Differences in Reliability of Reproductive History Recall Among Women in North Africa

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Abstract

Breast cancer is the most common cancer among women in North Africa. Women in this region have unique reproductive profiles. It is essential to obtain reliable information on reproductive histories to help better understand the relationship between reductive health and breast cancer. We tested the reliability of a reproductive history-based questionnaire. We interviewed 25 breast cancer patients and 25 non-cancer controls from hospitals in Morocco and Egypt about their reproductive history in colloquial Arabic. The questions included pregnancy history, breastfeeding practices, menstruation, contraceptive use and knowledge of breast screening and re-interviewed the same women after 2 weeks. Two-way paired t-test was used to compare observed mean changes in response, and the Fishers Exact test was used for small-cell data. Pearson's correlation test was used to estimate the correlation of subjects' responses to continuous questions between the first and second interview. For categorical questions, percentage of agreement was calculated along with Cohen's Kappa Coefficient values. Moroccan subjects showed good to excellent agreement for responses to all demographic and reproductive questions (r = 0.87 to 0.99). Egyptian subjects had excellent agreement for these questions(r = 0.87 to 0.99), except for those regarding duration of oral contraceptive pill use and reported age at menarche (r = 0.72 and 0.59, respectively). We showed highly correlated responses to most reproductive questions. Duration of contraception use and age at first pregnancy elicited slightly less than reliable responses. In Egypt, responses relating to self-reported age at menarche were less reliable than those given by Moroccan subjects. Future epidemiological studies should take these differences into account when constructing reproductive history questionnaires.

Key words: **Key words**: *Breast Cancer, Reproductive Factors, Reliability, Egypt, Morocco.*

Introduction

Breast Cancer is the most common malignancy in most countries including Morocco and Egypt in North Africa.[1,2] Some reproductive factors such as early menarche, late menopause, infertility, and age older than 35 years at first child birth are known as risk factors for breast cancer.[2-4] In order to better understand the relationship between reproductive factors and breast cancer, using a reliable tool for measuring reproductive health histories is crucial for conducting research. Such tools include questionnaires, many of which have been designed and tested mainly within Western populations.[5,6] However, few studies have investigated the reproducibility and reliability of reproductive health questionnaires in developing countries, such as North Africa. Rather, most have focused on the validity of reporting factors pertaining to maternal morbidity and mortality.[7-9] None have looked at the reliability of self-reported menstrual histories, pregnancy histories or duration of contraceptive use.

In North Africa, women have longer reproductive periods than their Western counterparts. This is characterized by multiple pregnancies over extended periods and associated prolonged breastfeeding that spans over many years. This greater variation in number and duration of pregnancies can make recall of specific reproductive events more difficult.[10-12] Furthermore, these reproductive trends vary throughout the Arab countries due to different cultural and social backgrounds.[7,10] Also, different geographical regions like North Africa practice different methods of family planning and contraceptive and hormonal use from the rest of the Arab countires.[13,14] Considering such variations, it is important to ensure using reliable tools in research studies eliciting reproductive information.

We are in the process of planning a large epidemiological study to investigate the risk factors of breast cancer in North Africa. A major part of the epidemiological data will be based on an interviewer-administered questionnaire.[2,15] Detailed questions will cover reproductive, lifestyle, family and environmental histories. To maximize the efficiency of future data collection, we conducted this pilot-study to assess the reliability of the reproductive health history questionnaire.

Methods

Study Population

This study was conducted between May and August 2007 at the Ibn Rochd University Hospital in Casablanca, Morocco and at the Gharbiah Cancer Society in Tanta, Egypt. Two groups of breast cancer patients and a group of apparently healthy women (controls) from each center were recruited. Patients were identified upon arrival to the centers for medical appointments. Controls were relatives and friends accompanying patients to the center. Patients and controls returned to the centers after about two weeks for a second interview, where the exact same questionnaire was re-administered. It is customary in North Africa to have relatives and friends accompanying the patients during their treatment visits. The friends and relatives who were available during first interviews came also with the patients during the second interviews. Because patients in the department of medical oncology and radiotherapy come to the hospitals on regular basis to receive their weekly cycles of treatment, their inclusion and interviews were conducted during their regular weekly treatment visits. Some women were unable to return to the hospital due to logistical constraints and were re-interviewed over the telephone. The study was approved by the Institutional Review Boards in Michigan, Morocco, and Egypt.

In Morocco, of the 58 women approached to participate, only two refused. A total of 25 patients and 25 controls were successfully interviewed twice, with four patients and two controls interviewed once but subsequently lost as follow-up. In Egypt, of the 56 women approached, only one refused to participate. A total of 25 patients and 25 controls were successfully interviewed twice, with one patient and four controls lost as follow-up. A total of 100 women, fifty patients and fifty controls, were included in the final statistical analysis.

The Questionnaire

The questionnaire that was used and tested in this study resulted through collaborations between the National Cancer Institute in Bethesda, MD, and the co-authors from Morocco, Egypt, and the University of Michigan. The questionnaire was translated, with the help of local collaborators, into colloquial Arabic dialects followed by back translation to English. In Casablanca, the questionnaire was translated into Moroccan Colloquial Arabic and in Tanta, into Egyptian Colloquial Arabic. Special attention was paid to "popular" terminology used in everyday conversation. For example, in North Africa, the formal Arabic word for "breast" is not commonly used. Rather a more vernacular term was used, which differs between Moroccan and Egyptian

dialects. Likewise, forms of definitions and terms of contraception and contraceptive use were modified for each study location to reflect these differences. This questionnaire was administered to both patients and controls by one of the co-authors [KAA] in Egyptian and Moroccan colloquial Arabic dialects. Native Arabic speakers supervised all interviews in Morocco [NB] and Egypt [SS and HO] to ensure accuracy.

The questionnaire included 58-questions pertaining to pregnancy history, breastfeeding, menstruation, contraception and general breast health (length and duration of infections, discharges, and surgeries). Given the extremely rare use of post menopausal hormone therapies in North Africa, specific questions regarding use of brand-name hormones for hormone therapy and fertility treatment were modified. An open-ended question on this subject was included whereby patients could supply the name of the hormone used, if remembered. Questions were added to cover non-medical sources of hormone therapy or fertility treatment, from traditional healers or *midwives.*

Often women in North Africa have larger families and do not remember each pregnancy as a "number," which is commonly seen in the West. Therefore, a timeline of major events in the subject's reproductive life (i.e., age at menarche, age at marriage, age at first birth, etc.) was created to help recall specific past events and establish the temporal relationships among events. Within this framework, the interviewer asked the subject to recall specific details of these events to help trigger recall (e.g. names of children, children's current grade at school, etc.). Our earlier studies helped to clarify the appropriate sociological insights that must be considered for questionnaire design and interviewing.[16,17]

Data Management and Statistical Analysis

Consistency in subjects' responses between the first and second interviews was examined. For this analysis, consistency of reports of age, age at first pregnancy, age at menarche, age at menopause, number of total pregnancies, months of oral contraceptive pill use, and months of Intrauterine Device (IUD) use was assessed. These variables were of interest as they measure the key exposures of interest enabling calculation of length of endogenous and exogenous hormone exposure and pregnancy history.[5,6] For continuous variables, we subtracted the value given in the second interview from the value given in the first interview. For example, we subtracted the self-reported age given during the

second interview from the same patient's self-reported age at the first interview.   Variables used in this analysis included categorical questions related to menstrual regularity, contraceptive use, fertility problems, and knowledge of breast health practices. Initial analysis included all 100 patients and controls pooled together. Subsequent analysis included a comparison between patients and controls in each location, followed by comparisons of Moroccan and Egyptian subjects irrespective of cancer status. Box plots were constructed to assess the difference in continuous variables and identify outliers. Two-way paired t-test was used to compare observed mean changes in response, and the Fishers Exact test was used for small-cell data. Pearson's correlation test was used to estimate the correlation of subjects' responses to continuous questions between the first and second interview. Continuous variables were then grouped into cut-points (whether a subject's response changed by less than or more than one year) to assess altered their responses. For categorical questions, percentage of agreement was calculated along with Cohen's Kappa Coefficient values. SAS version 9.1 was used in all statistical analyses.

Results

No significant differences between the first and second interviews were observed for self-reported demographic and reproductive characteristics (Table 1). When comparing the combined group of patients and controls (i.e. subjects) by country of residence, no significant difference in these demographic or reproductive characteristics were seen, except that Moroccan subjects reported reaching menarche at an earlier age than Egyptians (13.4 ± 1.73 and 14.1 ± 1.80 years for Morocco and Egypt respectively, p = 0.03) and fewer Moroccan subjects reported using IUDs (16% and 48% for Morocco and Egypt respectively, $P < 0.001$) (Table 1). Comparison of patients and controls within each country revealed no significant differences, except that cases were significantly older than controls in each location (mean age = 49.4 ± 11.7 and 40.8 ± 11.4 years, for patients and controls, respectively in Morocco, $P = 0.01$; and mean age = 54.5 ± 10.9 and 37.7 ± 7.2 years for patients and controls, respectively in Egypt, $P < 0.0001$) (Table 1).

Analysis of the mean change in subject responses to self-reported demographic and reproductive questions showed no significant difference between patients and controls in Morocco. In Egypt, a significant difference between patients and controls was seen in reporting the total number of pregnancies

and age at menarche. Cases in Egypt reported a greater number of pregnancies at the second interview and controls reported a fewer number (mean change in self-reported number of pregnancies between the first and second interview 0.16±0.47 and -0.04±0.20 for cases and controls respectively, *P* = 0.06) (Table 2). Patients in Egypt reported an older age at menarche during the second interview and controls reported a younger age (mean change in self-reported age at menarche between the first and second interview 1.2±4.07 and -0.34±1.28 years for patients and controls respectively, *P* = 0.08) (Table 2). After ignoring cancer status and comparing subjects by country of residence, analysis of the mean change in subject responses to self-reported demographic and reproductive questions showed no significant difference between subjects in Morocco and Egypt (Table 3).

In Morocco, patients who were not available for the second interviews were 4 out of 29 (13.7%) and 2 controls out of 27 (7.4%). In Egypt, patients who were not available for the second interviews were 1 of 26 cases (3.8%) and 4 of 29 controls (13.7%). Patients and controls who were not available for the second interviews were not statistically significant from patients and controls who completed the two interviews with respect to the demographic and reproductive variables reported in table 3.

Analysis of all 100 subjects showed that 43% changed their responses to age at first pregnancy by more than twelve months. This observation was more pronounced in Egypt among all subjects, independent of cancer status. There, 54% of all subjects changed their responses by more than one year, while 54% of patients and 60% of controls did so (data not shown).

Correlation analysis of responses to demographic and reproductive questions showed that overall, subjects gave highly correlated responses between the first and second interview (r ≥ 0.90), except to questions regarding age at menarche (r = 0.72), duration of contraceptive pill use (r = 0.81) and duration of IUD use (r = 0.88) (Table 4). In Morocco, when ignoring cancer status, subjects gave highly correlated responses to all questions, except those regarding duration of IUD use (r = 0.87) (Table 4). Controls gave highly correlated responses to all questions while cases had less than-highly correlated responses to questions regarding age at first pregnancy (moderate correlation, r = 0.88), duration of oral contraceptive pill use (moderate correlation, r = 0.87) and duration of IUD use (low correlation, r = 0.71) (Table 4). In Egypt, when ignoring cancer status, all

responses were highly correlated except those regarding age at menarche (r = 0.59), duration of oral contraceptive pill use (r = .72) and duration of IUD use (r = 0.87) (Table 4). Patients in Egypt gave highly correlated responses except to questions regarding age at first pregnancy (moderate correlation, r = 0.87), age at menarche (low correlation, r = 0.58), duration of oral contraceptive pill use (moderate correlation, r = 0.81), and duration of IUD use (low correlation, r = 0.71) (Table 4). Controls in Egypt had highly correlated responses except to questions regarding age at menarche (low correlation, r = 0.59), duration of oral contraceptive pill use (low correlation, r = 0.72), and duration of IUD use (moderate correlation, r = 0.87) (Table 4).

Box plots were used to assess the differences in self-reported responses to demographic and reproductive questions and to assess the potential influence of single observations. Further stratification by country and cancer status within each country confirmed the results reported above. Questions regarding duration of contraceptive use showed the greatest variation in subject response between the first and second interview. This variation was seen regardless of cancer status or country of residence. Subjects in Egypt showed greater variation in their responses age at menarche. No great leverage from single observations was observed.

Agreement analysis of subject responses to dichotomous questions regarding contraceptive use, fertility problems, menstrual regularity, hormonal use and knowledge of breast screening showed that controls in Morocco exhibited strong agreement for all questions (percentage of agreement ≥ 80%). (Table 5) Patients in Morocco showed strong agreement except to questions regarding knowledge of breast exams (percentage of agreement 67%), performance of breast exams (percentage of agreement 73%) and knowledge of mammograms (percentage of agreement 75%). (Table 5) Patients and controls in Egypt showed strong agreement for all questions (percentage of agreement ≥ 80%). (Table 5)

After ignoring cancer status, agreement analysis showed that subjects in Morocco had strong agreement for all questions except those regarding knowledge of breast exams (percentage of agreement 76%), performance of breast exams (percentage of agreement 77%), and knowledge of mammograms (percentage of agreement 78%). Subjects in Egypt showed strong agreement for all questions (percentage of agreement ≥ 80%). (Table 5)

Discussion

This study showed a reliable and consistent answers and agreement between the interviews irrespective of the cancer status. The small sample size of the study should be considered before generalization of the study. The study revealed several interesting observations regarding the reliability of women's recall of reproductive health histories in North Africa. First, women in Morocco and Egypt tended to give reliable and consistent answers relating to most demographic and reproductive questions and that these results did not differ significantly by cancer status or country of residence. Second, high levels of agreement between the first and second interviews were observed for responses to questions regarding contraceptive use, fertility problems, menstrual regularity, hormonal use, and knowledge of breast screening. Again, these high levels of agreement were observed regardless of cancer status or country of residence. These findings suggest that cancer status may play a limited, if any, role in the reliable recall of reproductive health history.

This pilot study showed that the existing questionnaire elicits reliable and consistent results, regardless of cancer status or country of residence. However, certain questions resulted in less than reliable recall or showed considerable variation between interviews in their reported responses. This suggests that these questions will need to be modified for future versions of the current questionnaire. Questions regarding duration of contraceptive use were troublesome for subjects in Morocco and Egypt, and slightly more so for patients. Questions regarding age at first pregnancy also proved difficult in both countries, but more so for women in Egypt, regardless of cancer status. Questions regarding age at menarche elicited less reliable results among Egyptian subjects. Future epidemiological studies should take these differences into account when developing new questionnaires or modifying existing ones to obtain data related to questions that provided less reliable answers in this study.

The results from this pilot study confirmed the findings of previous studies conducted in North Africa. Rao et al.[9], showed that maternal recall, prompted via interviews, provided a reliable count of births, stillbirths and child deaths in rural Egypt. Despite experiencing more pregnancies and child mortality, women in developing countries can still provide reliable information via maternal recall. Likewise, Strickler et al.[8] investigated the reliability

of self-reported contraception use in Morocco. The 1992 and 1995 demographic and Health Survey showed that individual estimates of contraception-use, may have lower levels of reliability. However, at the aggregate level, these estimates tended to be consistent and reliable.[8] Similarly, the findings from our analysis showed reliable and consistent results, whereas individual estimates showed greater variation.

A few studies have looked into the reliability and recall of women in developing countries.[18-20] However, these studies focused on maternal recall for factors such as child mortality, birth complications, and gynecological morbidity. Large families exert suffering on all family members.[21,22] Like the Giza Study of the 1980s in Egypt, these studies have developed questionnaires that solicit information primarily on maternal morbidity, which are then validated against a doctor's examination.[7] Their focus has not been purely on the reliability of self-reported factors such as contraceptive use, hormonal intake and breast health—factors which, especially in the developing world, cannot be validated or confirmed against medical records. Furthermore, these studies exclude women who have never been married or pregnant. This study differed from earlier ones in that the definition of reproductive history is more encompassing than previous studies—including questions regarding breast health practice and knowledge. This study also included never-married and never-pregnant women in the study population.

In addition, this study looked at the effect of breast cancer status on recall of reproductive events. Studies that have investigated this relationship have been conducted only within Western populations and have confirmed the reliability of self-reported reproductive characteristics regardless of breast cancer status.[5,6] This study also illustrated that breast cancer patients and controls gave primarily reliable responses, even within a non-Western setting. This study remains one of the first to investigate this possible relationship within developing countries.

This study has several strengths. The geographic and cultural variations between Morocco and Egypt presented a diverse and unique study population. As a multi-country study, it is the first of its kind to investigate potential regional differences in the reliability of reproductive history recall among women living in North Africa. The majority of the women included in our study were middle-aged with a longer reproductive period, which enhanced our opportunity to capture a wide-range in reproductive differences. Likewise, the older age of subjects

captured a shift in contraceptive-use, meaning that many women had used multiple methods of birth control over a longer time period. Again, this potentially allows for more error in subject recollection and lets us better estimate recall reliability. The interviewer administering the questionnaire is formally trained in Arabic and had a native-speaker monitoring all interviews. This ensured more accurate and efficient data collection. Lastly, the short administration time of the questionnaire meant subjects were less likely to suffer from fatigue. The relatively small sample size of the study might be a limitation.

In conclusion this study showed consistent and highly correlated responses to most reproductive questions, irrespective of cancer status or country of residence. Questions regarding duration of contraception use and age at first pregnancy elicited slightly less than reliable responses among cancer patients. In Egypt, responses relating to self-reported age at menarche were less reliable than those given by Moroccan subjects. Future epidemiological studies should take these differences into account when constructing questions regarding contraceptive use, age at menarche and age at first pregnancy.

Acknowledgments

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Table 1. Mean change in Self-Reported Variables between First and Second Interview by Location.

Variable	Morocco N=50	Egypt N=50	P^a
Age (years) Mean change ± SD	0.10 ± 0.65	-0.03 ± 1.55	0.59
Number of Pregnancies Mean change ± SD	0.04 ± 0.40	0.06 ± 0.37	0.80
Age at First Pregnancy (years) Mean change ± SD	0.13 ± 3.90	-0.16 ± 3.65	0.70
Age at Menarche (years) Mean change ± SD	-0.05 ± 0.83	0.43 ± 3.09	0.29
Age at Menopause (years) Mean change ± SD	0.88 ± 5.79	-0.71 ± 7.10	0.90
Contraceptive Pill Use (months) Mean change ± SD	-2.18 ± 34.23	-3.12 ± 50.85	0.80
IUD use (months) Mean change ± SD	2.34 ± 14.74	1.57 ± 29.68	0.56

[a] Two-way T-test by Location

Table 2. Mean change in Self-Reported Variables between First and Second Interview by Cancer Status and Location

Variable	ALL SUBJECTS N= 100	Morocco			Egypt		
		PATIENTS N=25	CONTROLS N=25	*P* [a]	PATIENTS N=25	CONTROLS N=25	*P* [a]
Age (years) Mean change ± SD	-0.04 ± 1.2	0.12 ± 0.52	0.08 ± 0.76	0.83	-0.14 ± 2.14	0.08 ± 0.57	0.62
Number of Pregnancies Mean change ± SD	-0.05 ± 0.39	0.04 ± 0.55	0.04 ± 0.20	1.00	0.16 ± 0.47	-0.04 ± 0.20	-0.06
Age at First Pregnancy (yrs) Mean change ± SD	0.02 ± 3.8	0.58 ± 5.44	-0.32 ± 1.05	0.42	-0.64 ± 4.88	0.32 ± 1.71	0.36
Age at Menarche (yrs) Mean change ± SD	-0.19 ± 2.26	-0.08 ± 0.99	-0.02 ± 0.60	0.80	1.2 ± 4.07	-0.34 ± 1.28	0.08
Age at Menopause (yrs) Mean change ± SD	-0.80 ± 6.44	0.08 ± 2.53	1.68 ± 7.79	0.33	-0.30 ± 5.50	1.72 ± 8.39	0.32
Contraceptive Pill Use (months) Mean change ± SD	2.65 ± 43.13	4.88 ± 32.4	-9.24 ± 35.18	0.14	1.96 ± 39.63	-8.20 ± 60.45	0.48
IUD use (months) Mean change ± SD	-1.95 ± 23.31	5.16 ± 20.52	-0.48 ± 2.4	0.18	3.13 ± 29.93	0 ± 29.95	0.71

[a] Two-way T-test by Cancer Status

Table 3. Demographic and Reproductive Characteristics Reported at First Interview by Location and Cancer Status

Variable SUBJECTS *	ALL N=100 No. (%)	Casablanca, Morocco**			Tanta, Egypt**		
		PATIENTS N=25 No. (%)	CONTROLS N=25 No. (%)	*P*	PATIENTS N=25 No. (%)	CONTROLS N=25 No. (%)	*P*
Age (years)							
Mean ± SD	45.6 ± 12.3	49.4 ± 11.7	40.8 ± 11.4	0.01[a]	54.4 ± 10.9	37.7 ± 7.2	<0.0001[a]
Median (Range)	42 (23 – 78)	50 (36 – 78)	38 (26 – 63)		40 (23 – 52)	40 (23 – 52)	
Resident							
Urban	81 (81)	24 (96)	23 (92)	0.76[b]	16 (64)	18 (72)	0.60[b]
Rural	19 (19)	1 (4)	2 (8)		9 (36)	7 (28)	
Number of Pregnancies							
Mean ± SD	3.0 ± 2.6	3.2 ± 3.3	2.2 ± 2.0	0.20[a]	3.8 ± 3.0	2.8 ± 1.8	0.16[a]
Median (Range)	3 (0 – 14)	2 (0 – 10)	2 (0 – 8)		4 (0 – 14)	3 (0 – 7)	
Age at First Pregnancy (yrs)							
Mean ± SD	21.8 ± 4.6	21.9 ± 6.6	21.2 ± 5.4	0.72[a]	22.5 ± 3.7	21.6 ± 3.2	0.41[a]
Median (Range)	21 (14 – 36)	20 (15 – 36)	20.3 (14 – 34)		23 (16 – 31)	21 (16 – 28)	
Age at Menarche (yrs)							
Mean ± SD	13.7 ± 1.8	13.6 ± 1.7	13.1 ± 1.7	0.27[a]	14.1 ± 1.9	14.1 ± 1.7	0.96[a]
Median (Range)	14 (9 – 18)	14 (11 – 18)	13.5 (9 – 16)		14.3 (11 – 18)	14 (11 – 17)	
Age at Menopause (yrs)							
Mean ± SD	48.4 ± 5.9	49.0 ± 4.8	50.0 ± 4.1	0.63[a]	48.2 ± 6.8	42.7 ± 8.1	0.21[a]
Median (Range)	50 (36 – 58)	50 (36 – 55)	48 (45 – 57)		50 (36 – 58)	39 (37 – 52)	
Ever used methods to prevent pregnancy							
Yes	63 (63)	13 (52)	15 (60)	0.77[b]	16 (64)	19 (76)	0.54[b]
No	37 (37)	12 (48)	10 (40)		9 (36)	6 (24)	
Ever used oral contraceptive pills							
Yes	47 (47)	12 (48)	14 (56)	0.78[b]	14 (56)	7 (28)	0.08[b]
No	53 (53)	13 (52)	11 (44)		11 (44)	18 (72)	
Ever used an IUD							
Yes	32 (32)	4 (16)	4 (16)	1.00[b]	10 (40)	14 (56)	0.40[b]
No	68 (68)	21 (84)	21 (84)		15 (60)	11 (44)	
Ever had fertility problems							
Yes	15 (15)	3 (12)	5 (20)	0.70[b]	5 (20)	2 (8)	0.42[b]
No	85 (85)	22 (88)	20 (80)		20 (80)	23 (92)	

[a] T-Tests; [b] Fisher's Exact Tests

* Two-way t-tests comparing means from Interview 1 and Interview 2 showed no significant differences at the α = .05 and .10 level

** Two-way t-tests comparing means from Morocco and Egypt

Table 4. Correlations* for Self-Reported Variables between First and Second Interview by Cancer Status

Variable	**Morocco**				**Egypt**		
	ALL SUBJECTS N = 100	**PATIENTS N = 25**	**CONTROLS N = 25**	**COMBINED PATIENTS & CONTROLS N = 50**	**PATIENTS N = 25**	**CONTROLS N = 25**	**COMBINED PATIENTS & CONTROLS N = 50**
	r	**r**	**r**	**r**	**r**	**r**	**r**
Age (years)	0.99	0.99	0.99	0.99	0.98	0.99	0.99
Number of Pregnancies	0.98	0.99	0.99	0.98	0.99	0.99	0.98
Age at First Pregnancy (years)	0.92	0.88	0.99	0.92	0.87	0.98	0.92
Age at Menarche (years)	0.72	0.95	0.94	0.95	0.58[a]	0.78	0.59
Age at Menopause (years)	0.97	0.99	0.94	0.97	0.97	0.86	0.96
Contraceptive Pill Use (months)	0.81	0.87	0.92	0.89	0.81	0.66	0.72
IUD use (months)	0.88	0.71	0.99	0.87	0.71	0.90	0.87

All p-values < .001

* Pearson's Coefficients

[a] $P = .002$

Table 5. Agreement and *P*-value of Kappa Coefficients for Self-Reported Variables between First and Second Interviews by Cancer Status.

VARIABLE	ALL SUBJECTS N = 100	Morocco			Egypt		
		PATIENTS N = 25	CONTROLS N = 25	COMBINED PATIENTS & CONTROLS N = 50	PATIENTS N = 25	CONTROLS N = 25	COMBINED PATIENTS & CONTROLS N = 50
	%	%	%	%	%	%	%
Ever used methods to prevent pregnancy	94	88	96	92	92	100	96
Ever used oral contraceptive pills	90	84	96	90	88	92	90
Ever used an IUD	97	96	100	98	96	96	96
Ever used an injection	94	100	100	100	92	84	88
Ever had fertility problems	95	88	96	92	100	96	98
Ever been pregnant	97	88	100	94	100	100	100
Menopausal status	97	96	96	96	100	96	98
Are periods usually regular	90	88[a]	80	84	96	96	96
Artificial hormone use	90	92	96	92	84	92[a]	88
Ever heard of a breast exam	84	67[a]	84[a]	76	88	96	92
Ever performed a breast exam	86	73	80	77	96	92	94
Ever heard of a mammogram (MGM)	83	75	80	78	84	92	88

Unless noted, all p-values < 0.10
[a] *P* > 0.10
NA= not applicable