Parents' understanding of children's needs for medical care often differs from that of physicians. This study was made to learn how mothers would respond to particular symptoms and particular circumstances involving their children. Findings are presented and the implications discussed.

MOTHERS' INTENDED ACTIONS FOR CHILDHOOD SYMPTOMS

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The Problem

In 1960, the large cities of the United States had childhood mortality rates more than 55 per cent higher than the national average.[1] Within large cities the childhood mortality was greatest in the low-income areas.[2] Ironically, these areas are closest to the large, modern medical centers that operate outpatient clinics. It is clear that in the future these centers must pay more attention to the prevention of diseases which occur with increased frequency in these low-income neighborhoods, and to the way that medical care is sought by low-income urban families.

This study addressed itself to one aspect of the problem of providing medical care: mothers' responses to circumstances or symptoms possibly requiring medical attention. Parents' understanding of the need for medical care often differs from that of the physician. For example, it has been demonstrated that a realization of the urgency of a symptom affects appointment keeping,[3] and that the accuracy of a person's information about tuberculosis can be closely associated with appropriate use of a specific medical service.[4] The use of medical service can also be affected by factors such as the desire for medical care relative to the desire for material goods,[5] parents' educational level,[6] or parents' concern about their own health.[7] Use of services may be decreased in association with feelings of powerlessness and alienation,[6] or with a close-knit, nonscientific ethnic tradition.[8]

It is clear that if parents do not understand that some symptoms are related to life-threatening disease, some infants who might survive with early treatment will die. In this study, we sought to learn what a mother would do in response to particular symptoms in her child and to particular circumstances. Our first step was to describe a number of situations and to ask her what she would do in each case. Her answer should indicate which disease symptoms require more education of parents. The social characteristics of mothers, associated with misinformation about disease, should help clinicians or nurses predict which mothers need special assistance or advice about use of medical services.

A parent's error can occur in two directions: requesting medical help when it is not needed, or failing to seek help when the child is in danger. The pattern of social characteristics asso-

ciated with answers leading to overuse or underuse of services should suggest underlying causes and a general orientation for future study.

Procedures

Thirty-eight vignettes, each describing a situation that might require medical attention, were prepared. In some vignettes, the child's age and the time of day were specified. The symptom and situations presented ranged from life-threatening conditions to harmless physiologic reactions. They were arranged in random order, as listed in Table 1. Ten common responses to the

Table 1—Vignettes of symptoms and situations "What would you do if?"

1. Your child has had signs of a cold during the day but now is breathing very rapidly and with difficulty?
2. Your child ate some rat poison?
3. Your child fell off the steps onto his (her) head and began vomiting about an hour later?
4. Your child begins to cough?
5. You were polishing a table and your child took the bottle of polish and drank part of it?
6. Your baby ate two cigarette stubs from an ash tray?
7. Your child played outdoors all afternoon and now he complains of a pain in his foot?
8. Your child cried everytime he (or she) passes urine?
9. Your child is having a convulsion (fit) that has lasted more than 5 minutes?
10. Both of your child's eyes are watery and red and his (or her) nose is running with thin mucous?
11. Your two-month old baby has been crying steadily between 6:00 p.m. and 10 p.m.?
12. Your baby just lies flat; he (or she) seems too weak to lift his head?
13. Your child had a convulsion (fit) that lasted 5 minutes?
14. Your child who is not old enough to go to school has a hoarse voice and a cough?
15. At suppertime, when your baby is usually wide-awake, you notice that he (or she) is very tired and drowsy?
16. Your child has sneezed several times during the afternoon; at bedtime he sneezed again?
17. Your child has a cough and also complains of pains in chest?
18. Your child fell on the playground and came home with a bump on his forehead (1 inch across)?
19. Your child swallows a nickel?
20. Your child vomits her (or his) breakfast before going to school?
21. Your child eats half of a bottle of baby aspirin?
22. Your baby has been crying more than usual and has begun to wet its diaper several times every hour?
23. Your child is stung by a bee?
24. Your baby has dirtied 8 diapers with bowel movements between breakfast time and suppertime?
25. Your baby had not wanted to play all during the day?
26. Your baby, who usually spits up a little bit, vomited most of his evening feeding with great force?
27. The urine that your child has just passed in the toilet bowl is quite red?
28. Your child's eye is red and the eyelid is swollen?
29. Your child has hot dry skin (if you take its temperature, the thermometer reads 101.5)?
30. Your school child tells you that it hurt when he moved his bowels and that there was blood and phlegm on the toilet paper when he wiped himself?
31. At bedtime you realize that your baby has not had a bowel movement since yesterday morning?
32. For no apparent reason your baby does not seem hungry for solid food or for his evening bottle?
33. Your child's knee has become red, swollen, and so painful that he (or she) does not want to walk?
34. Your child has a rash (that you have never seen before) on her face and chest?
35. Your boy is crying because he wants to void (pee) but the urine won't come out?
36. Your child plays at the playground until suppertime when he complains of feeling tired and hot (if you take his temperature it reads 103)?
37. After eating only part of his supper, your child complains of pains in her (or his) stomach?
38. Your child has been crying, held his (or her) breath, and then "fell out"?

situations described in the vignettes were listed on a card in the order shown in Table 2. Those interviewed were asked to select one response from the card of each vignette. The interviewer recorded the responses of those reviewed by number.

There were 223 families, registered with the Maternal and Child Health Clinic of Johns Hopkins University School of Hygiene and Public Health, who were asked to participate in the interviews. Of these, 203 (91%) participated; the remainder refused or were not at home on three visits by the interviewer. All families had received comprehensive health services from the clinic for at least two years. On initial registration with the clinic, all families were eligible for ward services, lived within the Eastern Health District of Baltimore, included both parents, were Negro, had one parent who had lived in Baltimore five years, and had at least one relative in the same health district. Although all could be termed low-income, urban families, they had many qualities of stability that are not found in many outpatient clients. Since all families had received comprehensive services that emphasized health education and parent education, our population did not include the least-informed, least-organized families that may be found in many medical center clinics.

The interviews were completed by four trained social workers who had had no previous contact with the selected families and no knowledge of the child's medical history. Meetings of the interviewers were held to assure that instructions were observed, specific definitions were used, and that preferred answers were not being suggested by the response of the interviewer. The interviews were arranged by mail or telephone, and carried out in the parents' homes evenings or on Saturdays. Each vignette was read to the mother as she held the answer card in her hand. If the mother gave an answer not on the card, she was asked to clarify the answer by selecting the written answer with a meaning closest to her intent. If the mother could not read the answers, they were read to her. The vignettes were presented after the mother had been asked a series of questions about various past social experiences. After the vignettes were presented, she was asked a series of questions about her present social circumstances. These questions referred to characteristics which were selected from clinical experience and from the literature as likely to have a bearing on on the use of medical services.

Analysis of Data

To indicate patterns which might suggest causes underlying the observed responses, the answers were combined into several scores: (1) urgency; (2) underuse; (3) overuse; and (4) appropriate use of medical services as judged by the clinic staff. For the score of urgency felt by the mother, the first answer received ten points, the second nine points and so down to one point for the tenth answer. The mothers' total score determined her position in the scale. The score for underuse arranged mothers according to the proportion of answers

Table 2—Precoded answers to "What would you do if"

1. Take the child to the doctor as quickly as possible.
2. Call the doctor to see the child at home.
3. Telephone the doctor to ask his advice.
4. Take the child to the doctor the next day.
5. Ask a neighbor or relative for advice.
6. Ask the druggist for medicine.
7. Try aspirin or another medicine that you have in the house.
8. Put the child to bed until he or she is better.
9. Keep the child in the house.
10. Do nothing.

Table 3—Assignment of responses to categories of use

No. of vignette	Responses scored as appropriate	Per cent of mothers giving appropriate response	Responses scored as overuse	Per cent of mothers giving overuse response	Responses scored as underuse	Per cent of mothers giving underuse response
1	2,3,4	50.2%	1	33.9%	5–0	15.7%
2	1,3	96.0	2	1.4	4–0	2.4
3	1,3	93.5	2	4.4	4–0	1.9
4	7,9,0	79.3	1–6,8	20.6	—	—
5	1,3	91.6	2	2.4	4–0	5.9
6	0,3	53.6	1,2,4–9	46.3	—	—
7	0,8,9	41.8	1–7	58.1	—	—
8	4	3.4	1–3	95.0	5–0	1.4
9	1,3	88.1	2	8.8	4–0	2.9
10	4–9	48.7	1–3	49.7	0	1.4
11	0,3–5 7–9	59.6	1,2	40.3	6	—
12	1–3	79.3	—	—	4–0	20.6
13	1–3	90.6	—	—	4–0	9.3
14	2–4	26.6	1	13.3	5–0	60.0
15	3–5	35.4	1,2	5.4	6–0	59.1
16	0	20.1	1–9	79.8	—	—
17	2–4	49.7	1	33.4	5–0	16.7
18	9	4.9	1–8	88.1	0	6.8
19	4,5,0	8.3	1–3,6	80.7	7–9	10.8
20	8–0	61.0	1–7	38.9	—	—
21	1,3	94.5	2	1.4	4–0	3.9
22	3,4	57.1	1,2	27.0	5–0	15.7
23	0,7	31.5	1–6,8,9	68.4	—	—
24	3,4	49.2	1–2	30.5	5–0	20.1
25	8,9	24.1	1–7	43.3	0	32.5
26	3,8,9	45.3	1,2,4–7	38.9	0	15.7
27	3,4	39.4	1–2	56.6	5–0	3.9
28	3,4	48.7	1–2	34.4	5–0	16.7
29	3,4,7–9	44.3	1–2	54.6	5,6,0	0.9
30	3,4	27.0	1–2	62.5	5–0	10.3
31	0	16.2	1–9	83.7	—	—
32	3–5,8–9	44.3	1–2	6.4	6,7,0	49.2
33	2–4	31.0	1	57.1	5–0	11.8
34	2,3	46.7	1	42.3	4–0	10.8
35	1,3	96.5	2	1.9	4–0	1.4
36	8,9	20.6	1–6	78.3	0	0.9
37	3–5,8,9	48.7	1–2	12.3	6,7,0	38.9
38	0,4	9.8	1–3,5–9	90.1	—	—

given where optimal care was not sought; that for overuse arranged parents on how often professional care was sought for benign symptoms; and that for appropriate use classified mothers according to the proportion of responses that corresponded to accepted medical opinion. Table 3 indicates how responses for each vignette were assigned to appropriate use, overuse, or underuse. These scores were compared with social characteristics, each of which was dichotomized or trichotomized. A zero-order correlation matrix was carried out

on the four scales and social characteristics.

Results

The results of the questions on social characteristics are presented in Table 4. For the majority of characteristics the mothers were distributed between two or three groups of approximately equal size. The dividing points were meaningful. About half of the mothers did not complete high school education; the re-

Table 4—Social characteristics of the interviewed population (203 mothers)

Social characteristic	Per cent of respondents		
Education of mother	59% Did not complete high school		41% Completed high school
Education of father	79% Did not complete high school		21% Completed high school
Change in marital status since admission to clinic	81% No change in husband		19% Separation, divorce or remarriage
Family income	51% Less than $5,000 per year		49% Over $5,000 per year
Maternal employment	51% Unemployed		49% Employed
Rural and small town or urban origin	35% Rural or small town		65% Urban
Use of health literature	49% None or only occasionally		51% Frequently
Illnesses in children (mother's estimate of whether her children have less, average, or more illness than other families she knows)	54% Less	38% About same number	8% More
Mother's current religious practice	17% None or non-practicing		83% Practicing
Problems taken to minister	68% No		32% Once or more than once
Joint parental problem solving (when household mother and father disagree)	75% Mother or father gives in		25% Solve jointly
Length of parental disagreement Usual length of disruption due to disagreement	43% Less than an hour		58% More than an hour
Mother's social activities	(Scale giving 1 point for affiliation, 2 points for monthly meeting, 3 points for a weekly meeting)		
Mother's appearance in court as a witness or defendent	77% Never		23% Once or more

mainder completed high school or attained some college. The rate of 15 per cent change in marriage partners allowed families to be classified in this respect. The median income of those interviewed was $5,000 and included indigent, medically indigent, as well as self-supporting families, even though they were all eligible for ward care below full-pay status at the time of registration with the clinic.

The number of times that mothers selected a given action for each of the 38 vignettes is recorded in Table 5. The vignettes are arranged in this table according to the frequency with which parents responded to: "Take the child to the doctor as soon as possible." Ingestion of rat poison, convulsion lasting more than five minutes, and aspirin poisoning were understood by all but a few to require urgent action. The responses indicating the use of a home remedy gave an artificial picture of nonurgency until we recognized that "causing the child to vomit" is a home remedy that is part of the process of obtaining emergency care for poisoning. The same home remedy for furniture polish was inappropriate because of the danger of aspiration. The questionnaire located four parents who did not know about the dangers of aspirin.

A symptom of hoarseness with cough in an infant was selected to test the parent's recognition of the onset of croup. Seven parents said they would do nothing and only 27 saw it as requiring a physician as quickly as possible. The vignette may be unsatisfactory, or parents may be particularly uninformed about the dangers of croup. The vignette of a small child who had symptoms of a cold which progressed to rapid and difficult breathing also deserved a higher position on the list. The story of the infant too weak to lift his head from the crib, which may be a presenting symptom of sepsis, was ignored by five of the mothers. The vignette describing eight soiled diapers in one day was apparently not recognized as diarrhea in its most treatable stages by 13 of the mothers.

The frequency of telephone calls to the physician seemed to be associated with doubt as to what to do, rather than with requests for treatment by the physician. With the vignettes arranged in descending order of perceived need of emergency action, the frequency of telephone calls actually increased before eventually decreasing. The symptoms of urinary frequency, ingestion of cigarettes, red eye and swollen eyelid, red urine, and painful urination had the highest frequency of use of the telephone.

Other symptoms that resulted in a high frequency of telephone calls were common ones that warranted telephone recommendations. Eight soiled diapers in one day should hardly be mysterious, but recommendations for modifying formula or diet would be particularly appropriate response for families acquainted with private practice methods.

Perhaps the most overrated symptomatic situation was the bee sting. We have no explanation for the 69 instances in which parents thought a bee sting needed to be seen as quickly as possible by the physician. The questionnaire may have uncovered an unrecognized fear on the part of urban mothers. Perhaps, too, recent newspaper publicity about anaphylactic shock from bee stings made this a maximum threat to mothers inexperienced with bees.

Of 203 mothers, at least one thought of coughing and sneezing without other symptoms as sufficient reason to consult a physician as soon as possible. At the other extreme, there were scattered numbers of mothers who chose to do nothing in life-threatening situations. To help these few it is probably necessary to continue regular efforts to educate, reassure, clarify, and alert mothers

Table 5—Actions selected by 203 mothers in response to 38 vignettes of childhood symptoms

No.	Vignettes arranged by frequency of answers in column one	1 M.D. as quickly as possible	2 Ask for house call	3 Telephone M.D.	4 See M.D. next day	5 Ask neighbor	6 Ask druggist	7 Family medication	8 Rest	9 In doubt	10 Nothing
2	Ate rate poison	184	3	11				5			
9	Convulsion lasting 5 min	168	18	11	1	1		3		1	
21	Aspirin poisoning	166	3	26				4		1	3
35	Urinary obstruction	157	4	39	1		1				1
5	Furniture polish ingestion	149	5	37	1		2	8			1
3	Head injury with vomiting	148	9	42	1	1		1		1	
38	Breath holding to unconsciousness	145	20	16	1	1			1		19
19	Swallowing a nickel	128	2	33		2	1	22			15
13	Convulsion lasting 5 min	125	20	39	1			6	5	2	5
30	Phlegm and pain on bowel movement	119	8	50	5		4	16			1
8	Dysuria	116	8	69	7			2			1
33	Red, painful knee	116	21	35	7		5	11	6	1	1
18	Hematoma on forehead	107	2	25	2	2	3	37	1	10	14
12	Too weak to lift head	107	29	54	6	2			3		2
27	Red urine	106	9	74	6	2		1		2	3
36	Evening fever	101	19	38	1			23	14	5	2
29	Low-grade fever	95	16	54	2			31	2	1	2
34	Rash on face and chest	86	14	81	13	1	3	2	1	2	
1	Cold—rapid difficult breathing	69	18	81	3	3	1	25	2		1
23	Bee sting	69	4	43		3	17	56		3	8
17	Cough with pain in chest	68	9	83	9		3	25	4	2	
28	Red eye and swollen eyelid	67	3	90	9	2	3	16	1	7	5
11	Four hours of crying	65	17	93	3	5		4	3	4	9
24	8 soiled diapers in one day	59	3	92	8	2	2	21	3		13
6	Ingestion of cigarettes	49	1	86		5	5	27	2	5	23
26	Vomited supper	47	12	80	3	2	1	14	7	5	32
22	Urinary frequency with crying	42	13	114	2	4		4	2	2	20
10	Hay fever symptoms	34	11	56	5	1	6	61	22	4	3
14	Hoarseness with cough	27	1	45	8		8	76	19	12	7
7	Foot pain	26	6	40	11	2	2	31	43	28	14
37	Stomach pain during supper	20	5	57	2		1	54	33	7	24
32	Appetite loss	11	2	72	3	3	2	6	8	4	92
25	Loss of interest in play	11	3	55	6	4		9	25	24	66
15	Early fatigue	8	3	62	6	4	2	11	70	6	31
31	Missing daily bowel movement	4	1	54	6	1	10	94			33
20	Vomiting before school	4	4	37		2	2	30	30	58	36
4	Cough	1	2	19		1	13	122	6	14	25
16	Sneeze	1	1	7	5		2	121	15	10	41

to the true dangers to their children.

Correlation between the scoring of mothers' responses and family social characteristics are shown in Table 6. The scores for appropriate use were positively correlated at significant levels (0.05) with more favorable social characteristics than any other set of scores. They had low negative correlations with the number of changes in marital status and the number of court appearances by the mothers.

The mothers' scores for overuse correlated negatively with their education, but reached statistically significant levels with only one other social characteristic; it was therefore omitted from the table. The educational levels of the mothers correlated positively with appropriate use, and negatively with their scores for urgency and their scores for underuse. These findings emphasized the importance of education for selection of responses closest to the expectation of physicians. They did not prove the value of the content of public education, since it may chiefly reflect the perseverance of children or their parents. Negative correlations of the educational level with the scores for urgency and of underuse suggested that irrational or emotional factors contributed heavily to these higher scores.

The positive correlations between education of mother, the use of health literature, mother's social activities, family income, and the practice of taking problems to her minister indicated that these characteristics may be part of a cluster related to abilities in solving

Table 6—Correlations between scales derived from answers to vignettes and social characteristics indicated by coefficients for r and values for p

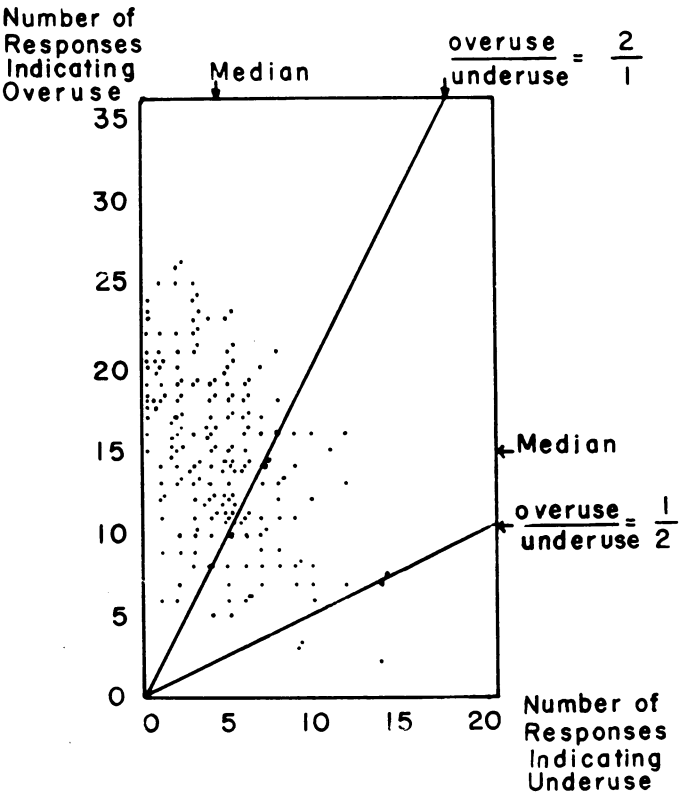
	Scale of urgency	Scale of underuse	Scale of appropriate use	Education of mother
Education of mother	r=−.148 p= .05	r=−.161 p= .05	r=+.172 p= .05	
Use of health literature	r=−.112	r=−.175 p= .05	r=+.106	r=+.165 p= .05
Severity of illnesses in children	r=+.038	r=−.031	r=+.056	r=+.203 p= .01
Religious practice—mother	r=+.172 p= .05	r=+.059	r=+.015	r=+.198 p= .01
Problems taken to minister	r=−.027	r=−.082	r=+.139 p= .05	r=+.152 p= .05
Joint parental problem solving	r=+.004	r=−.124	r=+.219 p= .001	r=+.080
Length of parental disagreement	r=+.032	r=+.162 p= .01	r=−.049	r=+.026
Change in marital status	r=+.060	r=+.124	r=−.153 p= .05	r=−.114
Mother's social activities	r=−.004	r=−.017	r=−.020	r=+.340 p= .001
Appearance in court	r=+.034	r=+.079	r=−.156 p= .05	r=−.020
Family income	r=−.009	r=−.077	r=+.137	r=+.235 p= .001

daily problems and maintaining social relationships. The positive correlation between a mother's education and the reported severity of illness in her child supported the impression that the more educated mother is more likely to interpret her own child's symptoms as abnormal, while still being able to discriminate their relative severity.

The distribution of inappropriate responses is presented in Graph I. Each point represents one respondent. If the population was made up of appropriate users (points near zero on both axes), overusers (points along the vertical axis), and underusers (points along the horizontal axis), there should be corresponding clusters of points. Instead, there is a diffuse distribution around the medians of 15 overuse responses and four underuse responses. There is an obvious scarcity of mothers who made less than ten inappropriate replies. Only 15 respondents gave no instance of underuse. The distribution shows that overuse was chosen more often than underuse, when an appropriate answer was not selected. The parent most deviant from this majority responded with a form of underuse in 13 instances and overuse in only two instances. (Note in Table 3 that there are 17 vignettes in which underuse cannot be scored and two in which overuse cannot be scored.)

Five parents gave overuse responses

Graph I—Inappropriate responses of 203 mothers to 38 vignettes arranged on the dimensions of overuse and underuse



just as frequently as underuse responses. Two lines have been drawn on the graph to include those mothers from whom one form of misuse was given as often as 33 per cent of the inappropriate answers. The most errant responder (appropriate answers to only six vignettes) is an example by giving 17 instances of overuse and 15 of underuse.

Discussion

A mother's recognition of a symptom, as part of a disease causing discomfort or death, is the basis for her decision to take her child to the doctor or to seek other advice or remedies. The literature (cited in the references), as well as clinical experience, cautioned us that this decision is affected by many factors. The low levels of correlation that we found between appropriate decisions and various social characteristics demonstrated this and suggested that there are other variables that we have not studied. If these social characteristics enter into a mother's ability to select an appropriate response on a questionnaire, their effect may be more evident when this mother is confronted by the actual symptom in the family setting.

The answers to hypothetical questions failed to reveal a large number of mothers who chose to underuse medical services. More remarkably, the distribution of answers suggested that when some mothers could not select an appropriate answer they were as likely to overreact as they were to underreact. Their situation may have been one of guessing, confusion, or ambivalence rather than apathy, as suggested by others.[5]

In our search for a general orientation to relate these observations to each other, we found that the concept of social integration was useful. Cooperation between a mother and her husband, or a family and other parts of the community, may be characterized as social integration and its opposite may be termed social disintegration.[9] Among the social characteristics that had statistically significant positive correlations with the scale of appropriate use, several are relevant to social integration. Religious practices are indicative of integration with a culture and its beliefs. Joint problem-solving also is evidence of integration, whereas extended disruptions—due to arguments or changes in marriage partners and appearance in court—are evidence of disintegration. Ignorance of a symptom does not represent disintegration, but failure to obtain advice or failure to have a method of finding a safe answer in the face of uncertainty illustrates a lack of a mutually cooperative system.

Appropriate use of calls, emergency visits, or office appointments to prevent discomfort or death, may perhaps be achieved by means of two classical approaches. The first is health education concerning the symptoms of diseases that are most likely to cause disability and death. This need is greater in less educated parents who need to acquire from the professional person more time to learn.[10] The second is recognition of parents who are likely to use medical resources inappropriately, because they are poorly adjusted (at home or in the community) and in need of counseling or social casework.

The approach suggested by the concept of social integration would include efforts to affect the capacity of the community to assist these families to integrate their needs with those expressed by other persons or institutions in the community. Evening clinic hours, comprehensive care clinics, neighborhood clinics, and community participation in planning services are included among these efforts.

Conclusions

Interviews with 203 mothers of low-income urban families revealed that the

symptoms of respiratory disease and of sepsis in small infants were very poorly understood. There was an unfortunately large number of mothers who stated that they would do nothing when typical vignettes of these syndromes were described to them. Very inappropriate actions were selected by a few parents for life-threatening situations, such as poisoning from aspirin or furniture polish at one extreme, or missing a daily bowel movement or sneezing at the other.

Appropriate answers were positively correlated with the mother's educational level, family income, use of health literature in the home, use of clergy for solving problems, and joint solution of problems by parents. They were negatively correlated with changes in marital status and appearance in court.

The distribution of inappropriate answers failed to reveal clusters of appropriate users, overusers, and underusers. It did reveal that an important number who gave responses indicating overuse were just as likely to give a response of underuse for another vignette.

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