Correlates of Oral Contraception Continuation

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SEVERAL studies reviewed by Jones and Mauldin (*1*) gave continuation rates for populations of oral contraception users, but only Jones and Mauldin (*1*) and Hall and Reinke (*2*) considered the differential characteristics of patients who continued or discontinued the use of oral contraception. Among the studies that were focused on differential continuation rates, the interest was centered on background characteristics of the women: age, parity, marital status, and education.

We have attempted to extend this literature. In addition to further reporting of continuation rates for oral contraception by a variety of background characteristics, we tested the relationship of other types of variables: side effects reported by patients, family structure and attitudes, knowledge of family planning, fears about the pill, and opportunity factors. Our research population was predominantly young, black (90 percent), low-income women in a publicly supported family planning program. Most of them had accepted oral contraceptives at the 6-weeks' post partum or post abortum checkup.

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Methodology

A group of medical students participating in a Population Council Summer Fellowship program at Emory University School of Medicine collected the data for the study as part of a research project. In an effort to concentrate the fieldwork geographically, a stratified cluster sample of 300 patients on oral contraception was selected. Census tracts (clusters) were stratified on the basis of the number of patients in the total clinic population of July through September 1967 who lived in given

tracts. The tracts from these strata were then sampled using probabilities that approximately equalized each patient's chance of being selected (*3*). These patients had received their initial prescriptions in the Emory University family planning program at Grady Memorial Hospital during July, August, and September 1967. They were interviewed in July 1968. The interviews provided the data for the dependent variable as well as for most of the independent variables. With this type of design and a relatively small number of cases, the analysis must be basically correlational rather than causal.

The students located and interviewed 139 patients (46 percent of the total sample). The others could not be located, usually because they had moved. In many instances, the interviewers reported that dwellings at the addresses had been obliterated by freeway construction and urban renewal. The time available for the study did not permit another effort to locate these subjects. Analysis of clinic records, however, indicated that those who were not located and interviewed did not differ significantly in age, marital status, education, race, or parity (X^2, $P>0.10$) from those who were located.

Clinic records also showed that the subjects interviewed did not differ from those not interviewed in the percentage of deliveries through December 1968. Similarly, the difference between the two groups in the percentage on "active" clinic status at the time of the interview was only 1 percent.

Continuation Rates

The percentages of patients who were "continuers" at the end of each cycle (28 days) following the clinic visit at which oral contraceptives were accepted are given in table 1. A patient was counted as discontinuing if she interrupted her use of oral contraception for a cycle whether or not she later resumed. There would have been only small differences in continuation rates at each point if patients who resumed medication were readmitted to the continuer group. Patients who admitted minor lapses of forgetting to take a few pills were not on that basis counted as discontinuing their use. It was rare for a patient to begin using an alternative method immediately upon discontinuing oral contraception, although some patients began using another method after a hiatus of several months.

Table 1. Remaining number and percentage of women continuing oral contraception at each stage

Time of discontinuation	Number who discontinued	Number of continuers remaining	Percentage of continuers remaining
Number of acceptors	.....	139	100
Before taking any pills	13	126	91
During 1st cycle	3	123	88
After completing—			
1st cycle	16	107	77
2d cycle	7	100	72
3d cycle	9	91	65
4th cycle	10	81	58
5th cycle	6	75	54
6th cycle	10	65	47
After 7th cycle and before interview [1]	12	53	38

[1] Category spans several cycles since the timing of the interview ranged from the 10th to 12th cycles.

Analysis of table 1 indicates that 13 patients "discontinued" before taking any pills, three started but discontinued before completing the first cycle, and 16 completed the first cycle but not the second. Thus 23 percent of the initial acceptors discontinued using the pill by the end of the first cycle. Interestingly, the continuation rate after the first cycle (77 percent) is within the range that Jones and Mauldin (*1*) indicate has been found in several studies in developing countries (20 to 30 percent failure to return for new supplies in the second cycle).

By the end of the sixth cycle, about half (47 percent) of the initial acceptors were continuers. Thirty-eight percent of the initial acceptors were continuers at the time of the interview, which ranged from the 10th cycle for some patients to the 12th for others. The continuation rate of 38 percent at 10 to 12 months is lower than the 12-month rates reported in most other studies. A review of studies (*1, 2*) done in both developed and developing countries revealed only one lower 12-month continuation rate: 8 percent in Ankara, Turkey, for paying patients.

Background Characteristics of Patients

This section parallels the focus of previous studies on the relationship between background characteristics and oral contraception continuation rates of patients. Later sections deal with other types of correlates not reported in the literature. In each comparison, continuation data after three

cycles, six cycles, and to the time of interview will be presented. The background characteristics reported in table 2 were ascertained when the patient visited the clinic and accepted oral contraception.

Age. A positive relationship was found (table 2) between age and continuation of the pill after three cycles, with fairly large differences in continuation between the younger (13–17 years old) and older patients (18–24 and 25–45 years old). After the end of six cycles, the relationship was smaller and V-shaped, with the youngest and oldest women the poorest continuers. The pattern of this relationship remained essentially the same to the time of the interview.

Similar patterns of continuation, by age, after 30 months were reported by Frank and Tietze (*4*) and after 12 months by Hall and Reinke (*2*). Both studies were based on populations similar in demographic characteristics to our sample. In a nationwide sample of married women, 18–55, living with their husbands, Westoff and Ryder (*5*) reported lower continuation rates for women 30 years old or older after three, six, 12, and 24 cycles. Except for the first three cycles, our findings are consistent with this observation since the very young women (13–17 years old) in our sample had no counterpart in the Westoff-Ryder study.

Parity. Previous studies of the relationship between parity and continuation have yielded somewhat inconsistent results. Interpretation of differences from one study to another has been complicated by the use of different parity categories and variations in sample composition.

Table 2. Background characteristics of 139 women as related to continuation of oral contraception

Characteristics	Number of patients	Percentage of continuers		
		After 3 cycles	After 6 cycles	To interview, 10-12 cycles
Age (years):				
13–17	23	48	35	30
18–24	68	66	53	44
25–45	48	73	44	33
Parity:				
0–1	56	59	45	36
2–3	44	80	57	50
4–11	38	48	37	26
Not reported	1	..	..	..
Education (grade):				
5–9	28	50	36	29
10–11	50	68	50	42
12–13	58	69	47	36
Not reported	3	..	..	..
Marital status:				
Married	63	67	49	41
Single	53	64	45	38
Separated, widowed, divorced	23	65	43	30

Frank and Tietze (*4*) found slightly lower continuation rates at 30 months for nulliparous women than for parous women; the differences, however, were too small to be of substantive importance. Kanitkar, in Jones and Mauldin (*1*), reported higher continuation rates for higher parity women (four or more) through the first seven cycles, but reversing to higher continuation for lower parity women (none to three) from the seventh cycle through the 25th. In their national sample of married women, Westoff and Ryder (*5*) found higher continuation rates for lower parity women (less than three) after three, six, 12, and 24 months.

Our findings are somewhat similar to those of Westoff and Ryder in that our two-three parity women had substantially higher continuation rates than higher parity women at each of the three points in time (table 2). Considering all three parity categories, however, our data indicate a V-shaped relationship at each of the three intervals. In other words, the two-three parity women were also better continuers than the lowest parity women (none to one). (In our study the women under 18 were concentrated in the parity category of none to one. The Westoff-Ryder study did not include women under 18.) There also was some tendency in our data for the size of the differences to decrease over time.

Expectedly, there was a strong relationship between age and parity. A satisfactory attempt to disentangle this relationship could not be made because of the small sample size. Nonetheless, with age controlled by subdivision, the parity and oral continuation relationship tended to retain its V-shaped pattern for patients 18 to 24 and 25 to 45 years old. Among patients 17 years old or under, parity did not vary enough to produce a meaningful pattern.

Education and marital status. Differences in the rates of continuation by educational categories were not as marked as those by age and parity (table 2). There was a consistent but weak tendency for women who had completed less than 10 years of school to have lower continuation rates than those with higher levels of education. Age most likely was a factor in this relationship. Fur-

ther analysis indicated that both the oldest and the youngest patients were disproportionately located in the lowest category of education (less than 10 years).

The continuation rates by marital status are remarkable for their similarity. It had been assumed that married women would report the highest rates of continuation because of a higher risk of pregnancy. The differences shown in the marital status section of table 2 were too small to support this assumption. To summarize, those most likely to continue oral contraception, based on their characteristics at the time of the first clinic visit, after three, six, and 10 to 12 cycles were 18 to 24 years old, had two or three children, and had completed at least 10 years of schooling.

Side Effects

Discontinuation of oral contraception because of side effects has been a central concern in the literature. Typically, patients have been asked the open-ended question of why they quit, which has posed difficult problems of classifying responses. Investigators following this procedure have found it necessary to distinguish between the reasons given that do not affect the acceptability of oral contraception and those that do. Thus several studies (reference *4*, for example) distinguish between relevant and nonrelevant responses to this type of question. Also, patients do not necessarily give exhaustive responses to open-ended questions. They may mention only one of several pertinent factors.

Table 3. Side effects reported by 123 women as related to continuation of oral contraception

Symptoms	Number of patients [1]	Percentage of continuers		
		After 3 cycles	After 6 cycles	To interview, 10–12 cycles
Weight gain:				
Yes	46	78	61	48
No	73	70	48	40
Not reported or don't know	4	..	..	..
Headaches:				
Yes	25	84	64	44
No	90	71	50	42
Not reported or don't know	8	..	..	..
Nausea:				
Yes	60	62	45	33
No	63	86	60	52
Bleeding:				
Yes	42	71	45	31
No	81	75	57	49
Dizzy spells or nervousness:				
Yes	41	76	56	44
No	80	75	53	44
Don't know	2	..	..	..

[1] Of the original 139 acceptors of oral contraception, the 123 who actually completed the 1st cycle were asked to report side effects.

In research investigating the reasons for discontinuation, this methodology was inadequate for yet another reason. Only discontinuers were queried. Unanswered is the basic question of whether or not discontinuers experienced side effects more frequently than continuers.

In our study, each woman was asked if she experienced certain side effects from taking the pill. We asked her if she—

1. Gained weight from taking the pill?
2. Had more headaches than usual from taking the pill?
3. Felt sick in her stomach from taking the pill?
4. Had any bleeding in between periods from taking the pill?
5. Had dizzy spells or nervousness from taking the pill?

We did not attempt to establish that oral contraception had in fact caused the side effects but whether she so perceived it. Rates of discontinuation for each side effect are reported in table 3.

Only two side effects, nausea and bleeding, were related to continuation in the expected manner: higher discontinuation rates among those reporting side effects. The bleeding relationship was unnoteworthy until after the sixth cycle. With other side effects, it was those who reported the symptoms who were somewhat more likely to continue oral contraception, although the differences diminished by 10 to 12 cycles.

Family Structure and Attitudes

In this and subsequent sections, we present correlates of the continuation of oral contraception that heretofore have not been discussed in the literature. As part of the interview after 10 to 12 cycles, the patients were asked several informational and attitudinal questions about their current living arrangements and families of orientation. The relationship of several of these variables to continuation is discussed in this section.

Living arrangements. Each patient was asked for a complete roster of her household. Patients were then classified as (*a*) living with husband,

(*b*) living with parent(s), or (*c*) head of household. Two patients reported the presence of both husband and parent(s), and they were included in the *a* category. No one reported living with a male friend. There is good reason to believe that several patients either failed to report such an arrangement or reported such a male as a husband.

We anticipated that the presence of a husband would mean a higher continuation rate of oral contraception—presumably because of a higher and more regular and predictable incidence of coitus. Table 4 confirms this opinion; however, most of the differences were not large. At the time of the interview, those living with a husband showed a continuation rate 10 percent higher than that for those living with parents.

Unexpected was the finding that after six cycles and at the time of the interview those living with parents were better continuers than those who headed a household. Age, marital status, and exposure to pregnancy may partially explain this finding. Those living with parents were disproportionately in the younger age categories (13–17 and 18–24 years of age), whereas the heads of households were disproportionately older (25–45 years of age). Disrupted marriages and older age may have been associated with lower coital rates and risk of pregnancy and hence lower continuation rates.

Achievement of desired family size. Each respondent was asked how many children she would like to have by age 45 if she could start over and have just the number she wanted. The response to this question was compared with the number of

Table 4. Family characteristics of 139 women as related to continuation of oral contraception

Characteristics	Number of patients	Percentage of continuers		
		After 3 cycles	After 6 cycles	To interview, 10-12 cycles
Living arrangement:				
Living with husband[1]	64	70	53	45
Living with parent(s)	48	60	46	35
Head of household	23	70	35	26
Other	4	..	..	..
Desired completed family size:				
Exceeded	38	75	50	37
Equaled	29	73	52	38
Less than equaled	64	60	43	38
Not reported	8	..	..	..
Mother's parity:				
1–4	44	80	55	48
5 and over	92	58	42	33
Not reported	3	..	..	..

[1] Includes 2 women living with both husband and parent(s).

Table 5. Family-planning knowledge and fears of 139 women as related to continuation of oral contraception

Knowledge and fears	Number of patients	Percentage of continuers		
		After 3 cycles	After 6 cycles	To interview, 10-12 cycles
Knowledge (number of items correct):				
0–1	28	50	39	29
2	43	79	53	44
3–5	68	63	46	38
Fear level about pill:				
Low (agree with both items)	42	81	57	52
Medium (agree with 1 item)	51	73	57	37
High (agree with neither item)	45	44	27	27
Not reported	1	..	..	..

her living children to determine whether she had exceeded the desired completed family size.

Presumably, patients who had equaled or exceeded their desired family size would be more inclined to terminate childbearing and thus would show higher continuation rates of oral contraception. Table 4 indicates that this factor affected continuation only during the first few cycles. Those who had equaled or exceeded the desired family size showed only slightly higher continuation rates after six cycles, and the differences disappeared at 10 to 12 cycles.

Our finding of no differences at 10 to 12 cycles contradicts the general findings of Rainwater (*6*) and Potter and co-workers (*7*) that performance of contraception improves markedly after the birth of the last wanted child. However, all of their respondents were living with a husband. Some of our respondents who had exceeded the desired family size were not living with a husband and therefore may have been less exposed to pregnancy.

The findings appear less discrepant, however, if our sample of predominantly low-income blacks is compared with only the similar segment of Rainwater's sample. In the "lower-lower" class segment of Rainwater's sample, use of effective contraception appears to differ little between those who have borne their last wanted child and those who have not. And among his "upper-lower" class subjects, the Negro rate of effective contraception varies considerably less in terms of birth of last wanted child than does the white rate, according to Rainwater, because the Negro husband is not as motivated as his wife to take the necessary actions to limit family size.

Mother's parity. Although the patient's indication that she had achieved her desired family size did not show much relationship to continuation, continuation may be influenced by the family-size orientations of other family members—perhaps in this population especially by the mother and, if so, probably in an indirect and diffuse manner.

No direct measure of family-size expectations or preferences of other family members was available. Parity of the patient's mother was available, and table 4 indicates that this is related to the continuation of oral contraception. Patients whose mothers had lower parities were better continuers. What may be operating here is not the mother's family-size example or expectations per se but the transmission of a subculture that broadly influences the daughter's life style, including her motivation and ability to continue contraception.

Knowledge and Fears of Patients

Knowledge about family planning. The interview included several true-false items designed to measure family planning knowledge. These items

Table 6. Opportunity factors affecting 114 women as related to continuation of oral contraception

Factor	Number of patients [1]	Percentage of continuers		
		After 3 cycles	After 6 cycles	To interview, 10-12 cycles
Transportation:				
Walked	23	83	65	48
Drove self	21	81	57	57
Bus	52	81	56	44
Taxi or other driver	15	67	47	33
Not reported	3	..	..	..
Time required to fill 1st prescription:				
Less than 1 hour	31	81	65	58
1 hour or more	75	80	55	41
Not reported	8	..	..	..
Cost per package:				
Free	50	80	56	46
$0.25–$3.50	61	77	56	44
Not reported	3	..	..	..

[1] Table based on the 114 of 139 patients who filled prescriptions they received during clinic visit.

were based on the content of instructions routinely given in the family planning clinic. We selected the following items for the analysis:

1. Douching after having sexual relations is a good way to keep from getting pregnant.
2. It is important not to douche at least 6 hours after using foam.
3. One application of birth-control foam will last for 24 hours.
4. The intrauterine device must be changed by the doctor every 3 months.
5. If you forget to take just one birth control pill, you should stop taking the pills at once.

Only one item pertains specifically to the oral method. Three questions on how to use the pill were asked but not used because they failed to generate varied responses. Almost all patients answered them correctly. The women were scored by number of items to which they responded correctly. "Don't know" responses were scored as incorrect.

The relationship between knowledge of family planning and continuation of the pill is V-shaped (table 5). Those with least and most knowledge are poorer continuers at each point in time than those with intermediate knowledge. Actually the largest differences are in the expected direction—between the categories of least and intermediate knowledge.

The continuation rate of the most knowledgeable patients ranged from 16 percentage points below that of the intermediate group after three cycles to a difference of only six points at the time of the interview. Although such differences are not large and tend to diminish over time, they are in the unexpected direction. Given the nature of the knowledge test—not limited to the oral method—a possible interpretation is that some women who discontinue oral contraception are in the market for an alternative method and hence may selectively obtain more information about other methods. A "before" measure of knowledge would help to clarify this finding.

Fears about the pill. Two items were used to assess patients' fears about oral contraception: (*a*) the birth control pill does not hurt you when you use it many years and (*b*) the birth control pill does not cause cancer. (In the interview, these were mixed with the knowledge items.) The respondents were scored as agreeing with both, one, or neither item. There was a significant number of "don't know" responses to each item. We assumed that a "don't know" response indicated some reservation about the safety of the pill. This scoring method seemed justified since the items were worded to deny negative consequences of the pill.

As expected, table 5 indicates that continuation rates decrease as confidence in the safety of oral contraception diminishes. The most marked differences occurred after three cycles, but considerable variation was found after six cycles and to the time of the interview. Since the interviews were conducted after discontinuation, it was not possible to determine the extent to which fears preceded discontinuation. It is quite possible that some expressed lack of confidence in the method was a rationalization for discontinuation. Particularly with this type of independent variable, a longitudinal study is needed.

Opportunity Factors

Several possible practical impediments to continuation of oral contraception are dealt with in this section. The interview included questions pertaining to the time, money, and inconvenience of having prescriptions filled for oral contraception. Such "opportunity" factors may be quite important to the success of programs like the one serving the research population of this study.

Of the 139 patients, the 114 who filled their prescriptions were asked to indicate mode of transportation to the place where it was filled, how long it took to get there and back, and cost per package. Continuation percentages for these factors are presented in table 6. Little difference was noted in continuation among patients who walked, drove, or rode the bus. The few who reported taking a taxi or depending on someone else to drive them had lower rates of continuation.

The time it took to fill the prescription increasingly affected continuation over time. After three cycles there was no difference in continuation between patients reporting less than 1 hour and those spending 1 hour or more. After six cycles, the difference increased to 10 percent, and at the time of the interview it was 17 percent, favoring patients reporting the least time.

Whether or not the patient paid for her first prescription produced no meaningful difference in continuation rates. Paying for the first prescription usually meant paying for subsequent ones. The absence of difference is probably due largely to the fact that income is a factor in determining the amount the patient must pay for drugs in this medical care system.

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EWER, PHYLLIS A. (Emory University), and GIBBS, JAMES O.: *Correlates of oral contraception continuation. HSMHA Health Reports, Vol. 86, May 1971, pp. 449–456.*

Continuation of oral contraception in a sample of 139 predominantly black, young, low-income patients who had accepted oral contraception at a publicly supported family planning clinic has been analyzed. Only 38 percent of the sampled patients continued oral contraception to the time of a followup interview, 10 to 12 months after the clinic visit.

Several patient characteristics were found to be related to continuation. In composite form, patients with the highest continuation rates were in the center age group (18–24), in the two-three parity category, living with their husbands, were daughters of relatively low-parity mothers, and were able to fill prescriptions in less time with more convenient methods of transportation.

In contrast, the discontinuers tended to have high-parity mothers, live with parents or head their own households, and be at either end of the age and parity categories (13–17 or 25–45 years of age and parities of 0–1 or 4–11). Further, perceiving certain side effects and having fears about the consequences of long-term use of oral contraception appeared to be implicated in the pattern of discontinuation.

It is tempting to speculate that the discontinuers represent two stages of a life pattern. The 13- to 17-year-old girl, still a dependent living with her parents, begins her childbearing at a very early age—perhaps in part as a result of her mother's example of high parity—and becomes, through her inability to use contraception, the older, high-parity woman who heads her own household. Although this life-cycle notion cannot be concluded firmly from the survey-type analysis, the data do not support the belief that simply making oral contraception available to a population of low income women will insure continuous protection against pregnancy.

The data suggested that discontinuation might have been associated with irregular coital experience and thus less exposure to pregnancy. For example, those who headed households and those who lived with parents had higher discontinuation rates than those who lived with husbands. But even though coital rates and risk of pregnancy may have been lower among the discontinuers, their lack of protection is a matter of concern because of their higher risk of low-quality reproduction. For example, among adolescents, chances of prematurity and perinatal mortality increase considerably for second and higher order pregnancies.