

# Validation of two inventories for the diagnosis and monitoring of functional memory disorder

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## Abstract

**Objective:** Functional memory disorder (FMD) is an acquired nonorganic condition characterized by significant deficits of memory and concentration that occur in daily living and are thought to be caused by psychosocial burden and distress. FMD is an important differential diagnosis to organic mild cognitive impairment. Although frequent, FMD is under-researched and mostly diagnosed by exclusion rather than by positive diagnostic criteria. Diagnosis can be difficult in patients with borderline cognitive test results. **Methods:** To aid in the clinical diagnosis and monitoring of FMD, a short 10-item FMD questionnaire and a 22-item FMD rating scale were developed. They assess a range of memory complaints thought to be indicative of FMD. Each of the two inventories was applied and evaluated in a separate study involving FMD patients and control groups. In one study, the natural course of FMD was observed. In the other study, the effect

of a therapeutic intervention was assessed. Here, we present the full text of the two FMD inventories and data on test quality characteristics. **Results:** Internal consistency and split-half-reliability indices were excellent throughout. At suitable cutoffs, both versions discriminated FMD patients from control subjects with high accuracy. Both also demonstrated discriminant construct validity. Moreover, the long version demonstrated high test-retest reliability and convergent construct validity and proved to be sensitive to change. **Conclusion:** The short version of the FMD inventory is a helpful tool in the clinical diagnosis of FMD. The longer version is suitable for monitoring of FMD severity in the context of therapeutic interventions and observational studies. To determine whether the inventories can discriminate FMD from organic mild cognitive impairment, further studies are required.

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## Introduction

Memory dysfunction in the absence of a recognizable organic cause and of objective cognitive impairment is a frequent phenomenon in younger and elderly patients who attend memory clinics or see neurologists and psychiatrists in private practice [1–3]. It is known that nonorganic cognitive impairment can be caused by depression, dissociative states, posttraumatic stress disorder, and other psychiatric conditions. However, field studies have shown that presumably nonorganic cognitive impairment is also prevalent in community-dwelling patients who are free of major psychia-

tric disease [4,5]. In patients with high baseline capacity or with early-stage organic disease, normal test results may be misleading. It has indeed been shown that a minority of those with subjective impairment but normal test results deteriorate towards dementia [6,7]. Other studies have shown no such deterioration among patients with normal baseline cognition [8–10]. Even among patients with subnormal test results at baseline, considerable proportions have been observed to revert to normal later on [11]. Nonorganic memory dysfunction is thus a significant and sometimes difficult differential diagnosis to prodromal dementia.

The diagnosis of a nonorganic condition by exclusion only, i.e., by demonstration of normal test results, is unsatisfactory for patients who continue to experience deficits in daily living. The diagnosis may remain doubtful if test results are borderline or inconsistent or if nonorganic

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memory disorder is assumed to superimpose an organic condition. If the diagnosis of a nonorganic condition was supported by positive clinical criteria, physicians and psychologists could communicate it with higher confidence. It could also serve as a basis for a more targeted exploration into the causes and into possible therapeutic measures. A positive diagnosis is also important with regard to the necessary exclusion of patients with nonorganic disorders from clinical drug trials which target degenerative diseases.

Nonorganic memory impairment is usually not explained by hypochondria [12] and has impact not only subjectively but also on patients' private and professional activities. Possible consequences include anxiety, frustration, fear of organic disease, repeated cerebral imaging, etc. We have suggested the term "functional memory disorder" (FMD) and proposed an etiological model [5] that interprets FMD as *an acquired condition caused by long-term psychological and emotional distress*. Distress is assumed to induce a state of chronic internal distractedness, which leads to a reduced ability to focus, to maintain attention, to encode and to retrieve contents of memory [13]. The consequences of this impediment on patients' daily activities and well-being can amount to a significant secondary burden factor and thereby induce a vicious circle of cognitive dysfunction and distress.

We propose grouping FMD with the class of somatoform disorders because it shares many characteristics with these disorders, and it can be explained well by adapted etiological models of somatoform disorders [5]. Features that are observed in both FMD and other somatoform disorders are fear of organic disease, request for repeated technical examinations, reluctance to accept non-organic disease models, and low rate of spontaneous remission [13]. It needs to be pointed out that FMD, as defined here, is separate from cognitive dysfunction in the context of major psychiatric disease, namely depression, psychosis, and dissociative states. Furthermore, FMD does not encompass cognitive dysfunction in adult attention deficit disorder, personality disorders and other long-standing conditions.

To sum up, the term FMD is applied to characterize patients with subjective (nonorganic) memory complaints that warrant the classification as a psychological disorder. Clearly, there are also individuals with less distinctive presentations of subjective memory complaints. They will rather be seen as participants in memory training courses (see also Ref. [14]) than as patients presenting in memory clinics. Just as there is a threshold for the occurrence of depressive symptoms to warrant diagnosis of a depressive disorder, we suggest that the same is true for subjective memory complaints with regard to the diagnosis of FMD. For this purpose, we devised an inventory of typical symptoms of FMD (see below) and compared healthy control subjects and patients who showed the clinical signs of FMD (see Panel 2).

The complaints of FMD patients are quite stereotypical and differ from the pattern of complaints encountered in organic conditions [2,12,15]. Typical examples of nonorganic subjective memory complaints include prospective

memory failures [16–18], i.e., forgetting of errands on the way to their execution, forgetting of appointments, temporary block of overlearned names [16], words and PIN codes, disruption of the coherence of thoughts [17], rapid forgetting of contents of conversations, etc.

Two versions of a structured FMD inventory were compiled on the basis of such symptoms. The *short version* was designed as a brief diagnostic instrument. The *longer version* was designed as a Likert scale for in-depth evaluation and for the assessment of change of FMD expression across longer periods of time or therapeutic interventions. Here, the two versions of the FMD inventory are presented together with data on test quality characteristics, which were gathered in two independent studies on the natural course of FMD [13] and on a novel FMD treatment program [15].

## Methods

### *Study 1 assessing the short version of the FMD inventory*

Symptoms of presumably nonorganic memory and concentration failure have been assessed in previous studies (see above). Based on these symptoms, a short questionnaire for the quantitative assessment of FMD symptomatology was compiled (Panel 1). It is comprised of 10 "yes or no" questions. The overall score equals to the number of yes answers and ranges from 0 to 10. All questions pertain to the time period during which patients experience memory problems. "Yes" answers are required if the corresponding symptom has been present "clearly more often" during the questionable time period, compared to earlier.

#### Panel 1 FMD inventory, short version

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##### *Items related to a deficit of working memory and concentration*

1. Do you forget errands on the way to their execution?
2. Do you rapidly forget essential parts of a personal or telephone conversation?
3. Do you experience disruptions of the thread of thoughts in conversations?
4. Do you experience absent-mindedness and day-dreaming during conversations?

##### *Items related to a deficit of the registration of new contents*

5. Do you forget important contents of conversations, appointments and errands (time scale of days)?
6. Do you experience difficulties understanding and registering the contents of news, reading and lectures?

##### *Items related to a deficit of retrieval*

7. Do you experience blocks of retrieval of well-known names, phone numbers, PIN codes, etc. (but typically recall them later)?
8. Do you commit errors, or experience "blackouts" during routine activities at work, at home, while driving, etc.?
9. Do you experience difficulties finding words?

##### *Item related to the variability of symptom severity*

10. Is your memory impairment subject to variations, namely less marked during times of relaxation?
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