and predicted distress at six months.

This suggests that it is satisfaction with one's network rather than size that is helpful for mental health in the longer term post-stroke. From our study it could be argued that measurements that look at subjective elements of social support (satisfaction, loneliness, perceived support) are more revealing that objective measurements such as size of network. However, more nuanced network characteristics (e.g. frequency of contact, geographic dispersion, density, composition of members) may also be revealing. Certainly, other studies looking at stroke long-term outlook (≥12 months) have found that elements of a person's network such as contact with family and friends(26) and levels of isolation(20) are associated with depression and life satisfaction

In terms of baseline measures predicting future psychological distress, we found that those with high distress at baseline were 6.46 times more likely to be distressed at six months. This is in line with previous studies(6;27) and highlights the persistence of distress post-stroke. Loneliness and satisfaction with network prior to stroke were both predictive of distress at six months. It may be that during a stressful life event such as a stroke, an individual is particularly in need of the 'buffering' effect of feeling connected to others. There is an extensive literature suggesting that social support can alleviate the stress response(35) and aid the process of psychosocial adjustment following a stroke.(36) Those who lack such a buffer may therefore be particularly at risk of developing depression. Studies have shown having a stroke is associated with a reduction in social activities(37) and social contacts,(26;38) and that this in turn is associated with subsequent depression.(39) Our finding enriches this picture: it appears social factors *prior* to the stroke, i.e. not just those caused by the stroke, make a person more at risk of developing post-stroke depression. An alternative explanation may be that those who are predisposed to feel lonely and dissatisfied with their social support are more likely to suffer psychological distress during adverse life events, such as a stroke. Interestingly, perceived social support prior to the stroke did not predict psychological distress at six months. This could be because the measure used includes functions such as tangible support which the literature suggests is less useful to both mental and physical recovery post stroke.(34;36)

Strengths of our study comprise a longitudinal design, the inclusion of people with aphasia and a wide range of variables, including social factors, in the exploration of predictors of distress post-stroke. Thus, the logistic regression models we derived accounted for sizeable proportions of the variance in distress (29-51%). Still, a limitation of the study is that other factors, such as cognitive impairment, may have

played a role but were not considered, as we tried to keep respondent burden low. Another limitation is the exclusion of people with very severe receptive aphasia and the small number of people with aphasia at the six months post-stroke stage.

In summary, a combination of stroke-related and social factors contribute to psychological distress after stroke. Stroke severity and loneliness were the only two factors that were associated with high distress at all times of assessment post stroke. Stroke severity accounted for most of the variance in distress at baseline, whereas in the longer term, social factors were more important. A clinically important question is what factors at the onset of stroke may predict high distress in the long-term. We found that psychological distress at baseline and feelings of loneliness and low satisfaction with one's social network predicted high distress six months post-stroke. Our findings suggest that clinicians need to monitor for these factors and provide early intervention to address them, in order to improve long-term stroke outcomes. Further studies, including larger proportions of people with aphasia in the long-term and following participants to over a year post-stroke would improve our understanding of factors affecting psychological distress particularly for people with aphasia.

Clinical messages

- The strongest predictor of distress early post-stroke was stroke severity, whereas three and six months later social factors were more important.
- Three months post-stroke, 93% of those with aphasia experienced high distress, as opposed to 50% of those without aphasia
- Distress at the time of the stroke and feelings of loneliness and low satisfaction with one's social network *prior* to the stroke predicted distress at six months.

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Table 1: Respondent characteristics

Variable	Respondent n (%)		
	Baseline	**3 months**	**6 months**
Gender	**n=87**	**n=76**	**n=71**
Female	35 (40)	32 (42)	31 (44)
Male	52 (60)	44 (58)	40 (56)
Age			
Mean [SD]	69.7 [14.1]	69.7 [14]	69.3 [14.2]
Range			
18-45	7 (8)	6 (8)	6 (8)
46-64	14 (16)	12 (16)	11 (16)
65-74	30 (35)	27 (35)	27 (38)
75+	36 (41)	31 (41)	27 (38)
Co-morbid conditions			
None	10 (11)	8 (11)	8 (11)
One	14 (16)	13 (17)	12 (17)
Two	21 (24)	19 (25)	18 (25)
Three	18 (21)	17 (22)	16 (23)
Four +	24 (28)	19 (25)	17 (24)
Ethnic group			
Asian	10 (11)	9 (12)	9 (13)
Black	6 (7)	5 (6.5)	5 (7)
White	65 (75)	57 (75)	52 (73)
Other	6 (7)	5 (6.5)	5 (7)
Marital status			
Married	33 (38)	31 (41)	29 (41)
Has partner	12 (14)	9 (12)	9 (13)
Single	20 (23)	17 (22)	14 (20)
Divorced	7 (8)	6 (8)	6 (8)
Widowed	15 (17)	13 (17)	13 (18)

Table 2: Descriptives of psychological distress, stroke related and social variables

Variable	Respondents n (valid %)		
Categorical variables	**Baseline n=87**	**3 months n=76**	**6 months n=71**
Stroke type			
Ischaemic	75 (86)	67 (88)	62 (87)
Haemorrhagic	12 (14)	9 (12)	9 (13)
Stroke classification			
Lacunar (LAC)	24 (27.5)	21 (27.5)	20 (28)
Posterior circulation (POC)	24 (27.5)	22 (29)	20 (28)
Total anterior circulation (TAC)	13 (15)	9 (12)	9 (13)
Partial anterior circulation (PAC)	26 (30)	24 (31.5)	22 (31)
Psychological distress			
No-low distress (0-2 on GHQ-12)	30 (34)	32 (42)	39 (55)
High distress (3-12 on GHQ-12)	57 (66)	44 (58)	32 (45)
ADL dependence			
Dependent on ADL (0-90 on BI)	56 (67)	26 (35)	22 (32)
Independent on ADL (95-100 on BI)	28 (33)	49 (65)	47 (68)
Missing	3	1	2
Presence of aphasia			
Non-aphasic	55 (63)	62 (82)	60 (84)
Aphasic	32 (37)	14 (18)	11 (16)
Scale variables		**Mean (SD) Median Range (n*)**	
NIH Stroke Scale (NIHSS)	6.03 (4.5) 4 0-21	2.04 (2.72) 1 0-12	1.52 (2.12) 1 0-10

	(n=86)	(n=74)	(n=67)
Barthel Index (BI)	65.83 (31.57) 70 5-100 (n=84)	89.60 (18) 100 25-100 (n=75)	91.23 (15.52) 100 35-100 (n=69)
Loneliness	3.40 (.92) 4 0-4	3.19 (1.05) 4 1-4 (n=73)	3.24 (1) 4 0-4 (n=70)
Social network size	11.65 (9.38) 9 0-65	10.67 (8.32) 9 1-51 (n=74)	9.16 (6.69) 8 1-45 (n=70)
Satisfaction with social network	4.30 (.98) 5 1-5	4.16 (1.25) 5 0-5 (n=75)	4 (1.23) 4 0-5
Social support scale (SSS)	3.82 (.96) 3.92 1.42-5 (n=86)	4 (.92) 4.32 1.47-5 (n=73)	3.82 (1.08) 3.97 1.16-5 (n=70)
Frenchay Activities Index (FAI)	N/A	17.87 (11.80) 18 0-38	19.11 (11.92) 20.36 0-39

*: n given only where there are missing data; otherwise n=87 at baseline, n=76 at 3 months and n=71 at 6 months post stroke

Table 3: Logistic regression for predictors of psychological distress at baseline, 3 months and 6 months post stroke

Predictor	B	S.E.	Wald (d.f.=1)	Exp(B)	95% confidence intervals	
					Lower	Upper
Baseline (n=86)						
Stroke severity - baseline	.21	.08	7.95**	1.24	1.07	1.44
Age	-.04	.02	3.85	.96	.92	1.00
Loneliness - baseline	-.60	.31	3.77	.55	.30	1.00
Constant	4.69	1.86	6.36*	108.75		
3 months (n=70)						
Stroke severity – 3m	.29	.19	2.30	1.33	.92	1.93
Aphasia – 3m[†]	2.17	1.19	3.32	8.73	.85	89.71
ADL dependence – 3m	-.14	.86	.03	.87	.16	4.68
Loneliness – 3m	-.30	.38	.62	.74	.35	1.56
Satisfaction with SN – 3m	-.80	.44	3.32	.45	.19	1.06
Social support – 3m	-.91	.42	4.66*	.40	.18	.92
Constant	7.90	2.57	9.45**	2.700E3		
6 months (n=65)						
Stroke severity – 6m	.15	.17	.71	1.16	.82	1.62
ADL dependence – 6m	-1.36	.79	3.01	.26	.06	1.19
Loneliness – 6m	-1.07	.47	5.32*	.34	.14	.85
Satisfaction with SN – 6m	-1.31	.64	4.16*	.27	.08	.95
Social support – 6m	-.15	.46	.11	.86	.35	2.10
Constant	10.20	3.20	10.10**	2.678E4		

*: p<.05, **: p<0.01
[†]: Categorical variables in italics

Table 4: Logistic regression for baseline predictors of psychological distress at six months post stroke (n=71)

Predictor	B	S.E.	Wald (d.f.=1)	Exp(B)	95% confidence intervals	
					Lower	Upper
Psychological distress – baseline[†]	1.86	.72	6.66**	6.46	1.57	26.63
Loneliness - baseline	-1.35	.44	9.32**	.26	.11	.62
Satisfaction with SN - baseline	-.79	.39	4.00*	.45	.21	.98
Constant	6.65	2.48	7.18**	772.12		

*: p<.05, **: p≤.01
[†]: Categorical variables in italics