



# Measuring change in clinical profiles between hospital admission and discharge and predicting living arrangements at discharge for aged patients presenting behavioral and psychological symptoms of dementia



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## ABSTRACT

**Background:** The clinical courses of psychogeriatric inpatients presenting behavioral and psychological symptoms of dementia, between their admission and discharge, have been poorly documented. Based upon our previously elaborated profiles of psychogeriatric patients, this study aimed to describe these courses and to explore whether changing clinical profiles could predict living arrangements at discharge. **Methods:** Retrospective data were collected on 397 patients with dementia and hospitalized from 2011 to 2014 in French-speaking Switzerland. Patients were classified on admission and at discharge using four clinical profiles (*BPSD-affective*, *BPSD-functional*, *BPSD-somatic*, and *BPSD-psychotic*). Multinomial logistic regression analyses were used to identify predictors of living arrangements at discharge. Age, gender, marital status, living arrangements on admission, and clinical profile on admission and discharge, were used as potential predictors.

**Results:** Of the patients classified as *BPSD-functional* or *BPSD-affective* on admission, 70.18% and 73.48%, respectively, had the same classification at discharge. However, 45.74% of patients classified as *BPSD-somatic* on admission were discharged with a *BPSD-functional* profile, and 46.15% of inpatients classified as *BPSD-psychotic* on admission were discharged as *BPSD-affective* ( $\chi^2(9) = 128.8299$ ;  $p < 0.000$ ). At discharge, 64.99% of all patients were admitted to a nursing home. The significant predictors of return to home were: being male (OR = 0.96; 95% CI: 0.93–0.99) and *BPSD-affective* profile (OR = 1.95; 95% CI: 1.08–3.54). Significant predictors of transfer to acute care or death were: *BPSD-somatic* (OR = 12.98; 95% CI: 1.96–85.91) or *BPSD-psychotic* profile (OR = 13.53; 95% CI: 1.65–111.05).

**Discussion:** This study provides new information concerning the clinical course of older psychogeriatric inpatients using profiles derived from clinically sensitive profiles.

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## 1. Background

Psychogeriatric patients hospitalized in specialized care units due to behavioral and psychological symptoms of dementia (BPSD) are particularly vulnerable. Their health status is complex due to combinations of physical and psychiatric morbidities, often associated with social and relationship problems. BPSD are present

in nearly 98% of patients suffering from neuro-degenerative diseases over a period of five years (Steinberg, Tschanz, Norton, Breitner, & Lyketsos, 2006). Moreover, they are characterized by fluctuations in their frequency and severity. Different trajectories could still be identified on the basis of differences in the evolution of their frequency over time (stable, increased, decreased or fluctuating) and severity (mild, moderate, severe) for three syndromes identified by factor analysis (psychotic, emotional and behavioral) over a period of two years (Garre-Olmo, López-Pousa, Vilalta-Franch, de Gracia Blanco, & Vilarrasa, 2010). Thus, patient trajectories are complex and variable, resulting from the

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interaction of several factors. However, the trajectories were generally analyzed using special parameters and not from patient profiles taking into account most of the bio-psycho-social aspects. As the population of patients presenting with BPSD grows, a better understanding of their clinical profiles as they change over time, the examination of patient trajectories after discharge and the identification of predictors of the latter are becoming increasingly important. This information is valuable for health policy decision-making regarding dementia care systems as well as for planning and delivering more efficient, evidenced-based and patient-centered care (Soto et al., 2013).

Patients are usually discharged from specialized psychogeriatric care units into three distinct living arrangements: 18–58% of patients go to nursing homes (Astell, Clark, & Hartley, 2008; Hanna, Woolley, Brown, & Kesavan, 2008; Slaets, Kauffmann, Duivenvoorden, Pelemans, & Schudel, 1997; Tulloch, 1986), 9–35% go back home (Astell et al., 2008; Hanna et al., 2008; Porello, Madsen, Futterman, & Moak, 1995; Tulloch, 1986), 3–5% are transferred to another hospital (Astell et al., 2008). Finally, 6–24% die during hospitalization (Astell et al., 2008; Hanna et al., 2008; Pitt & Silver, 1980; Tulloch, 1986).

Numerous studies have identified factors influencing long-term placement in nursing homes. These include general health as well as psychological and sociodemographic determinants including the presence of dementia or cognitive impairment (Andel, Hyer, & Slack, 2007; Andersson et al., 2012; Brodaty et al., 2014; Cohen-Mansfield & Wirtz, 2009; Gnjidic et al., 2012; Luppá et al., 2010, 2012; Pasquini, Leys, Rousseaux, Pasquier, & Hénon, 2007; Zekry et al., 2009), significant functional decline (Brodaty et al., 2014; De Buyser, Petrovic, Taes, Vetrano, & Onder, 2014; Hatoum, Thomas, Lin, Lane, & Bullock, 2009; Luppá et al., 2010, 2012; Zekry et al., 2009), BPSD (Brodaty et al., 2014; McCallum, Simons, Simons, & Friedlander, 2007; Okura et al., 2011; Tew, Tan, Luo, Ng, & Yap, 2010), the presence of depression, delusions, agitation, and hallucinations (Cohen-Mansfield & Wirtz, 2009; Okura et al., 2011), comorbidities (De Buyser et al., 2014; Luppá et al., 2010; McCallum et al., 2007), urinary and fecal incontinence (McCallum et al., 2007), older age of both patients (Andel et al., 2007; Cohen-Mansfield & Wirtz, 2009; Hatoum et al., 2009; Luppá et al., 2010; McCallum et al., 2007; Pasquini et al., 2007) and caregivers (Eska et al., 2013), gender (Hatoum et al., 2009; Luppá, Luck, Brähler, König, & Riedel-Heller, 2008; Luppá, Luck, Weyerer, König, & Riedel-Heller, 2009), living alone or the absence of a spouse (Eska et al., 2013; Luppá et al., 2012), employment of domestic staff (Tew et al., 2010), ethnicity (Andel et al., 2007; Luppá et al., 2010), the presence of caregivers (Luppá et al., 2010; Tew et al., 2010), and caregiver burden (Eska et al., 2013). These results clearly illustrate that multiple factors determine nursing home placement. But only one study examined the predictors of living arrangements for patients discharged from specialized hospital care units and showed that the level of functional dependence was the main predictor (Astell et al., 2008). However, each living arrangement after discharge was analyzed independently from one another and no comparison was performed.

The complexity of a given clinical status depends not only on the number of comorbidities or problems, but also on how they co-occur and overlap. Consequently, although a global health score, calculated using a given multidimensional tool, can provide information on the severity of a patient's clinical status, it may not adequately reflect a patient-sensitive representation of its component morbidities and their intricate course. That is why a patient classification system is considered useful: it permits the identification of specific profiles present in a given heterogeneous samples of patients. Indeed, there is significant evidence that identifying groups of people who share similar clinical characteristics not only helps to explain their particularities better, but

improves care plans or care transitions (Everitt, Landau, Leese, & Stahl, 2011; Hair, Black, Babin, & Anderson, 2010).

There are but a few studies associating transitions from one clinical profile to another using the explanatory power of covariates (Lafortune, Beland, Bergman, & Ankri, 2009a; Raïche, Hébert, Dubois, Gueye, & Dubuc, 2012; Raïche, Hébert, Dubois, Gueye, & Dubuc, 2014). Two classifications do exist – Health State Profiles in the USA (Lafortune, Beland, Bergman, & Ankri, 2009b) and the Iso-SMAF profiles (functional autonomy measurement system or SMAF) in Canada (Dubuc, Hébert, Desrosiers, Buteau, & Trottier, 2006). However, the Health State Profiles do not fit the reality of the health care system in Switzerland and the Iso-SMAF profiles were developed based on the functional autonomy and do not include all the predictors of institutionalization.

In order to better meet the needs of psychogeriatric inpatients presenting BPSD through better targeted interventions, a new classification system was developed and validated (results have been submitted for publication). The Lausanne classification of psychogeriatrics inpatients (LCPI) uses variables from the Health of the Nation Outcome Scales for aged people (HoNOS65+), resulting in four profiles generated by several clustering techniques. These profiles are labeled *BPSD-affective*, *BPSD-functional*, *BPSD-somatic*, and *BPSD-psychotic* (Ortoleva Bucher, Dubuc, von Gunten, Trottier, & Morin, 2016), although it must be kept in mind that all patients have BPSD as a common reason of admission. It was hypothesized that these profiles would change between admission and discharge, and that the classification would be sensitive enough to predict the patients' living arrangements after discharge. These hypotheses needed to be tested.

This study specifically aimed to describe the clinical course of aged patients, between admission to and discharge from acute psychogeriatrics hospital wards, using the four profiles of the LCPI. Furthermore, we wished to explore whether or not these profiles, and a final set of covariables, could predict placement in a nursing home at discharge.

## 2. Material and methods

### 2.1. Sources of data and measurements

This study included aged patients suffering from dementia who were hospitalized in one of three psychogeriatric wards in French-speaking Switzerland between January 1st 2011 and June 30th 2014. These wards are specialized programs devoted to the investigation and the management of patients with psychiatric or behavioral disorders with a probable organic or dementia syndrome. Given the tendency of these patients to wander, the wards are closed. Only first hospitalizations were considered in this study. Routinely collected patient data were provided by the hospital data managers, under the supervision of the head of the psychogeriatric service (AvG), and were analyzed after approval by the canton of Vaud's Human Research Ethics Committee (Protocol n° 231/14). Overall mental health was evaluated using the French version of the (HoNOS65+, Burns, Lawlor, & Craig, 2004; Canuto et al., 2007). Only patients with fully completed HoNOS65+ questionnaires on admission and at discharge were included. This scale is a diagnosis-independent assessment of mental health and social functioning and includes 13 items: [1] behavioral disturbance; [2] non-accidental self-injury; [3] problem drinking or drug use; [4] cognitive problems; [5] problems related to physical illness or disability; [6] problems associated with hallucinations and/or delusions or false beliefs; [7] problems associated with depressive symptoms; [8] other mental and behavioral problems; [9] problems with social or supportive relationships; [10] problems with activities of daily living; [11] overall problems with living conditions; [12] problems with work and leisure activities—quality

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