A study was made to see whether a deficient pattern of personal health care was an important mechanism through which poverty affects health. Data from the study support this proposition, and the findings are used to indicate what modifications of behavior might be undertaken.

THE RELATIONSHIP OF SOCIOECONOMIC STATUS TO HEALTH

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NUMEROUS studies have documented that both the level of health[1-12] and the quality of personal health behavior[13-22] are positively related to socioeconomic status. There is need for further exploration of *how* socioeconomic position affects health—particularly the mechanisms by which poverty adversely affects human health.

This paper is concerned with this general question: *Why* does the underclass have poorer health than more affluent groups in the population? The general proposition is that one of the mechanisms through which poverty adversely affects health is a deficient pattern of personal health care which includes deficiencies in personal health maintenance practices, use of medical services, health knowledge, and health-supportive equipment in the home. These hypotheses are examined:

1. The quality of personal health behavior, knowledge, and home health equipment are positively related to the level of health.
2. In general, socioeconomic status is positively related to the quality of personal health behavior, knowledge, and health equipment. However, socioeconomic status is more closely related to certain types of health behavior than to other types.
3. Lower socioeconomic status persons experience a disproportionately large number of health *problems* in those health areas in which the health *behavior* of low-income persons is especially deficient relative to the health behavior of higher-income persons.
4. Within the lower socioeconomic group, those with good personal health behavior have a higher level of health than those with poorer health practices.

Method

The paper is based on information obtained from detailed interviews with a sample of 401 mothers with children aged 9 to 13, from households having a husband in the residence and living in a northern New Jersey city. The health data reported here are based on the personal reports by the mothers and not on medical tests.

Tests of Significance

In determining statistical significance in the present study, chi-square test, the significance of the differences between means (t test), and the significance of differences between percentages have been employed. In every case where a difference has been reported as significant, the difference met at least the 0.05 level of confidence.

Definitions

Socioeconomic Status

The family's assignment to a socioeconomic level was based on the occupation of the head of the household and

total family income. The top level consisted of families with total incomes of $10,000 or more and with household heads who were managers, owners, or professionals. The middle level ranged in income from $6,000 to $9,999 and worked in clerical, sales, skilled, or semiskilled occupations. The low group consisted of families who had incomes under $6,000 and/or unskilled occupations. Included in this group were some families with low incomes but occupations which were semiskilled or skilled.

The percentage distribution of the sample by socioeconomic status groups was as follows:

Socioeconomic group	Per cent of families
High	26
Middle	47
Low	27
Total	100
	(401)

A very wealthy segment of the community was excluded from the sample by design. The very bottom economic level was underrepresented because of the exclusion of fatherless households from the sampling. While the three socioeconomic divisions of the sample have been referred to as "high," "middle," and "low" as a matter of convenience in the analysis, the definitions of these three groups should be kept in mind in interpreting the findings of the study. In particular, it should be noted that the "low" socioeconomic group was "poor" but not, by and large, destitute.

Quality of Personal Health Care

Four dimensions of personal health care were conceptualized for the present study:

1. Personal Health Maintenance Practices—An index composed of responses to 76 questions was constructed to represent the over-all quality of personal health maintenance practices. Health areas included were sleep, exercise, elimination, dental hygiene, smoking, alcohol consumption, and nutrition. In addition, using the same questions, seven separate indexes were constructed as measures of each of the seven health practice areas.

2. Use of Professional Health Services—A composite index was constructed to represent the quality of utilization of professional medical services which was based on responses to 44 questions. In addition, separate indexes were constructed to represent the quality of use of *preventive* health services, *specialized* medical services, and services for *illness*.

3. Level of Health Knowledge—The adequacy of the respondent's information concerning common health matters was measured by nine true-false questions, covering such issues as the effect of exercise, the female fertile period, body temperature indicating fever, criteria for selecting a physician, and proper dental hygiene techniques.[23]

4. Amount of Health Equipment in the Home—This index was based on whether or not the respondent's home had each of 24 items of health supportive equipment, including facilities for cleaning the house and clothing, personal hygiene equipment, and common medical supplies.

Level of Health

Two indexes were designed to measure the respondent's level of health which were based on the woman's own responses to questions concerning her present and recent health:

1. Level of Health—This index was based on two questions: the respondent's rating of her present level of health and whether she had been ill during the preceding two weeks.

2. Extent of Health Problems—A composite Health Problems index was based on the respondent's reports on

Table 1—Quality of health maintenance practices in relation to level of health and extent of health problems

Quality of health maintenance practices:	Average scores on indexes of:	
	Level of health*	Extent of health problems†
Poor	2.3	33.7
Medium	2.8	27.9
Good	3.1	24.2
Total	2.8	27.8

* A high score indicates good health on the *level of health* index.

† A high score indicates poor health or many problems on the *extent of health problems* index. The score on this index was based on the number of health problems the person reported ever having and an additional weighting if she had had the problem within the past two weeks.

The difference between the poor and the good health practices groups in average (mean) *level of health* is significant at the 0.025 level. The difference between the poor and the good health practices groups in mean *extent of health problems* is significant at the 0.005 level.

whether or not she had ever had each of 22 health problems and whether or not she had had each within the preceding two weeks. The problems included constipation, headache, skin rash, toothache, cough, heartburn, dizziness, stiff joints, and others.

Results

Hypothesis 1: The quality of personal health behavior, knowledge, and equipment are positively related to the level of health.

Personal Health Practices in Relation to Level of Health—It was found that the higher the quality of personal health practices the higher the level of health and the fewer the health problems reported by the respondent. Table 1 shows that the average score on the Level of Health index was 3.1 for those with good health maintenance practices, compared to 2.3 (a significantly poorer score) for those with poor health maintenance practices. The group with good health practices also had a significantly lower average Health Problems score (24) than did those with poor health maintenance practices (34).

Use of Professional Services in Relation to Level of Health—The quality of use of professional health services was also found to be positively related to level of health, but the differences, though significant, were not as large as those found for health maintenance practices. Table 2 shows that those with the poorest use of professional health services averaged 2.5 on the Level of Health index, somewhat poorer than those with the best use of professional services (3.0).

Health Knowledge in Relation to Level of Health—No relationship was found between level of health knowledge and level of health or the extent of health problems (Table 3).

Health Equipment in Relation to Level of Health—There was not found to be a significant relationship between amount of health equipment in the home and the woman's level of health. In fact, the very slight difference found was in the opposite direction (Table 4).

Table 2—Quality of use of professional health services in relation to level of health

Quality of use of professional health services	Average scores on level of health index
Poor	2.6
Medium	2.7
Good	3.0
Total	2.8

The mean level of health of those with poor use of services is significantly different from the mean of those with good use of services at the 0.025 level.

Table 3—Level of health knowledge in relation to level of health and extent of health problems

Level of health knowledge:	Average scores on indexes of: Level of health	Extent of health problems	No. of cases
0 (low)	(3.5)	(6.0)	(2)
1	2.6	7.3	16
2	2.6	7.7	64
3	2.8	7.1	121
4	2.8	7.4	131
5	2.8	7.4	54
6 (high)	2.8	8.1	13
Total	2.8	7.4	401

Table 4—Amount of health equipment in relation to level of health

Amount of health equipment	Average scores on level of health index
High	2.8
Medium	2.7
Low	3.0
Total	2.8

Hypothesis 2: Socioeconomic status is positively related to the quality of health behavior, knowledge, and health equipment. However, socioeconomic status is more closely related to certain types of health behavior than to others.

1. Socioeconomic Status in Relation to Personal Health Practices

Higher socioeconomic status women scored slightly higher, on the average, on the Health Maintenance Practices index than did lower-status women. The differences were not statistically significant, however, the scores ranging from 41 for low socioeconomic status women to 45 for the high-status group (Table 5).

While the summary index of health practices did not provide substantial support for the hypothesis, some of the component measures of the index—measures of specific health areas—were found to be significantly related to socioeconomic status: namely *exercise, nutrition,* and *dental hygiene.* The scores on these component indexes are given in Table 5. On these indexes, a high score indicates "good" health practices, with the exception of the smoking and alcohol indexes in which a high score

Table 5—Socioeconomic status in relation to health maintenance practices

Socio-economic status	Total health maintenance practices	Average scores on the health practices indexes:* Nutrition	Exercise	Elimination	Dental hygiene	Sleep	Alcohol	Smoking	No. of cases
High	45	9.8	2.1	6.7	4.7	4.9	2.4	2.2	(104)
Middle	44	9.1	2.0	6.3	4.5	4.8	1.9	2.3	(191)
Low	41	8.6	1.2	6.3	3.9	4.4	1.8	2.0	(106)
Total	43	9.1	1.8	6.5	4.4	4.8	2.0	2.2	(401)

* A high score on the indexes indicates "good" health practices, with the exception of the alcohol and smoking indexes in which a high score indicates high consumption or "poor" practice. In constructing the *total health maintenance practices index,* low consumption of cigarettes and alcohol were scored as "good" health practices.

The differences between the mean health practice scores of the high and the low SES groups are statistically significant at the 0.005 level for nutrition, 0.01 level for exercise, 0.025 for dental hygiene, and 0.005 for alcohol practices.

indicates high consumption or "poor" practice.

Exercise—Specific practices in which the lower-income women were especially deficient compared to high socioeconomic status women were these: the lower the income level, the less likely women were to exercise or to engage in sports, to do so regularly, or to spend many hours in these activities. Ninety per cent of the low socioeconomic group, compared to 69 per cent of the higher-income women, engaged in no sports or games.

Nutrition—Specific findings included these: one-fifth of the low-income women compared to one-tenth of high-income women failed to eat breakfast; 40 per cent of the low-income compared to 28 per cent of the high socioeconomic group failed to have all the major food groups at the dinner meal.

Dental Hygiene—Specific practices in which lower-income women were deficient relative to high-income women were these: failure to brush the teeth regularly (17% of the poor as compared to 1% of the higher-income women), and failure to have dental cleaning follow meals (for example, about 8 in 10 of the poor women compared to 6 in 10 of the high-income women failed to brush after breakfast).

Sleep, Rest, and Elimination—Practices in these areas showed only slight and inconsistent positive relationships to socioeconomic status.

Alcohol Consumption—This was found to be lower among low-income women than among high socioeconomic status women. The specific practices included these: Low-income women were less likely to drink at all and if they did, they drank less frequently and smaller quantities. This conforms to the findings of other studies.[24]

Cigarette Consumption—The pattern of relationship was similar to that for alcohol, but the relationship was not significant.

2. *Socioeconomic Status in Relation to Use of Professional Medical Services*

There was found to be a slight tendency for higher socioeconomic status to be associated with higher ("better") average scores on the over-all index of Quality of Use of Medical Services. As shown in Table 6, the average scores on the over-all index ranged from 34 for the lower socioeconomic status to 39 for the high-status women.

Two components of the over-all index were found to vary significantly with socioeconomic status. They were the use of *preventive* and *specialized* medical

Table 6—Socioeconomic status in relation to the quality of use of medical services*

Socioeconomic status	Total use of medical services	Use of preventive services	Use of specialized services	Use of services for illness
High	39	15.4	3.1	4.1
Middle	37	14.2	2.8	3.8
Low	34	12.8	2.2	3.7
Total	37	14.2	2.7	3.9

* The higher the score on these indexes, the "better" the rating on quality of use of services.

The differences between the high and low SES groups in mean use of preventive services and in mean use of specialized services are both significant at the 0.005 level.

Table 7—Socioeconomic status in relation to level of health knowledge

Socioeconomic status	Health knowledge: Per cent answering correctly: 0–3 items	4 or more items	Total %
High	43	57	100
Middle	50	50	100
Low	58	42	100
Total	51	49	100

The percentage difference between the high and low socioeconomic groups is significant at the 0.05 level.

services. There was less variation among the socioeconomic groups in the use of medical services for *illness* (the third component of the over-all index). Scores on these three indexes are presented in Table 6.

Use of Preventive Services—Specific findings included these: More than five in ten of the high-income group compared to fewer than three in ten of the low-income group had had general checkups when they were not ill; one-third of the low-income women compared to only 12 per cent of the high socioeconomic group failed to see a physician within the first trimester of pregnancy; the high-income women were more likely than low-income women to have had dental x-rays, cleaning of the teeth by a dentist, examination of teeth by a dentist, urinalysis, and smallpox and polio immunizations. (Tables for these detailed findings on use of services have not been presented because of space limitations.)

Use of Specialized Services—The higher the socioeconomic level the greater the use of the following specialists: dermatologists (skin), orthopedists (foot or bone), optometrists or ophthalmologists, surgeons, and psychiatrists.

Use of Services for Illness—There was not found to be a consistent relationship between socioeconomic level and the items measuring the use of medical services for *illness* or *symptoms*. There was no significant difference in the tendency of the income groups to have a general physical examination after illness had developed. On the other hand, twice as many low-income as high-income women reported that they currently needed medical care which they had not obtained (55% compared to 24%).

3. *Socioeconomic Status in Relation to Health Knowledge*

The higher socioeconomic status women scored significantly higher as a group on a nine-item health knowledge test than lower-income women. In the top socioeconomic group, 57 per cent answered four or more items correctly compared to 42 per cent in the low-income group (Table 7). The high-income group performed better on seven of the nine items. It should be noted, however, that while the higher-income group performed better on the health knowledge questions than the low-income group, even the top-income group averaged only about four items answered correctly.

4. *Socioeconomic Status in Relation to Health Equipment*

The high socioeconomic group tended to have more health equipment than the low socioeconomic group; however, the differences among the economic groups were not large or consistent (Table 8).

Hypothesis 3: Lower socioeconomic status persons experience a disproportionately high number of health problems in those health areas in which the health practices of low-income persons are especially deficient relative to the practices of higher-income persons.

In testing hypothesis 2 it was found that the health maintenance practices

Table 8—Socioeconomic status in relation to amount of health equipment

Socioeconomic status	Health equipment (%)		
	High	Medium/low	Total
High	62	38	100
Middle	67	33	100
Low	54	46	100
Total	62	38	100

of lower-income women were especially deficient relative to higher-income women in the areas of exercise, nutrition, and dental hygiene. The question now is whether the lower socioeconomic women also experienced a disproportionately large number of the types of problems that could be associated with deficiencies in these types of health practices.

1. Exercise and Nutrition Practices and Problems

The health problems that could be associated with faulty exercise and nutrition practices that were measured in the present study were obesity, indigestion, and nausea. These problems were associated with socioeconomic level. Over half of the low-income women were judged to be obese (by a height-weight chart), compared to about one-fifth of the high-income women. Twice as many low-income women (29%) as high-income women (14%) had experienced indigestion or nausea within the past two weeks.

2. Dental Hygiene Practices and Problems

More low-income women (32%) than high-income women (14%) had had ten or more teeth extracted. More low-income (19%) than high-income women (4%) had experienced toothache or bleeding gums within the preceding two weeks.

3. Elimination Practices and Problems

Recall that there was not found to be a significant relationship between socioeconomic level and elimination practices. Neither was there a relationship between socioeconomic level and elimination problems. Lower socioeconomic status women were not more likely than higher-income women to have experienced problems of constipation or diarrhea.

Hypothesis 4: Within the lower socioeconomic group, those with good personal health behavior have a higher level of health than those with poorer health practices.

1. Health Practices in Relation to Level of Health Among the Poor

The quality of personal health behavior was found to be positively related to level of health independently of socioeconomic status, but the relationship was strong only within the low socioeconomic group. A striking indication of the relationship of health practices to the level of health was the finding that lower socioeconomic status persons *with good health practices* showed *no disadvantage* in level of health as compared to those in the higher socioeconomic group with equivalent practices. That is, when health practices were good, level of health was equally high in all socioeconomic groups (Table 9). However, low socioeconomic status persons with medium- or low-quality personal health practices had a lower level of health than those in the higher-income groups with equivalent health practices. (Because of the small number of cases in this comparison, the difference did not meet the test of statistical significance.) Thus, poor health practices ap-

Table 9—Quality of personal health practices in relation to level of health by socioeconomic status groups

Quality of health maintenance practices	Average level of health scores by socioeconomic status groups: High SES	Middle SES	Low SES	No. of cases
Poor	2.9	2.7	2.1	(108)
Medium	3.0	2.9	2.6	(214)
Good	3.1	3.1	3.0	(79)
Total	3.0	2.9	2.6	
No. of cases	(104)	(191)	(106)	(401)

peared to have a more direct bearing on the health level of low socioeconomic status than higher-status women. And since poor health practices were more prevalent among the low than among the high socioeconomic status women, the influence of poor health practices on health level was very important in the low-income group.

2. *Use of Medical Services in Relation to Level of Health Among the Poor*

The pattern of relationship of use of medical services to the level of health was similar to that found between personal health practices and level of health. Good use of medical services tended to be associated with a high level of health among the low-income group, but not in the high socioeconomic group (Table 10). Further, low-income persons with good use of medical services had only a slightly lower level of health (2.7) than high-income persons with good use of services (3.0). Among women with poor use of services, on the other hand, those in the low socioeconomic group had a somewhat lower average level of health (2.4) than those in the high-income group (3.0).

3. *Health Knowledge in Relation to Level of Health Among the Poor*

Level of health knowledge was not found to be related to level of health

Table 10—Quality of medical services in relation to level of health, by socioeconomic status groups

Quality of use of professional health services	Average level of health scores by socioeconomic status groups: High SES	Middle SES	Low SES	No. of cases
Poor	3.0	3.0	2.4	(60)
Medium	2.9	2.8	2.7	(187)
Good	3.0	2.8	2.7	(154)
Total	3.0	2.9	2.6	
No. of cases	(104)	(191)	(106)	(401)

in any socioeconomic group. It is possible that the lack of relationship was due to the generally low level of knowledge found in the sample as a whole. However, the fact that a relationship was found between health knowledge and socioeconomic status suggests that there was sufficient range in the level of knowledge among members of the present sample to permit the emergence of a relationship with health level if such a relationship did exist.

4. Health Equipment in Relation to Level of Health Among the Poor

There was no evidence that persons whose homes were well supplied with health equipment had a higher level of health than those lacking such equipment, and this was true of the poor as well as the higher-income groups.

Summary

The data from the present study tended to support the general proposition that one of the mechanisms through which poverty adversely affects health is a more deficient pattern of personal health care among the poor than among higher socioeconomic groups. The findings indicated that the following modifications and specifications of the general proposition were needed:

1. Poorer personal health maintenance practices among lower socioeconomic status women were significantly related to their lower level of health. In fact, low-income women with good health practices were not significantly disadvantaged in health level as compared to higher socioeconomic women. Not all types of health practices were related to socioeconomic status, however. Exercise, nutrition, and dental hygiene practices were especially deficient among low-income women relative to higher-income groups. Low-income women were also found to experience a disproportionately high number of health problems in these particular health areas. On the other hand, alcohol consumption was lower among the poor than among the higher-income women. And sleep and rest, elimination, and smoking habits were not significantly related to socioeconomic status.

2. The poorer quality of use of professional medical services tended to be related to the lower level of health among low-income women. It was in the use of specialized and preventive medical services that the low-income women were especially deficient relative to higher-income women. There was not found to be a clear or consistent relationship between socioeconomic status and the use of medical services for illness.

3. As has been found in other studies, health knowledge and health-related equipment in the home were positively related to socioeconomic status. However, there was no evidence in the present study to suggest that these factors are mechanisms through which poverty adversely affects health. Neither was found to be related to the level of health in any socioeconomic group.

Conclusions

Based on the findings of the study, the following suggestions are offered for consideration in attempts to help economically disadvantaged persons to improve their health:

1. Health programs should focus on highly specific health practices, for these can be learned and practiced routinely without comprehension of complex or abstract principles of health. This conclusion is based on the fact that some very specific items of health behavior were found in this study to be deficient and related to health problems, but general health knowledge was not found to be related to the level of health among the poor. The importance of establishing concrete behavior patterns

as opposed to absorbing information was pointed up in another study which found that teen-agers' information or values concerning dental care were not related to their tendency to go to a dentist for preventive care. On the other hand, having a dentist actually clean their teeth or advise them on care of teeth, or having their own parents go to a dentist for preventive care were related to the teen-agers' own dental care practices.[25]

2. One aspect of body care that requires more positive attention is physical exercise. Many health programs stress nutrition to the neglect of exercise, and this is especially true in health programs for girls and women. In the present study, both exercise and nutrition practices were found to be important in the lowel level of health of economically disadvantaged women. Any effort to modify the exercise practices of disadvantaged persons must take recognition of the fact that their present deficiencies in exercise are related to poorer health and greater fatigue.

3. The sound health practices found in concentration among low-income women should be encouraged and reinforced in health programs. These practices can serve as focal points around which improvements in other areas may be developed.

4. A multifaceted program of assistance is required. If significant improvements in health are to be realized, poor persons will need to have, in combination, easy access to good medical services and sound personal health practices.

5. Programs which focus specifically on the health behavior of the lower socioeconomic group may be particularly beneficial, not only because of the greater prevalence of poor health practices in this group, but also because poor health practices appeared to have a more adverse effect on the health level of low than high socioeconomic status women. A possible explanation is that in the low-income group there are few alternative supports for good health (such as opportunities for recreation or good working conditions), so that poor health practices are not mitigated. In higher-income groups, on the other hand, even when particular health practices are deficient, health may be sustained by other supportive factors.

The desirability of addressing attention to health practices among the low-income women is further pointed up by the finding that when low-income women did have sound health practices their health level was as good as was found among high-income women with equivalent health practices. However, health programs should not ignore completely the health behavior of high socioeconomic status women, for many women in all socioeconomic groups were found to have a variety of faulty health practices.

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