Novel Psychological Intervention for Decision Support in Women Considering Fertility Preservation Before Cancer Treatment

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Decisions about fertility preservation in young adults with cancer are often made under conditions of high subjective stress and time pressure. In women, these decisions are further complicated by the invasiveness of fertility preservation procedures, concerns about health risks of these procedures, and financial barriers. This article describes the rationale for and development of a brief decision support and stress management intervention for women aged 18–40 who are considering fertility preservation before cancer treatment. Case examples from participants are provided to illustrate the potential applicability of the intervention to survivors in a variety of circumstances.

Keywords: fertility preservation, decision support, psychological intervention, values clarification, women

Introduction

YOUNG PEOPLE DIAGNOSED with cancer often describe a “double hit” scenario in which they are confronted not only with a potentially life-threatening disease but also with a significantly altered future beyond treatment. A majority of young adults with cancer report interest in becoming future parents^{1,2} and strongly endorse a desire to understand how treatment will affect their fertility.³ A lack of information, or poor quality information, is among many fertility-related stressors that young survivors encounter. In a recent survey of more than 500 adolescent and young adult cancer survivors, about half identified unmet needs for information about becoming a parent after treatment.⁴ These and other concerns can hinder effective decision making about fertility preservation (FP).⁵

Despite generally positive perceptions of FP, many survivors report difficulty in making decisions about FP at the time of treatment planning. This is particularly true for women, for whom infertility tends to be more distressing,^{6,7} and FP is typically more invasive, time consuming, and costly than for men. Even when FP services are available, they may not be utilized by appropriate candidates.⁸ Although improving the basic accessibility of FP is an important priority for adolescent and young adult survivorship care, knowledge and counseling about these options may also be protective against future distress.^{5,9,10}

There is scant literature regarding psychological support for women facing difficult decisions about FP. To our knowledge,

only one study has specifically examined the effect of psychological support on fertility-related decisions in people newly diagnosed with cancer. In this study, individuals and couples who had an FP consultation reported that additional psychological counseling was helpful and beneficial for making treatment decisions.¹¹ However, the sample size was small, and the study did not include empirical measures of distress or decision satisfaction.

Our present aim is to describe the development and conceptual basis for a brief in-clinic intervention to support women aged 18–40 who are newly diagnosed with cancer as they navigate their options for FP. We also report early experiences with three participants who have completed the intervention as part of their fertility-related care at a comprehensive cancer center.

Methods

Theoretical basis for intervention

Psychosocial interventions, mainly cognitive behavioral in orientation, have been shown to reduce fertility-related distress in the general population.^{12–15} However, cancer survivors who are faced with infertility face unique circumstances, including time pressure to make decisions about FP, the additional burden of disease-related distress, and worries about future suitability for long-term partnership or parenthood. It is also notable that the real or perceived costs of FP (financial loss, risks of fertility-sparing procedures themselves, concern

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TABLE 1. COMPONENTS OF THE INTERVENTION

<i>Component</i>	<i>Rationale</i>	<i>Description</i>	<i>When introduced</i>
Values elicitation/clarification	Values clarification is considered an essential element of decision support and may also facilitate behavioral change to reduce distress.	A semi-structured interview is used to elicit the patient's values and attitudes toward fertility and family building. Topics covered include: <ul style="list-style-type: none"> • General life goals and values • Familial and cultural norms about parenthood • Ethical and religious considerations • Importance of biological parenthood • Importance of co-parenting versus single parenthood • Attitudes toward reproductive technologies and gestational surrogacy • Considerations of personal health status and transmission of potential hereditary risk factors • Social support for reproductive decision making • Partner concerns and attitudes toward fertility preservation (if applicable) • Other matters of personal relevance 	Session 1
Writing exercise	Provides the opportunity to consolidate discussion of values and explicitly consider treatment decisions in a future context, which may help to de-bias decision making.	Participants are prompted to consider their two most likely choices about fertility preservation and to imagine them in the context of a future in which cancer treatment goals have been met (or the patient is otherwise able to begin building her family).	Session 1
Mindfulness	Mindfulness training is a common component of interventions for anxiety and stress management. A single session of mindfulness training can have acute positive effects on mood and anxiety. ²²	Participants receive psychoeducation followed by a scripted "mindful breathing" exercise (~15–20 minutes). Instructions for further home practice are provided.	Session 1
Cognitive defusion	Cognitive defusion is a cognitive coping strategy used to reduce distress due to catastrophic or maladaptive thoughts. ²¹	Participants receive psychoeducation about the relationship between thoughts and emotional distress. They are then taught techniques to observe and gain distance from their thought processes. The goal is to view thoughts as "a story our mind tells us," and to understand that thoughts may or may not be true or helpful. For instance, a common technique is to restate a spontaneous thought as an observation (example: restate "my situation is hopeless" as "I'm having the thought that my situation is hopeless").	Session 2
Skills review	Additional feedback and reinforcement of skills practice facilitates further gains from intervention.	Participants are invited to discuss their perceptions of the intervention and which components are helpful or not helpful. Barriers and obstacles to the use of skills are reviewed, and problem solving is applied as needed.	Sessions 2 and 3

about health risks associated with future pregnancy) largely precede the anticipated (and uncertain) benefits. In view of the unique context of FP in cancer survivors, we considered two key decision-making concepts in the development of the intervention:

Intertemporal choice. Central to understanding fertility-related decision making is the idea that treatment decisions are "intertemporal choices," or choices with consequences that

manifest over a period of time in the future. In general, as the rewards or desired outcomes of a given action are expected to occur farther into the future, their value is "discounted" relative to the value of the same outcome in the present.¹⁶ Hence, the perceived value of maximizing fertility potential may be somewhat diminished in view of other, more immediate rewards such as the relief of starting treatment as soon as possible. However, research suggests that this effect is modifiable. For instance, explicitly contemplating the future outcomes of

decisions may reduce the extent of temporal discounting, in effect leading to more “forward looking” decisions.^{17,18} Therefore, one potential role of counseling is to create time and structure for a deliberate analysis of these difficult choices and their long-term ramifications.

Emotional effects on decision making. Anxiety is common after a recent diagnosis of cancer, and the anticipated costs or trade-offs of a treatment decision may exacerbate anxiety. Decisions made under conditions that are perceived as uncertain or risky are particularly susceptible to the influence of anxiety or other strong emotional states.¹⁹ Avoidance is a common, if at times maladaptive, strategy to cope with decisional conflict or uncertainty.²⁰ In the setting of a new cancer diagnosis, when there is usually at least moderate time pressure to initiate treatment, the deferral of action may result in a *de facto* treatment decision that may be inconsistent with the patient’s values or desired outcomes. To the extent that anxiety hinders effective decision making, improved distress management strategies may help patients make satisfactory decisions about FP and cope with the often mixed consequences that follow.

The primary goal of the intervention is to facilitate patients’ decision-making process about FP with counseling that includes values clarification and an opportunity to deliberate options in the context of these values. Counseling strategies include validation of the survivor’s concerns, exploration of various “what-if” scenarios, and neutrality with respect to her treatment decision. An additional goal is to help the patient develop skills for distress tolerance and for coping with uncertainty. Relevant to both of these goals, values serve to “clear the path” toward purposeful action.²¹

Structure of the intervention

Intervention components. Women who participate in a standard FP consultation and voice decisional conflict are invited to take part in the intervention within 24 hours of the consultation. Intervention components are summarized in Table 1. We assumed considerable variability in the timeframe to make decisions about FP, depending on patients’ disease types and treatment plans, and potential logistical problems with distributing this deliberation across multiple visits. Therefore, we decided to concentrate most of the decision support content to be delivered soon after the FP consultation. The first face-to-face session is ~75 minutes long and includes brief history-taking, questions to elicit values related to fertility and family building, brief assessment of psychiatric history and trauma, and an introduction to mindfulness practice using a scripted breathing exercise. Participants are asked to practice mindful breathing each day and to complete a writing exercise to further deliberate their two most likely choices (e.g., oocyte cryopreservation vs. gonadotropin releasing agonist [GnRH] injections; trachelectomy vs. hysterectomy) by imagining these choices in a future context.

Two follow-up telephone calls, up to 30 minutes each, take place 1 week and 1 month after the face-to-face visit and focus primarily on distress management. By this point, some participants have made a decision about FP and may benefit from further coping support, whereas others may be con-

tinuing their deliberations. During the 1-week call, participants are oriented to “cognitive defusion”²¹ strategies to reduce distress. The main concepts conveyed are the relationship between distressing thoughts and emotional responses and strategies to promote detachment or distance from upsetting thoughts. In the final call, coping skills are reviewed, the participant is debriefed, and feedback is solicited. Additional referrals are provided as necessary. The interventionist is a licensed psychologist with expertise in sexual and reproductive health (AB).

Results

In the next section, we provide a narrative description of the characteristics and experiences of three women who received our psychological intervention within 24 hours of a standard FP consultation. Pseudonyms, along with slight changes in demographic and clinical information, are used to protect the privacy and identity of participants.

Case 1. “Angela” is a 28-year-old woman with a new diagnosis of stage II invasive ductal carcinoma of the breast. At the time of her diagnosis, Angela was single but had a current intimate partner whom she described as supportive. Angela described a lifelong goal to marry and start a family of her own. Although she was initially anxious about the possible health risks of pursuing FP, she was reassured after meeting with the reproductive endocrinologist. At the time of her initial counseling session, she was strongly considering oocyte cryopreservation. Angela engaged in the initial face-to-face session and subsequent telephone calls. She did not complete any additional written exercises outside of the session. However, she did report use of cognitive coping strategies introduced in the second session. She proceeded with a successful oocyte retrieval before initiating neoadjuvant chemotherapy. Angela indicated that the sessions provided her with strategies to manage her overall health-related anxiety. She suggested that future interventions incorporate an opportunity to talk with other female cancer survivors who had navigated decision making about FP.

Case 2. “Natalie” is a 30-year-old woman with newly diagnosed low-grade ovarian cancer. At the time of her diagnosis, she had been married for 3 years and had one child. As she desired at least one more child, she presented to the FP program for a consultation. After learning about her options, she struggled with the decision to preserve her eggs or embryos versus the option of pursuing adoption at a later time. Natalie appeared engaged and was adherent to assigned exercises. However, the timing of sessions was complicated by the demands of her treatment plan, with the scheduled follow-up times interrupted by her surgery and other treatment planning. She persisted with mindfulness exercises on her own several times per week, as noted during the second session. Five weeks after her initial session, she participated in a brief call to check on her well-being and to arrange a final follow-up session. She reported that ultimately she opted to forego any procedures to preserve her fertility, and she admitted to struggling with this decision after her surgery. Natalie coped by taking comfort in her healthy child and using mindfulness skills to manage worries about her future health. She initiated chemotherapy a few days afterward and, unfortunately, was lost to further follow-up.

Case 3. “Helen” is a 37-year-old woman diagnosed with a stage III invasive ductal carcinoma of the left breast. She had two children from a previous marriage, and she was diagnosed with cancer <1 year after remarrying. Helen and her husband had long discussed a future pregnancy to bring another child into their blended family; therefore, the prospect of future infertility prompted her to consult our fertility service. Her mental health history was significant for depression, which had been treated with psychotherapy and pharmacotherapy and was in remission at the time of her diagnosis. She engaged readily in the intervention and completed all of the assigned components. The primary focus of the intervention was the patient’s decision making about whether to use GnRH agonist injections to potentially spare her ovarian function during chemotherapy. Ultimately, much to Helen’s disappointment, her physician advised against this due to a lack of evidence regarding the safety of GnRH agonists in women with estrogen receptor-positive cancers.²³ However, Helen reported frequent use of mindfulness practice during times of stress, which she found to be beneficial. She also reported benefiting from the opportunity to “stop in the middle of it all and do a head check” and to evaluate her options in a private and confidential space between her cancer-related appointments. Ultimately, Helen decided that she would return for re-evaluation of her fertility 1 year after completing treatment, and at that point decide whether to pursue further family building.

Conclusion

At present, we are testing our intervention in an adaptive randomized trial comparing outcomes of our standard FP consultation with and without the addition of the psychological intervention described earlier. The trial has been approved by the institutional review board at our institution. The design of the trial includes several validated outcome measures assessing decisional conflict, decisional satisfaction, and distress. In our experience, all enrolled patients have been receptive to the intervention, and with the exception of Case 2, all have completed all three sessions without difficulty. Although we encourage practice and reflection between sessions, we have observed that the logistics of planning for cancer treatment often make this difficult. The brief format of the intervention and telephone-based support were designed to overcome some of these barriers. As we look toward future evaluation of the intervention, streamlining the intervention will be a priority. For instance, closer coordination with clinic staff may reduce the time to gather history and to screen for distress. We may also consider more flexible scheduling options. The results of our ongoing trial will inform future work to refine the process of providing fertility care to young women diagnosed with cancer.

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References

1. Geue K, Richter D, Schmidt R, et al. The desire for children and fertility issues among young German cancer survivors. *J Adolesc Health*. 2014;54(5):527–35.
2. Schover LR. Patient attitudes toward fertility preservation. *Pediatr Blood Cancer*. 2009;53(2):281–4.
3. Quinn GP, Murphy D, Knapp C, et al. Who decides? decision making and fertility preservation in teens with cancer: a review of the literature. *J Adolesc Health*. 2011;49(4):337–46.
4. Keegan THM, Lichtensztajn DY, Kato I, et al. Unmet adolescent and young adult cancer survivors information and service needs: a population-based cancer registry study. *J Cancer Surviv*. 2012;6(3):239–50.
5. Kim J, Deal AM, Balthazar U, et al. Fertility preservation consultation for women with cancer: are we helping patients make high-quality decisions? *Reprod Biomed Online*. 2013;27(1):96–103.
6. Jordan C, Revenson TA. Gender differences in coping with infertility: a meta-analysis. *J Behav Med*. 22(4):341–58.
7. Gardino S, Rodriguez S, Campo-Engelstein L. Infertility, cancer, and changing gender norms. *J Cancer Surviv*. 2010;5(2):152–7.
8. Panagiotopoulou N, Ghuman N, Sandher R, et al. Barriers and facilitators towards fertility preservation care for cancer patients: a meta-synthesis. *Eur J Cancer Care*. 2015. [Epub ahead of print] DOI: 10.1111/ecc.12428.
9. Shah MS, Letourneau JM, Niemasik EE, et al. The role of in-depth reproductive health counseling in addressing reproductive health concerns in female survivors of nongynecologic cancers. *J Psychosoc Oncol*. 2016;34(4):305–17.
10. Carter J, Raviv L, Applegarth L, et al. A cross-sectional study of the psychosexual impact of cancer-related infertility in women: third-party reproductive assistance. *J Cancer Surviv*. 2010;4(3):236–46.
11. Besse D, Bellavia M, de Ziegler D, Wunder D. Fertility and cancer: psychological support in young women who contemplate emergency assisted reproductive technologies (ART) prior to chemo- and/or radiation-therapy. *Swiss Med Wkly*. 2010;140:w13075.
12. Faramarzi M, Alipor A, Esmaelzadeh S, et al. Treatment of depression and anxiety in infertile women: cognitive behavioral therapy versus fluoxetine. *J Affect Disord*. 2008;108(1–2):159–64.
13. Domar AD, Gross J, Rooney K, Boivin J. Exploratory randomized trial on the effect of a brief psychological intervention on emotions, quality of life, discontinuation, and pregnancy rates in in vitro fertilization patients. *Fertil Steril*. 2015;104(2):440–51.e7.
14. Galhardo A, Cunha M, Pinto-Gouveia J. Mindfulness-based program for infertility: efficacy study. *Fertil Steril*. 2013;100(4):1059–67.
15. Koszycki D, Bissierre JC, Blier P, et al. Interpersonal psychotherapy versus brief supportive therapy for depressed infertile women: first pilot randomized controlled trial. *Arch Womens Ment Health*. 2012;15(3):193–201.
16. Berns GS, Laibson D, Loewenstein G. Intertemporal choice—toward an integrative framework. *Trends Cogn Sci*. 2007;11(11):482–8.
17. Sasse LK, Peters J, Büchel C, Brassen S. Effects of prospective thinking on intertemporal choice: the role of familiarity. *Hum Brain Mapp*. 2015;36(10):4210–21.

18. Lempert KM, Phelps EA. The malleability of intertemporal choice. *Trends Cogn Sci*. 2016;20(1):64–74.
19. Loewenstein GF, Weber EU, Hsee CK, Welch N. Risk as feelings. *Psychol Bull*. 2001;127(2):267–86.
20. Anderson CJ. The psychology of doing nothing: forms of decision avoidance result from reason and emotion. *Psychol Bull*. 2003;129(1):139–67.
21. Hayes SC, Luoma JB, Bond FW, et al. Acceptance and commitment therapy: model, processes and outcomes. *Behav Res Ther*. 2006;44(1):1–25.
22. Johnson S, Gur RM, David Z, Currier E. One-session mindfulness meditation: a randomized controlled study of effects on cognition and mood. *Mindfulness*. 2010;6(1): 88–98.
23. Moore CF, Unger JM, Phillips, K-A, et al. Goserelin for ovarian protection during breast-cancer adjuvant chemotherapy. *N Eng J Med*. 2015;372(10):923–32.

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