Patient Education and Counseling 99 (2016) 1907–1910

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Reflective practice

ENRICH: A promising oncology nurse training program to implement ASCO clinical practice guidelines on fertility for AYA cancer patients

Susan T. Vadaparampil[a,b,*], Clement K. Gwede[a], Cathy Meade[a], Joanne Kelvin[c], Richard R. Reich[a,d], Joyce Reinecke[e], Meghan Bowman[a], Ivana Sehovic[a], Gwendolyn P. Quinn[a,b], ENRICH RESEARCH GROUP

[a] Health Outcomes and Behavior Program, H. Lee Moffitt Cancer Center, 12902 USF Magnolia Dr, MRC-CANCONT, Tampa, FL 33612, United States
[b] Morsani College of Medicine, University of South Florida, 12901 Bruce B Downs Blvd, Tampa, FL 33612, United States
[c] Memorial Sloan Kettering Cancer Center, 1275 York Ave, NY, NY 10065, United States
[d] College of Arts and Sciences, University of South Florida Sarasota-Manatee, 8350 N Tamiami Trail, Sarasota, FL 34243, United States
[e] Alliance for Fertility Preservation, Lafayette, CA, United States

ARTICLE INFO

Article history:
Received 27 October 2015
Received in revised form 6 April 2016
Accepted 14 May 2016

Keywords:
Reproductive health
Fertility
Fertility preservation
Training
Oncology
AYA
Nurses
Quality of life
QOPI

ABSTRACT

Objective: We describe the impact of ENRICH (Educating Nurses about Reproductive Issues in Cancer Healthcare), a web-based communication-skill-building curriculum for oncology nurses regarding AYA fertility and other reproductive health issues.
Methods: Participants completed an 8-week course that incorporated didactic content, case studies, and interactive learning. Each learner completed a pre- and post-test assessing knowledge and a 6-month follow-up survey assessing learner behaviors and institutional changes.
Results: Out of 77 participants, the majority (72%) scored higher on the post-test. Fifty-four participants completed the follow-up survey: 41% reviewed current institutional practices, 20% formed a committee, and 37% gathered patient materials or financial resources (22%). Participants also reported new policies (30%), in-service education (37%), new patient education materials (26%), a patient navigator role (28%), and workplace collaborations with reproductive specialists (46%).
Conclusion: ENRICH improved nurses' knowledge and involvement in activities addressing fertility needs of oncology patients. Our study provides a readily accessible model to prepare oncology nurses to integrate American Society of Clinical Oncology guidelines and improve Quality Oncology Practice Initiative measures related to fertility.
Practice implications: Nurses will be better prepared to discuss important survivorship issues related to fertility and reproductive health, leading to improved quality of life outcomes for AYAs.

1. Introduction

In 2013, the American Society of Clinical Oncology (ASCO) published updated clinical practice guidelines extending the responsibility for discussion and referral about fertility preservation (FP) for patients of reproductive age beyond the medical oncologist to explicitly include, nurses and oncology allied health care professionals. [1]. Oncology nurses are well positioned to initiate conversations and facilitate referrals for FP; however, they report lacking knowledge, skills, or confidence [2–4]. Our team developed a fertility and reproductive health training program for nurses who care for adolescent and young adult (AYA) patients. **E**ducating **N**urses about **R**eproductive **I**ssues in **C**ancer **H**ealthcare (ENRICH) is an R25E grant funded by the National Cancer Institute [5]. This report describes the impact of ENRICH on knowledge, behaviors, and institutional changes among the first cohort.

2. Methods

2.1. ENRICH program

ENRICH program development is detailed elsewhere [5]. In brief, the program was informed by prior work [2–4] and guided by Adult Learning Theory [6]. Nurses completed 8 modules comprised

* Corresponding author at: H. Lee Moffitt Cancer Center, Health Outcomes and Behavior Program, 12902 Magnolia Dr, MRC-CANCONT, Tampa, FL 33612, United States
E-mail addresses: susan.vadaparampil@moffitt.org (S.T. Vadaparampil), clement.gwede@moffitt.org (C.K. Gwede), cathy.meade@moffitt.org (C. Meade), kelvinj@MSKCC.ORG (J. Kelvin), richie.reich@moffitt.org (R.R. Reich), joyce@allianceforfertilitypreservation.org (J. Reinecke), meghan.bowman@moffitt.org (M. Bowman), Ivana.sehovic@moffitt.org (I. Sehovic), gwen.quinn@moffitt.org (G.P. Quinn).

http://dx.doi.org/10.1016/j.pec.2016.05.013
0738-3991/

of narrated PowerPoints, course textbook readings [7], case studies, and interview-based learning assignments [8]. The modules focused on infertility, FP options, sexuality, alternative family building, and skill building. Ethical, legal, and psychosocial considerations were infused throughout all modules. The time commitment was ~60–90 min over the 8 week training program. Nurses completing requirements received 11 Continuing Education Units. No other incentive was provided.

2.2. Recruitment

ENRICH requirements included a Registered Nurse license, providing care for ≥5 AYA patients annually, and completing a program application. Nurses were recruited through: conference promotions (e.g., Advances in Pediatric Hematology/Oncology Conference), list-serve emails through nursing professional organizations (e.g., Oncology Nursing Society, Academy of Nurse Navigators), 592 nursing program alumni associations, outreach to 69 NCI cancer centers, and a Children's Oncology Group newsletter.

2.3. Measures

2.3.1. Knowledge

All participants completed a 14-item multiple choice knowledge assessment prior to and after viewing the 6 modules in the course that primarily presented content (the final 2 modules were skill-building and practical application activities). Items were developed by our expert advisory panel, reviewed for content validity, and tested among nurses who did (n = 10) and did not (n = 17) participate in the ENRICH program. Compared with non-participants, ENRICH pilot participants significantly higher scores demonstrated good discriminant validity (data not shown). Table 1 provides a description of the items rather than specific questions and response options to avoid contamination of knowledge assessments in future ENRICH cohorts.

2.3.2. Learner perceptions and behavior

One ENRICH goal is to empower participants to apply knowledge and skills within their institution. All program participants received a 6-month follow-up survey and were offered a $5 gift card for completion. Participants rated perceived changes knowledge and confidence to initiate reproductive health discussions using a 0 (no change) to 10 (most change) point scale. Participants identified specific workplace reproductive health initiatives: meeting with other health care providers to discuss FP, reviewing current institutional practices, forming a committee/taskforce, contacting national organizations for patient education materials or to obtain financial resources for patients, and seeking additional training.

2.3.3. Institutional change

Participants were asked whether they or their institution made changes regarding reproductive health in their workplace post program completion in the following categories (no, yes): policies, in-service education, patient education materials, collaboration with reproductive specialists, and designation of a fertility navigator/nurse specialist, with an option to specify additional activities not listed.

2.4. Data analysis

Data were analyzed using SPSS v. 21. To assess changes in knowledge, each item and the total score (% correct) were compared between pre- and post-test using related samples non-parametric (McNemar's test for single items; Wilcoxon signed ranks test for total score) tests using a $p < 0.05$ level of significance. Descriptive statistics were used to summarize learner perceptions, behaviors, and institutional change.

3. Results

Eighty four applicants were accepted for the 2014 ENRICH cohort; 77 (92%) completed the course. Table 2 summarizes participant demographic and professional characteristics.

3.1. Knowledge

The mean pre- to post-test total score increased from 58% (sd = 15%) to 77% (sd = 15%) correct ($p < 0.001$). The effect size for this change was large (Cohen's d = 1.5) [9]. Over two-thirds (72%) scored higher on the post-test than on the pre-test. There was a statistically significant increase ($p < 0.05$) from pre- to post-test in 9 of the 14 items (Table 1).

3.2. Learner perceptions and behavior

Of 77 nurses, 54 (70%) completed the 6-month follow-up survey. On average, nurses rated their perceived knowledge and confidence changes as 6.7 (sd = 2.1) and 6.8 (sd = 2.1), respectively.

Table 1
Overall and Item-Specific Change in Knowledge from Pre- to Post-Test ENRICH Course Participation (n = 77).

Item Content	Correct (pre-test)	Correct (post-test)	P value
Overall Knowledge (% of total items correct)	58%	77%	<0.001
Fertility Risks			
Fertility risk in young male oncology patient previously treated with prednisone for rheumatoid arthritis	57%	73%	0.05
Impact of cancer site on sperm count and sperm motility	78%	93%	<0.01
Impact of age, gender, and radiation site on future fertility outcomes	24%	33%	0.30
Impact of chemotherapeutic agents on gonadal damage and fertility	64%	91%	<0.001
Impact of age, gender, and cancer site on fertility	77%	93%	0.04
FP Options			
Standard methods to obtain sperm from men prior to treatment	73%	86%	0.04
Success rates for female FP methods	67%	85%	<0.01
Pregnancy success rates with embryos cryopreserved prior to receiving chemotherapy with alkylating agents	40%	59%	0.07
Benefits and limitations of oophoropexy	54%	79%	<0.001
Success rates for male FP options	41%	62%	<0.01
Use of Tanner Stage to determine FP options	49%	85%	<0.001
Sexual Function			
Impact of nerve-sparing radical prostatectomy on sexual function.	72%	69%	0.83
Impact of biologic response modifiers on sexual function.	54%	83%	<0.001
Physical effects of targeted therapies on sexual function.	61%	85%	<0.01

Table 2
ENRICH Learner Demographic and Practice Characteristics (n = 77).

Ethnicity: Not Hispanic/Latino	71 (92%)
Race: White	65 (84%)
Sex: Female	76 (99%)
Region	
Northeast	16 (21%)
South	20 (26%)
Midwest	29 (38%)
West	12 (16%)
Highest Degree	
Associate's	8 (10%)
Bachelor's	22 (29%)
Graduate	47 (61%)
Years in Nursing	
1–10	26 (34%)
11–20	20 (26%)
21+	30 (39%)
Workplace Setting	
Academic Cancer Center	34 (44%)
Community Cancer Center	11 (14%)
University Hospital	11 (14%)
Community Hospital	8 (10%)
Private Practice	3 (4%)
Other	10 (13%)
Participants Per Institution	
1	34 (44%)
2–3	31 (40%)
4–6	12 (16%)
Established FP Program at Workplace	28 (36%)
Established FP Referral Procedures at Workplace	33 (43%)
Reproductive Endocrinology and Infertility (REI) Specialist on Staff	23 (30%)
Partnership with Reproductive Endocrinology and Infertility Specialist in Area	32 (42%)
Reproductive Health Staff Education Materials	30 (39%)
Reproductive Health Patient Education Materials	50 (65%)

The most frequent action to promote change was sharing strategies to initiate reproductive health conversations with other providers (72%). Reported involvement in institutional changes included reviewing current reproductive health practices (41%), forming a committee/taskforce to address reproductive health issues (20%), and contacting national organizations for patient materials (37%) and financial resources (22%).

3.3. Institutional changes

Participants reported they or their workplace created reproductive health policies (30%), provided in-service education (37%), developed patient education materials (26%), initiated a fertility patient navigator role (28%), and developed workplace collaborations with reproductive specialists (46%). For the 10 institutions with >1 participant responding to the 6-month follow up survey, we examined whether the institutional level changes were consistently reported. Concordance of reported institutional changes ranged from 100% across all six questions at two institutions to 33% at one institution.

4. Discussion and conclusion

4.1. Discussion

Although the ASCO guidelines [1] served as an impetus for oncology team members to share the responsibility of addressing FP issues with patients, few studies have reported on interventions to facilitate implementation of these guidelines. ENRICH results demonstrate objective and self-assessed gains in areas of low perceived [4] and actual [10] knowledge identified in prior studies about key aspects of fertility and FP for cancer patients, such as the impact of treatment on risk of infertility or types of FP options, thereby offering an approach for improving nursing education on this topic. Additionally, in the 6 months following program completion, participants reported engaging in behaviors/activities identified as important for programs to address fertility needs of AYA patients [11]. Over 70% of participants reported meeting with other providers to discuss reproductive health issues and almost half reviewed current practices at their organization. These behaviors are examples of activities facilitating systematic, counseling, and referral of patients to fertility specialists [12].

Other training programs support the need for more intense training programs, such as ENRICH, to impact nurse knowledge and behavior. Visovsky [13] assessed a brief nurse training and standardized tool for assessment of chemotherapy-induced peripheral neuropathy. Although self-reported attitudes and skills improved, knowledge did not significantly change. Parker [14] conducted a randomized trial of a brief communication intervention (viewing a 20-min video, a laminated reminder card and email) to improve oncology nurses' knowledge about and referrals for complementary and alternative medicine (CAM). At the 2-month follow-up, the intervention group reported they were more likely to ask about CAM use than the control group, but there was no significant difference in the number of patients who indicated they were asked about CAM use. Twelve months after participation in Grant's [15] 2.5 day in-person cancer survivorship care training program the effectiveness, receptiveness, and comfort of survivorship care were significantly higher than baseline.

While our results suggest ENRICH holds promise, findings must be considered in light of limitations. First, our pre- and post-test questions were brief; therefore we could not assess knowledge across all curriculum content areas. Additionally, about 30% of trainees did not complete the 6-month follow-up survey and may also reflect those less likely to apply their training. Additionally, behavioral changes were self-reported. Future studies should include objective measures (e.g., chart review specific to clinics where participants practice) and/or interviews with

administrators to verify reported institutional changes. Finally, the sample may not have been representative of nurses working in oncology settings with respect to employment (academic centers over-represented) and race/ethnicity (predominantly non-Hispanic white).

4.2. Conclusion

Knowledge gains leading to behavior change likely require more extensive and ongoing training programs. ENRICH may have greater reach at lower costs afforded by an entirely web-based training program. Importantly, nurses consider continuing education via online learning as useful, practical, and convenient [16]. Future directions may include assessing the impact of this training from the perspective of AYA patients who participate in the discussion.

4.3. Practice implications

ENRICH provides a new opportunity to operationalize ASCO guidelines by identifying a key member of the health care team who can serve as a champion for this topic (i.e., nurses), providing training that can be completed at the pace and time of the participants (i.e., web-based, asynchronous training), and ultimately improving both knowledge and behaviors directly relating to the clinical practice guidelines and quality measures (i.e., discussion of fertility and FP with AYA patients). Institutions that successfully meet AYA patients' fertility needs often have an internal who facilitate institutional activities including ongoing provider and patient education, notification procedures regarding fertility risks prior to initiation of treatment, referrals to fertility specialists, and a policy addressing FP [11,17]. The ENRICH program can cultivate this individual by providing knowledge and practical skills to champion organizational changes that address AYA patients' fertility needs.

Funding

ENRICH is funded by a National Cancer Institute R25 Training Grant: #5R25CA142519-02.

References

[1] A.W. Loren, P. Mangu, L. Nohr Beck, L.V. Brennan, A.J. Magdalinski, A.H. Partridge, et al., Fertility preservation for patients with cancer: american society of clinical oncology clinical practice guideline update, J. Clin. Oncol. 31 (2013) 2500–2510.
[2] S.T. Vadaparampil, G.P. Quinn, H.B. Clayton, L.M. King, C.A. Miree, Institutional availability of fertility preservation, Clin. Pediatr. 47 (2008) 302–305.
[3] S.T. Vadaparampil, H. Clayton, G.P. Quinn, L.M. King, M. Nieder, C. Wilson, Pediatric oncology nurses' attitudes related to discussing fertility preservation with pediatric cancer patients and their families, J. Pediatr. Oncol. Nurs. 24 (2007) 255–263.
[4] L. King, G.P. Quinn, S.T. Vadaparampil, C.K. Gwede, C.A. Miree, C. Wilson, et al., Oncology nurses' perceptions of barriers to discussion of fertility preservation with patients with cancer, Clin. J. Oncol. Nurs. 12 (2008) 467–476.
[5] S.T. Vadaparampil, N.M. Hutchins, G.P. Quinn, Reproductive health in the adolescent and young adult cancer patient: an innovative training program for oncology nurses, J. Cancer Educ. 28 (2013) 197–208.
[6] K.P. Cross, Adults as Learners, Jossey-Bass, San Francisco, 1981.
[7] G.P. Quinn, S.T. Vadaparampil, Reproductive health and cancer in adolescents and young adults, Adv Exp Med Biol, Springer, Dordrecht, 2012.
[8] G.P. Quinn, B.J. Zebrack, I. Sehovic, M.L. Bowman, S.T. Vadaparampil, Adoption and cancer survivors: findings from a learning activity for oncology nurses, Cancer 121 (17) (2015) 2993–3000, doi:http://dx.doi.org/10.1002/cncr.29322.
[9] J. Cohen, Statistical Power Analysis for the Behavioral Sciences, 2nd ed., Lawrence Erlbaum Associates, Hillsdale, NJ, 1988.
[10] T. Goodwin, B. Elizabeth Oosterhuis, M. Kiernan, M.M. Hudson, G.V. Dahl, Attitudes and practices of pediatric oncology providers regarding fertility issues, Pediatr. Blood Cancer 48 (1) (2007) 80–85.
[11] J.F. Kelvin, J. Reinecke, Institutional approaches to implementing fertility preservation for cancer patients, Adv. Exp. Med. Biol. 732 (2012) 165–173.
[12] J. Scott-Trainer, The role of a patient navigator in fertility preservation, Cancer Treat. Res. 156 (2010) 469–470.
[13] C. Visovsky, M. Haas, B. Faiman, S. Kurtin, A.M. Shaftic, E. Lyden, et al., Nurse self-evaluation of assessment of chemotherapy-induced peripheral neuropathy in patients with cancer, J. Adv. Pract. Oncol. 3 (2012) 319–325.
[14] P.A. Parker, D. Urbauer, M.J. Fisch, B. Fellman, H. Hough, J. Miller, et al., A multisite, community oncology-based randomized trial of a brief educational intervention to increase communication regarding complementary and alternative medicine, Cancer 119 (2013) 3514–3522.
[15] M. Grant, D. Economou, B. Ferrell, G. Uman, Educating health care professionals to provide institutional changes in cancer survivorship care, J. Cancer Educ. 27 (2012) 226–232.
[16] S. Karaman, Nurses' perceptions of online continuing education, BMC Med. Educ. 11 (2011) 86.
[17] M.L. Clayman, M.M. Harper, G.P. Quinn, J. Reinecke, S. Shah, Oncofertility resources at NCI-designated comprehensive cancer centers, J. Natl. Compr. Canc. Netw. 11 (2013) 1504–1509.