Title

Physician's knowledge, attitude and behavior regarding fertility issues for young breast cancer patients: a national survey for breast care specialists

Running Title

Physician's attitude regarding fertility issues in breast cancer patients

Chikako Shimizu[1], Hiroko Bando[2], Tomoyasu Kato[3], Yuri Mizota[4], Seiichiro Yamamoto[4]

1 Breast and Medical Oncology Division, National Cancer Center Hospital

2 Breast and Endocrine Surgery, Graduate School of Comprehensive Human Sciences, University of Tsukuba

3 Division of Gynecology, National Cancer Center Hospital

4 Center for Cancer Control and Information Services, National Cancer Hosptital

Corresponding Author: Chikako Shimizu

Breast and Medical Oncology Division, National Cancer Center Hospital

5-1-1 Tsukiji, Chuo-ku, Tokyo 104-0045, Japan

Phone: +81-3-3542-2511

Fax: +81-3-3542-3815

e-mail: cshimizu@ncc.go.jp

Abstract

Background: Fertility is one of the key aspects of quality of life for breast cancer patients of childbearing age. The objective of this study was to describe fertility-related practice for young breast cancer patients and to identify healthcare provider factors that contribute to physicians' behavior towards fertility preservation.

Methods: A cross-sectional survey was developed in order for Japanese breast cancer specialists (n=843) to self-evaluate their knowledge, attitude and behaviors regarding fertility preservation. Survey items included questions regarding knowledge of and attitude toward fertility issues in cancer patients, fertility-related practice, potential barriers for the discussion of fertility with patients and provider socio-demographic background.

Results: Between June and July, 2010, 434 (52%) breast oncologists responded to the survey. Female and younger oncologists (age<50) had significantly higher probability of referring patients to reproductive specialists. Physicians who had better knowledge score and positive attitudes toward fertility preservation were more likely to discuss potential fertility issues with cancer patients. This was significantly associated with consultation and referral to reproduction specialists when encountering fertility issues with cancer patients. Risk of recurrence, lack of collaborating reproductive specialists,

and time constraints in the clinic were identified as major barriers to discussion of fertility preservation with breast cancer patients.

Conclusion: Female and younger physicians as well as physicians working in a multidisciplinary care environment had positive attitudes towards fertility issues in breast cancer patients. The development of comprehensive and interdisciplinary programs for healthcare providers is necessary to meet the expectations and fertility needs of breast cancer patients.

Introduction

With improvement of cancer prognosis, fertility has become one of the key aspects of quality of life for breast cancer patients of childbearing age. Distress about interrupted childbearing is likely to persist in long-term female cancer survivors[1]. The American Society of Clinical Oncology (ASCO) has developed guidance for oncologists regarding available fertility preservation methods and related issues[2]: oncologists should address the possibility of infertility with patients during their reproductive years and be prepared to discuss possible fertility preservation options or refer appropriate and interested patients to reproductive specialists as early as possible during treatment planning.

However, previous studies have shown that only 23% of the patients younger than 40 years of age were informed of potential infertility after cancer treatment in a single institution in Japan and less than half of oncologists were following ASCO guideline in the United States[3,4].

The practice of oncologists related to fertility issues in patients of reproductive age depends on multiple factors: the patient's medical condition, patient's interest in fertility preservation, information provided by healthcare providers, and importantly access to options for fertility preservation.

We have previously analyzed the decision making process for adjuvant treatment in young breast cancer patients of reproductive age. Significantly less patients expressed interest in fertility when they had children or advanced disease. Less aggressive treatment (without chemotherapy) was recommended by oncologists for patients who voluntarily expressed an interest in preserving fertility[4]. Nearly one-third of the patients who expressed an interest in fertility selected a different adjuvant treatment from the primary recommendation of the oncologist because of their concern for preserving fertility, whereas the majority of patients who did not express an interest in preserving fertility followed the oncologists' primary recommendation[4]. These data suggest patients' awareness regarding fertility. Their attitude in the clinic is likely to

influence the practice of treating oncologists.

The awareness and attitude of patients in the clinic might reflect the ability of healthcare providers to provide an environment with patients in which they could bring up fertility issues. The objectives of this study include describing fertility-related practice for breast cancer patients in a variety of clinical settings in Japan and identifying healthcare provider factors that contribute to physicians' behavior regarding fertility preservation in young breast cancer patients.

Methods

Selection of participant

A cross-sectional survey was developed in order for board-certified breast oncologists of the Japanese Breast Cancer Society (JBCS), who are the main physicians treating breast cancer patients in Japan, to self-evaluate their knowledge, perception and behaviors regarding fertility issues in young breast cancer patients.

Measures

The survey consisted of 49 items including questions regarding knowledge of and attitudes towards fertility in cancer patients, practice behavior of fertility-related

discussions with patients, potential barriers for these discussions and demographic background of the practitioners (Table 1). Survey items were derived from existing literature and multidisciplinary discussion. Physicians were asked to evaluate their agreement to the statements using a five-grade system (1: Strongly agree, 2: Agree, 3: Cannot decide, 4: Disagree, 5: Strongly disagree).

1. Knowledge about fertility issues in breast cancer patients

   To evaluate the accuracy of knowledge about fertility issues in breast cancer patients, the statements were developed from the latest JBSC treatment guideline[5]. For statements A-1 and A4, the respondents were considered to have more accurate knowledge when the score was lower. For Statements A-2 and A-3, the respondents were considered to have more accurate knowledge when the score was higher. Then the sum of [(5-"score for A-1") + ("score for A-2") + ("score for A-3) + (5-"score for A-4")] was calculated. The respondents with a higher sum were considered to have more accurate overall knowledge. A-5 was not used to evaluate the accuracy of knowledge because of lack of definite evidence, but correlated with the use of LHRH agonist for fertility preservation.

2. Practice behaviors for breast cancer patients of reproductive age

   Practice behavior statements consisted of 13 items including statements used in the

US oncologist survey with some modifications to adapt to Japanese practice setting. The statements “I discuss the impact of cancer treatment on future fertility with my patients”, “I consult reproductive specialists with questions about fertility issues in my patients”, and “I refer patients who have questions about fertility to reproductive specialists” were considered the most important behaviors according to the ASCO guideline[2].

3. Potential barriers for discussing fertility issues with breast cancer patients

   Among seven potential barriers asked in the questionnaire, four were similar to statements used in the US survey[4]. We put three additional statements (patients' voluntary expression of interest, existence of spouse/partner, and support from co-medical staff) that were hypothesized from our previous study[2] and knowledge of Japanese culture. In addition, we asked the participant to describe the greatest difficulty in discussing fertility in an open question.

4. Attitude towards fertility preservation of cancer patients

   Five statements were selected from the US survey[4]. Because the hereditary aspect of breast cancer was considered to be not genuinely linked with perception of fertility preservation, the item was not included in our analysis. Participants were considered to be positive toward fertility preservation if the sum of score was higher

than 3. The sum of scores for statements from D-1 through D-5 was calculated and the respondents with higher total score were considered as physicians with "positive attitude" towards fertility preservation.

5. Individual and institutional background

The items included physicians' gender, age, religious background, length of professional career, and specialty. We also asked for a description of practicing institution: the number of breast surgeries, the number of young breast cancer patients, presence of female colleagues in the team, the presence of one or more medical oncologist(s), breast cancer certified clinical nurse specialist (CNS) and board-certified pharmacists in the institution.

Procedures

The names of study participants and the institutions of breast oncologists were obtained from the JBCS website. After confirmation of each physician's affiliation, anonymous paper surveys were sent out to all 843 breast oncologists by mail with a return postage-paid envelope. The survey was sent out on 28 May, 2010 and the mailed surveys postmarked by July 31 were included in the analysis. No honorarium was offered for completing the survey.

Data analysis

All analyses were conducted using IBM SPSS statistics version 18. Accuracy of knowledge on fertility was valued based on four questions (A-1,2,3,4, table1) concerning the standard knowledge about the chemotherapy and the effect of chemotherapy on fertility. Respondents with appropriate knowledge were considered "accurate". Four questions (D1, 2, 3, 5, table1) concerning the perspective and opinion about the fertility preservation were asked and scored as attitude score. Respondents were divided into "positive attitude group" and "negative attitude group" depending on the attitude score. Chi-square test was applied for correlation analysis between physician knowledge, attitude and background. Physicians' background demographics, knowledge, and attitude regarding fertility issues were associated with physicians' practice behaviors regarding fertility issues. Odds ratios(OR) and their 95% CIs were estimated to compare physician background factors, knowledge and attitude with physician practice pattern, using simple and multivariable logistic regression models. All *P* values are two sided, and the statistical significance level was set at the $p<0.05$. No adjustments for multiple comparisons were considered because of the exploratory nature of this study.

Results

Response rate

The response rate was calculated as the number of breast oncologists completing the survey (n=434) divided by the initial sample size minus undeliverable

(843-8=835): This yielded a 52% response rate. This is higher than the previous survey on fertility preservation referral targeting oncology specialists in the United States[3].

Demographic and characteristics of responding breast oncologists

The background of respondents is shown in Table 1. 16.6% of the respondents were female. More than 95% of the respondents were experienced physicians reflecting the requirement of basic board certification in general medicine, surgery, radiation oncology or pathology in order to obtain JBCS Breast Oncologists certification. The majority was surgeons. Less than half responded that they have medical oncologists in their institutions. About 70% were the institutions in which they operated on less than five breast cancer patients per week (less than approximately 200 cases per year).

Association between knowledge, attitude and physician background (table 3)

Two hundred and seventy nine (64%) respondents were considered to have accurate knowledge. Accuracy of knowledge on fertility was correlated with the number of young breast cancer patients treated ($p=0.006$), presence of children of the physician ($p=0.01$), age of the physician ($p=0.019$) and the presence of female colleagues ($p=0.019$).

The existence of spouse/partner ($p=0.011$), age ($p=0.032$) and gender ($p=0.023$)

of the physician were the factors significantly correlated with a positive attitude toward fertility considerations of breast cancer patients. Physicians who have spouse/partner, physicians who are younger than 50 years, and female physicians had more positive attitudes toward fertility issues for breast cancer patients.

Practice of fertility issues among breast oncologists

83.3% of the participants responded that they were positive in discussing fertility issues with young breast cancer patients.

21.2% responded that patients voluntarily bring up fertility issues in the clinic. Physicians who treat two or more young patients per week perceived that patients voluntarily express their concern in the clinic compared to physicians who treat fewer (Odds ratio [OR] 1.843, 95% confidence interval [CI] 1.132-3.002, p=.008). Physicians who treat two or more young patients per week (OR 1.304, 95% CI 1.048-2.453, p=0.023), who have board certified nurse colleagues (OR 1.553, 1.187-2.032, p=0.000) and have more than six breast surgeries per week (OR 1.201, 1.023-1.410, p=0.014) responded that they perceived that patients talk to co-medical staff about their concerns about fertility. 23.7% of the respondents consulted reproductive specialists when they encountered fertility problems in their patients and 41.7% referred patients to

reproductive specialists when patients expressed concerns regarding fertility.

The association between physicians' behaviors related to fertility issues and their knowledge, attitude and background demographics are shown in table 3. Fair knowledge had the strongest impact on physicians' positive behavior towards discussing fertility issue with patients. Positive attitude, presence of breast cancer specialized CNS, young age and female gender were also significant factors positivity towards the discussion. Female oncologists and medical oncologists were more likely to take into account patients' social backgrounds such as history of childbirth, presence of spouse/partner and patients' economic status when discussing fertility issues.

Physicians with a positive attitude, physicians younger than 50 years, and female physicians were more likely to discuss fertility issues with patients with poorer prognoses. Positive attitude was the strongest factor related to consultation and referral to reproductive specialists.

Barriers for discussion with patients

High risk of disease recurrence (51.3%), lack of reproductive specialists or infertility clinic for referral (45%), and time constraints in the clinic (45%) were regarded as major barriers for discussing fertility issues. When only physicians who

were negative in discussing fertility issues (n=69) were analyzed, high risk of recurrence (56.5%), no signal of interest in fertility from patients (49.2%) and lack of reproductive specialists or infertility clinic for referral (37.6%) were the major barriers to discussing fertility with patients.

Discussion

This study describes the attitude of the main providers of breast cancer treatment in Japan towards fertility issues in young breast cancer patients. The high response rate to our survey in a relatively short time indicates the interest of breast oncologists in fertility issues. More than 80% of the participants responded that they were positive in attitude when discussing fertility issues in the clinic, but this result may be biased by the respondents' interest in fertility issues. The recent awareness of fertility issues among Japanese breast oncologists may be related to publication of the ASCO guideline in 2006 and the inclusion of fertility-related contents in JBCS Patient Guideline 2009 [2,6]. Indeed, the JBCS treatment guideline, the standard textbook for board certification of Breast Oncologists, updated their contents to cover fertility related issues in July, 2010[5].

The physicians with a positive attitude and working in institutions with

medical oncologists and/or female colleagues had a higher likelihood of consultation or referral to reproductive specialists. The likelihood of referring to reproductive specialists was slightly higher in female physicians, which was consistent with the results of the survey in the United States. These results indicate that participation of female healthcare providers in the team and a multidisciplinary working environment might enhance physicians' awareness of and behavior toward fertility-related issues. Because knowledge and attitude seem to be influenced by gender, personal experience, and the working environment of the physicians, we think that outreach with educational materials and systematic learning opportunities for healthcare providers would be helpful in expanding knowledge and performance reading fertility issues in young breast cancer patients.

High risk of disease recurrence was considered the greatest barrier for physicians. In our previous study, patients' with higher risk of disease recurrence did not voluntarily express their concerns regarding fertility when compared to patients of lower risk of disease recurrence[3]. Both patients and physicians may refrain from discussing future fertility when the estimation of prognosis of the cancer is poor. Moreover, fertility preservation techniques such as embryo preservation and oocyte preservation connote ethical issues especially in patients with poor prognosis[7]. Ethical

and psychosocial support is necessary in the shared-decision making process among patients, families and physicians.

A lack of reproductive specialists or infertility clinic for referral is a real problem. A survey in the United States showed that many breast cancer clinicians reported that they do not have knowledge of or resources for fertility preservation[8]. Interdisciplinary communication between reproductive specialists and oncologists is necessary.

Early case-control studies suggest that pregnancy after primary treatment of breast cancer does not have negative impact on cancer prognosis, although "healthy mother" bias might exist[9]. Because prognostication of breast cancer has become individualized using genetic biomarkers[10,11] , further investigations to clarify the impact of pregnancy after primary treatment on an individual basis is needed so that patients can personalize their decision-making regarding both cancer treatment and fertility.

In conclusion, Japanese breast oncologists were in general positive in discussing fertility issues with young breast cancer patients. Female and younger physicans, physicians working in a multidisciplinary environment had more positive attitudes and behavior towards fertility preservation. The development of multidisciplinary and interdisciplinary programs is necessary to meet the fertility

needs of breast cancer patients.

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References

1. Canada AL, Schover LR. The psychosocial impact of interrupted childbearing in long-term female cancer survivors. Psycho-Oncology 2010 Dec 2. (e-pub ahead of print)

2. Lee SJ, Schover LR, Partridge AH, et al. American Society of Clinical Oncology Recommendations on fertility preservation in cancer patients. J Clin Oncol 24; 2917-2931, 2006.

3. Okada N, Shimizu C, Ando M, et al. The impact of expression of patients' concern for fertility on decision making of adjuvant treatment (Rx) for primary breast cancer. 2009 ASCO Breast Cancer Symposium (abstr. 325)

4. Quinn GP, Vadaparampil ST, Lee JH, et al. Physician referral for fertility preservation in oncology patients: a national study of practice behaviors. J Clin Oncol 27;5952-5957, 2009.

5. Japanese Breast Cancer Society. Breast Cancer Treatment Guideline for patients 2009 (Japanese), Kanehara Shoten, 2010, Tokyo.

6. Japanese Breast Cancer Society. Breast Cancer Treatment Guideline 2010 (Japanese), Kanehara Shoten, 2010, Tokyo.

7. Gerber B, Dieterich M, Muller H, Remer T. Controversies in preservation of ovary function and fertility in patients with breast cancer. Breast Cancer res Treat 108;1-8, 2008.

8. Goldfarb S, Dickler M, McCabe M, et al. Oncology clinicians knowledge, attitude and practices regarding fertility preservation, SABCS2010

9.Kranick MA, Schaefer C, Rowell S, Desai M, Petrek JA, Hiatt RA, Senie RT. Is pregnancy after breast cancer safe? Breast J 16;404-411, 2010.

10. Oakman C, Santarpia L, Di Leo A. Breast cancer assessment tools and optimizing adjuvant therapy. Nat Rev Clin Oncolo 7:725-732, 2010.

11. Goldhirsch A, Ingle JN, Gelber RD, Coates AS, Thurlimann B, Senn HJ, panel members. Thresholds for therapies : highlights of the St Galln International Expert

Consensus on the primary therapy of early breast cancer 2009. Ann Oncol 20:1319-1329, 2009.

Table 1　Questionnaire statements

A. Knowledge about fertility issues of breast cancer patients

1. Total dose of alkylating agents are related to infertility.
2. Pregnancy after breast cancer increases risk of recurrence.
3. Pregnancy after chemotherapy increases risk of deformity of the child.
4. Pregnancy should be avoided during tamoxifen treatment.
5. Luteinizing hormone releasing hormone analogue reduces the risk of chemotherapy-induced amenorrhea.

B. Practice behaviors

1. Patients voluntarily bring up the fertility issues in the clinic.
2. I discuss the impact of cancer treatment to future fertility with my patients.
3. I do not feel comfortable to discuss fertility issue with my patients.
4. I take into account the history of childbirth when I discuss fertility issue with my patient.
5. I take into account whether she has spouse/partner when I discuss fertility issue with my patient.
6. I take into account economical status of the patient when I discuss fertility issue with my patient.
7. I discuss fertility issue with breast cancer patients with high risk of recurrence.
8. Patients talk to co-medical staff about their concern about fertility.
9. I ask co-medical staff if a patient has interest in fertility.
10. I provide my patients with educational material about fertility preservation.
11. I use LHRH-analogue to preserve fertility.
12. I consult reproductive specialist with questions about fertility issues in my patients.
13. I refer patients who have questions about fertility to reproductive specialists.

C. Barriers for discussing fertility issues

1. The patient does not express their interest in fertility.
2. The patient has high risk of recurrence.
3. The patient has economic problem.
4. The patient does not have a spouse/partner
5. There is no place/person to refer my patients to for fertility preservation.
6. Time constraints affect my ability to discuss fertility preservation.
7. There is no support from co-medical staff.
8. What is the greatest difficulty in discussing fertility issue with young breast cancer patients?

D. Attitured toward fertility preservation

1. Patients with poor prognosis should not pursue fertility preservation.
2. Posthumous parenting is troublesome for bereaved family.
3. Losing mothers will negatively affect bereaved children.
4. I fear passing hereditary cancer to a biological child.
5. Treating cancer is more important than fertility preservation.

E. Demographics and medical backgrounds

1. What is your gender?
2. What is your age?
3. What is your religious background?
4. When did you graduate from Medical School?
5. What is your specialty?
6. Where is your primary practice located?
7. What kind of institution do you practice in?
8. Is your institution community-base hospital for cancer-care?
9. How many physicians are in your practice setting including you?
10. Are there any female physicians in your practice setting?
11. Are there any medical oncologists in your practice setting?
12. Are there any breast cancer specialized nurses in your practice setting?
13. Are there any cancer specialized pharmacists in your practice setting?
14. Is there genetic counseling clinic in your practice setting?
15. In typical week, how many breast cancer surgeries are performed in your practice setting?
16. In typical week, how many breast cancer patients under 40 years of age do you see?
17. Do you have a spouse/partner?
18. Do you have children?
19. Do you have relatives or close friends who passed away leaving after minor children?

Table 2. Demographic background of the responding physicians

		n	%
total		434	100
Gender	female	72	16.6
	male	357	82.3
	unknown	5	1.2
Age	20–29	1	0.2
	30–39	52	12
	40–49	183	42.2
	50–59	148	34.1
	60–69	41	9.4
	70–	4	0.9
	unknown	5	1.2
Religion	Buddist	144	33.2
	Christian	9	2.1
	No special religion	270	62.2
	Others	5	1.2
Year graduated from medical school	–1994	347	80
	1995–2000	76	17.5
	2001–2005	6	1.4
	unknown	5	1.2
Specialty	Surgery	412	94.9
	Medcial Oncology	6	1.4
	Radiation Oncology	9	2.1
	Gynecology	1	0.2
	Others	6	1.4
Type of affliation	Cancer Center	40	9.2
	General Hospital	190	43.8
	University Hospital	122	28.1
	Private clinic	74	17.1
	unknown	8	1.8
Number of physicians	1–3	164	37.8
	4–7	137	31.8
	8–	125	28.8
	unknown	8	1.8
Female physician colleague	present	276	63.6
	absent	150	34.6
	unknown	8	1.8
Medical oncologist	present	172	39.6
	absent	255	58.8
	unknown	7	1.6
Breast Cancer Specilized Nurse	present	202	45.5
	absent	225	51.8
	unknown	7	1.5
Board certified pharmacists	present	227	62.3
	absent	199	45.2
	unknown	11	2.5
Number of breast surgery (per week)	0–5	310	71.4
	5–10	85	19.5
	11–15	14	3.2
	16–20	3	0.7
	20–	14	3.2
	unknown	8	1.8
Number of patietns aged <40 (per week)	0–1	122	28.1
	2–4	202	46.5
	5–	103	23.7
Partner/Spouse	present	401	92.4
	absent	25	5.8
	unknown	8	1.8
Children	present	351	80.9
	absent	64	14.7
	unknown	19	4.4

Table 3. Correlation between physician background, knowledge and attitude

	Knowledge	Attitude
attitude	0.113	
knowledge		0.113
gender	0.062	0.032
age	0.019	0.023
specialty	0.131	0.259
type of affilating insitution	0.208	0.144
number of physicians in the team	0.064	0.224
female colleague in the team	0.019	0.065
medical oncologist in the affiliating institution	0.151	0.237
breast care nurse in the team	0.266	0.136
board certified pharmacist in the affiliating institutic	0.08	0.102
number of breast surgery per week	0.356	0.116
number of young breast cancer patients per week	0.006	0.084
partner/spouse (yes/no)	0.144	0.011
children (yes/no)	0.01	0.1

Table 3. Factors associated with fertility-related practice behaviors

		I discuss the impact of cancer treatment to future fertility with my patients.				I do not feel comfortable to discuss fertility issue with my patients.				I take into account the history of childbirth when I discuss fertility issue with my patient.				I take into account whether she has spouse/partner when I discuss fertility issue with my patient				I take into account economical status of the patient when I discuss fertility issue with my patient.				I discuss fertility issue with breast cancer patients with high risk of recurrence.				I ask co-medical staff if a patient has interest in fertility				I provide my patients with educational material about fertility preservation.				I use LHRH-analogue to preserve fertility.				I consult reproductive specialist with questions about fertility issues in my patients.				I refer patients who have questions about fertility to reproductive specialists.			
		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI		p	Odd's Ratio	95% CI	
				min	max			min	max			min	max			min	max			min	max			min	max			min	max			min	max			min	max			min	max			min	max
Knowledge	Fair Not Fair	0.000	1.717 1.000	1.321	2.231	0.063				0.799				0.839				0.609				0.910				0.242				0.125				0.653				0.442				0.162			
Attitude	Conservative Aggressive	0.012	1.000 1.542	1.145	2.079	0.180				0.697				0.601				0.694				0.001	1.000 1.640	1.250	2.150	0.895				0.100				0.248				0.032	1.000 1.599	1.014	2.798	0.003	1.656 1.000	1.183	2.319
Gender	Female Male	0.005	1.166 1.000	1.080	1.258	0.807				0.022	1.130 1.000	1.041	1.227	0.033	1.089	1.002	1.185	0.622				0.047	1.089 1.000	1.000	1.185	0.133				0.047	1.183	0.973	1.440	0.399				0.039	1.121 1.000	0.995	1.277	0.001	1.176 1.000	1.062	1.302
Age	<50 >50	0.000	1.584 1.000	1.280	1.959	0.203				0.625				0.326				0.267				0.003	1.391	1.131	1.712	0.262				0.416				0.914				0.264				0.004	1.424 1.000	1.110	1.828
Specialty	Surgery Others	1.000				0.625				0.756				0.225				0.343				0.273				0.105				0.066				0.057				1.000				0.795			
Affilation	University Hospital/Cancer Center General Hospital/Private Hospital	0.032	1.235 1.000	1.047	1.457	0.147				0.900				0.364				1.000				0.219				0.795				0.046	1.000 1.671	0.959	2.911	0.656				0.007	1.349	1.067	1.706	0.012	1.243 1.000	1.047	1.474
Female Physician	present absent	0.079				1.000				1.000				0.412				0.194				0.649				0.793				0.026	1.919 1.000	1.014	3.632	0.259				0.051	1.467 1.000	0.995	2.164	0.123			
Medical Oncologist	present absent	0.432				0.366				0.043	1.190	1.003	1.141	0.022	1.206 1.000	1.032	1.408	0.043	1.261 1.000	0.996	1.596	1.000				0.443				0.407				0.381				0.103				0.042	1.212 1.000	1.011	1.453
Breast cancer specialized	present absent	0.606				0.480				0.327				0.434				1.000				0.588				0.316				0.871				0.516				0.710				1.000			
Board Certified	present absent	0.001	1.510 1.000	1.220	1.868	0.721				0.324				0.694				0.136				0.745				0.900				0.325				0.663				0.803				0.138			
Number of Breast Surgery per	1-5 6-	0.884				0.692				0.495				0.125				0.262				0.903				1.000				0.273				0.402				0.785				1.000			
Number of young patient per	0-1 2-	0.474				0.113				0.500				0.746				0.273				0.810				0.583				0.721				1.000				0.270				0.813			
Partner/spouse	present absent	0.281				0.008	1.000 1.158	0.989	1.355	0.193				0.299				0.192				1.000				0.192				1.000				0.828				0.807				0.670			
Children	present absent	0.074				0.088				0.740				0.183				1.000				0.025	1.116 1.000	1.029	1.211	0.614				1.000				0.156				0.197				0.209			