Infertility is a common result of cancer treatment; however, opportunities exist for patients to preserve fertility prior to treatment. Recent evidence suggests that healthcare providers, including nurses, do not consistently discuss fertility preservation (FP) with patients. This qualitative, cross-sectional pilot study used a focus group and in-depth interviews to explore knowledge, attitudes, and practice behaviors related to nurses’ discussion of FP with patients with cancer. Results indicate that only half of the nurses discuss FP methods with patients, even though most believe that having discussions with patients about fertility is part of their role. Factors associated with the discussion of FP among nurses included (a) knowledge (FP procedures, fertility institutes and clinics, resources for patients, and practice guidelines), (b) attitudes (difficulty finding facilities, time constraints, role, comfort level, ethical issues, financial considerations, and patient characteristics), and (c) behaviors (patient initiation, physician behaviors, patient characteristics, and timing). Discussion should be stimulated among nurses about the role of nurses in the FP discussion, and educational interventions and practice guidelines should be developed that are aimed at oncology nurses to help facilitate discussions with patients.
At a Glance

Oncology nurses may be in an ideal position to discuss fertility preservation with patients with cancer, but prior research shows that this topic is not discussed consistently.

Nurses believe that discussing fertility preservation with patients with cancer is part of their role; however, most participating in focus groups on this topic were not routinely having conversations about fertility at the time of the study.

Educational interventions and practice guidelines aimed at oncology nurses should be developed to help facilitate fertility preservation discussions with patients.

Fortunately, advances in reproductive technology may allow some patients to preserve their fertility. The ability to preserve fertility, called fertility preservation (FP), can be affected by several factors, including age, type of cancer, and type of treatment (Dow & Kuhn, 2004; Leonard, Hammleef, & Smith, 2004; Wallace et al., 2005). According to the American Society of Clinical Oncology (ASCO), sperm cryopreservation for men and embryo cryopreservation for women are considered standard FP practices with the highest likelihood of success; other available FP methods should be considered investigational and be performed in specialty centers with expertise (Lee et al., 2006). Table 1 summarizes the FP options for men and women.

To provide quality cancer care and address fertility as an important concern of patients with cancer, healthcare professionals must recognize and address the impact of treatment on fertility (Lee et al., 2006). However, existing studies indicate that FP is not discussed consistently by healthcare professionals with patients with cancer (Reebals, Brown, & Buckner, 2006; Schover et al., 2002a). Fewer than 50% of cancer survivors who were diagnosed prior to the age of 35 recalled receiving information from healthcare professionals about the risks of infertility from their treatments (Schover et al., 1999). At least 40% of patients with cancer in a study of patients of childbearing age (18–45 years) did not recall being informed about the potential impact of treatment on fertility (Schover et al., 1999).

Communication between healthcare professionals and patients plays a key role in influencing FP behavior (Achille et al., 2006). Discussion about FP is most important when it occurs during the small window of opportunity after cancer diagnosis and prior to initiation of treatment (Schover, 1999). However, minimal data exist about the extent of discussions regarding infertility or FP between healthcare professionals and patients (Goodwin, Oosterhuis, Kiernan, Hudson, & Dahl, 2007; Partridge et al., 2004; Reebals et al., 2006; Schover et al., 2002a, 2002b). Most studies to date have focused on the FP discussion from the perspective of physicians or patients; few have focused on nurses. In addition, male patients with cancer are given more attention in studies about fertility than female patients with cancer. Reebals et al. examined nurses’ barriers to offering sperm banking to newly diagnosed, male, adolescent patients with cancer and found that nurses’ lack of knowledge may be prohibiting them from discussing FP with patients. A study by Goodwin et al. focused on attitudes and practices regarding fertility issues of pediatric oncology providers, including nurse practitioners and RNs from Stanford University Medical Center. The researchers found that the providers thought FP was an important issue but desired more information.

Oncology nurses play a key role in the care and education of patients with cancer and their families and, compared to other healthcare professionals, are more likely to have multiple interactions with patients prior to the initiation of treatment (Cope, 2002). Therefore, oncology nurses may be in an ideal position to discuss clinical as well as quality-of-life issues such as FP with patients and their families. A recent study of oncologists about discussion of FP reported that physicians feel the responsibility of discussing FP options was part of the role of the support staff, including nurses (Quinn et al., 2007). The objective of the present study was to explore knowledge, attitudes, and practice behaviors of oncology nurses at a major cancer center in the southeastern United States toward the discussion of FP with male and female patients with cancer of childbearing age.

Table 1. Fertility Options for Men and Women

<table>
<thead>
<tr>
<th>TIME FRAME: Fertility preservation</th>
<th>OPTIONS FOR MEN</th>
<th>OPTIONS FOR WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before cancer treatment (most relevant to fertility preservation)</td>
<td>Sperm banking, Testicular sperm extraction, Testicular tissue freezing</td>
<td>Embryo freezing, Egg (oocyte) freezing, Ovarian tissue freezing, Ovarian transposition, Radical tracheectomy</td>
</tr>
<tr>
<td>During cancer treatment</td>
<td>–</td>
<td>Gonadotropin-releasing hormones</td>
</tr>
<tr>
<td>After cancer treatment</td>
<td>Testicular sperm extraction, Donor sperm, Adoption</td>
<td>Embryo freezing, Egg (oocyte) freezing, Ovarian tissue freezing, Donor embryos, Donor eggs, Adoption</td>
</tr>
</tbody>
</table>

Note. Based on information from Fertile Hope, 2008.

Methods

Recruitment and Data Collection

This qualitative, cross-sectional pilot study used a focus group and in-depth interviews. Qualitative data were collected with a semi-structured interview guide, and results were analyzed with qualitative methods. Nurses were selected via a purposeful sampling strategy that chooses participants specifically for their experiences with the outcome of interest (i.e., discussion of FP with at least five patients of childbearing age per year) (Krueger, 1997), rather than random sampling that traditionally is used with quantitative research methods.

Upon approval from an institutional review board, the researchers obtained the name and contact information of all nurses employed in outpatient clinics at a major cancer center in the southeastern United States. Thirty-six nurses were identified who work at the cancer center in the programs most likely to see patients of childbearing age, including gynecologic oncology, comprehensive breast, blood and marrow transplant, genitourinary, head and neck, hematologic malignancies, neuro-oncology, sarcoma, thoracic, and gastrointestinal.
Each nurse received an e-mail describing the study and inviting them to take part in a 45–60 minute focus group regarding their knowledge, attitudes, and practice behaviors related to the discussion of FP with patients with cancer and their families. For those who did not respond to the focus group request or who were unable to attend the focus group, a separate e-mail invited nurses to participate in an individual interview on the same topic. To participate in the study, nurses had to be employed at the cancer center and see at least five patients of childbearing age per year.

Two days prior to the scheduled focus group and interviews, participants were called and sent an e-mail reminder. The first and fifth authors served as moderators for the focus group, and the first author served as the interviewer for the in-depth interviews. Each was trained in qualitative interviewing and data coding through graduate university course work as well as in-house training programs offered through the cancer center. On the day of the focus group and individual interviews, the moderator or interviewer reviewed the informed-consent document with each participant, which included permission to take written notes of and tape record the sessions. The focus group and individual interviews were held in a neutral location that allowed participants to give honest answers to the questions. As an incentive for participating in the focus group and interviews, each participant received lunch or a coupon equivalent.

**Study Instrument**

Prior to conducting the focus group and interviews, the study team reviewed the available literature on knowledge, attitudes, and practice behaviors associated with FP in populations of patients with cancer. Medline® and PsycINFO® databases were searched for peer-reviewed, English-language articles that included FP discussions by healthcare professionals with patients with cancer. The key words used in the search included: sperm banking, cryopreservation, fertility preservation, assisted reproduction, healthcare professionals, and nurses. Seven journal articles met the search criteria (Crawshaw, Glaser, Hale, & Sloper, 2004; Davis, 2006; Dow & Kuhn, 2004; Goodwin et al., 2007; Keating, 1992; Koeppel, 1995; Wallace, 2007). Of them, four focused on FP from the nursing perspective (Davis; Dow & Kuhn; Keating; Koppel).

The articles were used to identify broad issues that were explored and then incorporated into a qualitative semi-structured focus group and interview guide. The literature review and question development were led by three doctorally prepared researchers with extensive experience in qualitative research methods, cancer prevention and control, and nursing. The group has previous experience conducting research on the discussion of FP with pediatric oncology nurses, physicians, and social workers (Quinn et al., 2007; Vadaparampil, Clayton, et al., 2007). The interview guide consisted of seven demographic questions and 13 primary interview questions and acted only as a guide. When needed, additional questions and probes were used to stimulate and focus the discussion among participants.

**Analysis**

One focus group was held and lasted approximately 45 minutes, and in-depth interviews were 15–30 minutes long. The sessions were audiotaped and transcribed. The transcripts were read with hand-coding methods. Hand coding is an established term indicating that coding was not performed via a computer program but rather through in-depth review and re-review of the transcripts by study team members. The term also refers to a process for establishing reliability among coders (Guba, 1978; Patton, 2002).

The content was analyzed by a method in which the researchers review all the data and cull out those aspects most relevant to the research questions. Through this analysis, key themes were determined related to nurses’ knowledge, attitudes, and practice behaviors regarding FP. First, four members of the study team read through the entire text of the transcripts, making note of nurses’ responses and placing them in the broad themes of knowledge, attitudes, and practice behaviors (Punch, 2005), which were based broadly on the subcodes identified in the initial interview guide. These themes were further analyzed via a convergent classification system. Convergence involves a process for identifying which data fit together to develop codes and categories. The criteria used to guide the placement of data into categories include: internal homogeneity (the extent to which the data within a category are similar and relate in a meaningful way) and external heterogeneity (extent to which differences among categories are apparent) (Guba, 1978; Patton, 2002). After responses were placed in these categories, four additional study team members reviewed the categorization and changes were made as needed.

Reliability was determined by draft attempts at coding, which established categories. Reliability aided in determining whether codes were correct, whether they should be expanded or collapsed, and the rate of agreement among codes. The number of codes agreed on among the reviewers determined the establishment of inter-rater reliability. A rate of 89% was established by researchers noting the number of content areas to be coded, divided by the number of agreements. Consensual validity was determined by peer debriefing whereby all researchers reviewed the codes, validated the definitions, and verified all interpretations of the data (Punch, 2005; Quinn et al., 2007). Because both interview and focus group methods were used, triangulation, a strategy for improving validity and reliability that strengthens a study by combining methods, was used. If results are the same from each method, validity is established. Convergence and divergence were searched for to triangulate the data and create categories, and each member of the research team verified all interpretations (Patton, 2002).

**Results**

**Response Rate**

Fifteen of the 36 nurses who were sent the recruitment letter were able to take part in the study, with seven participating in the focus group and eight participating in in-depth interviews. Reasons for nonresponses and declines included not reading e-mails, lack of time, declining the request without giving a reason, and being on vacation at the time of the study. Two additional nurses were scheduled to attend the focus group but did not show up because they were unable to get away from their duties. All nurses who were identified and sent the recruitment letter were women;
thus, only women participated in the study. Nine of the nurses held an RN diploma, four held a bachelor of science in nursing degree, one held a master of science in nursing degree, and one did not specify degree level but indicated she had a degree in nursing. Although respondents had difficulty providing an exact number, all nurses confirmed they saw at least five patients per year who were of childbearing age. After researchers averaged each participant’s estimates, patients of childbearing age appeared to make up 15% of the total patients seen by the nurses, on average. The nurse participants were employed in the following clinics: comprehensive breast (n = 2), genitourinary (n = 1), gynecologic oncology (n = 1), hematologic malignancies (n = 2), blood and marrow transplant (n = 1), neuro-oncology (n = 4), and sarcoma (n = 2). In addition, two nurses were recruited who worked previously in clinics at the institution but who now work in clinical research. Both occasionally see patients as needed. Although those nurses do not see as many patients as the other nurses in the study, they were included in the average stated above and met the study eligibility criteria of seeing at least five patients per year who were of childbearing age.

Qualitative analysis of the final transcripts resulted in three major categories emerging as factors associated with the discussion of FP among nurses: (a) knowledge (FP procedures, fertility institutes and clinics, resources for patients, and practice guidelines), (b) attitudes (difficulty finding facilities, time constraints, role, comfort level, ethical issues, financial considerations, patient characteristics, and priority of discussion), and (c) behaviors (patient initiation, physician behaviors, and patient characteristics and timing). Each of these categories and the key themes emerging from each category are discussed in the following section and illustrated in Tables 2 and 3. Table 2 provides a summary of the categories and key themes, and Table 3 provides a summary of the responses.

Knowledge

None of the nurses reported receiving any training on FP or being aware of any institution-based or national guidelines for FP. Most participants were aware that the standard FP option available for men is sperm banking and the primary option available for women is embryo cryopreservation. Few were aware of more experimental options such as ovarian or testicular tissue freezing.

I know we sperm bank and harvest eggs.

One of those transposition things where they can go in and move ovaries to a different location temporarily for radiation and then put them back where they go. I’ve never heard of that.

Knowledge of fertility institutes and clinics: Some of the nurses were aware of fertility institutes in the broader tri-county area but stated that, in general, few clinics are in the city. A few knew of fertility clinics in other parts of the state and across the country.

There’s only a couple [fertility institutes] here in [this city].

I have a list that I just a lot of times give the patient; it has places all over the country as well.

Knowledge of fertility preservation resources for patients: Few nurses were aware of patient education materials, such as brochures or posters. Most did not have any materials for their individual clinics. When the Fertile Hope brochures were passed around, most participants had not seen them prior to the focus group or interviews.

I’ve never [heard of Fertile Hope], and it probably depends on the type of cancer.

No, I’ve never seen [Fertile Hope brochures]. I would love to have some, yes, absolutely.

Attitudes

The nurses commented on many factors related to FP attitudes and barriers to the discussion of FP, including nurses being unaware of the FP issue, difficulty finding FP facilities, time constraints, role, comfort level, ethical issues, financial considerations, patient characteristics, and priority of discussion. The nurses also commented that they believe that social workers have a role in FP discussion.

One of the biggest things [barriers] is nurses just not thinking about it.

Dealing, you know, time issues, many of the clinics’ nurses when they’re seeing patients, you know, they might have five minutes to spend with them, so they don’t have the

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1 Fertile Hope is a national nonprofit organization partnered with the Lance Armstrong Foundation and is dedicated to providing reproductive information, support, and hope to patients with cancer whose medical treatments present the risk of infertility. For more information, call 888-994-HOPE or visit www.fertilehope.org.
time to delve into any of those issues and the patient’s willingness to learn and having appropriate educational materials to give to patients.

**Role:** Most respondents believed they should be involved in the discussion of FP and that it was part of their role as nurses. Some believed that physicians should initiate the discussion first and nurses should provide follow-up discussion, such as making sure patients understand, going into more detail, and finding resources for patients.

It’d be nice to have the doctors [initiate the discussion], but it’s going to be the nurses.

I think [nurses] can have a role.

I don’t think physicians need to be the person that brings it up because, to me, this is more of a holistic thing, so thinking about the disease and the treatment of the disease, and nurses tend to be a little bit more holistic in thinking about, “Okay, how’s this going to affect everything else?”

**Comfort:** When asked how comfortable they were discussing FP, participants gave varied responses. Although most respondents reported they were comfortable being involved in discussions, the same group also reported they would feel more comfortable if they had more information about FP resources.

Oh yeah [I’m comfortable], whenever cancer patients come and they have questions about anything, I usually look over the brochures first, give it to them, tell them what I know. Usually, the brochures are very self-explanatory, and if they still want more information, then I’ll get somebody to talk to them about it or have them look at the Web site.

**Table 3. Key Themes From Interviews and the Focus Group**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>KEY THEMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td><strong>Most of the oncology nurses</strong></td>
</tr>
<tr>
<td></td>
<td>Knew that sperm banking and embryo cryopreservation were options for their patients.</td>
</tr>
<tr>
<td></td>
<td>Did not have knowledge of or have access to patient education materials.</td>
</tr>
<tr>
<td></td>
<td><strong>Some of the nurses</strong></td>
</tr>
<tr>
<td></td>
<td>Knew of fertility clinics in the tri-county area.</td>
</tr>
<tr>
<td></td>
<td><strong>None of the nurses</strong></td>
</tr>
<tr>
<td></td>
<td>Was aware of any national or institution-based guidelines for fertility preservation (FP).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitudes</th>
<th><strong>Most oncology nurses believed</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The discussion of FP was a part of their role as nurses. They would be comfortable discussing the topic if they had more information.</td>
</tr>
<tr>
<td></td>
<td>FP should be a top priority, but treatment and cure always come first.</td>
</tr>
<tr>
<td></td>
<td>The financial situation of patients and families would not stop them from discussing FP.</td>
</tr>
<tr>
<td></td>
<td>Patient age, treatment, odds of survivorship, and level of interest would determine whether FP was discussed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavior</th>
<th><strong>Most oncology nurses</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did not have the opportunity to discuss FP.</td>
</tr>
<tr>
<td></td>
<td>Only discussed FP if patients initiated the conversation.</td>
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</tbody>
</table>

We don’t have enough information to really talk to them in detail, but I know I’ve had to deal with it, but we’re just not educated. We don’t have the literature to tell us everything about it.

**Priority of fertility preservation discussion:** Most participants agreed that discussion of FP should be one of the top priorities on a list of everything to review with newly diagnosed patients with cancer. In reality, they did not think healthcare professionals at the institution where they work put FP as a top priority because treating and curing patients are always the main concerns. Also, some of the participants commented that in many cases, because patients have been diagnosed at a facility outside the institution, patients need to begin treatment as soon as possible and that discussing FP is imperative.

It [priority of FP] should be up there, but I don’t think it is.

Diagnosis and what they need done, that’s number one.

They may be going the next day to surgery, you don’t have time to think about that, you’re trying to save their life.

**Ethical issues:** Various ethical issues were mentioned by the nurses, including religion, patient prognosis, and what happens to sperm or eggs after patients die. The nurses said it may be difficult for patients to think about FP if they do not have a good chance of surviving. Some of the nurses thought patients may not want to have children if they would not live long enough to see them grow up. Other nurses discussed that patients’ spouses or partners may want a living reminder of patients if they die.

Some people might have problems with that. I know, not everybody believes in fertility treatment because religious views, as far as, if God wanted it that way.

I think the two big ethical issues are: not wanting people to rush in, you know, contemplating having a family right after treatment to realize that they’re not going to survive long enough to see those kids grow up, and then the ethical issue, you know, what happens after the patient dies.

Their [patients with cancer in their clinic with low chance of survival] chance of survival is a year, so when they talk about the thought of actually having children and not being there to see them grow up, that’s kind of far off their list.

**Financial considerations:** Most participants believed that FP is expensive but were unaware of what the actual costs were. The majority of the participants were unaware of the financial situation of individual patients. Although participants were concerned that the cost of FP would serve as a barrier to patients, they did not think it served as a barrier for nurses to discuss the issue with patients.

I think [financial issues] play a big role, bigger than they should.

There is a financial [issue regarding fertility preservation], and I don’t know what the financial is. I think it’s expensive to store things like that, and I never thought of
how a patient would do that financially. It wouldn’t serve as a barrier for me, but it might serve as a barrier to the patient.

Yeah, you know, [financial considerations] may. I really don’t know if insurance covers this or not—probably not.

**Patient characteristics:** When asked what patient factors determine whether participants would discuss FP, age, treatment, survivorship odds, and patient interest level were mentioned most often. When asked whether they thought patients wanted to get information about FP, most nurses stated that their patients are interested. Most participants agreed they would still try to have a discussion about FP, even if a patient was very overwhelmed, and said they would give brochures or other information to patients and family members. Most agreed the discussion should be held before treatment appointments but not at the initial diagnosis appointment because patients are overwhelmed at diagnosis and may not retain information from the initial visit.

We would just hand the information probably to the supportive person and say, “You know, this is available. Maybe you want to talk later at home about this.”

[If overwhelmed] I’ll ask them a second time, or a third time, just to make sure before they start chemo, just to make sure that that is an option, something to think about, you know, you think about your life now, but maybe down the road, you know, it’s something you’ll have to think about.

I think if they are at a point where they’ve just been diagnosed, they’re not receptive to listening to anything. If we had pamphlets to give them, so they could at least take it home, talk about it with their families, think about the options, because usually you don’t start treatment the same day you come in.

**Behaviors**

When participants were asked about the opportunity to discuss FP methods with patients with cancer of childbearing age prior to the initiation of cancer treatment, responses varied greatly. Some nurses said they do get the opportunity to discuss FP methods. A few reported that they have a difficult time finding facilities and information and therefore do not discuss FP. Some participants have never thought to discuss the issue or believed that such discussions were carried out by other healthcare professionals.

We’ll talk to them before they have their chemo and also before radiation.

No, I don’t have that many of childbearing age and most of them have already had children, but there are a few people that do ask about [FP].

In all the years I’ve been here, we had one young man who wanted to do sperm banking. Trying to find out where to send him for sperm banking was a challenge, because nobody knew anything. Nobody knew where to tell me to send the patient.

We don’t have enough information to really talk to [patients] in detail, but I know I’ve had to deal with it and send a fellow to a sperm bank. We’re just not educated. We don’t have the literature to tell us everything about it.

**Patient initiation:** Of those nurses who reported they have the opportunity to discuss FP, the majority discussed it only with patients who initiated the conversation. A small minority of respondents said they made discussing FP with all patients of childbearing age a routine practice.

I think it would depend on if the patient brings it up with the physician, or who it’s brought up with, and sometimes I would initiate it if I knew that a patient was going through chemotherapy that could destroy their fertility and see what options they’re interested in doing.

My role can be at any point, sometimes, especially women, and sometimes even couples are more comfortable bringing it up with the nurse. They may want to bring it up, and they don’t know how to do it, so by having someone bring it up, even by just discussing sexuality during treatment and things like that, could lead to that discussion.

I think it’s more the patients that are interested. I think if the patient doesn’t say, ‘I want to have more children,’ if the patient comes forward and says, ‘Well, what if I wanted to have more children,’ then they would talk about what those options are. Unless they actually say that they want to preserve their fertility, then I don’t think that we necessarily talk about it.

**Physician behaviors:** When the nurses were asked whether they knew physicians in their clinics were having the FP discussion, responses varied. Although some reported that physicians routinely discussed FP with patients or directed patients to nurses for follow-up, some said physicians did not discuss FP with patients. Other nurses indicated that for physicians to have the FP discussion, patients had to bring up the topic. Many nurses also suggested that patients feel more comfortable talking with nurses about the issue rather than physicians.

At the initial diagnosis it’s not usually brought up [by physicians].

I don’t really talk to them about it as much as the doctor speaks with them, and then I just verify that they understood what they were told.

A lot of times I’ll start the discussion with them [before the physician] and at least find out if they’re interested, if it’s appropriate.

I’ve been a nurse for quite a while, so a lot of times, there are things that I may bring up with the patient that the doctor doesn’t necessarily bring up.

**Patient characteristics and timing:** Some nurses reported that they have limited opportunities to discuss FP because they do not see newly diagnosed patients. Many also reported that most of their patients are diagnosed in the community before coming to the institution for treatment.

I would say it was about, probably 70% [are diagnosed] in the community then sent here for a referral.

By the time they’ve come to us, they’ve had chemotherapy.
Discussion

This study explored knowledge, attitudes, and practice behaviors related to nurses’ discussion of FP with patients with cancer. None of the participants had received any training or were aware of any guidelines for FP. ASCO and the American Society of Reproductive Medicine developed guidelines about FP in patients with cancer (Ethics Committee of the American Society of Reproductive Medicine, 2005; Lee et al., 2006). Although targeted toward physicians, the ASCO guidelines were published in the Journal of Clinical Oncology, which has a readership that spans a variety of health professions, including nurses (Lee et al.). In 2004, the Royal College of Nursing in the United Kingdom developed FP guidelines for oncology nurses and male patients with cancer. The guidelines suggest that nurses providing care to patients whose fertility may be compromised by treatment should provide comprehensive verbal and written information about patients’ fertility options and document this in patients’ records. To date, no guidelines have been developed for nurses practicing in the United States or for female patients in the United States or the United Kingdom.

Nurses appeared to have a general awareness of standard FP options, but few were aware of more experimental options. Although some of the nurses knew of fertility clinics, many were not aware of FP resources, such as educational brochures or Web sites. Figure 1 gives a summary of some useful FP resources. Results from the present study indicate that more knowledge and information about FP should be available to nurses. Similarly, a study by Goodwin et al. (2007) in pediatric oncology reported that providers’ knowledge was not up to date. Only 50% of the providers were aware that the risks of infertility are higher in boys than girls (Goodwin et al.). In a study by Achille et al. (2006) of patients and healthcare professionals regarding barriers and facilitators to sperm banking found that healthcare professionals may not be able to adequately discuss FP with patients because they lack knowledge.

Most participants indicated that nurses should be involved in FP discussion and take it on as their role; however, some believed that physicians should initiate the discussion first and encourage nurses to provide follow-up care. One qualitative study of adult oncology physicians reported that nurses believed that the responsibility of discussing FP is the role of nurses, which suggests that institutions need to provide clear guidelines and assign whose role it is to discuss FP so that patients are not missed because one healthcare professional assumes another spoke to patients and vice versa (Quinn et al., 2007). Most nurses also indicated they would be more comfortable discussing FP if more information was readily available. Reebals et al. (2006) found that 67% of nurses would be more likely to offer sperm banking if educational materials explaining the process were readily available. Achille et al. (2006) found that healthcare professionals had appeared unsure in discussing sperm banking, and patients indicated that if the doctor had insisted on banking, they would have done it, but because the doctor did not insist, it did not seem that important from patients’ perspectives. With physicians often having little time to see patients during each appointment and many issues to discuss, they may not remember to discuss every issue with every patient. Nurses could take on the role of prompting physicians to have FP discussions with patients.

Most nurses ranked the FP discussion as a medium to high priority of all of the issues to discuss with patients with cancer. Even though the nurses acknowledged the importance of discussing FP, they also felt that other issues, such as patients’ treatment and cure, would take first priority. Goodwin et al. (2007) found that providers acknowledge the importance of fertility to their patients and are willing to consider making changes in their current practices; however, improvements require education and behavioral changes by clinicians.

One ethical issue that emerged as a key theme from the nurses in the study was that patients may be strongly focused on survival and their cure and may not want to think about other issues, which could serve as a barrier to the FP discussion. Most nurses in the study indicated that healthcare professionals should still try to have an FP discussion with patients even if patients are very overwhelmed by their diagnosis. Achille et al. (2006) also found that some patients’ strong focus on survival was the only thing that mattered and nothing else had the same priority to patients or family members. Achille et al. reported that healthcare professionals did not push patients to bank sperm if they were very overwhelmed and only focused on treatment and survival. Nurses in the present study, however, indicated that if patients were overwhelmed, they would try to discuss the FP issue at a follow-up visit or provide brochures to patients or family members. Another ethical issue that emerged was that patients may not want to consider FP if they have a poor prognosis for survival, with some nurses suggesting that patients would not want to leave their spouses alone to raise a child and others suggesting that spouses would want a living reminder of the patient. Schover et al. (1999) found that 60% of patients surveyed still wanted to be parents even if they died young, but 58% did not want to leave a spouse alone to raise a child.

Nurses also reported that cost could be another barrier to the FP discussion for patients, but the vast majority said patients’ financial situations would not make them less likely to discuss FP because most nurses were unaware of the financial situations of patients. Reebals et al. (2006) found that nurses may have been under the impression that FP may be very expensive and could take on the role of prompting physicians to have FP discussions with patients.

To order copies of brochures provided by Fertile Hope, go to www.fertilehope.org or call 888-994-HOPE.

To order copies of ASCO patient guides, call ASCO customer service at 888-273-3508 or send an e-mail to ascopubs@asco.org.
indicated that this may inhibit nurses from discussing the issue, but nurses in the present study reported that the issue should be discussed with all patients regardless of financial situation. Sperm cryopreservation typically costs $1,500 for three samples stored for five years. The approximate cost per cycle of embryo cryopreservation is $8,000 plus $350 per year for storage fees. Sperm and embryo cryopreservation often are not covered by insurance, but that can vary from state to state (Lee et al., 2006; Oktay, Beck, & Reinecke, 2008).

About half of the nurses had the opportunity to discuss FP with patients of childbearing age, but it was not routine. Some nurses had a difficult time finding facilities and information for patients, did not discuss or had never thought to discuss FP, or thought FP was addressed by another healthcare professional. Goodwin et al. (2007) found that 64% of oncology providers surveyed “had experienced difficulties in finding proper facilities and specialists for their patients” (p. 84). Goodwin et al. mentioned the importance of establishing liaisons with reproductive specialists to provide comprehensive cancer care. Similarly, Reebals et al. (2006) suggested that locating a convenient FP facility for patients should not prevent healthcare professionals from discussing the option. A list can be found on the Internet, and some facilities have mail kits available for sperm banking at home.

Of the nurses who had the opportunity to discuss FP with patients, the majority only discussed with patients who initiated the conversation, whereas very few nurses initiated the conversation themselves. Reebals et al. (2006) found that 85% of nurses would be more likely to offer sperm banking to patients who initiated the discussion and stated that they wanted future children. The responses of the nurses in the present study also varied in regard to physician behaviors related to the FP discussion. Some nurses reported that physicians initiated the FP discussion and then directed patients to nurses for follow-up. Canada & Schover (2005) and Reebals et al. suggested that although oncologists ideally would conduct FP discussions with all patients, it is unrealistic because of time constraints; training nurses to have the discussion is more feasible. Results of the present study indicate that some of the nurses already were having the discussion and acknowledged that it is often unrealistic for physicians to do it.

Some nurses also indicated that they have limited opportunities to discuss FP because most patients were diagnosed or started treatment before coming to a particular nurse’s clinic. Zapzalka, Redmon, & Pryor (1999) found that 63% of oncologists considered urgency to start treatment as an important factor when deciding whether to discuss FP but suggested that men should always have enough time to bank at least one sample and that no male patient should be denied the opportunity because of urgency to start treatment. The situation can be more difficult for female patients. Embryo cryopreservation requires partner or donor sperm and 10–14 days of ovarian stimulation from the beginning of the menstrual cycle, which can require a delay of two to six weeks in treatment initiation if patients do not start this procedure at the beginning of the cycle. Some patients have a four- to six-week break between surgery and the start of chemotherapy, which could provide a window to preserve embryos, but this option may not work if treatment has to begin immediately (Lee et al., 2006; Oktay et al., 2008).

Nurses gave suggestions for making the FP discussion process more efficient. They included developing a system to automatically remind healthcare professionals to discuss FP or generating a referral to a fertility specialist if patients are of childbearing age. Further research is warranted to examine the feasibility of an automatic reminder system, which could lead to the possibility of creating one as a future intervention.

Most nurses felt that community education is needed for patients and healthcare providers. Schover et al. (1999) reported that large cancer centers can easily overlook reproductive issues, but fertility counseling and information often are less available to patients in community treatment settings. Canada and Schover (2005) have developed a computerized, interactive FP educational tool for patients, families, and physicians available on CD-ROM or the Internet. Nurses also indicated an immense need for more patient educational resources to be available in the institution. Cope (2002) suggested giving patients educational materials to read and consider, then planning a follow-up discussion to answer any questions or address any concerns. Canada and Schover reported that one of the most common reasons men give for failing to bank sperm is that they did not receive needed information on the topic before starting cancer treatment.

Most nurses in the present study indicated that nurses and other healthcare professionals in the institution where they work need training and thought guidelines for nurses and the FP discussion would be appropriate. Many agreed that a grand rounds or continuing education session would be most effective. Similar studies also found a need for professional education and open discussion between nurses and patients and counseling guidelines (Cope, 2002; Heath & Stern, 2006; Reebals et al., 2006; Schover et al., 1999). Achille et al. (2006) and Zapzalka et al. (1999) found that cancer survivors suggested that healthcare professionals need to be clear and assertive and make the information personally relevant for patients in addressing fertility risks and FP because patients often do not think about the long-term issues of cancer. They also reported that offering FP has not translated into standard practice, although many previous studies have found that when FP is offered in standard care and patients are receptive of the information, patients are more likely to complete the FP process. Training and educational offerings would encourage and facilitate the process (Achille et al.; Zapzalka et al., 1999).

Limitations

Although the present study is among the first to examine nurses’ knowledge, attitudes, and behaviors related to the discussion of FP issues, results should be interpreted cautiously because of certain limitations. Because this was an exploratory pilot study, the participant pool was limited to nurses at one institution. In addition, participants may be more likely to have greater interest in and knowledge about FP and may be more likely to discuss the issue in their practices than the average nurse at the institution where this study was performed because the recruitment letter indicated that participants would be interviewed about FP and the first nurses to respond were recruited. As with all qualitative research, the results are not intended to be generalizable to other populations. Qualitative research is conducted to gain a more complete, in-depth understanding of a topic. Transferability is
one concept that can be used in qualitative research, but when attempting to replicate a study, researchers must carefully consider whether the results can transfer to another environment (Krueger, 1997).

Another limitation of the study is the omission of a pediatric patient population. The institution where the study was conducted does not admit pediatric patients. A few pediatric cases are seen at the institution under the admitting privileges of some of the physicians; however, the numbers are too low to conduct research and to draw any conclusions. Consequently, the researchers have conducted similar research studies with healthcare professionals who primarily serve a pediatric oncology population (Clayton et al., 2007; Vadaparampil, Clayton, et al., 2007; Vadaparampil, Quinn, et al., 2007; Vadaparampil, Quinn, King, Wilson, & Nieder, in press).

Implications for Practice

As FP technology improves, understanding the issues surrounding the clinical adoption of the discussion is critical in ensuring that patients receive FP information. Oncology nurses are in an ideal position to discuss FP issues with patients with cancer. This study shows that nurses believe discussing FP with patients is part of their role, but they often have difficulty finding resources, facilities, and educational materials for patients. As guidelines are incorporated into more institutions, the discussion may become more routine. Barriers such as lack of comfort in finding resources for patients could be overcome through educational materials, and training could be offered as part of continuing education for nurses. Providing nurses with more knowledge and information would increase nurses’ comfort in discussing FP. Further research is needed to generate testable hypotheses among representative samples of nurses regarding the discussion. Discussion needs to be stimulated among nurses about the role of the nurse in the FP discussion and to develop educational interventions and practice guidelines aimed at oncology nurses, to help facilitate discussions with patients.

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