

through previous puncture sites which may be superficially infected.²

X-ray films demonstrate changes typical of osteomyelitis only after 10 to 14 days and usually show bone resorption in the area of the plantar cortex in osteomyelitis due to puncture wounds. In the case of older children with hematogenous osteomyelitis, there is usually destruction of the calcaneal epiphysis and metaphysis. Reossification usually takes three to four months, but has been noted to take up to three years.

The development of this iatrogenic complication of nursery care may carry with it considerable difficulties in dealing with both hospital staff and parents. If more than one person is involved in obtaining blood from the infant, identification of possible carriers of staphylococcus aureus is complicated. The physician must be sensitive to the concerns of the parents not only regarding the

etiology of the problem, but also in dealing with their emotional reactions towards those entrusted with the care of their child.

There is some controversy regarding the duration of antibiotic therapy in such cases. Ten days of antibiotic therapy may be adequate for infection derived from local sites, but many authors recommend treatment for from three to six weeks on the basis of possible systemic infection.²

References

1. Lilien LD, Harris VJ, Ramamurthy RS, et al: Neonatal osteomyelitis of the calcaneus: Complication of heel puncture. *J Pediatr* 88:478, 1976
2. Blumenfeld TA, Turi GK, Blanc WA: Recommended site and depth of newborn heel skin punctures based on anatomical measurements and histopathology. *Lancet* 1:230, 1979
3. Feigin RD, McAlister WH, San Joaquin VH, et al: Osteomyelitis of the calcaneus. *Am J Dis Child* 119:61, 1970

Social Support and Utilization of Medical Care

Robert L. Blake, Jr, MD, Carl Roberts, MSPH, Thomas Mackey, RN, MSPH, and
Michael Hosokawa, EdD
Columbia, Missouri

There is accumulating evidence that the availability and quality of social relationships affect an individual's health.¹⁻⁴ Social support is conceptualized as a valuable resource that enhances host resistance to environmental stresses.^{5,6} In this conceptual model a deficient lay support system increases vulnerability to illness and predisposes to utilization of medical services. This pilot study tests the hypothesized association of weak social support with increased use of professional services in a rural primary care setting.

Methods

The study population consisted of adult users of the only source of primary care in a midwest farm

community of 500 people. This clinic was staffed by a family nurse practitioner and a family physician and provided services three half-days a week. Demographic, socioeconomic, and family data were collected at the time of user registration. Information about each encounter was recorded on special forms by the provider. A utilization rate was calculated for each user by dividing the number of clinic visits by the number of days since registration, which occurred at the time of the first visit.

At the end of the first ten months of clinic operation a questionnaire was mailed to each user. Among the questions were two which assessed availability of social support: "When you are sick, is there a family member or friend who helps care for you?" and "Do you have a special person you confide in or talk to about yourself or your personal problems?" One question assessed health status: "How would you rate your overall

From the Department of Family and Community Medicine, University of Missouri—Columbia, Columbia, Missouri. Requests for reprints should be addressed to Dr. Robert L. Blake, Jr, Department of Family and Community Medicine, University of Missouri—Columbia, Columbia, MO 65212.

Table 1. Utilization Rate by Sex, Age, Social Support, Health Status, and Health Advisor				
Variable		Number	Utilization Rate (per 100 days)	Statistical Significance
Sex	Male	32	1.54	NS
	Female	40	1.64	
Age		72		$r = .21, P < 0.08$
Social Support	High	10	1.11	$F = 10.5, P < 0.001$
	Medium	45	1.31	
	Low	9	2.66	
Health Status	Good	29	1.11	$t = 3.1, P < 0.01$
	Less than Good	37	1.77	
Health Advisor	Yes	25	1.36	NS
	No	39	1.45	
NS = not significant				

health?" Another determined availability of a lay source of health advice: "Is there someone in the community other than a doctor or nurse of whom you ask health advice when you need to know what to do?"

The response options to the questions that assessed social support were "always," "sometimes," and "never." On the basis of these responses the authors calculated a social support score for each respondent. A value of one was arbitrarily assigned to the response "always," a value of two to "sometimes," and a value of three to "never." A score was computed by summing the numerical values of the responses. The range of social support scores was from two to six. Subjects were categorized into a high support group (score of two), medium support group (score of three or four), or a low support group (score of five or six).

Response options to the query about health status were "very poor," "poor," "average," "good," and "excellent." In the analysis, subjects were categorized as having good health (good and excellent) or less than good health (very poor, poor, and average). Response options to the presence of a lay source of health advice were "yes" and "no."

The study was limited to clinic users over the age of 17 years who had been seen for the first time at least four weeks prior to the time the questionnaire was sent out and the time utilization rates were calculated. Thus, the study focuses on utili-

zation during the first nine months of clinic operation (September 1978 through May 1979).

Results

Of 117 adult users of the clinic eligible for the study, 72 returned a questionnaire, a 62 percent response rate. The duration of respondent registration ranged from 28 to 294 days and the utilization rates ranged from .34/100 days to 4.46/100 days. The mean utilization rates of both respondents and nonrespondents were 1.6/100 days.

Table 1 shows the relationship of study variables with utilization. Since all of the users were white, race was not a factor in the analysis. Sex and the presence of a lay health advisor in the community did not affect utilization rate. There was a tendency of increasing age to be associated with increasing utilization. Health status and social support were associated with utilization. Respondents with low support had a higher rate of utilization and those with less than good health had a higher rate than those with good health. At this point it is necessary to consider the possibility that the apparent association of social support with utilization was secondary to the association of either age with utilization or health status with utilization.

Social support was inversely correlated with age. The mean ages for the three groups were high, 36.2 years; medium, 43.9 years; and low, 66.7 years, statistically significant differences ($F = 7.3, P < .005$). Age may well have been a confounding

variable. Controlling for the effects of age, seven respondents over the age of 60 years who had low social supports had a mean utilization rate of 2.9/100 days compared to a mean rate of 1.0/100 days for 13 respondents over 60 years who had medium or high supports ($t=4.3$, $P<.001$). The 3:1 ratio persisted when health status was included in the analysis. The six respondents over 60 years with low supports and less than good health had a mean rate of 3.1/100 days compared to a mean rate of 1.1/100 days for the nine over the age of 60 years with medium or high social supports and less than good health ($t=4.6$, $P<.001$). The association of low supports with increased utilization in respondents over 60 years was not secondary to the effects of age or self-reported health status. A similar analysis for those under the age of 60 years is not possible since there were only two respondents in the low supports group who were less than 60 years of age.

In the entire sample of respondents there was a tendency of those with high supports to have good health (six of ten) and those with low supports to have less than good health (seven of nine), but the numbers were small. In order to have larger numbers of subjects in each group, respondents were categorized into two social support groups instead of three, to further investigate potential confounding by health status. The 35 subjects with a social support score of two or three were categorized as high supports while the 29 with scores of four, five, or six constituted the low supports group. The 20 subjects with good health and high supports had a mean utilization rate of 1.0/100 days compared to a rate of 1.1 for the 15 with good health and low supports. When the respondent reported good health, social supports did not affect utilization. However, when health status was reported as less than good, social supports made a difference. The 15 subjects with less than good health and high supports had a utilization rate of 1.5 compared to a rate of 2.2 for the 14 with less than good health and low supports ($t=1.91$, one tailed test, $P<.05$).

Discussion

Several methodological limitations of the study are evident. The study population is small, is defined by distinctive geographical and sociocultural

characteristics, and is self-selected for a specific type of health care delivery system. The determination of antecedent-consequent relationships between social supports and utilization is precluded by the retrospective nature of the study. Use of only one source of care is measured. The authors do not know whether respondents with a certain level of social supports disproportionately used alternative sources of care in nearby communities. Also, since the authors did not measure symptoms or illness episodes occurring in the sample, the data do not delineate whether the effect of weak social support is to impair health or to lower the threshold for help seeking from professionals. Only 62 percent of the eligible adults responded to the questionnaire. While the utilization rates of respondents and nonrespondents were identical, there is a possibility of a selection bias that affected the results.

Despite the limitations, these findings contribute to an evolving body of knowledge pertaining to the effects of social resources on health seeking behavior. They suggest that an assessment of lay support resources, particularly among older people and among people with a perception of low health status, may reveal deficiencies of clinical significance. Further understanding of the role of social support should lead to more effective strategies in clinical and community interventions.

Social support has been defined and measured in many different ways. There is, as yet, no widely used uniform scale or instrument for the measurement of social support. From a practical standpoint, the questions used in this study to determine social support could be easily incorporated into clinic based information collecting systems for research and patient care purposes.

References

1. Nesper WB, Tyroler HA, Cassel JC: Social disorganization and stroke mortality in the black population of North Carolina. *Am J Epidemiol* 93:166, 1971
2. Nuckolls KB, Cassel JD, Kaplan BH: Psychosocial assets, life crisis, and the prognosis of pregnancy. *Am J Epidemiol* 95:431, 1972
3. Berkman LF, Syme SL: Social networks, host resistance, and mortality: A nine year follow-up of Alameda county residents. *Am J Epidemiol* 109:186, 1979
4. Vaillant GE: Natural history of male psychologic health: Effects of mental health on physical health. *N Engl J Med* 301:1249, 1979
5. Cassel J: The contribution of the social environment to host resistance. *Am J Epidemiol* 104:107, 1975
6. Pilisuk M, Froland C: Kinship, social networks, social support, and health. *Soc Sci Med* 12B:273, 1978