

Patient Compliance With Medical Advice Given by Telephone

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Data on compliance with medical advice given by telephone consultation services are currently lacking. The aim of this study was to assess patient compliance with medical advice given by a call center. A cross-sectional telephone survey was carried out on a random sample of 463 callers 72 hours after contacting the Grenoble Dial 15 center in France.

Four hundred nine subjects (88.3%) participated in the study. Of these, 286 callers (69.9%) complied with the medical advice given. Compliance was 61.4% among patients who were advised to treat themselves, 83.9% among patients who were advised to consult a general practitioner during business hours, and 64.0% among patients who were advised to go to an accident and ED ($P < .01$). The survey pointed out adverse events resulting from the service. Assessing patient compliance can be an important source of information for improving aspects of patient management provided by telephone consultation services. (Am J Emerg Med 2003;21:288-292. © 2003 Elsevier Inc. All rights reserved.)

Health care systems have encountered a number of difficulties in meeting their responsibility for patient care 24 hours a day and in satisfying the increasing demand for primary care services over the past decade.¹⁻⁴ A large part of patient demand for emergency medical services could be managed by a telephone advice service, particularly outside normal working hours.^{5,6} Telephone consultation services have been set up in various settings.⁷⁻¹¹ However, the impact of telephone triage on general practitioner workload and on demand at EDs remains controversial.¹² The experience of the French emergency medical service Dial 15 (SAMU Center 15), officially launched in 1986, could contribute to this debate, despite structural differences between the French and US health care systems.¹³ There are 105 SAMU units disseminated over the French territory at the rate of 1 per administrative county.¹⁴ These call centers guarantee permanent medical assistance for the entire population and adapt responses to the seriousness of each case.

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All calls are taken by a team of trained physicians, and general practitioners are encouraged to participate in this service. Patients always have telephone access to a physician who determines the need for telephone advice, ED services, consultation with a general practitioner, a home visit by a doctor, or a mobile emergency intensive-care unit, with reference to predetermined guidelines. Various local media campaigns associating general practitioners have been designed to inform the population on how to use the Dial 15 service. The community now shows satisfactory awareness of the service. The number of calls received by the Dial 15 centers has tripled in 10 years, increasing from 3.5 million in 1987 to 11 million in 1997. This illustrates that Dial 15 centers have dealt with all calls for medical assistance and not only serious ones requiring emergency health care. Little research has been carried out to explore patient compliance with medical advice given by telephone consultation services. A previous study suggested a disagreement between the advice that nurses documented as having been given, the advice the caller recalled receiving, and the action the patient subsequently took.¹⁵ Moreover, surveying patient compliance should constitute a critical method of identifying potential areas for improving aspects of patient management provided by telephone consultation services. The aims of this study were to survey patient compliance with the advice offered by a French call center, assess overall satisfaction, and investigate adverse events.

METHODS

Setting

The study was conducted at the Dial 15 center of the teaching hospital of Grenoble, France. This call center serves approximately 1.06 million people. Of these, 40% live in a large urban center of more than 200,000 inhabitants and 25% live in rural and mountainous areas. The geographic area covered is approximately 7,430 km². The call center managed 148,000 calls in 2000, with 51 general practitioners participating in the service. Two or more physicians and 3 receptionists are present at all times. The receptionists take patient details using specific software and then pass calls on to a physician. Data collected include the date and time of the call, the caller's name and phone number, the relationship to the patient, the patient's name, gender, and age, the chief complaint, and advice given. The out-of-hours periods were defined as 7 PM to 8 AM on weekdays in addition to weekends and holidays.

Population

The study included all the calls received between April 1 and 30, 2000, and followed by medical advice. Calls for

which patient compliance made no sense were excluded from the study: calls for which the physician arranged for a home visit or for an emergency mobile intensive-care unit, contacts from other health professionals, and requests for information about available services (for example, the address of the on-duty pharmacy, dentist, and general practitioner) were excluded.

Procedure

One of the authors contacted the callers within 72 hours of their call to the call center. The follow-up period was determined to limit memory bias. Attempts to reach patients were abandoned after an explicit refusal or 5 unsuccessful calls at different times of the day (no answer, busy line, answering machine, or wrong phone number). The interviewer introduced himself by describing the purpose of the study and the guarantee of confidentiality. The survey was conducted using a 16-item questionnaire on the following topics: overall satisfaction, self-reported compliance with the advice given, the action the patient subsequently took, and baseline characteristics (monthly household income, family size, marital status, occupation, and general practitioner). The process of questionnaire development should ensure content validity. Items were devised by experts or were taken from published French-language instruments.^{16,17} The item pool was submitted to 15 consecutive callers. Minor rewordings were necessary because of poor comprehension. No additional item was suggested. Test-retest reliability could not be assessed because of complex maturation phenomena in self-reported compliance or satisfaction.¹⁸ Completing the questionnaire lasted an average of 10 minutes. Details of the medical advice and repeat calls within 72 hours were extracted from the record database. We were unable to verify hospital or other outpatient use.

Outcome Measures

Self-reported compliance was assessed using a 3-point Likert scale. Patients were also asked to rate their level of overall satisfaction using a 4-point Likert scale. Actual compliance was assessed by checking the action the patient stated he or she had subsequently taken against the advice that physicians documented as having been given. Adverse events were investigated by gathering deaths and attendance at EDs within 72 hours of a contact.

Sample Size

A random sample of 12% of the calls was compiled to enroll at least 400 patients. The sample size was considered large enough to estimate the true proportion of patient compliance with a sampling error of, at most, 5%.

Statistical Analysis

The rate of patient compliance was calculated on all eligible patients and a 95% confidence interval for proportions was determined by using the normal approximation to the binomial distribution. We systematically examined the relationship between compliance and baseline characteristics. Univariate analysis was performed using the Chi square test or Fisher's exact test, where appropriate. The critical level of significance was $P < 0.05$. Statistical analyses were performed using the SPSS software (Chicago, IL).

RESULTS

Response Rate

The Dial 15 center received 10,160 calls of which 3,852 were eligible during the study period (Fig 1). The random

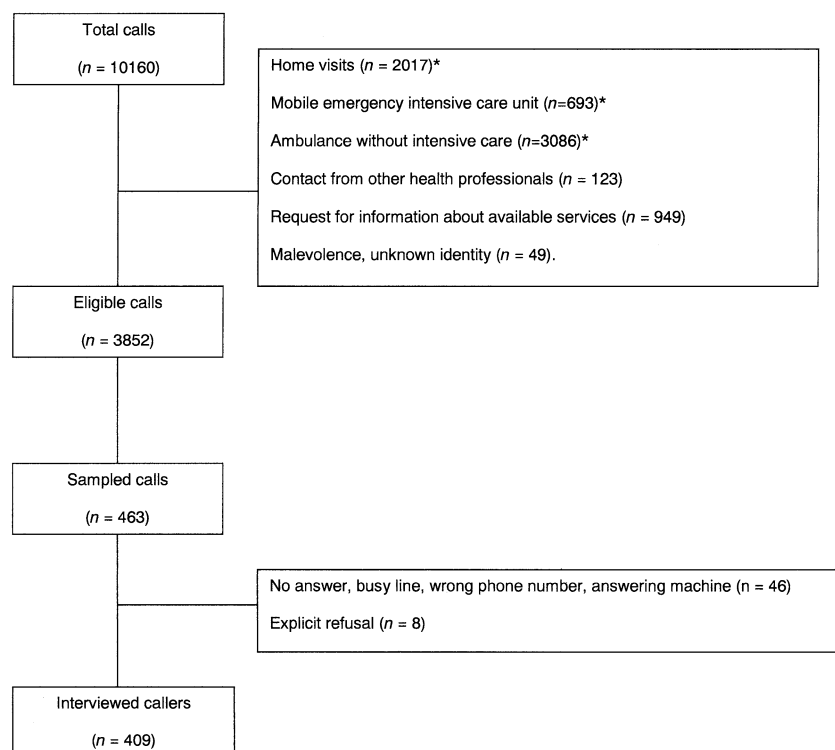


FIGURE 1. Survey sampling. *Not exclusive items (more than one item per patient).

TABLE 1. Characteristics of Calls and Rate of Patients Who Actually Complied With Medical Advice

Characteristics	No. of Calls	Percentage of Compliance (95% CI)	P
Caller			.22
Patient	158	67.1 (59.8–74.4)	
Parent, spouse	201	69.7 (63.3–76.0)	
Other	50	80.0 (68.9–91.1)	
Time of call			.49
Working hours	59	66.1 (54.0–75.3)	
Out of hours*	350	70.6 (65.8–78.2)	
Previous call			.69
Within 6 mo	139	71.2 (63.7–78.7)	
More than 6 mo before	121	66.9 (58.6–75.3)	
None	149	71.1 (63.9–78.4)	
Type of advice			<.01
Self-treat	210	61.4 (54.8–68.0)	
To see a general practitioner during working hours	149	83.9 (78.0–89.8)	
Go to an ED	50	64.0 (50.7–77.3)	
Overall satisfaction			<.01
Fairly/very satisfied	344	73.5 (68.9–78.2)	
Fairly/very unsatisfied	59	52.5 (39.8–65.3)	

*7 PM to 8 AM on weekdays, weekends, and holidays.

sample included 463 callers. Forty-six subjects (9.9%) could not be reached and 8 callers (1.7%) declined to participate. Finally, 409 callers were interviewed, giving a response rate of 88.3%.

Patient Characteristics

One hundred fifty-eight callers (38.6%) were the patients themselves (Table 1). The mean age of the patients was 24.7 years (95% confidence interval; range, 22.5–26.9 y) and 53.8% were women (Table 2). One hundred seventy calls (41.6%) concerned pediatric patients (up to 15 y of age). Three hundred fifty calls (85.6%) were received during the defined out-of-hours periods. The most common chief complaints were gastrointestinal (18.3%), musculoskeletal (14.2%), and upper respiratory (12.5%) (Table 3). Two hundred ten subjects (51.3%) were advised to treat themselves and to call again if the situation worsened, 149 patients (36.4%) were advised to see a general practitioner during normal working hours, and 50 patients (12.2%) were advised to immediately go to an accident and ED.

Compliance and Overall Satisfaction

Three hundred forty-four callers (84.1%) were fairly or very satisfied with the medical advice and 363 callers (88.7%) thought they had followed some or all of the advice given. In fact, 286 subjects (69.9%; 95% confidence interval, 65.4–74.4%) actually complied with the advice when checking the record of the call. Actual patient compliance was significantly related to the type of advice; it was 61.4% among patients who were advised to treat themselves, 83.9% among patients who were advised to consult a general practitioner during the daytime hours, and 64.0% among patients who were advised to go to an ED ($\chi^2 = 21.9$, $df = 2$, $P < .01$) (Table 4). There was no significant discrepancy in patient compliance based on baseline characteristics, except overall satisfaction (Tables 1 and 2).

TABLE 2. Baseline Characteristics and Rate of Patients Who Actually Complied With Medical Advice

Characteristics	No. of Patients	Percentage of Compliance (95% CI)	P
Age group (y)			.09
<15	170	68.8 (61.7–75.9)	
15–59	199	67.8 (61.2–74.4)	
≥60	40	85.0 (73.9–96.1)	
Gender			.30
Female	220	67.7 (61.5–73.9)	
Male	189	72.5 (66.1–78.9)	
Residential town size (inhabitants)			.21
<2000	66	78.8 (68.9–88.7)	
2000–20,000	69	63.8 (52.4–75.1)	
20,000–50,000	44	63.6 (49.4–77.9)	
≥50,000	230	70.4 (64.5–76.3)	
Marital status			.79
Single, divorced, widowed	303	68.1 (58.6–77.7)	
Married	91	69.6 (64.5–74.8)	
Household size (people)			.89
1	47	63.8 (50.1–77.6)	
2	41	73.2 (59.6–86.7)	
3	108	69.4 (60.8–78.1)	
4	129	70.5 (62.7–78.4)	
≥5	69	68.1 (57.1–79.1)	
Monthly household income (euro)			.35
<760	49	61.2 (47.6–74.9)	
760–1525	130	72.3 (64.6–80.0)	
≥1525	194	70.1 (63.7–76.5)	
Household headed by			.79
Blue collar worker	56	66.1 (53.7–78.5)	
White collar worker	273	69.2 (63.8–74.7)	
Other	64	71.9 (60.9–82.9)	
Has a general practitioner			.63
Yes	364	70.9 (66.2–75.5)	
No	30	66.7 (49.8–83.5)	

TABLE 3. Chief Complaints of Patients

Category	No. of Patients (%)
Gastrointestinal (vomiting, abdominal pain, diarrhea)	75 (18.3)
Musculoskeletal (backache, stiff neck, trauma)	58 (14.2)
Upper respiratory, sore throat, cough	51 (12.5)
Fever	37 (9.0)
Skin	31 (7.6)
Lower respiratory, asthma	27 (6.6)
Psychological (depression, suicide attempt)	20 (4.9)
Urogenital (dysuria, renal colic, urinary tract infection)	19 (4.6)
Fainting	18 (4.4)
Poisoning	12 (2.9)
Ophthalmologic (conjunctivitis, foreign body)	10 (2.4)
Other	51 (12.5)

Adverse Events

One subject (0.2%) for whom the call center had been contacted died at home. This patient was a 64-year-old man with a history of pancreatitis and whose chief symptom was chest pain. The caller was advised to self-treat. The physician arranged for an emergency mobile unit after a repeat call received 30 minutes later because of worsening conditions. The cause of death was an acute myocardial infarction. Twelve of the 125 callers (9.6%) who were advised to consult a general practitioner during normal working hours were subsequently sent to an ED (Table 4). Moreover, 7 of the 69 callers (10.1%) who did not follow the instruction to treat themselves and contacted a general practitioner were also sent to an ED.

DISCUSSION

This study suggests that self-reported compliance with the medical instructions given by the staff of our call center (88.7%) was comparable to that observed in other settings.^{7,19,20} In fact, actual compliance (69.9%) was lower than that patient thought. Patient compliance was significantly related to overall satisfaction. Indeed, patient satisfaction is considered to be predictive of future behavior by several authors.¹⁵ A previous qualitative survey reported

that the most common reason for dissatisfaction was the caller feeling that the doctor could not make a correct diagnosis without having seen the patient.²¹ Moreover, many patients were anxious about their ability to describe symptoms over the telephone, or understand and follow the advice they received.²¹ Using physicians to handle these calls does not seem to increase compliance with the advice compared with a help line staffed by nurses. Poor compliance with the instructions could result from the fact that the advice is given by someone who does not know the patient's history.²¹ Moreover, patient compliance was significantly related to the type of advice in our study. These findings are consistent with those of a previous study carried out in a pediatric resident continuity clinic of a tertiary hospital.²² Compliance with medical advice seems to encompass expectations, perceived appropriateness of the advice, and satisfaction.^{15,17,23} Therefore, telephone consultations require specific skills on the doctor's part, especially because the doctor is not familiar with the patient and has to come to a decision (diagnosis, referral, or self-treatment).⁹ Training in giving advice should cover areas such as listening and questioning skills, including the need to check that callers have understood the advice given before ending a call.^{9,24} The vast majority of telephone consultations evolved without problems.²⁵ However, our survey revealed adverse events such as death or delayed admissions to an ED. Our staff systematically reviews these adverse effects to explore the appropriateness of the advice.²⁶ A large part of the adverse effects could be unknown because of a lack of feedback.²⁷

It is particularly interesting to note that a large percentage of calls were received out of normal working hours. Indeed, telephone consultations, which are followed by self-care advice or by delayed consultation with a general practitioner, are expected to reduce the demand for home visits or emergency services.

Several methodologic limitations need to be considered in interpreting these results. First, the results of this study probably depend on the setting; both caller satisfaction and compliance are related to expectations, which differ from 1 country to another.¹⁵ Second, validity of self-reported compliance has not been established.¹⁵ Therefore, we tried to assess actual compliance by interviewing callers and checking the record of each call. However, we were unable to verify hospital or other outpatient use. Third, the patient-

TABLE 4. Patients' Compliance With the Medical Advice (no. of patients [%])

What the Patient Did Within 72 hours	Medical Advice That Physicians Documented as Having Been Given		
	Self-treat and Call Again	See a General Practitioner During Business Hours	Go to an Accident and ED
Self-treatment	116 (55.2)	10 (6.7)	7 (14.0)
Repeated call	13* (6.2)	9 (6.0)	0 -
Saw a general practitioner routinely	69† (32.8)	125‡ (83.9)	11§ (22.0)
Went to an emergency department	12 (5.7)	5 (3.3)	32 (64.0)
Total	210 (100)	149 (100)	50 (100.0)

*One patient died at home. Six subjects were subsequently sent to a general practitioner and two patients were advised to consult an ED.

†Seven subjects were subsequently sent to the ED.

‡Twelve patients were subsequently sent to the ED.

§Five patients were subsequently sent to the ED.

physician interaction may not be entirely logical and several obstacles exist which may prevent the patient from following the advice.²³ Patients' compliance is not necessarily the main criterion by which Dial 15 centers should be judged,^{12,28,29} but the perception of the patients can contribute important information to quality-of-care assessment that is not gained by monitoring solely more traditional measures of performance.³⁰

CONCLUSION

The provision of telephone advice by the staff of our call center is rated highly by the community and self-reported compliance with the advice is strong. Assessing patient compliance and investigating adverse events can be an important source of information for screening problems and developing an acceptable plan of action. Further qualitative research should be helpful to exploring why patients do not comply with the medical advice dispensed.

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