

ISSUES AND INNOVATION IN NURSING PRACTICE

Mental disturbances and perceived complexity of nursing care in medical inpatients: results from a European study

Peter De Jonge PhD

Psychologist/Methodologist, Psychiatry Service, Vrije Universiteit Medical Centre, Amsterdam, The Netherlands

Marieke M. Zomerdijsk MSc

Psychologist, Psychiatry Service, Vrije Universiteit Medical Centre, Amsterdam, The Netherlands

Frits J. Huyse MD PhD

Psychiatrist, Psychiatry Service, Vrije Universiteit Medical Centre, Amsterdam, The Netherlands

Per Fink MD PhD DMedSc

Psychiatrist, Research Unit for Functional Disorders, Psychosomatics and CL Psychiatry, Aarhus University Hospital, Aarhus, Denmark

Thomas Herzog MD PhD

Psychiatrist, Department of Psychosomatic and Psychological Medicine, Christophsbad, Goepfingen, Germany

Antonio Lobo MD PhD

Psychiatrist, Psychosomatic and CL Psychiatry Service, Hospital Clinico Universitario, Zaragoza, Spain

Joris P.J. Slaets MD PhD

Geriatrician, General Internal Medicine, University of Groningen Hospital, Groningen, The Netherlands

Volker Arolt MD

Psychiatrist, Department of Psychiatry, University of Muenster, Muenster, Germany

Nandor Balogh MD

Informatics Specialist, Department of Medical Informatics, Institute of Cardiology, Budapest, Hungary

Graca Cardoso MD

Psychiatrist, Department of Psychiatry, Hospital Fernando Fonseca, Amadora, Portugal

and Marco Rigatelli MD

Psychiatrist, Department of Psychiatry, University Hospital, Modena, Italy

Submitted for publication 24 January 2001

Accepted for publication 23 July 2001

Correspondence:

*Peter De Jonge,
Psychiatry Service,
Vrije Universiteit Medical Centre,
PO Box 7057,
1007 MB Amsterdam,
The Netherlands.
E-mail: p.dejonge@azvu.nl*

DE JONGE P., ZOMERDIJK M.M., HUYSE F.J., FINK P., HERZOG T.,
LOBO A., SLAETS J.P.J., AROLT V., BALOGH N., CARDOSO G.
& RIGATELLI M. (2001) *Journal of Advanced Nursing* 36(3), 355–363
**Mental disturbances and perceived complexity of nursing care in medical inpatients:
results from a European study**
Aims and objectives. The relationship between mental disturbances – anxiety and
depression, somatization and alcohol abuse – on admission to internal medicine

units and perceived complexity of care as indicated by the nurse at discharge was studied. The goal was to study the utility of short screeners for mental disturbances to select patients for case-management on admission.

Design. The study had a cohort design: patients were included on admission and followed through their hospital stay until discharge. The study was conducted within the framework of the European Biomed 1 Risk Factor study.

Research methods and instruments. In the first 3 days of admission the patients were interviewed by a trained health care professional, who scored the SCL-8D, a somatization questionnaire based on the Whiteley-7 and the CAGE. At discharge, nurses rated the complexity of the patient's care.

Results. Patients with high scores on anxiety and depression (SCL-8D) and on somatization received higher ratings on perceived nursing complexity than those with low scores, with and without control for age, severity of illness and chronicity. The actual nursing intensity and medical care utilization, as measured daily by means of a checklist, could not explain these relations. No differences were found between patients with high or low scores on alcohol abuse.

Conclusions. The study shows a potential use of screeners for mental disturbances to detect patients for whom nurses might need additional help. However, mental disturbance is not the sole criterion: functional status and other variables that predict medical and nursing care utilization should be included in a screening strategy for case-management programmes.

Keywords: depression, anxiety, alcohol, somatization, nursing care complexity, length of stay (LOS), internal medicine, case management

Introduction

The complexity of the needs of patients admitted to general hospitals is of growing concern. Because of the ageing of the population, a growing number of patients with chronic diseases and decreased physical functioning are admitted to hospital with complex care needs. A large number of studies have focused on the detection on admission of patients with a risk of complex medical and/or nursing care. After severity of illness, the focus of these studies has been on mental disturbance.

In European countries the proportion of patients with some form of mental disturbance (affective disorders, anxiety disorders, organic mental disorders and alcohol abuse) in general hospitals, estimated to be 25–30%, is larger than in the general population, estimated to be 15% (Mayou & Hawton 1986, Silverstone 1996, Arolt *et al.* 1997). Furthermore, a recent study showed that the overall prevalence of mental disturbances is even higher if somatoform disorders are also taken into account (Hansen *et al.* 2001).

Many studies suggest that patients who suffer from mental disturbances have a longer hospital stay than other patients (Saravay & Lavin 1994), while others failed to find any

relationship between mental disturbances and length of hospital stay (Levenson *et al.* 1986, Fulop *et al.* 1998, Koenig & Kuchibatla 1998). Similarly, effect studies have had mixed results: some found that treatment of mental disturbances resulted in reduced hospital stay (Mumford *et al.* 1982, 1984, Devine & Cook 1983) while others did not (Hengeveld *et al.* 1988, Levenson *et al.* 1992, Gater *et al.* 1998).

Most of the above mentioned studies focus on the relationship of mental disturbances to medical care, mainly length of hospital stay. The number of studies on their relationship to nursing care is much smaller (Prescott *et al.* 1991, Bostrom 1992), although several arguments for such studies exist. First, length of stay is a crude measure of outcome, as the difficulty of treatment is not taken into account (De Jonge *et al.* 2001a, 2001b, Huyse *et al.* 2001). Secondly, as Halloran *et al.* (1987) reported, nursing care is responsible for 20–30% of all costs during admission. Thirdly, the requirement for complex nursing care seems to expand as a direct consequence of the growing complexity of needs of the (older) population. Finally, programmes in which care for complex patients is co-ordinated by a case manager, mostly a specialized nurse (Paul 2000), have proved

to be successful in reducing care utilization (Stewart *et al.* 1999), but there is no standardized instrument by means of which target patients can be detected (Curley *et al.* 1998).

The relationships of mental disturbance with perceived nursing complexity, actual nursing care and medical care utilization were investigated in the present study. Screeners for depression, anxiety, somatization and alcohol abuse were administered on admission. Patients with high and low scores on these screeners were then compared on the outcome measures. As earlier research has shown a higher use of medical care at a higher age, higher severity of illness and among patients with a malignancy (Mumford *et al.* 1984, De Jonge 1999), these variables were controlled for. If mental disturbance on admission is related to nursing complexity measured at discharge, a potential use of these screening instruments lies in early detection of patients in need of nonstandard care, for example case-management, on admission.

The study

Methods

Design and procedure

The study had a cohort design. Patients were included on admission by means of a consent procedure and followed through their hospital stay until discharge. The study was conducted within the framework of the Biomed 1 Risk Factor Study (Huysse *et al.* 1995, De Jonge 1999, De Jonge *et al.* 2001a, 2001b, Huysse *et al.* 2001). The aim of this study was to develop a short screening instrument designed to detect on admission patients with a risk of complex care needs (mental illness and psychological and behavioural complications to medical and surgical diseases). On admission, a comprehensive list of possible risk factors was scored by the responsible physician and nurse and by a researcher drawing on a patient interview. At discharge the medical and nursing complexity for all included patients was scored by the responsible physician and nurse and by the researcher, using the medical records. For the present study, only variables related to mental disturbances and nursing complexity were selected. In addition, socio-demographic variables and information with regard to past and present medical care utilization were used.

Included patients were admitted consecutively to general internal medicine wards of 11 European hospitals (in the Netherlands, Spain, Italy, Portugal, Denmark, Hungary and Germany). For every unit, a fixed time was set, with an average of 3 months, within which, patients were asked to participate in the study, giving informed consent. In the first

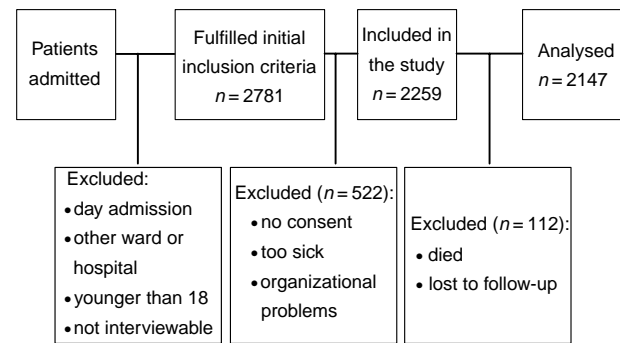


Figure 1 Patient inclusion.

3 days after admission, patients were interviewed by a trained health care professional (a nurse, medical student, physician, etc.). When possible the interview took place in a investigation room on the ward concerned.

Patients

Patients were asked to participate when they were admitted directly to the ward (that is, not through another ward or through another hospital) and stayed at least one night. In addition, they had to be at least 18 years of age and be interviewable (no language, hearing, or severe cognitive problems). When a patient could not be interviewed because of severity of symptoms, the inclusion procedure was repeated on the next 2 days. After that, the patient was excluded. In Figure 1, the flow chart of the study is shown.

The study was approved by the medical ethics committee of the VU Medical Centre in Amsterdam, in which the project was coordinated. As no intervention was conducted, a nonwritten informed consent procedure was judged to be appropriate.

Of the 2781 patients who met the inclusion criteria, the data of 2147 patients were finally analysed.

Instruments and operationalization

Mental disturbances. The assessment of mental disturbance was based on the patient interview during the first few days of admission using standardized instruments. The following questionnaires were used: for depression and anxiety, the short 8-item version of the SCL-25, the SCL-8D, was used (Fink *et al.* 1995). The SCL-25 consists of the anxiety and depression scale of the SCL-90 (the SCL-90 measures psychoneurotic symptoms). Based on factor loadings and the magnitude of the residuals of the SCL-25, 17 items were included. Secondly, the data were analysed in a Rasch model, and eight items had a significant fit. The external validity of the SCL-8D is equal to the SCL-25. Sensitivity is 0.62 and specificity is 0.81 with a cut-off point of 1/2. The patient

indicates on a four point scale to what extent he/she has been bothered by a number of complaints during the last month. In the analysis, the scores are dichotomized in such a way that 1 and 2 ('not at all' and 'a little bit') and counted as negative and 3 and 4 ('quite a bit' and 'very much') as positive responses. The SCL-8D contains the following questions: How much were you bothered by: (a) feeling blue, (b) feeling hopeless about the future, (c) feeling everything is an effort, (d) feeling worthless, (e) nervousness or shakiness inside, (f) worrying to much about things, (g) feeling fearful, (h) spells of terror or panic.

For alcohol abuse the CAGE was used. CAGE is an acronym of cut down, annoyed, guilty and eye opener. Mayfield *et al.* (1974) found a sensitivity of 0.81 and a specificity of 0.89 with a cut-off point of 1/2. The CAGE consists of the following four questions, preceded by a general question concerning alcohol use: (a) have you ever felt the need to cut down on your drinking, (b) do you ever feel guilty about your drinking, (c) have people ever annoyed you by criticising your drinking, (d) have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover. All questions can be answered with yes or no.

For somatization symptoms, we used a short instrument based on the Whiteley-7 index (Fink *et al.* 1999), consisting of the following five questions: (a) in general do you worry a lot about your health, (b) in general when you go to the doctor with illness and he/she tells you there is nothing to worry about, is it hard for you to believe the doctor, (c) are you bothered by pains and aches during the last week, (d) in general, are you bothered by pain and (e) in general, how much are you bothered by many different symptoms.

Perceived nursing complexity. Nursing complexity was measured at discharge by the nurse on duty. A questionnaire was scored, consisting of the following seven questions: (1) has this patient required complex nursing care, (2) has the organization of care during hospital stay been complex, (3) did this patient, to your knowledge, have a mental health disturbance during hospital stay, (4) have there been, to your knowledge, discharge problems for this patient, (5) after discharge, do you think this patient will be limited in activities of daily living (ADL), (6) if so what is in your opinion the longterm medical care needs of the patient, (7) does the patient need more support after discharge than before this admission.

Medical, nursing care and psychosocial care. From the medical records, indicators of the complexity of hospital care, number of consultations from medical specialists,

number of days with laboratory and diagnostic tests, medications, and length of hospital stay were scored. As an indicator of the number of nursing interventions, a score was recorded if during their hospital stay, on any day one of the following interventions was conducted: haemofiltration techniques, artificial respiration, special care for wounds and scars, airway cleaning, drains, nasal oxygen, parenteral nutrition, nasal tube feeding, IV lines, neurological monitoring, more than standard monitoring. A binary variable was derived from these data: 0=no interventions, 1=at least one intervention on any day. As further indicators of (the need for) nursing interventions, functional status was scored on a daily basis by the nurse responsible (whether or not on any in-hospital day the patient was fully bedridden and/or limited in activities of daily living). Two binary variables were derived from these data: 0=on none of the days was bedridden or limited, 1=at least on one day bedridden or limited. Finally consultations by psychosocial services and use of psychoactive medication were recorded.

Confounding variables. The following possible confounding variables were controlled for, scored on the basis of medical status or rated by the responsible physician on admission: sex, age, severity of illness (life threatening situation and chronicity) and malignancy. As the study was conducted in seven European countries, we added country as a potential confounder.

Data analysis

Based on their scores on the indicators for mental disturbance, patients were divided into two groups. For the SCL-8D and CAGE, we used the cut-off score suggested in the literature, namely 1/2 and 1/2, respectively. For the somatization questionnaire, we used the median score as a cut-off point (5/6). Groups were then compared on the nursing complexity scale by means of Mann-Whitney *U*-tests. In the case of significant results ($P < 0.05$), analyses were repeated by controlling for significantly related confounding variables by means of linear regression analysis.

In addition, patients were compared on the indicators for the complexity of hospital care and the number of nursing interventions by means Mann-Whitney *U*-tests or chi-square tests in the case of proportional variables.

Results

In Table 1, a description of the sample is given. In Table 2, the scores on the indicators for mental disturbance are shown.

Table 1 Sample characteristics

	Total sample (n = 2147)
Admission status	
Age in years (mean; SD)	61.8 (16.9)
Sex (% male)	52.5
Unplanned admission (%)	60.0
Admitted from own home (%)	93.3
Having a job (%)	23.1
Retired (%)	49.4
Life-threatening illness (%)	34.1
Chronic disease (%)	70.8
Suspected malignancy (%)	22.8
Discharge status	
Length of stay (mean; SD)	11.4 (10.3)
Discharged to own home (%)	89.9

It can be seen that almost half of the patients had a positive score on the SCL-8D (at least two variables with a positive score) and somatization questionnaire (total score at least 6); only 5.3% had a positive score on the CAGE (total score at

least 1). Almost 40% of the patients had a limited functional status for at least one day; a majority of patients (70%) received at least one specific nursing intervention. The reliabilities of the questionnaires for mental disturbances were 0.80 for the SCL-8D, 0.68 for somatization and 0.76 for the CAGE. The perceived nursing complexity scale had a reliability of 0.75.

Relationship between mental disturbance and perceived nursing complexity

In Table 3 the relationship between mental disturbance and perceived nursing complexity is shown.

Patients with high scores on the SCL-8D and the somatization questionnaire were perceived to have more complex needs. With respect to the CAGE, no difference was found on this variable. No differences were found on limited functional status and nursing interventions, except for patients with high scores on somatization, who had a lower risk of being limited in functional status.

Table 2 Descriptive statistics on mental disturbance and nursing complexity

	α	Mean	SD	Minimum	Maximum	Cut-off	Positive (n)	Positive (%)
Mental disturbance								
SCL-8D	0.80	2.0	2.1	0	8	1/2	944	46.2
Somatization	0.68	5.8	3.9	0	18	5/6	991	48.6
CAGE	0.76	0.2	0.7	0	4	1/2	110	5.5
Nursing complexity								
Perceived complexity scale	0.75	4.8	3.2	0	17	-	-	-
Limited functional status	-	-	-	0	1	0/1	841	39.2
Nursing interventions	-	-	-	0	1	0/1	1445	69.6

Table 3 The relationship between mental disturbance and nursing complexity

	Below cut-off	Above cut-off	P-value
SCL-8D			
Perceived complexity scale [median; mean (SD)]	4 4.4 (3.0)	4.5 5.1 (3.3)	0.00
Limited functional status (%)	39.1	36.3	0.19
Nursing interventions (%)	70.6	68.0	0.21
Somatization			
Perceived complexity scale [median; mean (SD)]	4 4.2 (2.9)	5 5.2 (3.2)	0.00
Limited functional status (%)	41.3	34.5	0.00
Nursing interventions (%)	69.9	68.0	0.64
CAGE			
Perceived complexity scale [median; mean (SD)]	4 4.7 (3.1)	5 5.3 (3.5)	0.13
Limited functional status (%)	38.3	44.5	0.19
Nursing interventions (%)	69.3	77.5	0.08

Regression analysis confirmed the positive relationship between SCL-8D and somatization with perceived complexity after controlling for age, life threatening illness, chronic illness and suspected malignancy in the total sample (SCL-8D: $P=0.00$; somatization: $P=0.00$). Regression analysis repeated for the separate national samples resulted in at least one of the two being significantly related to perceived complexity in each of the subsamples (the Netherlands: SCL-8D: $P=0.01$; somatization: NS; Spain: SCL-8D: $P=0.02$; somatization: NS; Italy: SCL-8D: NS; somatization: $P=0.01$; Portugal: SCL-8D: NS; somatization: $P=0.01$; Denmark: SCL-8D: $P=0.02$; somatization: NS; Hungary: SCL-8D: $P=0.00$; somatization: $P=0.00$; Germany: SCL-8D: NS; somatization: $P=0.00$).

Relationship between mental disturbance and medical care

In Table 4, the relationship between mental disturbance and medical care is shown. In general, patients with high scores on mental disturbance had higher scores on psychoactive medication use, on consultations by psychosocial services and on days with diagnostic procedures. Patients with high scores on somatization had higher scores on most of the indicators of medical care utilization.

After adding the significant indicators for the intensity of the medical care in the regression models for perceived nursing care complexity, the effects of the SCL-8D and somatization questionnaire remained significant.

Table 4 The relationship between mental disturbance and medical care

	Below cut-off	Above cut-off	<i>P</i> -value
SCL-8D			
Length of hospital stay [median; mean (SD)]	6	6	0.62
	11.3 (10.1)	11.6 (10.8)	
Days with lab tests [median; mean (SD)]	4	3	0.60
	5.2 (5.2)	5.1 (5.2)	
Days with diagnostic procedures [median; mean (SD)]	3	3	0.01
	3.8 (3.8)	4.1 (3.6)	
Prescribed medications [median; mean (SD)]	6	6	0.56
	7.0 (4.7)	7.2 (5.3)	
Use of psychoactive medication (%)	26	41	0.00
Consultation by medical specialist (%)	59	64	0.02
Consultation by psychosocial service (%)	4	12	0.00
Somatization			
Length of hospital stay [median; mean (SD)]	9	10	0.00
	10.7 (9.9)	12.2 (10.9)	
Days with laboratory tests [median; mean (SD)]	3	4	0.20
	5.1 (5.4)	5.1 (4.9)	
Days with diagnostic procedures [median; mean (SD)]	3	4	0.00
	3.7 (3.7)	4.2 (3.7)	
Prescribed medications [median; mean (SD)]	6	7	0.00
	6.9 (5.1)	7.3 (4.6)	
Use of psychoactive medications (%)	28	38	0.00
Consultation by medical specialist (%)	56	66	0.00
Consultation by psychosocial service (%)	7	9	0.07
CAGE			
Length of hospital stay [median; mean (SD)]	9	8.5	0.51
	11.4 (9.8)	13.2 (17.7)	
Days with laboratory tests [median; mean (SD)]	4	4	0.64
	5.1 (5.1)	5.6 (7.0)	
Days with diagnostic procedures [median; mean (SD)]	3	3	0.03
	4.0 (3.6)	3.9 (5.1)	
Prescribed medications [median; mean (SD)]	6	6	0.86
	7.1 (4.8)	7.2 (5.3)	
Use of psychoactive medications (%)	32	49	0.00
Consultation by medical specialist (%)	62	59	0.62
Consultation by psychosocial service (%)	7	19	0.00

Discussion

The relationship between mental disturbance – anxiety/depression, alcohol abuse and somatization – on admission and perceived complexity of care needs according to the nurse responsible at discharge, was studied in a European sample of medical inpatients. Patients scoring high on screeners for anxiety/depression and somatization had higher scores on perceived complexity of care needs measured at discharge, a relationship that could not be explained by reduced functional status or actual nursing interventions. Also, this finding was stable across the different national subsamples and the differences were not because of age and disease characteristics. Although patients scoring high on the scales for mental disturbances also had a higher utilization of psychosocial services and an increased risk of being prescribed psychoactive medications, medical care utilization during hospital stay was higher especially for patients with high somatization scores. When controlled for medical care utilization, the differences between the two groups based on the SCL-8D and somatization questionnaire with respect to perceived complexity remained significant. To summarize, none of the potential confounding variables explained the effect of mental disturbance on perceived complexity of care needs.

Three limitations of the study should be mentioned here, having to do with the inclusion of patients and operationalization of mental disturbance. First, a considerable number of patients, including some with the most complex needs, could not be included in the study because of the filter of the patient interview. For example, patients with severe cognitive disorders were excluded in this way. Secondly, the proportion of patients with alcohol problems found in this study was considerably lower than mentioned in the literature (5.3% vs. 16.9% found by Niles & McCrady 1991). It is probable that only patients with clear alcohol problems were detected in this study. These patients have a higher chance of being detected by the responsible physician and subsequently referred an outpatient alcohol clinic, without posing a heavy burden on nurses. The version of the somatization questionnaire used in the study has not yet been validated, which may have resulted in a nonoptimal detection of patients with somatization symptoms.

Despite these limitations, the present study shows a potential use of screeners for mental disturbance to detect patients for whom the nurses might need additional help. Mental disturbance is an independent predictor of perceived complexity and is, as such, a candidate measure for inclusion in a case-finding instrument for care coordination programmes. On the other hand, mental disturbance cannot be

the sole criterion as the magnitude of the differences was limited. Other variables that predict medical and nursing care utilization should be included, such as functional status or subjective health ratings by the patient. In future studies, the relationship between mental disturbance and complexity could be addressed in patients with high care utilization, as it can be argued that, for those patients, mental disturbance could complicate (somatic) health care delivery.

In the past years, our research group has worked on the development of a strategy to improve detection and treatment of patients admitted to a general hospital who in addition suffer from psychiatric comorbidity. Our vision is to detect, within the first days of admission, patients with a high risk of developing complex care needs during hospitalization or after discharge. For this, we developed the COMPRI (De Jonge *et al.* 2001a, 2001b, Huyse *et al.* 2001). The COMPRI is meant to be a first screener, which should be sensitive but may include false positives. After detection, a more elaborate assessment of patient care needs should be made. For this we developed the INTERMED, which is a method in which, based on a patient interview and a review of the medical record, the patient's care needs are described in terms of the biological, psychological and social characteristics and demands on the health care system (Huyse *et al.* 1999, Stiefel *et al.* 1999, De Jonge *et al.* 2001c). The INTERMED can be applied by a clinical nurse specialist and takes about 15–20 minutes to score. The INTERMED is used to rule out the false positive patients, and directs interdisciplinary treatment for true positive patients with a high biopsychosocial vulnerability and associated care needs. The present study shows a potential use for existing screeners for anxiety, depression and somatization, which may be used in a stepped detection strategy for patients perceived as having complex care needs.

In this study no standardized psychiatric diagnoses such as the CIDI (Composite International Diagnostic Interview) or SCAN (Schedules for Clinical Assessment in Neuropsychiatry) were used and therefore no psychiatric diagnoses were made. Such extensive diagnostic interviews demand considerable resources and therefore brief screening instruments that can be used by ward nurses need to be developed. In this study only symptoms of mental disturbances which can be assessed by ward nurses without extensive efforts were scored. It was found that patients with high scores on the short screening instruments were considered to have relatively complex needs (with the exception of the CAGE). Future studies – which include a screener for cognitive disorders such as the Mini Mental State Examination (MMSE) (Folstein *et al.* 1975) – should further elaborate on the use of psychological screeners to detect patients for care coordination programmes.

Conclusion

The detection of patients who are considered to have complex needs by ward staff may improve patient care and prevent burn-out of ward staff. Protocols for managing complex patients in hospital and after discharge are evolving, but will encounter difficulties in being implemented when applied to all patients admitted. This study shows the potential of using very easy screening instruments to detect patients whom nurses felt have been difficult to handle.

Acknowledgements

The authors wish to thank: John S. Lyons, Brent C. Opmeer, Barbara Stein and Morten Steen Hansen for conceptual contribution in the design of the study. This study was conducted within the framework of a European Union Biomed1 grant no. BMH1-CT93-1180.

References

- Arolt V., Driessen M. & Dilling H. (1997) The Lübeck General Hospital Study. I: prevalence of psychiatric disorders in medical and surgical inpatients. *International Journal of Psychiatry in Clinical Practice* 1, 207–216.
- Bostrom J. (1992) Early determinants of required nursing care hours in the acute care setting. *Inquiry* 29, 99–104.
- Curley C., McEachern J.E. & Speroff T. (1998) A firm trial of interdisciplinary rounds on the inpatients medical wards. *Medical Care* 36, AS4–12.
- De Jonge P. (1999) *Detection of Complex Patients in the General Hospital*. Thela-Thesis, Amsterdam.
- De Jonge P., Huysse F.J., Slaets J.P.J., Herzog T., Lobo A., Lyons J.S., Opmeer B.C., Stein B., Arolt V., Balogh N., Cardoso C., Fink P., Rigatelli M., van Dijk R. & Mellenbergh G.J. (2001a) Care complexity in the general hospital: results from a European study. *Psychosomatics* 42, 204–212.
- De Jonge P., Huysse F.J., Herzog T., Lobo A., Slaets J.P.J., Lyons J.S., Opmeer B.C., Stein B., Arolt V., Balogh N., Cardoso C., Fink P. & Rigatelli M. (2001b) Risk factors for complex care needs in general medical inpatients: results from a European study. *Psychosomatics* 42, 213–221.
- De Jonge P., Huysse F.J., Stiefel F.C., Slaets J.P.J. & Gans R.O.B. (2001c) INTERMED—a clinical instrument for biosychosocial assessment. *Psychosomatics* 42, 106–109.
- Devine E.C. & Cook T.D. (1983) A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nursing Research* 32, 267–274.
- Fink P., Jensen J., Borgquist L., Brevik J.I., Dalgard O.S., Sandager I., Engberg M., Hansson L., Holm M., Joukamaa M., Karlsson H., Lehtinen V., Nettelbladt P., Nordstrom G., Stefansson C.G., Sorensen L. & Munk-Jorgensen P. (1995) Psychiatric morbidity in primary public health care: a Nordic multicentre investigation. *Acta Psychiatrica Scandinavica* 92, 409–418.
- Fink P., Ewald H., Jensen J., Sorensen L., Engberg M., Holm M. & Munk-Jorgensen P. (1999) Screening for somatization and hypochondriasis in primary care and neurological in-patients: a seven-item scale for hypochondriasis and somatisation. *Journal of Psychosomatic Research* 46, 261–273.
- Folstein M.F., Folstein S.E. & McHugh P.R. (1975) Mini-Mental State Examination: a practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research* 12, 189–198.
- Fulop G., Strain J.J., Fahs M.C., Schmeidler J. & Snyder S. (1998) A prospective study of the impact of psychiatric comorbidity on length of hospital stays of elderly medical-surgical inpatients. *Psychosomatics* 39, 273–280.
- Gater R.A., Goldberg D.P., Evanson J.M., Lowson K., McGrath G., Tantam D. & Million L. (1998) Detection and treatment of psychiatric illness in a general medical ward: a modified cost-benefit analysis. *Journal of Psychosomatic Research* 45, 437–448.
- Halloran E.J., Patterson C. & Kiley M. (1987) Case-mix: matching patient need with nursing resource. *Nursing Management* 18, 27–39.
- Hansen M.S., Fink P., Frydenberg M., Søndergaard L., Oxhøj M.-L. & Munk-Jørgensen P. (2001) Mental disorders among internal medical in patients: prevalence, detection and treatment status. *Journal of Psychosomatic Research* 50, 199–204.
- Hengeveld W.M., Ancion F.A.J.M. & Rooijmans H.G.M. (1988) Psychiatric consultations with depressed medical inpatients: a randomized controlled cost-effectiveness study. *International Journal of Psychiatry in Medicine* 18, 33–43.
- Huysse F.J., Herzog T., Malt U.F., Cardoso G., Creed F., Lobo A. & Rigatelli M. (1995) *A Screening Instrument for the Detection of Psychosocial Risk Factors in Patients Admitted to General Hospital Wards*. IOS Press, Ohmsha.
- Huysse F.J., Lyons J.S., Stiefel F.C., Slaets J.P.J., De Jonge P., Fink P., Gans R.O.B., Guex P., Herzog T., Lobo A., Smith G.C. & Strack van Schijndel R. (1999) INTERMED: a method to assess health service needs: development and first results on its reliability. *General Hospital Psychiatry* 21, 39–48.
- Huysse F.J., De Jonge P., Slaets J.P.J., Herzog T., Lobo A., Lyons J.S., Opmeer B.C., Stein B., Arolt V., Balogh N., Cardoso C., Fink P. & Rigatelli M. (2001) COMPRI – an instrument to detect patients with complex care needs: results from a European study. *Psychosomatics* 42, 222–228.
- Koenig H.G. & Kuchibatla M. (1998) Use of health services by hospitalized medically ill depressed elderly patients. *American Journal of Psychiatry* 155, 871–877.
- Levenson J.L., Hamer R.M., Silverman J.J. & Rossiter L.F. (1986) Psychopathology in medical inpatients and its relationship to length of hospital stay: a pilot study. *International Journal of Psychiatry in Medicine* 16, 231–236.
- Levenson J.L., Hamer R.M. & Rossiter L.F. (1992) A randomized controlled study of psychiatric consultation guided by screening in general medical inpatients. *American Journal of Psychiatry* 149, 631–637.
- Mayfield D., McLeod G. & Hall P. (1974) The CAGE questionnaire: validation of a new alcoholism screening instrument. *American Journal of Psychiatry* 131, 1121–1123.

- Mayou R. & Hawton K. (1986) Psychiatric disorder in the general hospital. *British Journal of Psychiatry* **149**, 172–190.
- Mumford E., Schlesinger H.J. & Glass G.V. (1982) The effects of psychological intervention on recovery from surgery and heart attacks: an analysis of the literature. *American Journal of Public Health* **72**, 141–151.
- Mumford E., Schlesinger H.J., Glass G.V., Patrick C. & Cuerdon T. (1984) A new look at evidence about reduced cost of medical utilization following mental health treatment. *American Journal of Psychiatry* **141**, 1145–1158.
- Niles B.L. & McCrady B.S. (1991) Detection of alcohol problems in a hospital setting. *Addictive Behaviors* **16**, 223–233.
- Paul S. (2000) Impact of a nurse-managed heart failure clinic: a pilot study. *American Journal of Critical Care* **9**, 140–146.
- Prescott P.A., Ryan J.W., Soeken K.L., Castorr A.H., Thompson K.O. & Philips C.Y. (1991) The patient intensity for nursing index: a validity assessment. *Research in Nursing and Health* **14**, 213–221.
- Saravay S.M. & Lavin M. (1994) Psychiatric comorbidity and length of stay in the general hospital. *Psychosomatics* **35**, 233–252.
- Silverstone P.H. (1996) Prevalence of psychiatric disorders in medical in patients. *Journal of Nervous and Mental Diseases* **184**, 43–51.
- Stewart S., Marley J.E. & Horowitz J.D. (1999) Effects of a multi-disciplinary, home-based intervention on unplanned readmissions and survival among patients with congestive heart failure. *Lancet* **354**, 1077–1083.
- Stiefel F.C., De Jonge P., Huyse F.J., Vannotti M. & Spagnoli J. (1999) INTERMED: an assessment system for case complexity and health care needs: results on its validity and clinical use. *General Hospital Psychiatry* **21**, 49–56.