







TrueNTH Sexual Recovery Intervention for couples coping with prostate cancer: Randomized controlled trial results

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BACKGROUND: Despite significant sexual dysfunction and distress after localized prostate cancer treatment, patients typically receive only physiologic erectile dysfunction management. The authors performed a randomized controlled trial of an online intervention supporting couples' posttreatment recovery of sexual intimacy. **METHODS:** Patients treated with surgery, radiation, or combined radiation and androgen deprivation therapy who had partners were recruited and randomized to an online intervention or a control group. The intervention, tailored to treatment type and sexual orientation, comprised 6 modules addressing expectations for sexual and emotional sequelae of treatment, rehabilitation, and guidance toward sexual intimacy recovery. Couples, recruited from 6 sites nationally, completed validated measures at the baseline and 3 and 6 months after treatment. Primary outcome group differences were assessed with *t* tests for individual outcomes. **RESULTS:** Among 142 randomized couples, 105 patients (mostly surgery) and 87 partners completed the 6-month survey; this reflected challenges with recruitment and attrition. There were no differences between the intervention and control arms in Patient-Reported Outcomes Measurement Information System Global Satisfaction With Sex Life scores 6 months after treatment (the primary outcome). Three months after treatment, intervention patients and partners reported more engagement in penetrative and nonpenetrative sexual activities than controls. More than 73% of the intervention participants reported high or moderate satisfaction with module content; more than 85% would recommend the intervention to other couples. **CONCLUSIONS:** Online psychosocial support for couples can help couples to connect and experience sexual pleasure early after treatment despite patients' sexual dysfunction. Participants' high endorsement of the intervention reflects the importance of sexual health support to couples after prostate cancer treatment. *Cancer* 2022;128:1513-1522. © 2021 American Cancer Society.

LAY SUMMARY:

- This study tested a web-based program supporting couples' sexual recovery of sexual intimacy after prostate cancer treatment.
- One hundred forty-two couples were recruited and randomly assigned to the program (n = 60) or to a control group (n = 82).
- The program did not result in improvements in participants' satisfaction with their sex life 6 months after treatment, but couples in the intervention group engaged in sexual activity sooner after treatment than couples in the control group.
- Couples evaluated the program positively and would recommend it to others facing prostate cancer treatment.

KEYWORDS: couples, prostate cancer, rehabilitation, sexual dysfunction, telemedicine.

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INTRODUCTION

Although most men with localized prostate cancer become long-term survivors,¹ treatment with surgery, radiation, or androgen deprivation therapy (ADT) frequently results in significant sexual side effects that affect many men and their partners. Patient and partner distress about treatment-related sexual problems, including a decline in erectile function, negatively affects intimate relationships and quality of life.²⁻⁶ Although patients and partners report a desire for information and guidance to help them to cope with these side effects, this information is often unavailable.⁷⁻⁹ Support for sexual recovery remains a significant gap in prostate cancer survivorship care.

Experts in the field of sexual recovery after prostate cancer have advocated for the inclusion of partners and for support for couples' engagement in a process that is arduous and replete with feelings of loss and grief when men and partners need to accept a new sexual paradigm and when men often need to use pre-erectile aids.^{10,11} Additionally, the unique needs of gay and bisexual patients have been recognized.^{12,13} Existing interventions oriented toward couples' sexual recovery have not shown a significant effect on sexual function, which has generally remained in the dysfunctional range; this underscores the limited ability of psychosexual interventions to alter the biological impact of prostate cancer treatment on men's sexual function.^{14,15} However, psychosocial interventions have been shown to increase men's use of pro-erectile aids,^{16,17} increase their knowledge about the sexual side effects of treatment, improve partners' acceptance of the idea that men can have a satisfying sex life despite erectile dysfunction, and increase the persistence of sexual activity even after ADT treatment.¹⁸ The drawback of the reported interventions has been their administration by professionals or peers along with associated financial costs and the need for highly trained personnel; this has limited their dissemination in clinical practice.

Online interventions have shown promise as an approach to increasing the implementation of evidence-based approaches to health education and symptom management for cancer survivors.¹⁹⁻²¹ The use of an online platform can reduce barriers to specialized care, such as cost or distance, and this may be particularly important in addressing sexual side effects when patients and/or partners may be embarrassed and reluctant to seek in-person care.^{15,22}

The study goal was to test the impact of the TrueNTH Sexual Recovery Intervention, a tailored, interactive, web-based tool, on patients' and their partners' recovery of sexual intimacy after prostate cancer treatment in comparison with standard informational resources. We

hypothesized that the online format, available on an easily accessible platform, would deliver specialty care with evidence-based content and promote couples' engagement in sexual recovery as well as satisfaction with their sex lives.

MATERIALS AND METHODS

Study Design

The TrueNTH Sexual Recovery Intervention was developed and tested in a multisite randomized controlled trial between May 2016 and May 2019 at the University of California Los Angeles, Emory University, the Memorial Sloan Kettering Cancer Center, Johns Hopkins University, the University of Michigan, and the University of North Carolina at Chapel Hill.²³ All sites obtained approval from their respective institutional review boards. The study was registered at ClinicalTrials.gov (NCT02702453) on March 3, 2016.

Study Sample

Eligibility criteria included patients diagnosed with localized prostate cancer who were 18 years old or older and had been partnered for at least 6 months and their partners. Participants were required to speak English; each provided consent for participation in the study at least 2 weeks before starting prostate cancer treatment. Initially, men who received ADT were excluded; however, because many men undergoing radiation also received ADT, the enrollment criteria were modified (March 2017) to include them.

Enrollment and Randomization

Before study commencement, study ID numbers were randomized with 1:1 randomization and stratified by study sites with a randomized block design with block sizes of 4. Couples were randomized as a dyad to the same arm. New patients were identified on clinic schedules when they were coming in to discuss treatment for prostate cancer. Initial interest was solicited by phone, and a consent form was signed during the clinic visit. Consenting couples received their study IDs and a link to the study activities according to their randomization. The intervention IDs led couples to baseline assessments and to the TrueNTH Sexual Recovery Intervention. The control IDs led couples to baseline assessments and to a link to the American Cancer Society's web page on sexuality after cancer.²⁴

The TrueNTH Sexual Recovery Intervention

The intervention design was based on a conceptual model of sexual recovery after prostate cancer, expert feedback,

patient and partner focus groups, and usability testing.^{23,25} The conceptual model incorporated a biopsychosocial model of sexuality and grief and mourning as key elements in the process toward sexual recovery.²⁶ The content of the intervention was tailored to the participants' treatment type (surgery/radiation) and sexual orientation (female/male partner). The intervention's 6 modules were accessed over a 7-month period. Each comprised an introductory video of a patient, couple, or sex therapist; education content relevant to the stage of recovery; and suggested activities for the couple to engage in to maintain emotional and sexual connection. Between modules, couples received emails with strategies for concerns expressed during the activity. Module topics included the following: 1) preparation for treatment-related sexual side effects and emotional impact, 2) an overview of sexual aids for patients and partners, 3) preparation for sexual encounters, 4) strategies for expanding sexual repertoire, 5) the incorporation of the new sexual paradigm into daily life, and 6) guidance for speaking to health care providers about sexual concerns. The TrueNTH Sexual Recovery Intervention was developed according to established processes and user-centered approaches by the Center for Health Communications Research at the University of Michigan.²⁷

Outcome Measures

Outcome measures are detailed in Supporting Table 1 and in our published protocol.²³ The primary prespecified outcome was the Patient-Reported Outcomes Measurement Information System (PROMIS) Global Satisfaction With Sex Life (GSSL) scale,²⁸ to which the patient and the partner responded at the baseline and 6 months after the beginning of prostate cancer treatment. We hypothesized that GSSL at 6 months would decline for both groups but would be higher for couples in the intervention arm. Three-month assessments were not collected to reduce the response burden during a time of intensive intervention content transmission. We also did not hypothesize shorter term differences.

Secondary outcomes included PROMIS assessments of Sexual Interest, Sexual Activity, and Use of Sexual Aids²⁸; prostate cancer-specific quality of life as measured by the Expanded Prostate Cancer Index Composite (EPIC-26)²⁹; female partner sexual function as assessed by the Female Sexual Function Index, male partner sexual function as assessed by the International Index of Erectile Function (FSFI; for female partners,³⁰ IIEF; for male partners).³¹ Secondary outcomes were assessed at the baseline and 3 and 6 months after treatment. The

intermediate 3-month time point was added for the secondary outcomes because of couples' potential to engage in nonpenetrative sexual activities and use sexual aids for penetration, regardless of sexual function and current feelings of loss. On the basis of the existing literature on sexual function outcomes at 3 months, we did not expect a difference between the intervention and control arms in participants' sexual function. At the same time, we hypothesized that patients and partners in the intervention arm would have more sexual interest, accept the use of sexual aids more easily, and be more sexually active.

Patients and partners in the intervention arm evaluated their satisfaction with module content after each module by responding on a 5-point Likert scale to statements about whether the module was helpful, should be changed, or was confusing. Participants rated overall satisfaction with the intervention at the end of the intervention. They were also asked whether the intervention helped them to cope with the side effects and to manage their sex life, was helpful overall, and was worth recommending to others.

Statistical Design

A planned accrual of 142 patient-partner dyads was based on anticipated average adjusted scores of the primary outcome of 50 in the intervention group and 45 in the control group with a standard deviation of 10,³² 80% power, a 5% significance level, and 10% loss to follow-up.

Data Analysis

The analysis was performed on data from participants who completed at least 1 of the 2 surveys (3 and 6 months). Differences in baseline demographics and disease characteristics were compared between patients in the intervention and control arms with the Wilcoxon rank-sum test for continuous variables and with the χ^2 test for categorical variables. The primary outcome, GSSL, was reported as means and 95% confidence intervals at the baseline and 6 months by arm and was compared with the Student *t* test. Continuous outcomes, including Sexual Interest, the EPIC-26 Sexual domain, FSFI Total Sexual function and IIEF, were presented as means and 95% confidence intervals and were compared between study arms at the baseline, at 3 months, and at 6 months with ANCOVA models. The models at 3 and 6 months included an adjustment for the baseline score. Treatment arm differences in increases in sexual activity or use of sexual aids from the baseline were tested with χ^2 tests. Intervention use by module and user assessment by role and module are described with frequencies and proportions. The statistical

analysis was completed with SAS 9.4 (SAS Institute, Inc) at the 5% significance level.

RESULTS

Accrual

Across sites, 510 couples were approached (Fig. 1). There were 288 couples (56%) who declined to participate; 222 couples (44%) were randomized (100 couples to the intervention arm and 122 couples to the control arm). The difference in the sizes of the intervention and control arm cohorts was an artifact of the initial consenting process at 1 of the institutions: patients were consented early in their oncologic treatment, and some later chose active surveillance or sought treatment at a different institution and thus became ineligible to participate. The imbalance between the arms was not discovered early enough to attempt correction. Baseline surveys were completed by patients and partners within the

2 weeks before treatment for 62 couples (62%) in the intervention arm and for 80 couples (66%) in the control arm. Only participants who completed the baseline surveys were eligible to progress in the study. At 3 months, 107 patients (intervention arm = 41, control arm = 66) and 86 partners (intervention arm = 30, control arm = 56) completed the surveys. At 6 months, 105 patients (intervention arm = 39, control arm = 66) and 87 partners (intervention arm = 32, control arm = 55) completed the surveys.

Patient Characteristics

There were no significant differences in demographic or clinical characteristics between the study arm participants at the baseline (Table 1). Across study arms, the median patient age was 61 years, 20% were non-White, and 65% completed college. Nearly two-thirds (65%) had Gleason 7 disease, 85% received surgery, 11% received radiation, and 4% received combined radiation and hormonal

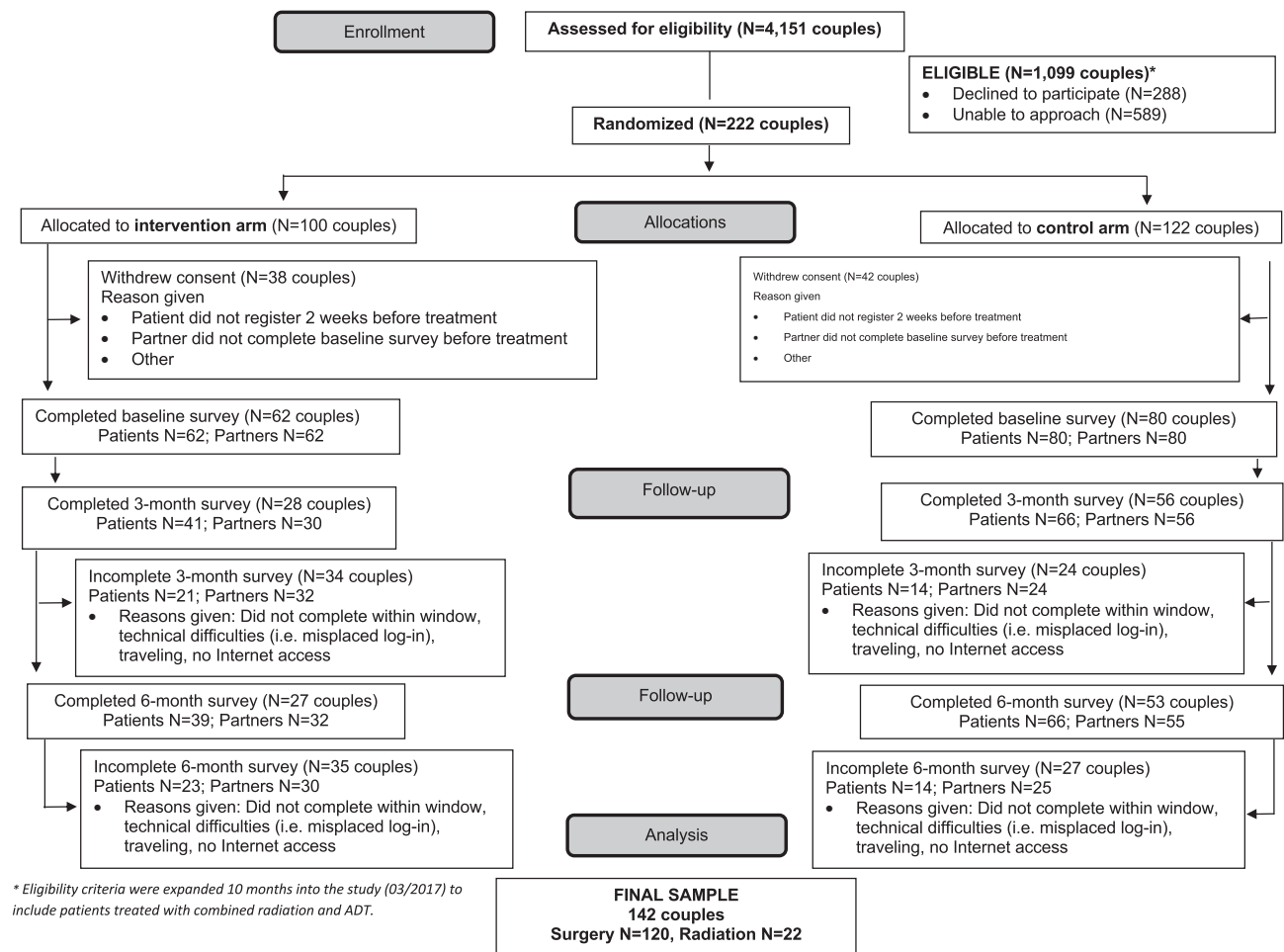


Figure 1. Consolidated Standards of Reporting Trials diagram for the TrueNTH Sexual Recovery Intervention. ADT indicates androgen deprivation therapy.

TABLE 1. Participant Characteristics

Characteristic	Patients With Prostate Cancer			Partners		
	Intervention	Control	<i>P</i>	Intervention	Control	<i>P</i>
No.	62	80	—	62	80	—
Age, median (IQR), y	62 (56-65)	61 (57-67)	.4	60 (53-64)	59 (53-63)	.6
BMI, median (IQR), kg/m ²	27 (25-31)	27 (25-30)	.7	26 (22-32)	25 (22-27)	.3
Gender, %			—			.8
Female	0	0		95	96	
Male	100	100		5	4	
Race, %			.5			.1
White/Caucasian	84	75		85	74	
Black/African American	13	16		11	11	
Hispanic/Latino	2	4		3	5	
Other	2	5		0	10	
Comorbidities, %			.5			.5
0	55	60		71	65	
≥1	45	40		29	35	
Employment status, %			.5			.8
Full-time	53	58		44	38	
Part-time	10	5		18	19	
Not working for pay	37	38		39	44	
Education, %			.4			.3
Less than high school	0	0		3	0	
High school graduate	31	38		27	31	
College graduate	69	63		69	69	
Income, %			1.0			.8
<\$50,000	6	6		8	8	
\$50,000-\$89,999	21	19		18	23	
≥\$90,000	68	70		68	65	
I don't know	5	5		6	4	
Primary treatment, %			.1	—	—	—
Surgery	90	81				
Radiation	10	13				
Radiation + ADT	0	6				
Received additional treatment, %	6	4	.5	—	—	—
Clinical T stage, %			.7	—	—	—
T1/T2	85	86				
T3/T4	3	1				
Unknown	11	13				
Pathological T stage, %			.4	—	—	—
T1/T2	70	59				
T3/T4	29	40				
Unknown	2	2				
Clinical Gleason score, %			.2	—	—	—
6	16	21				
7	73	59				
8-10	11	20				
Pathological Gleason score, %			.3	—	—	—
6	7	9				
7	87	77				
8-10	6	14				
PSA at diagnosis, median (IQR), ng/mL	5.5 (4.2-7.3)	6.3 (4.6-9.1)	.2			

Abbreviations: ADT, androgen deprivation therapy; BMI, body mass index; IQR, interquartile range; PSA, prostate-specific antigen.

therapy. Couples had been in their relationship 31 years on average; 4% were in same-sex partnerships. Partners' median age was 59 years, 21% were non-White, and 65% had completed college. For the 3-month follow-up, the only difference between participants in the intervention and control arms was educational status; there were no baseline differences between study arms among couples who completed the 6-month survey.

Primary End Point: GSSL in Patients With Prostate Cancer and in Their Partners

Table 2 indicates that, as expected, there were no significant differences in GSSL scores at the baseline between the intervention and control arms (mean, 62 vs 60; $P = .3$). The GSSL scores at the 6-month follow-up were not significantly different between the intervention and control arms (mean, 53 vs 51; $P = .4$ [after controlling

TABLE 2. Global Satisfaction With Sex Life (PROMIS) Association Between Arms at 6 Months

		Baseline (Actual Value)		Month 6 (Actual Value)		Model Estimate: Arm Effect at 6 mo Controlling for Baseline, Parameter Estimate (95% CI)	Treatment Arm <i>P</i>
		No.	Mean (95% CI)	No.	Mean (95% CI)		
Patients with prostate cancer	Intervention	31	62 (59-64)	31	53 (51-55)	1.3 (-1.6 to 4.2)	.4
	Control	51	60 (57-62)	51	51 (49-53)		
Partners	Intervention	30	58 (55-61)	30	53 (50-56)	-1.3 (-4.7 to 2.2)	.5
	Control	41	60 (57-63)	41	55 (52-57)		

Abbreviations: CI, confidence interval; PROMIS, Patient-Reported Outcomes Measurement Information System.

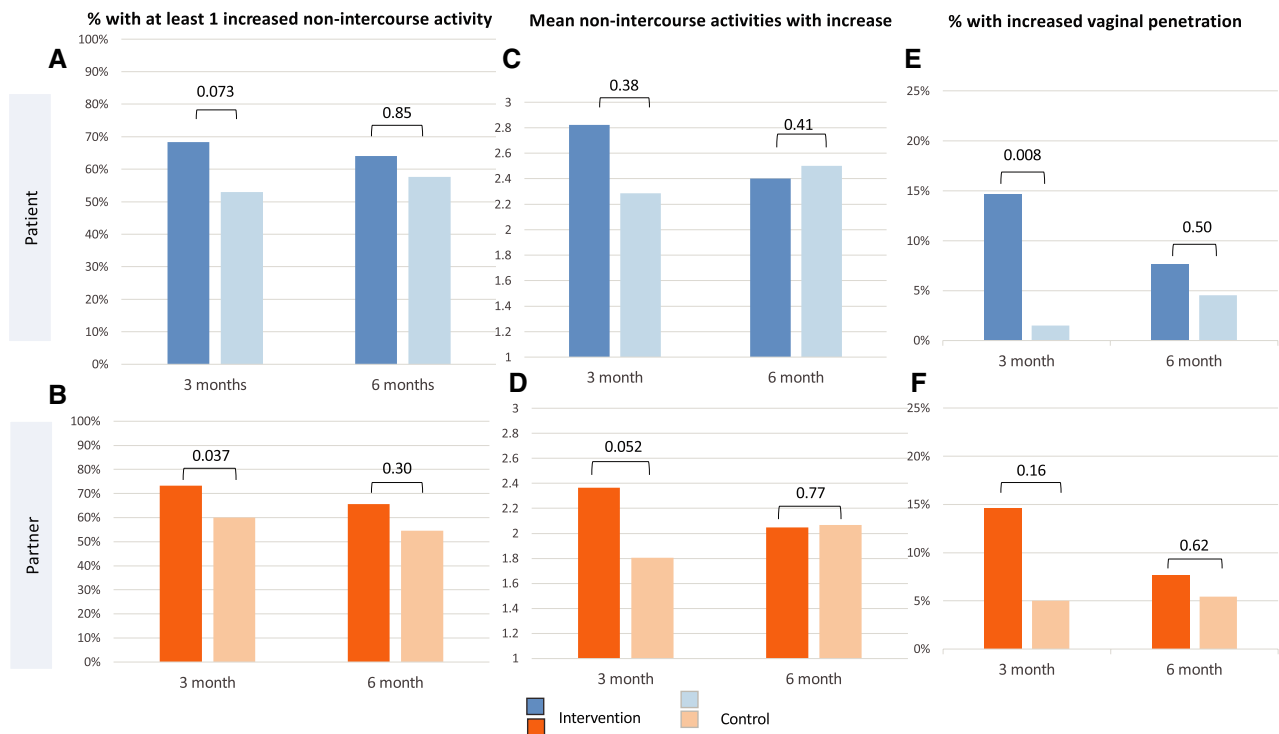


Figure 2. Sexual activity: patient frequency of reported increases in activity at 3 and 6 months in comparison with the baseline for patients and partners. (A,B) Proportions reporting an increase in at least 1 nonpenetrative activity. (C,D) Mean numbers of nonpenetrative activities with reported increases. (E,F) Frequencies of reported increases in vaginal penetration. *P* values are displayed for comparisons between arms.

for the baseline]). Similarly, partner GSSL scores at the 6-month follow-up, a secondary outcome, were not significantly different between the intervention and control arms (mean, 53 vs 55; *P* = .5 [after controlling for the baseline]).

Secondary Outcomes

Sexual activity at follow-up assessments (both 3 and 6 months) was compared with the baseline and reported for patients and partners by treatment arm. At 3 months, 68% of the patients in the intervention arm reported an increase in at least 1 nonpenetrative activity, whereas 53%

of the patients in the control arm did (*P* = .07; Fig. 2 and Supporting Table 1). Certain nonpenetrative activities (eg, hugging and kissing) as well as vaginal penetration were more present in the intervention arm than the controls (all *P* values < .05).

The intervention was also associated with more sexual activity reported by partners, with 73% in the intervention arm and 60% in the control arm reporting a 3-month increase in at least 1 nonpenetrative sexual activity in comparison with the baseline (*P* = .037). Significantly higher activities reported by partners in the intervention group included kissing, touching someone’s chest, and having

their own chest touched. Vaginal penetration was reported more often by intervention arm partners (13%) than controls (5%), although this difference was not statistically significant ($P = .16$). The 6-month comparisons were more modest and not statistically significant.

No statistical differences were found for sexual interest between the intervention and control arms for either patients or partners (Table 3) in male sexual function (EPIC-26 sexual domain) or female sexual function (FSFI) at 3 and 6 months. However, intervention arm partners' FSFI scores at 3 months were higher than those of the controls. The small sub-sample of male partners did not allow for the analysis of their sexual function outcomes.

Participant Evaluation of the Intervention

More than 73% of the patients and partners in the intervention arm reported high or moderate overall satisfaction with the intervention, and more than 89% of the patients and partners stated that they would recommend it to others. Participants also found individual modules related to the sexual recovery process useful. The first module was accessed by 90% of the participants; this declined to 54% for the final module. Modules were reported to be "found helpful" by 65% to 82% of the patients and by 65% to 82% of the partners, with a similar range reporting "would recommend." A minority of users (0%-19%) reported that the modules "felt confusing."

DISCUSSION

Sexual health support after prostate cancer treatment remains a significant gap in survivorship care. The goal of our TrueNTH Sexual Recovery Intervention was to address this gap by providing patients and their partners with tailored support along the trajectory of their recovery from the sexual side effects of prostate cancer treatment.

The study did not find significant differences between the intervention and control groups in the primary outcome: the GSSL scale. Our hypothesis that the intervention would mitigate the decline in satisfaction with sex life in the intervention group at 6 months may have been overly optimistic because 6 months after treatment, couples are still adjusting to troubling treatment-related sexual changes and may not feel much satisfaction with their sex lives.

Nonetheless, we did find that intervention couples, compared with controls, expanded their sexual repertoire to nonpenetrative activities (eg, hugging and

TABLE 3. Sexual Interest (PROMIS) and Sexual Function (EPIC-26 for Patients and FSFI for Partners)

	No.	Baseline, Mean (95% CI)		Month 3, Mean (95% CI)		Month 6, Mean (95% CI)		Estimated Arm Effect (Month 3 From Baseline)		Estimated Arm Effect (Month 6 From Baseline)	
		Intervention	Control	Intervention	Control	Intervention	Control	Parameter Estimate (95% CI)	Between-Arm P	Parameter Estimate (95% CI)	Between-Arm P
Patient with prostate cancer Sexual interest (PROMIS)											
		I = 47, C = 72	I = 41, C = 66	I = 41, C = 66	I = 39, C = 66	I = 41, C = 66	I = 39, C = 66				
	Intervention	60 (58-62)	56 (54-59)	56 (54-59)	56 (53-59)	56 (53-59)	56 (53-59)	2.3 (-0.8 to 5.4)	.15	1.9 (-1.3 to 5.1)	.2
	Control	58 (57-62)	53 (51-55)	53 (51-55)	53 (52-55)	53 (52-55)	53 (52-55)				
Sexual domain (EPIC-26)											
	Intervention	80 (73-87)	36 (27-45)	41 (32-51)	41 (32-51)	41 (32-51)	41 (32-51)	1.9 (-10 to 14)	.8	-4.5 (-15 to 6.3)	.4
	Control	79 (72-85)	33 (26-40)	33 (26-40)	42 (35-49)	42 (35-49)	42 (35-49)				
Partner Sexual interest (PROMIS)											
	Intervention	I = 37, C = 67	I = 30, C = 60	I = 30, C = 60	I = 32, C = 55	I = 30, C = 60	I = 32, C = 55	0.06 (-2.8 to 2.9)	1.0	0.9 (-1.6 to 3.4)	.5
	Control	53 (50-55)	50 (47-53)	50 (47-53)	52 (50-54)	52 (50-54)	52 (50-54)				
Sexual function (FSFI)											
	Intervention	24 (22-26)	22 (19-24)	22 (19-24)	21 (19-24)	21 (19-24)	21 (19-24)	2.5 (-0.3 to 5.4)	.09	2.1 (-0.8 to 5.0)	.2
	Control	22 (20-24)	18 (16-20)	18 (16-20)	18 (15-20)	18 (15-20)	18 (15-20)				

Abbreviations: C, control; CI, confidence interval; EPIC-26, Expanded Prostate Cancer Index Composite; FSFI, Female Sexual Function Index; I, intervention; PROMIS, Patient-Reported Outcomes Measurement Information System.

kissing) and engaged in penetrative sex (likely using sexual aids) more often early in the recovery. Findings from our secondary outcomes suggest that the intervention may have had the most impact at 3 months, when the intervention group engaged earlier in both penetrative and nonpenetrative sexual activities. We interpret this as couples' uptake of the intervention's guidance to accept treatment-related changes in sexual function, increase nonpenetrative sexual interactions, focus on pleasure, and incorporate the use of pro-erectile aids. These results corroborate previous research that found that couples find comfort in showing affection and sexual expression after a cancer diagnosis³³ and that including partners can increase men's uptake of pro-erectile aids.¹⁶ It is also possible that the intervention's encouragement to recognize patients' feelings of loss and help in coming to terms with sexual dysfunction diminished their ambivalence about sexual aids; this was similarly present in Nelson et al's randomized controlled trial of a patient-only directed intervention.³⁴

Our findings about the female partners' higher level of posttreatment sexual function in the intervention arm, though not significant at the .05 level, parallel research by Shindel et al,³⁵ who emphasized the association between higher female sexual function and prostate cancer patients' sexual outcomes. This finding, along with partners' higher level of sexual activity, also parallel findings by Northouse et al³⁶ showing the significant benefit that partners derive from supportive couple interventions. These findings also support our previous emphasis on partners' equal stake in the sexual recovery process³⁷ and signal that partners' support and sexual needs should be addressed

This study has many strengths, including its theory-driven online intervention modules, which were designed with a user-centered approach and tailored for patients receiving different treatments and by sexual orientation, and its ability to be disseminated to couples without professional resources. The majority of the patients and partners reported that the modules were helpful and said that they would recommend them to others. Another strength of this study was its use of a randomized controlled trial to test the intervention outcomes across multiple sites in the United States.

The study has several important limitations. First, there are notable sample characteristic limitations. Despite our best efforts, our sample was relatively homogeneous in terms of race, treatment type, and sexual orientation, and this limited the study's generalizability.

Second, the recruitment of men treated with radiation (with or without ADT) was low, and a separate

study testing the intervention with this population would be needed to ensure relevance. Furthermore, a relatively high proportion of participants had a prostate cancer at pathological stage T3/T4. Preoccupation with the severity of the disease may have diminished couples' motivation to stay engaged in sexual recovery or with the intervention.

Third, there was a 46% attrition rate for the 6-month follow-up, and this reduced the study's power to detect statistically significant differences between study arms and limited the generalizability of our findings. Hence, our findings must be viewed with caution. This level of attrition is consistent with a recent review of online support programs by Kang et al,³⁸ who reported up to 42% attrition in 4 sexual health support programs and up to 52% attrition in general lifestyle online programs. Online intervention requires self-motivation and independence from the encouragement of a clinician. Methodologies for maintaining adherence need to be further investigated. It is notable that even a study that had in-person telephone interventions with little attrition was not able to demonstrate a sustained impact on the majority of outcomes after 5 years.¹⁷

Fourth, our choice of the primary outcome may be a limitation as well. On the basis of earlier negative rehabilitation studies, experts proposed measuring satisfaction with sex life as a more viable primary outcome: couples could have a satisfying sex life while using sexual aids.³⁹ It is also likely that couples and individuals within them vary in what they want from sexual health support; focusing on a one-size-fits-all primary outcome may obscure significant benefits.²⁵

Fifth, recruiting couples versus individuals poses an extra challenge to engagement. Participants who completed the 6-month follow-up may have been more motivated than or otherwise different from those who did not, and this limited the generalizability of our findings. Moreover, the 6-month follow-up period may have limited our ability to observe the long-term impact of the intervention on the trajectory of sexual recovery, particularly in the context of the effects of different treatments on erectile function. It may be important to screen couples prospectively to identify individual needs, assess their motivation for engagement, and then tailor components of the intervention accordingly. Because patients' and partners' needs and motivation may change over time, a mixed methods implementation science approach to the study of the intervention's effectiveness may be more relevant because it allows for making modifications as new findings emerge.

Clinical Implications

Although the study did not yield expected improvements in patients' and their partners' satisfaction with their sex life at the 6-month follow-up, this randomized controlled trial of the TrueNTH Sexual Recovery Intervention was linked with improvements in a range of other important sexual outcomes, most specifically for patients treated with surgery and their partners. The intervention was also reported as helpful by patients and partners who participated in it. If integrated into usual care, the TrueNTH Sexual Recovery Intervention could become a valuable adjunct to oncologic treatment for patients and partners who are comfortable with using an on-line program support for their sexual recovery.

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CONFLICT OF INTEREST DISCLOSURES

Daniela Wittmann is routinely supported by the Department of Urology of the University of Michigan to attend annual meetings of the American Urological Association and the Sexual Medicine Society of North America, is a past Member of the Board of Directors of the Sexual Medicine Society of North America, and is an associate editor of the *Journal of Sexual Medicine*. Sharon L. Bober reports receiving honoraria from UpToDate and Johns Hopkins University and being chair for the Scientific Network on Female Sexual Health and Cancer. Ted A. Skolarus reports UpToDate royalties for authorship on a prostate cancer survivorship topic; he also reports grants from the National Cancer Institute (R37CA222885 and R01CA242559). Caroline Carter reports being a consultant for the Movember Foundation on a current sexual well-being project. Daniel E. Spratt reports personal fees from Boston Scientific, Bayer, Varian, Blue Earth, AstraZeneca, and Janssen. Stephanie Daignault-Newton reports belonging to a board for the American Urology Association. Bridget F. Koontz is a consultant for Rythera Therapeutics; reports research funding from Janssen Scientific Affairs, Merck Pharmaceuticals, and Blue Earth Diagnostics; receives royalties from Demos Publishing; is a symposium steering committee member for the American Society of Clinical Oncology; is a committee member for the American Association of Physicists in Medicine, the National Cancer Institute, and NRG; and is on advisory boards for Bayer, Blue Earth Diagnostics, and Myovant. L. Michael Glodé reports grants or contracts from the National Institutes of Health and the State of Colorado; consultancy for Janssen, Exelixis, Bayer, and Seattle Genetics; participation on boards for Janssen and Exelixis; multiple patents (none related to the topic of this article); committee membership for Movember; and stock or stock options in Aurora Oncology. John P. Mulhall is an Editor in Chief of the *Journal of Sexual Medicine*; advisor to Vault Health and reports stock or stock options in Vault Health, has received payment for expert testimony, and has received support for attending meetings and/or travel from Memorial Sloan Kettering. Laurel L. Northouse reports personal stock in Microsoft and Stryker and consulting fees for the Diadic Interventions for people with Advanced cancer and their Informal Caregivers study. Christian J. Nelson reports a grant from the National Institutes of Health (R01CA190636). Ronald C. Chen reports grants or contracts from the National Institutes of Health, THE Patient-Centered Outcomes Research Institute, and the Department of Defense and consulting fees from Myovant, AbbVie, Accuray, Blue Earth, and Astellas Pharma. Craig E. Pollack reports stock ownership in Gilead Pharmaceuticals and is working on a temporary assignment at the Department of Housing and Urban Development (HUD); this report does not represent the views of HUD. The other authors made no disclosures.

AUTHOR CONTRIBUTIONS

Daniela Wittmann: Conceptualization, methodology, analysis, writing, and editing. **Akanksha Mehta:** Conceptualization, methodology, analysis,

writing, and editing. **Sharon L. Bober:** Conceptualization, methodology, analysis, writing, and editing. **Ziwei Zhu:** Methodology, analysis, writing, and editing. **Stephanie Daignault-Newton:** Methodology, analysis, writing, and editing. **Rodney L. Dunn:** Conceptualization, methodology, analysis, writing, and editing. **Thomas M. Braun:** Methodology, analysis, and editing. **Caroline Carter:** Conceptualization, writing, and editing. **Ashley Duby:** Methodology, analysis, writing, and editing. **Laurel L. Northouse:** Conceptualization, writing, and editing. **Bridget F. Koontz:** Conceptualization, writing, and editing. **L. Michael Glodé:** Conceptualization, writing, and editing. **Jan Brandon:** Conceptualization and editing. **Rick Bangs:** Conceptualization and editing. **John McPhail:** Conceptualization and editing. **Susan McPhail:** Conceptualization and editing. **Lenore Arab:** Conceptualization, methodology, and editing. **Kellie Paich:** Conceptualization, writing, and editing. **Ted A. Skolarus:** Conceptualization, methodology, analysis, and editing. **Lawrence C. An:** Conceptualization, methodology, analysis, and editing. **Christian J. Nelson:** Conceptualization, methodology, analysis, and editing. **Christopher S. Saigal:** Conceptualization, analysis, writing, and editing. **Ronald C. Chen:** Conceptualization, analysis, writing, and editing. **John P. Mulhall:** Conceptualization, writing, and editing. **Sarah T. Hawley:** Methodology, analysis, writing, and editing. **Jason W. D. Hearn:** Conceptualization, analysis, writing, and editing. **Daniel E. Spratt:** Conceptualization, analysis, writing, and editing. **Craig E. Pollack:** Conceptualization, methodology, analysis, writing, and editing.

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