A Computer-Administered Interview on Life Events: Improving Patient-Doctor Communication

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A computer-administered interview on life events (CAI-LEV) was developed for use by patients in the waiting room of the model family practice unit at the Medical University of South Carolina, Charleston, South Carolina. Computer printouts of CAI-LEV are immediately available for doctor/patient communication, so that CAI-LEV fits into ongoing patient flow and care. Throughout a three-month study, confidentiality of information was protected by the use of numbers for patient responses to questions in 16 areas covering a wide range of possible life events. The adept physician can utilize the printout to assess stress in the patient's current situation, to focus quickly on any particular area of concern, or to initiate a counseling session. Of some 250 completed interviews, 93 have been reviewed by residents and faculty after in-depth utilization during patient care. Of these 93 physician-evaluated interviews, 40 percent yielded important new information, while in 22 percent of the cases, doctor/patient communication was improved.

Most of us believe that stress in our lives can cause, precipitate, or perpetuate illness.[1] The question is, "Which kinds of stress, at what particular times, and what forms of illness may result?" As doctors, we all know that illnesses, injuries, and operations can cause stress – emotional, economic, personal and social stress. How can we do a better job of alleviating *distress* in the lives of our patients?

In a recent study, a checklist of life events and a "point" system was developed by Holmes and Rahe to predict the occurrence of depression and illness in a person's life. Their study suggests that certain life events, such as a divorce, death of a relative, loss of a job, are significant *negative* life events.[2] Similarly, life events most commonly considered *positive*, such as a promotion, getting married, having a grandchild, can produce as much impact as negative events. Family physicians confront life events daily and can verify that, within families, many events tend to be quite ambiguous. It may take the most skillful family physician some time before he understands whether the anticipation of a new baby is going to be primarily positive or primarily negative in the history of a family.[3] The arrival of the baby and the task of caring for it will produce a new series of positive, negative, *and* ambiguous life events.

There is no substitute for the personal interview by a skillful doctor, nurse, or physician's assistant. How can any computer try to replace the subtleties, the body language, and the warmth of the personal doctor/patient interview? Nevertheless, the standardized interview which is collected in the waiting room by computer console has some interesting advantages. The computer has more patience in asking questions than the average person who can get tired, skip, or underestimate certain parts of the interview. The computer console is discrete during the interview; it does not raise eyebrows or appear shocked by anything that a person reports. Of course, the speed, the legibility, and the immediate data storage and retrieval possible with the computer are major advantages.[4]

Confidentiality must be protected in every area concerning the patient or the family. Is it possible to collect essential information, in a reasonable period of time, which will enhance the confidential doctor/patient relationship? Yes, if proper attention is devoted to preserving a maximum of information with a minimum of revealing detail. At least, this has been our experience in over 200 computer-administered interviews.

A Sample Case

Let us see how the computer-administered interview on life events (hereafter referred to as CAI-LEV) functions in a typical case. A female patient, for example, may be coming in for an annual physical examination, for treatment of a recent illness, or for any other situation requiring the help of a physician.

Arriving 15 minutes before the appointment, she begins by registering with the receptionist. The research assistant then introduces himself to the patient, explaining that the physician would like her to take the life events interview. Understanding that this is a voluntary procedure maintaining strict confidentiality, the patient then takes the interview. She sits at a computer terminal and responds to a series of computer-displayed questions concerning recent changes in her life. Each computer-assisted interview takes about 15 to 20 minutes and covers 16 areas with 193 items of possible life changes (Table 1). As the patient's memory is stimulated by each question, she responds by

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LIFE EVENTS FOR: MRS. W. 02/06/75
23 YEAR OLD FEMALE

AREA	EVENTS	SCORES EX	SI	VA	CO	TOTAL	VALENCE VL	EF	HELP NEEDED
HABITS	1	2	2	0	1	5	0	-1	
FINANCES	3	0	1	0	0	1	0	0	
		1	3	1	1	6	-1	-1	
		2	2	1	1	6	-1	0	
CHILD REL.	1	2	3	0	0	5	0	0	
LAW	2	1	3	1	0	5	-1	-2	
		2	3	2	1	8	-2	-1	
PERSONAL LIFE	2	2	3	1	1	7	-1	-1	
		2	3	0	1	6	0	-1	
HEALTH (PER)	1	2	2	0	0	4	0	0	
HEALTH (FAM)	1	2	1	0	1	4	0	0	
DEATH	1	0	1	1	0	2	1	0	
	12					59	-5		

TOTAL NUMBER OF EVENTS = 12 VALENCE NET SCORE = -5
OVERALL WEIGHTED SCORE = 59 TIME = 25 MINUTES

RESULTS OF SSS QUESTIONNAIRE

TENSE	3
STRAIN	3
EXHAUSTED	4
DAILY ACTIVITIES	4
TOTAL =	14

Figure 1. Summary of Mrs. W's Interview

Table 1. Areas of Life Events Included in CAI–LEV and Number of Rubrics per Area

Life Event Area	# of Rubrics
Residence	2
Social	10
Personal Habits	11
Transportation	9
Finances	27
Work	20
Child relationships	17
Law	11
Personal life	25
Religion	16
Personal health	16
Family health	17
Death	5
Bad things	2
Good things	5
Total	193

choosing and typing a single number or letter into the computer. For each life event, she is asked to report the following: when the change happened, if the change was expected or unexpected, if the change was small or large, if the change was good, neutral or bad, if it was easy to cope with or if she needs help, and if help is needed, the patient is asked what kind of help and from whom it should come. Finally, the patient is asked whether or not she believes the life event will have a positive, neutral, or negative effect on her health.

After finishing CAI-LEV, the patient is called in to see the doctor for her physical examination. Within a few minutes, the doctor has a computer printout of the patient's self-weighted life events along with the vital signs obtained by the medical assistants.

Following the day's activities, the doctor and the research assistant review and discuss the CAI-LEV printouts. For some patients, the printout confirms areas of stress which the doctor knew about; for other patients, important clues to new areas of stress are revealed.

Initial Experience

What have we learned so far from a three-month study of the use of computerized interviews with 93 patients evaluated by four residents and two faculty? The following information has been obtained:

1. In 40 percent of the cases, CAI-LEV revealed *new* areas or problems of concern to the patient.

2. In 34 percent of the cases, CAI-LEV revealed new information on the *importance* of any area or problem of concern to the patient.

3. In 22 percent of the cases, the doctor reported that his *communication* with the patient was improved in some way by CAI-LEV.

4. In 18 percent of the cases, the physician's plan for *management* of the patient was affected in some way by CAI-LEV.

These quantitative results encourage us to believe that CAI-LEV provides a useful standardized data base of personal and social areas of stress for the longitudinal management of illness and health in families. Some of the qualitative features of CAI-LEV in the context of patient care can be appreciated by the following case examples selected from 93 physician-evaluated patients who have taken CAI-LEV in the model family practice setting at Charleston, South Carolina, during a recent three-month period.

Case 1

Mrs. W. – 23-year-old patient at her second post partum visit.

This patient was being seen with her two-month-old infant for a routine post partum visit and well-baby check-up. She had been followed from the beginning of her pregnancy through a mild genitourinary tract infection in August and through an uneventful delivery at the university hospital. During the last trimester of her pregnancy, her physician had noted some emotional change in the patient at times, a sadness whose cause he could not explain. On several visits, he asked the patient direct questions as to how she was feeling, how things were going, and the state of her emotions, but could get no response. At the time of her post partum visit, she agreed to

take the computerized life events interview, which all of her physician's adult patients were now routinely taking in the waiting room.

In Figure 1 we see the printout of her interview just as her physician saw it during the office visit. Note that Mrs. W. reported 12 life event changes in eight of the 16 possible areas of life event changes. Her overall weighted score is 59 which represents a sizable total of significant self-reported life events. This is confirmed by the results of the subjective stress score (SSS) questionnaire developed by Dr. L. G. Reeder of the School of Public Health at UCLA, showing a total of 14 anxiety-stress points out of a possible 16 points.[5] Note that the column "Help Needed" is blank. Although there were many events reported and many of these were negative under the column labeled "VL" for valence, she did not ask for help even though she had the opportunity during the computerized interview. Had she done so, this would have been recorded in the "Help Needed" column.

After a brief introduction to life events, her physician became adept at working with the printout. He noted under the column headed "CO" for coping that in the areas of finances, law, and personal life there were indications that she was not sure whether or not she could cope with these life event changes (1 = not sure whether the event is under control). He also noted that under the column headed "EF" for effect on health, the changes in finances, law, and personal life carried negative weights of -1, -2, -1, etc, -1 meaning the change *could* be bad for her health and -2 meaning the change is *definitely* bad for her health.

Studying the printout with the patient, he asked her whether she would like to explain to him what some of these negative, stressful changes were which she had reported to the computer. Only then did the physician learn that the patient had been separated from her husband and had accumulated unpaid bills and debts during the last trimester of her pregnancy. She also revealed in discussing the printout under the item "law" that around Christmas she actually had to call the police to arrest her husband because he was bothering her.

This case suggests that as close as the doctor was to this patient, and as much as she trusted and confided in him about a wide range of medical problems, she never felt, for unexplainable reasons, free to confide in the physician about certain stressful life events she had experienced. The computer, at this point in time, provided a useful link between patient and physician. Somehow a permissive, persistent, impersonal interview situation in the waiting room allowed this patient a chance to lower her guard and to identify indirectly two areas in her life which were troubling her.

As a result of doctor/patient utilization of this computerized interview, her physician reported on the evaluation form that not only were new areas and problems revealed by the interview, but his level of communication with the patient was much improved.

Case 2

Mr. and Mrs. H. – a young couple with twins aged 1 1/2.

Mrs. H. is a 30-year-old college graduate whom the resident had seen for the first time about one month before the interview. He noticed that,

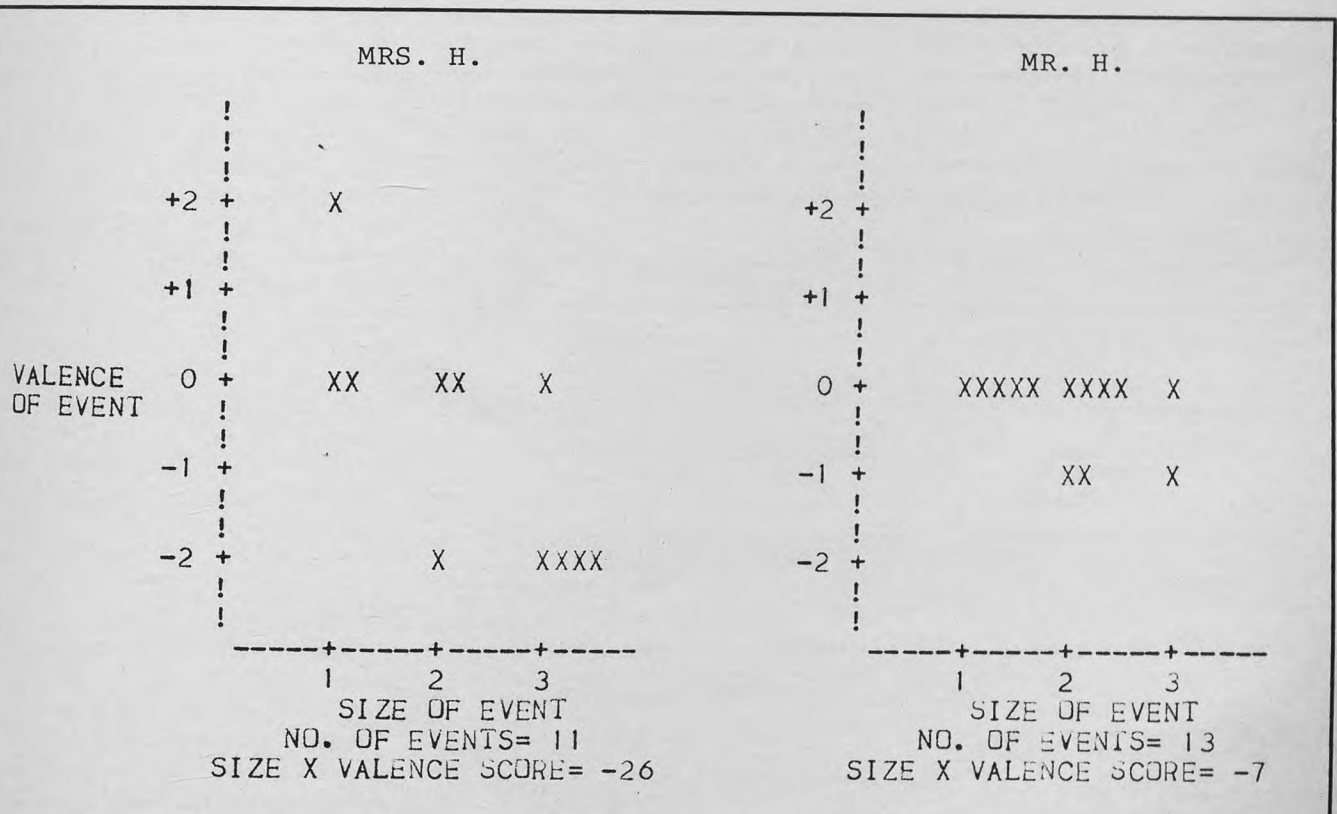

Figure 2. Graph Showing Mrs. H.'s and Mr. H.'s Life Events According to Size X Valence of Each Life Event

in filling out her routine history form, she responded to numerous items regarding insomnia, fatigue, nervousness, worry, feelings of unhappiness and depression, as well as symptoms of heartburn, indigestion, stomach pains, excessive gas and bloating. Her history also included frequent headaches and occasional numbness and tingling in her extremities.

The physician asked Mrs. H. if she could share with him what seemed to be the basis for her unrest. At this point, she referred to the CAI-LEV printout. Space does not permit showing her printout which listed 13 life events involving nine areas of activity, with the most significant stressful events centered in a change of residence and in her personal life. In contrast to the preceding case, Mrs. H. signalled her need for help in her personal life; furthermore, the program permitted her to indicate the kind of help: from "a psychologist or psychiatrist" and from a "doctor or a nurse."

Her stress score was 11, on the upper side of average. Her physician reported:

In this case, because the computerized interview was complete and detailed, it allowed me to see the areas of problems for which Mrs. H. felt she needed help. According to Mrs. H., her biggest problem was her personal life, particularly her marital relationship.

It so happened that her husband was in the Family Practice Unit on that particular day and was scheduled to have his initial interview. She shared with me some of the difficulties she had communicating with her husband. So I asked her if she wouldn't mind if I asked Mr. H. to come in and speak with me briefly and review his life events questionnaire to see where he stood and then to have them come into my office together. This plan worked very well.

Mr. H. reported even more events needing help than Mrs. H. (See Figure 2) After briefly talking with Mr. H., I asked Mrs. H. to come back into the room. I then asked the couple to use the life event printouts to identify which were the current areas of concern in their lives. Each of them referred to the printout, noting areas of agreement and disagreement on life events within this marriage. One specific area which the couple agreed upon was the lack of communication within their marriage. I felt as though CAI-LEV had facilitated communication and had helped start a counseling session which might not otherwise have been possible. First of all, we couldn't wait until next time because Mr. H. might not come in. Secondly, we wanted to start things right away because both of them were very upset about their marriage. My plan was to engage both of them in very simple direct communication and to have the dialogue continue at home.

At a subsequent visit, approximately one week later, scheduled for both Mr. and Mrs. H., only Mrs. H. was able to attend. She assured me that things had improved and that she had started the dialogue with her husband. The communication that began in my office was being carried on at home at an improved level.

I think Mr. and Mrs. H. fit into the category of persons who would cooperate with the computer and with their physician. I think they represent an optimal pair because they are interested in preserving their marriage and interested in each other.

It is worth noting that Mrs. H. took 18 minutes in the waiting room to complete CAI-LEV, and Mr. H. took 28 minutes. Their physician had less than a half hour available for the couple's counseling session. The printout enabled him to focus the couple's conversation effectively on target areas of their concern and to identify communication problems in their marriage in much less time than it would have taken ordinarily.

Figure 3 consists of histograms showing the score of Mrs. H. in relation to all the women who have taken the life events interview to date (-7), and Mr. H's score in relation to all the adult men who have taken the CAI-LEV (-26).

In Figure 4 one can see a spouse-pair score for Mr. and Mrs. H.: -26 - (-7) = -19. Their score (a rounded square) can be seen in relation to the scores of 46 families or spouse-pairs on a simple two-axis graph. To the right of the vertical axis, husbands and wives *agree* in reporting positive scores or negative scores. To the left of the vertical axis are those net scores which show *disagreement* within spouse pairs; in each case, the net score of a spouse is positive while the marital partner is negative. These simple graphs (Figures 3 and 4) are kept up-to-date by a computer program which enters each new interview and each new spouse pair on the histograms currently and cumulatively. The computer program provides a current histogram showing the distribution of individuals who are enrolled in our model family practice unit.

Table 2. Limitations and Advantages of CAI–LEV

Limitations	Advantages
Patient's underreporting.	The interview is standardized.
Patient's overreporting. (Inclusion of trivial events)	Confidentiality is protected.
The patient must arrive early or the interview is usually delayed.	Usual interview time is brief (10-20 min). Waiting room time can be utilized.
The printout reveals only general information, so that it can function only as a starting point for communication.	A persistent, non-threatening, well-organized interview enhances recall.
Cost, computer maintenance	The interview allows the patient to assign his *own* values and importance to any reported changes.
Patient's ability to read; to relate own experience to question format.	Repeated interviews give a longitudinal record of stress/coping in persons, couples, and families.
Clinical usefulness remains to be proved in private clinical practice, etc.	Allows the adept physician to focus efficiently on target areas of concern, improving communication.

Case 3

Twenty-three-year-old mother and aunt.

Space does not permit a detailed description of the third case – a 23-year-old woman. In brief, this woman was not scheduled for a regular visit, as she was bringing her seven-year-old son and ten-year-old niece in to the family physician for routine

Figure 3. Current Histogram Showing the Net Size X Valence Score of Mrs. H. and of Mr. H. (Rounded Square) in Relation to Other Scores

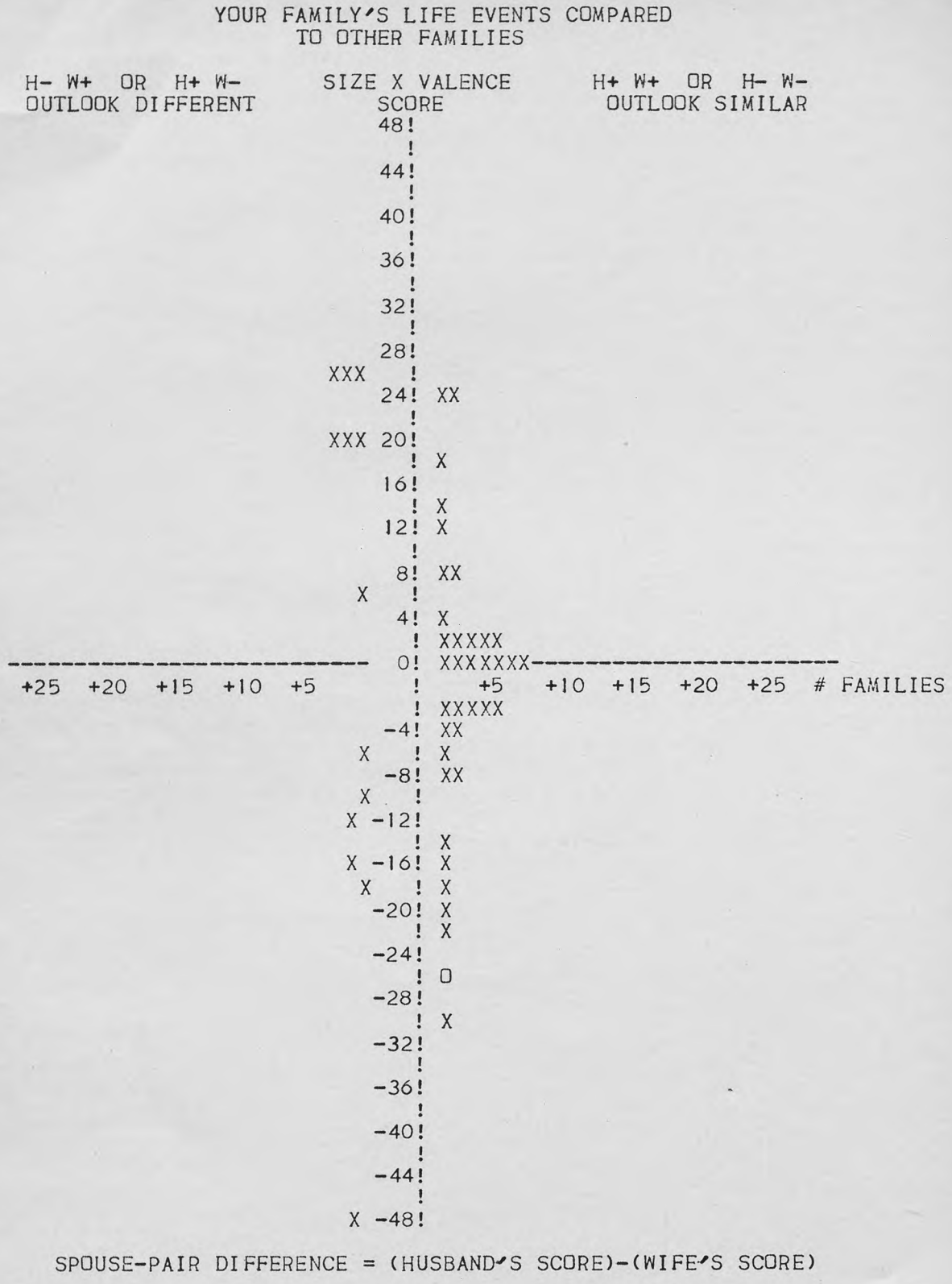

Figure 4. Current Histogram Showing the Net Size X Valence Score of Mr. & Mrs. H. as a Spouse-Pair Difference (Rounded Square), in Relation to Other Spouse-Pairs

pediatric care. However, in using valuable waiting room time to allow this seemingly well-adjusted mother to take the life events interview, her physician was able to discover a case of masked depression in his adult patient. The printout was so clearly symptomatic of a high stress score that the resident took special time to interview her and understand the depth and breadth of her depression and to offer her timely support. Although no medication was indicated, the door was opened to future possibilities and better communication on her feelings.

Case 4

Mrs. E.

A troubled young wife of a medical student reported 14 points on the Reeder Subjective Stress Scale and two highly stressful events in her work and personal life. This opened up the discussion for her family physician. The patient was exhausted from her work as a teacher, a fact which the physician had known from previous visits. She had told him that her husband was very understanding and sympathetic to her fatigue and work situation. However, the life event interview triggered a specific discussion of her problems in marriage and in sexuality which neither she nor her husband on previous visits had ever been able to bring out.

Again, somehow the impersonal computer was able to obtain a response in a sensitive area which the physician could utilize in opening up discussion. He reported that his level of communication with the patient was much improved following the interview. Arrangements were made for marital counseling before the problem would ordinarily have been recognized.

Discussion

Life events are being measured in a number of epidemiologic studies in order to test the hypotheses which relate personal and social stress to manifest disease, such as coronary heart disease, rheumatoid arthritis, etc.[6] On the other hand, life events play an important role in the day-to-day management of health and disease and crisis intervention in the offices of family practitioners across the country. Some of the advantages and limitations of a computer-assisted interview on life events are summarized in Table 2.

Four cases are described in order to demonstrate how *teamwork* between the alert physician and the computer-administered interview can result in better doctor/patient communication and quicker, more efficient application of behavioral science to the clinical care of patients.[7,8]

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