

European Consultation-Liaison Services and Their User Populations: The European Consultation-Liaison Workgroup Collaborative Study

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The authors identified variations in the characteristics of patients referred to 56 consultation-liaison (C-L) services in 11 European countries. The authors found differences in the types of patients referred to the services, and there were significant differences between countries. The first difference lays in whether services saw patients for deliberate self-harm and for substance abuse. German psychosomatic C-L services saw virtually no such patients, although in other C-L services these patients constituted one-quarter to one-third of the patients referred. The second difference lays in the remaining group of referred patients. This group is best characterized by two dimensions. One describes the severity of psychopathology — ranging from organic mental conditions to somatization. The other describes the clarity of the physical diagnosis — ranging from patients referred by surgical wards to those referred by general medicine and neurology wards.

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In 1991, the European Consultation-Liaison Workgroup (ECLW) conducted a collaborative study on consultation-liaison (C-L) service delivery in European general hospitals.^{1–4} One purpose of this European Union-funded study was to identify the characteristics of populations referred to C-L services. Our selection process encompassed

university and nonuniversity hospitals, larger and smaller C-L services, and psychiatric and psychosomatic C-L services. We believe that the resulting broadly varied data set well reflected the variety of general hospital settings and C-L services in the countries studied, with their divergent national health systems and local circumstances. The present article documents the variation in populations seen by the C-L services.

Earlier reported results^{4,5} are based on univariate analyses aggregated to the level of the C-L services, thereby correcting for the size of the group referred to a C-L service. The consultation rate of 1.4% found in the study underlines the gap between epidemiology of mental disorders

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in the medically ill and the services delivered. The core function of C-L services was found to be the delivery of emergency psychiatric care—33% of the referred patients had to be visited on the day of referral. This urgency is also reflected in the most frequent reasons for referral: current psychiatric symptoms (47%), deliberate self-harm (17%), unexplained physical complaints (22%), and substance abuse (10%). The elderly formed a major part of the nondeliberate self-harm population. Only 15% of all referred patients had been admitted to a mental hospital in the past 5 years. About 10% were suffering from either cancer or injuries; 3% were seen in intensive care units. Mood disorders and organic mental disorders were the most commonly diagnosed conditions (18%). Somatoform and dissociative disorders together constituted 7.5% of the diagnoses in the nondeliberate self-harm group.⁵

The primary characteristics of C-L services and their hospitals have been identified by multivariate analysis.⁶ The services could be described in terms of the size and experience of their staff and whether they had a multidisciplinary team. There were monodisciplinary C-L services organized according to the classic medical consultant model and other teams more comparable in composition to multidisciplinary teams in the mental health field. Hospitals attached to the participating C-L services could be described in terms of two independent dimensions: their size and the availability of psychosocial services. Hospitals with limited psychosocial services were found mainly in Italy, Greece, Portugal, and Belgium. Although no correlation was found between hospital characteristics and the size and organizational structure of a team, hospitals with limited availability of psychosocial services did tend to have the smaller monodisciplinary consultation teams based on the medical model and, hence, the most restricted mental health service delivery. Most of the German C-L services calling themselves “psychosomatic” were either monodisciplinary or smaller multidisciplinary C-L services.

The prevailing view in the literature is that the pattern of C-L service delivery is patchy.⁷ This article tests that view empirically in multivariate analysis of the univariate results reported earlier.⁵ Because C-L service delivery, based on psychosomatic principles, is more theoretically driven and less psychiatrically oriented, a further hypothesis is that this theoretical difference will be reflected in characteristics of the referred populations.

METHODS

Sample

The general outline of the ECLW Collaborative Study has been described in an earlier article.¹ The C-L services studied were to satisfy the following inclusion criteria: acceptance of the period of study (1 year), a minimum case-load of 26 cases, satisfaction of reliability criteria, and agreement to provide institutional and provider data. The study was coordinated by a program management group assisted by a network of representatives from various European countries. The network enabled the program management group to set up central and national training and reliability studies and to guarantee the reliability of the data collected from the broad sample of services.^{2,3} The final sample consisted of 56 C-L services in the following European countries: Belgium (4), Finland (6), France (1), Germany (11), Greece (4), Italy (5), the Netherlands (7), Norway (3), Portugal (5), Spain (3), and the United Kingdom (7). A total of 226 consultants spoke with 14,717 patients. Patients under 18 years of age were excluded, as were patients referred by casualty departments, because the study was focusing on inpatient C-L service delivery. The validation of the patient registration form and the psychiatric diagnoses has been reported in previous papers.^{2,3} The registration form consisted of 68 items. It was developed by the program management group and the national coordinators, and the form’s reliability was tested on 220 consultants with satisfying results. For the ICD-10 diagnoses, 167 of the 220 consultants (76%) had a kappa of at least 0.70, and only 13 (6%) had a kappa of 0.40 or lower.

Variables

Because our present purpose is to identify characteristics of the referred populations, we have included the following variables and categories, which can be distinguished into three main groups: 1) Status at referral: the basic clinical characteristics of patients at referral, including the referring ward (general medicine, surgery, neurology, other); type of referring ward (intensive care unit, inpatient ward, other); primary reason for referral (deliberate self-harm, unexplained physical complaints, problems coping with illness, substance abuse, current psychiatric symptoms); level of consciousness at referral; mobility status (ambulant, bedridden); principal physical diagnostic groupings (cancer, injury, other physical illnesses, no clear physical illness); and principal psychiatric diagnostic

groupings (substance abuse, mood, anxiety and adjustment disorders, dementia, delirium, other psychiatric disorders, including psychotic ones).

2) Status before admission: the physical and mental vulnerability and the health care utilization of patients in terms of actual medical and psychiatric care in the past 5 years; current mental health treatment status; past consultations with the C-L service; and poorest mobility status during the past year.

3) Sociodemographic characteristics: these included age, gender, marital status, present living situation, employment status, and educational attainment. Process variables such as lag time, urgency, and type of consultation (classic, contract, liaison) were omitted, because their relationship to patient characteristics has been explored separately.⁸

Statistical Analysis

Data Reduction For a more extensive description of the statistics, see Opmeer.⁸ We explored the primary sources of variation within each of the three groups of variables. The reason for analyzing the groups separately was to identify pertinent characteristics within the three groups while eliminating interaction effects of variables from the other two groups. Because the measurement level of almost all data was nonlinear (nominal and sometimes ordinal), we applied principal components analysis by alternating least squares (PRINCALS in SPSS) as an alternative to classic linear principal component analysis (PCA).⁹ Data reduction within each group was to result in one or more factors consisting of variables that showed strong associations. These factors or domains would represent the original information optimally in a reduced number of variables (composite variables) and can be seen as a kind of scale construction. The alternating least squares solution might expose one or more groups of referrals that dominate the solution. Such a marked deviation from the remaining population would then be regarded as a distinct group, identified by an indicator variable.

Aggregation to Site Level The reduced set of composite and indicator variables were aggregated to the site level in two ways: the continuous composite variables were averaged over the C-L services; thus, a hospital with a higher average had relatively more referrals with a high score on that variable; and for indicator variables, a percentage indicates the proportion of referrals belonging to the indicated category.

Cluster Analysis of Referred Populations Ward's method was applied in SPSS to generate clusters and classify referred populations into them because it takes the overall similarity of the characteristics into account by minimizing the variance within clusters.¹⁰ Selection of the appropriate number of "characteristic" populations was based on their clinical relevance and on a scree test, taking into consideration the distance between cluster centroids. As Aldenderfer¹⁰ advises, we further explored the stability of the cluster solution by replicating it in subsamples of the 56 referred populations.

RESULTS

Data Reduction (Figure 1)

Status at Referral The principal components analysis singled out two distinct subpopulations from the sample as a whole: patients referred after deliberate self-harm ($n = 2,338$) and patients referred or diagnosed for substance abuse ($n = 1,905$). These subgroups became indicator variables for the subsequent cluster analyses (Table 1). The remaining data set ($n = 10,474$, 71%) turned out to be more heterogeneous, as indicated by a more even distribution over the two resulting factors. The fit of the more restricted solution (single fit) was 0.65 (with eigenvalues of 0.39 and 0.27 for the two dimensions). Because almost no loss occurred by selecting it rather than the multiple fit model (0.00), the more parsimonious (single fit) model was deemed the best solution.

The first dimension was defined by three variables describing a patient's psychiatric diagnosis, the reason for referral, and the level of consciousness at the first visit (Figure 2, Table 2). The answer categories of the three variables are loaded in the following order: Not Alert, Delirium, Dementia, Current Psychiatric Symptoms, Psychoses, Mood Disorders, Unexplained Physical Complaints, Less Frequent Psychiatric Diagnoses, No Diagnosis, Coping, and Somatoform Disorders. This dimension thus ranked the psychiatric disturbances in a hierarchy virtually identical to that defined by ICD-10. It can therefore be said to excellently reflect the severity of psychopathology. One extreme of the dimension represented the psychiatric disturbances with a more direct etiological relation to serious physical illness (and this was additionally reflected by an association with a variable of an intermediate dimension discussed below—the intensive care unit as the location where the patient was seen). The other pole of the dimension represented psychiatric disorders that presented them-

selves as physical illnesses presumed to have a stronger psychological component in their etiology. This first dimension can thus be expressed in terms of two clinically identifiable constructs: the severity of psychopathology or from organic to somatization.

The second statistical dimension represented two variables: the referring ward and the major physical diagnostic groupings derived from the ICD-9 classification (cancer, injury, other physical illnesses, no clear physical illness). The answer categories of these two variables loaded in the

FIGURE 1. Process of data reduction and cluster analyses

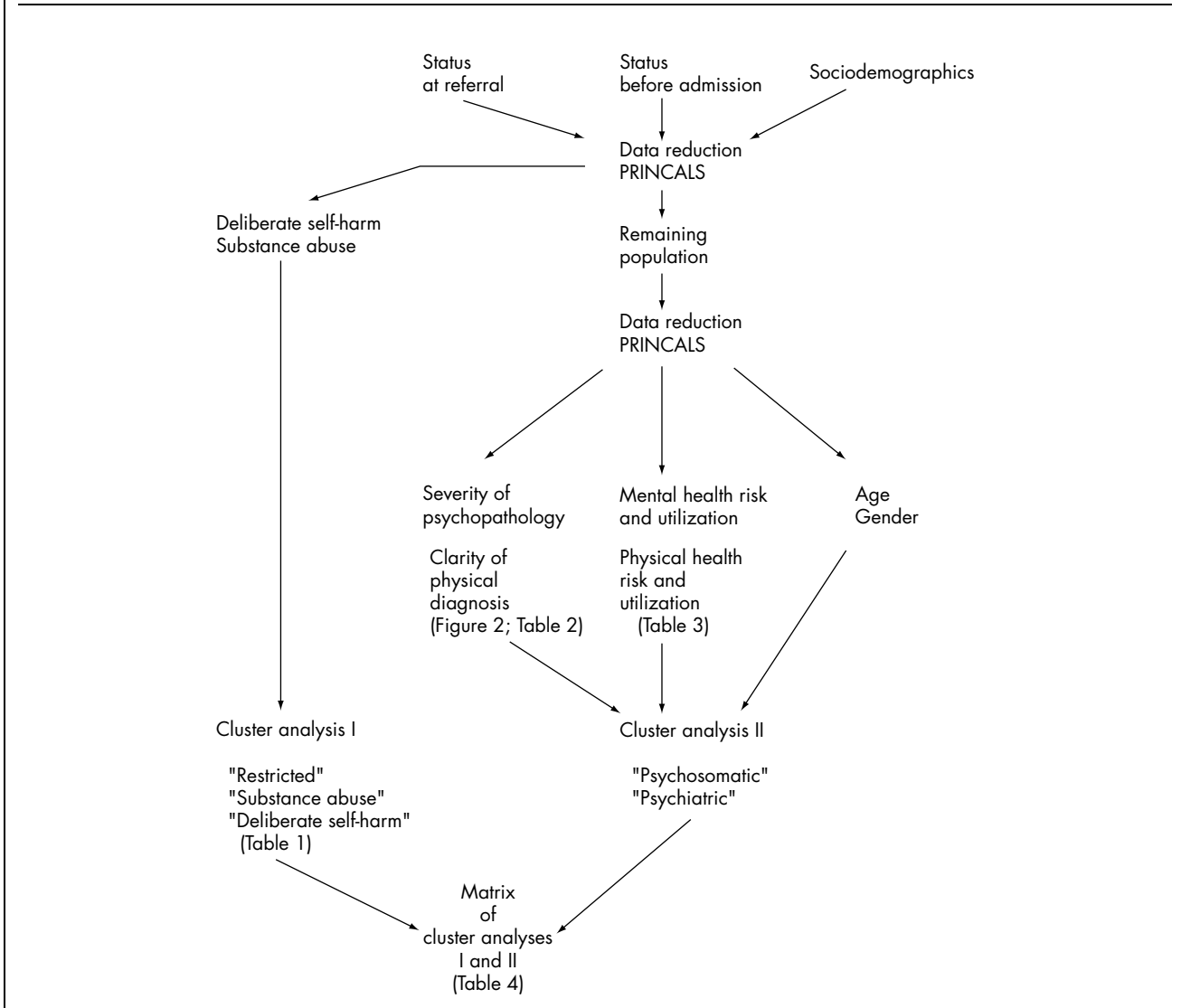


TABLE 1. Proportion of deliberate self-harm and substance-abuse patients: characteristics of referred populations

Cluster	Restricted		Substance Abuse		Deliberate Self-harm	
	mean%	min/max%	mean%	min/max%	mean%	min/max%
Referral characteristics						
Deliberate self-harm	1.3	0.0/7.5	7.3	2.3/31.0	24.9	5.4/58.8
Substance abuse	6.4	2.0/12.7	21.4	12.7/34.1	9.9	3.9/18.0

Note: The proportional distribution of deliberate self-harm patients across consultation-liaison services is skewed. The clusters are based on the square root transformation. For purposes of interpretation, the means of the nontransformed proportions are given here.

following order: Injury, Surgical Wards, Cancer, No Physical Illness, Other Physical Illness, Neurology, General Medicine, and Remaining Wards including Dermatology and Obstetrics/Gynecology. The second statistical dimension can be understood in terms of the clinical difference between surgical and nonsurgical wards. Surgical wards imply patients admitted with a clear surgical indication, such as injury or cancer. In general medicine wards, cancer patients are often admitted for more complex chemother-

apy, a procedure comparable to a surgical procedure. This was reflected statistically in the intermediate position of the variable Cancer between General Medicine and Surgery. General medicine and neurology can be characterized clinically as having patients with multiple disorders or for whom no diagnosis can be established. General medicine wards are well known for their more complex patients and diagnostic dilemmas. Hence, the best clinical interpretation of this dimension seems to be clarity of the physical di-

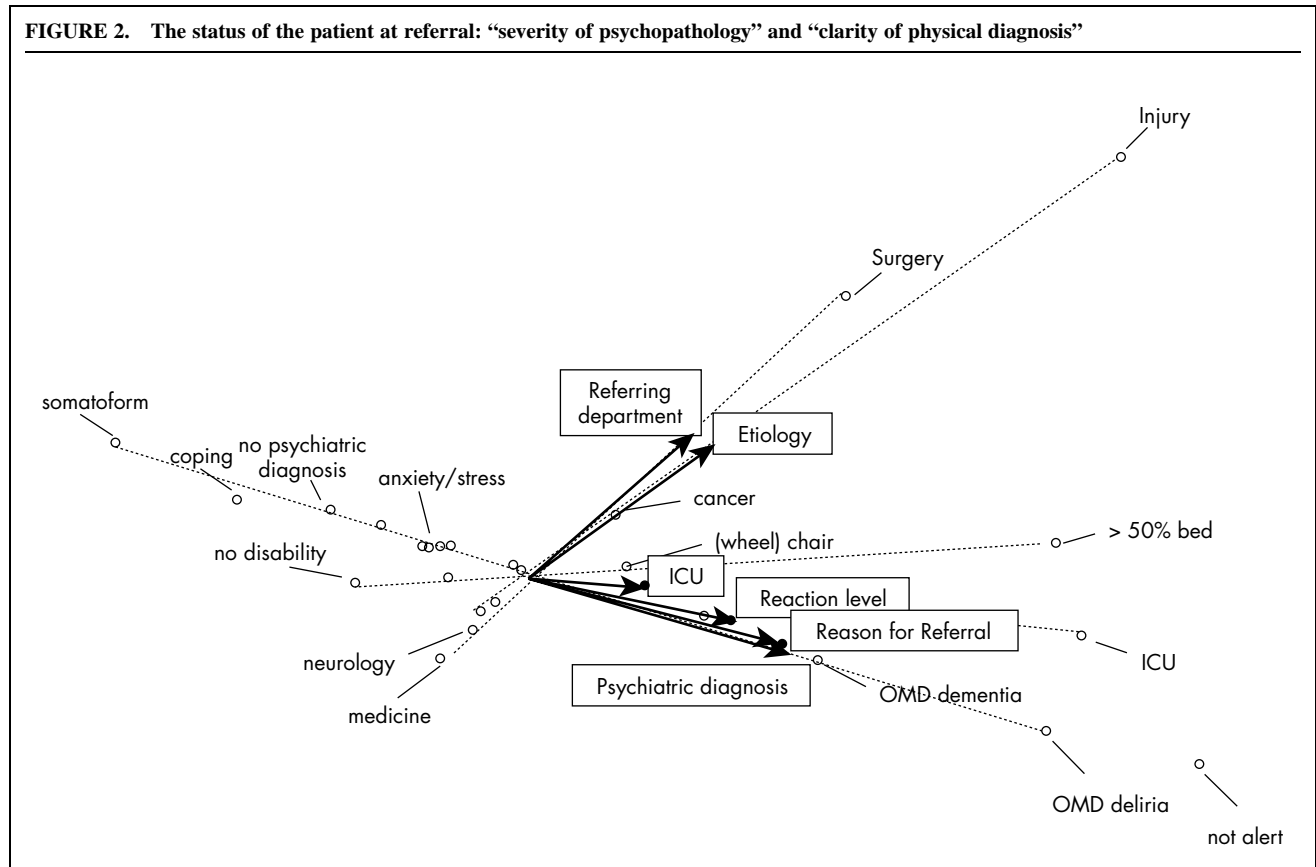


TABLE 2. Status at referral: rotated factor matrix

Status at referral characteristics	Dimension		Total Fit
	1	2	
Referring department	—	0.82	
Type of referring department	0.31	—	
Reason for referral	0.57	—	
Reaction level scale	0.75	—	
Motility status at referral	0.58	0.40	
Main physical diagnostic groups	—	0.81	
Psychiatric diagnosis	0.75	—	
Eigenvalues	0.30	0.18	0.48

agnosis (indicating the sensitivity and specificity of the physical diagnoses) or from general medicine to surgery.

Between, and hence associated with, these two dimensions are the variables describing patients’ mobility status and the type of referring service, indicated by the variable “intensive care unit.”

Status Before Admission (Table 3) To avoid performing analyses on different subsets of the study sample, we also excluded the patient groups defined by the indicator variables (deliberate self-harm and substance abuse). The PCA

solution had a total fit of 0.51 (eigenvalues 0.32 and 0.19), with no relative loss in the less restricted model. Two distinct dimensions could be distilled from the loading of the answer categories. These can be described as physical and mental health risk and care utilization. No relation was found between previous psychiatric care, including hospitalization, and care delivered in the general health care sector. The presence of a previous medical record at the C-L service, dating from either earlier hospitalization or outpatient referral, is associated with both factors.

Sociodemographic Characteristics Our principal components analysis showed age to be associated with living situation, marital status, and employment status. That was predictable, as several answer categories of these sociodemographic variables were clearly related to specific age phases (e.g., younger patients are more likely to live with parents and older patients to be retired or widowed). Thus, because age reflects variations in life cycles, we selected it as a variable that could reliably represent such variations. Gender was not found to be associated with any of the other variables and was therefore treated as a separate variable in the further analyses.

Aggregation to Site Level To assess differences across C-L services in the characteristics of their referred populations, patient scores on each composite dimension or indicator variable were averaged over the services.

Cluster Analysis of Referred Populations Our first cluster analysis was performed on the indicator variables “deliberate self-harm,” “substance abuse,” and “remaining population” (Table 1). The second was performed on the reduced factors of the remaining population (Table 1, Table 2, Table 3, and Figure 2).

The cluster analysis of “deliberate self-harm” “substance abuse,” and “remaining population” generated three clusters. The 12 C-L services in the first cluster saw a be-

low-average proportion of deliberate self-harm and substance abuse patients: about 8% of their referred population, almost all of whom were for substance abuse. Thus, service delivery to these two populations was a minor function of these C-L services. This cluster, henceforth referred to as “restricted,” included none of the Portuguese, Spanish, Finnish, or Dutch C-L services. It contained 5 German services, including 4 of the 6 with a psychosomatic profile. It further included 2 of the 4 Greek services and 2 of the 5 Italian ones. The second cluster comprised 13 C-L services. They saw the highest proportion of patients with substance-use problems, and 7% of their patients were referred for deliberate self-harm. These two populations together represented nearly 30% of the patients seen by the C-L services in this cluster. This second cluster, henceforth termed “substance abuse,” included all the Spanish and almost all the Portuguese C-L services.

In contrast, the C-L services in the third cluster were focused more strongly on deliberate self-harm populations (25% of their patients, plus an additional 10% for substance abuse). The indicator populations thus made up more than one-third of their users. This cluster, which we will call “deliberate self-harm,” was the largest of the three, containing more than half of all C-L services, among them all the Finnish ones, 5 of the 7 UK ones and 6 of the 7 Dutch ones. Although the German psychosomatic C-L services predominated in the “restricted” cluster, the remaining German C-L services were distributed over the other two clusters. Two of the 3 Norwegian services belonged to the “deliberate self-harm” cluster, as did 2 of the 4 participating Greek ones.

The cluster analysis performed on the indicators and the factors in the remaining population yielded two prominent clusters. Though the solution remained stable in subsets, the results of the scree test were not clear-cut. Because no clinical interpretations were apparent for additional clusters, the two-cluster solution was deemed adequate. One cluster, which may be called “psychosomatic,” contained 7 C-L services, including all the German psychosomatic services and one Norwegian service; the remaining 49 belonged to the other cluster, which we have called “psychiatric.”

Status at Referral Distinctions were found in the proportions of referrals from the various wards. The psychosomatic C-L services received a higher proportion (20%) of referrals from neurology, twice that of the psychiatric services. Psychiatric services saw twice the percentage of surgical patients (20% vs. 10%) and patients in intensive

TABLE 3. Status before admission: component loadings

Status before admission characteristics	Dimension		Total Fit
	1	2	
Psychiatric care past 5 years	0.87	-0.19	
Physical care past 5 years	0.20	0.78	
Mental health outpatient treatment at admission	0.84	-0.20	
Known at own service	0.65	0.20	
Worst motility status during the past year	0.07	0.78	
Eigenvalues	0.39	0.26	0.65

European C-L Services

care units (3% vs. 1%). The most prominent distinction between the two service types was the proportion of patients referred for unexplained physical complaints (48% vs. 21%). At the same time, this shows that dealing with unexplained physical complaints was an important function of psychiatric C-L services too. We found a reverse relationship between the two service types in the proportions of patients with current psychiatric symptoms: 31% for the psychosomatic services compared with 54% for the psychiatric ones. The contrast was further evident in the proportions of patients in a clouded state of consciousness at referral (1% vs. 15%). Psychiatric C-L services also saw a higher share of cancer patients (12% vs. 6%) and injury patients (8% vs. 4%). There was also a considerable contrast between psychosomatic and psychiatric C-L services in the psychiatric diagnoses made: 5% versus 22% for dementia and delirium, and 13% versus 5% for somatoform disorders.

Preadmission Status The patient population seen by psychosomatic C-L services was more mobile than that of the psychiatric services in the past year: 70% vs. 55% of the patients were ambulant.

Sociodemographics The population seen by psychosomatic C-L services was younger and contained more women than that seen by psychiatric C-L services.

DISCUSSION

Types of Services (Table 4)

Integrating the results of the two cluster analyses, we see a marked difference between the populations referred

to “psychosomatic” and “psychiatric” C-L services. The psychosomatic services saw virtually no deliberate self-harm patients and only a low percentage of substance-abuse patients. The clustering of most or all of the psychosomatic services into the same group in both our cluster analyses appears to confirm our assumption that services of this type probably have a more theoretically driven model and a clearer focus of service delivery. This is reflected in their focus on patients with unexplained physical complaints and on a younger, less severely physically ill and more mobile population without consciousness disturbances. Except for a small mixed group of six psychiatric C-L services from several countries, the caseload of deliberate self-harm and substance-abuse patients of the majority psychiatric C-L services comprised one-quarter to one-third of their referrals.

National Differences

All but one of the “psychosomatic” C-L services were in Germany. In the “substance abuse” group ($n=12$) and the “deliberate self-harm” group ($n=30$) there was evidence of national tendencies: all 3 Spanish and 4 of the 5 Portuguese services belonged to the group of 12 services with 20% substance abuse patients. All of the Finnish, 6 of the 7 Dutch, and 5 of the 7 UK services belonged to the group of 30 in the “psychiatric” and “deliberate self-harm” clusters. The German psychiatric services and the Belgian and Italian C-L services were distributed less homogeneously. The services in Finland operated in accordance with a national design. The UK and the Netherlands have networks of C-L psychiatry in which the consultants maintain

TABLE 4. Populations seen by consultation-liaison (C-L) services in the European Consultation-Liaison Workgroup Collaborative Study

		Restricted		Substance Abuse		Deliberate Self-Harm	
“Psychosomatic” C-L services	7	Germany, PS	4	Germany, PS	1	Germany, PS	1
		Norway	1				
“Psychiatric” C-L services	49	Belgium	1	Belgium	1	Belgium	2
		Germany, P	1	Germany, P	2	Germany, P	2
						Finland	6
						France	1
		Greece	2			Greece	2
		Italy	2			Italy	3
				Netherlands	1	Netherlands	6
				Portugal	4	Norway	2
						Portugal	1
				Spain	3		
		United Kingdom	1	United Kingdom	1	United Kingdom	5

Note: P = Psychiatric; PS = Psychosomatic

close contacts and that has promoted a more cohesive development of the C-L services.⁷

Patchy Pattern

No other differences in the C-L referral populations were found. This is another important empirical finding: except for the differences already noted above, the referred populations did not cluster to form other subtypes of psychiatric C-L services. C-L services comparable in one dimension (for instance older populations, more intensive care, or neurological patients) manifested different patterns on the other dimension. This empirically confirms the hypothesized “patchy” pattern of service delivery.⁷ Although the data available did not enable us to describe hospital populations, it does seem to support the conclusion that C-L service delivery is defined more by the needs of doctors than by those of the patients.⁶

Geriatric Patients

Elderly patients with concurrent somatic and organic mental disorders form a major patient group for the “psychiatric” C-L services, providing empirical evidence for an overlap with geriatrics. This would imply that psychiatric and geriatric C-L services need to rethink their functions.

CONCLUSION

We performed cluster analyses on indicators and dimensions derived from principal components analysis of a varied group of European C-L services. This generated a series of characteristics of the populations served by these services, which we believe are representative of the better developed C-L services in the participating countries.⁶ A prominent group of patients were those referred for deliberate self-harm or for known or suspected substance abuse. Psychosomatic C-L services were found to be more specialized in assessing unexplained physical complaints, and they had close relationships with neurology wards. Such patients are a critical target population because they have a high rate of medical care utilization and one-third of them are still employed. This type of patient is also seen by the psychiatric C-L services, the latter generally serve a more seriously ill population in both a physical and a psychiatric

sense. Although there were also other major differences between the services, these appeared to follow no clear pattern. That seems to confirm the “patchy” state of affairs described in the literature, which most probably reflects the spectrum of needs of the doctors and nurses.⁵

Here we have described the characteristics of the core populations of C-L services. It is evident that most hospitals are not developing service delivery to these populations in any systematic fashion. From the findings presented here, hospitals could extrapolate risk factors and indicators that would enable them to better tailor such services to the needs of the target populations.¹¹⁻¹³ Because C-L services have been shown to reduce unnecessary medical care utilization,¹⁴ the staffs of C-L services can and should make use of such empirical evidence in their negotiations with department heads, hospital boards, and health service subscribers. In addition, national C-L organizations could use such information to adapt the graduate and postgraduate psychiatric courses in their training programs to better prepare their consultants.

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