

# Sexual Rehabilitation After Localized Prostate Cancer

## Current Interventions and Future Directions

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**Abstract:** Many published articles have documented the impact of prostate-cancer treatment on sexual functioning in men treated for localized disease. Surprisingly, the literature on interventions to rehabilitate men's sexual functioning is much more limited. In this article, we review the sexual-rehabilitation interventions for prostate-cancer patients and identify a number of common themes across interventions. We also identify areas where further research is needed and propose a conceptual model based on psychologic and nursing theories and informed by the published research.

**Key Words:** prostate cancer, symptom management, psychosocial interventions, conceptual model

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Prostate cancer is the most common cancer among American men, with an estimated 186,320 new cases expected in 2008. It represents 25% of all new cancer diagnoses in men, has an incidence comparable with that of breast cancer in women, and continues to disproportionately affect minority men.<sup>1</sup> Patients with early localized prostate cancer have a number of treatment options, including surgical removal of the prostate, radiation therapy (external beam or implantation of radioactive “seeds”), hormonal therapy, cryoablation, or expectant monitoring (“active surveillance”).<sup>2,3</sup> However, most of these currently available treatments carry the risk of a number of treatment-related side-effects, including urinary incontinence, erectile dysfunction (ED), and others that vary, depending on the treatment received.<sup>4</sup> The issue of treatment-related side-effects is particularly important because the prognosis of men with prostate cancer, relative to other cancers, is good; and potential treatment-related symptoms can have important implications for health-related quality of life (HRQOL). Because early prostate cancer has a long natural history, men who develop treatment-related side-effects experience them for years.<sup>5</sup>

Beginning in 1995 with the publication of the University of California Los Angeles CLA Prostate Cancer Index by Litwin et al,<sup>4</sup> much has been learned about HRQOL in men treated for localized prostate cancer. Many articles have been published from large disease registries, such as the Cancer of the Prostate Strategic Urologic Research Endeavor study, a 13,000-man national study primarily drawn from community urology practices<sup>6</sup> and the Prostate Cancer Outcomes Study, a study that obtained follow-up HRQOL data from men who were part of the National Cancer Institute's Surveillance, Epidemiology, and End Results Program.<sup>6,7</sup> A large number of publications from smaller studies also have documented the changes in HRQOL experienced by men treated for localized prostate cancer.<sup>8–10</sup> Recent reviews have summarized the patterns in HRQOL over time.<sup>11,12</sup>

The recent Institute of Medicine (IOM) report, *From Cancer Patient to Survivor: Lost in Transition*,<sup>13</sup> highlights the growing number of persons now living far beyond treatment for their cancer, and the particular needs of cancer survivors for research and interventions that can improve symptom management and other aspects of quality of life. In particular, the IOM report recommends “intervention for consequences of cancer and its treatment, for example: medical problems such as lymphedema and sexual dysfunction; symptoms, including pain and fatigue; psychologic distress experienced by cancer survivors, and their caregivers.”<sup>13</sup> Among men with localized prostate cancer, the number of descriptive studies carried out has grown quite large and documents the ongoing burden of treatment-related symptoms; however, the literature contains relatively few intervention studies.<sup>14</sup>

Early general interventions for men with prostate cancer have included support-group programs,<sup>15</sup> diet and lifestyle interventions,<sup>16–18</sup> cognitive-behavioral stress-management programs,<sup>19</sup> psychoeducational groups,<sup>9</sup> nurse case management,<sup>20</sup> and uncertainty management.<sup>21</sup> In a study of the unmet information needs for men with prostate cancer, Boberg et al<sup>22</sup> found the greatest need for improvement in prostate-cancer education programs related to treatment-related symptoms and cancer recurrence. Among the published intervention studies, most have not provided specific information about managing treatment-related symptoms that are an important concern of men treated for localized disease and that address the IOM recommendations. The purpose of this article was to identify and briefly review published reports of sexual-rehabilitation and symptom-management interventions for men with localized prostate cancer, using PubMed and the recently published Cochrane reports on interventions for ED and sexual dysfunction after cancer treatment,<sup>23,24</sup> that sought to manage treatment-related side-effects or reduce the level of sexual-symptom distress or bother.

### GENERAL INTERVENTIONS THAT REPORTED SEXUAL REHABILITATION OUTCOMES

#### Uncertainty Management

One of the earliest interventions that included sexual rehabilitation after prostate cancer was conducted by Mishel et al<sup>21</sup> (Table

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1) at the University of North Carolina School of Nursing. The program was delivered by trained nurse educators over the phone and focused on psychologic outcomes, such as problem-solving, cognitive reframing, cancer knowledge, and patient-provider communications, and disease-specific outcomes that included symptom distress, number of symptoms, urinary and sexual functioning, and satisfaction with sexual functioning. Participants were assigned to 1

of 3 groups: intervention for prostate-cancer survivor alone, intervention for prostate-cancer survivor alone plus modified intervention for a family member, or a usual-care control condition. The intervention included both techniques to assess and reduce uncertainty about prostate cancer, and didactic information about various concerns, including symptom management. The intervention was offered in weekly telephone calls over 8 consecutive weeks. Most

**TABLE 1.** Psychosocial Interventions for Sexual Rehabilitation After Treatment for Localized Prostate Cancer

Author	Publication Year	Number of Participants	Randomized	Intervention Type	Partner Included	Outcomes	Results
Mishel et al <sup>21</sup>	2002	239	Yes	Psychoeducational telephone sessions with patient and designated person	Patient could designate person to be included in intervention (ie, partner, family member, etc)	SDS, SWOG QOL, nonstandard urinary function, and sexual function and satisfaction questions	Significant improvement in sexual satisfaction, trend toward interaction between sexual functioning and ethnicity
Lepore et al <sup>9</sup>	2003	250	Yes	6 educational sessions vs. 6 educational sessions plus discussion group	No	PCI, SF-36	Sexual bother reduced for men in the education-plus-discussion arm
Maliski et al <sup>26</sup>	2004	7 nurse case managers' notes on 30 patients	No	Case management	No	Not specified	Not specified
Weber et al <sup>27</sup>	2004	30	Yes	In-person peer support	No	PCI, GDS	Significantly less sexual bother in treatment group participants at follow-up
Canada et al <sup>30</sup>	2005	51 couples	Yes	4 sessions of psychoeducation for patient and partner	Some	IIEF, DAS, FSFI, PCI, SF-36, BSI	Significant improvements for treatment men in all IIEF domains and for treatment women in all FSFI domains
Giesler et al <sup>31</sup>	2005	99	Yes	Monthly sessions (2 in person, 4 by telephone) with patient and partner	Some	PC-QoL, DAS, CES-D, SF-36	Significant gains in sexual functioning and significant reductions in how much sexual dysfunction limited role activities at 7 and 12 mo post-treatment
Titta et al <sup>32</sup>	2006	57	Yes	Short-term psychodynamic therapy in person and on the phone	Yes	IIEF	Significant improvements in erectile functioning over time for both groups but men in the sexual counseling plus injection group reported significantly better erectile functioning at 18-mo follow-up
Molton et al <sup>33</sup>	2008	101	Yes	10-wk cognitive behavioral stress-management intervention	No	PCI	Men with greater interpersonal sensitivity reported greater increases in sexual functioning than men lower on this personality characteristic

BSI indicates Brief Symptom Index; CES-D, Center for Epidemiologic Studies—Depression; DAS, Dyadic Adjustment Scale; EDITS, Erectile Dysfunction Inventory of Treatment Satisfaction; FSFI, Female Sexual Function Inventory; GDS, Geriatric Depression Scale; IIEF, International Index of Erectile Function; PCI, University of California Los Angeles Prostate Cancer Index; PC-QoL, Prostate Cancer Quality of Life; SDS, Symptom Distress Scale; SF-36, MOS Short Form-36; SWOG QOL, Southwest Oncology Group Quality of Life Measure.

intervention effects were from baseline to 4 months. Men in the 2 uncertainty-management arms reported significantly better scores on the cognitive reframing and problem-solving scales at 4 months than men in the control arm, but this effect did not hold up at the 7-month assessment. As would be expected, given what is known in the prostate-cancer-symptom literature, men in all 3 groups reported fewer symptoms over time. A significant difference in urinary incontinence and satisfaction with sexual functioning was seen at 4 months between men in the 2 intervention groups combined versus control-group men. However, no significant differences between groups were found in cancer knowledge, patient-provider communication, or erectile functioning.<sup>21</sup>

This study included information about managing symptoms, such as sexual functioning. However, data were collected before the introduction of sildenafil and similar oral medications and focused on facilitating insertive sexual practices, mainly through the use of mechanical devices that helped participants develop erections. One reason participants who received the intervention did not show significant improvements in sexual functioning is that they also reported being troubled by the intrusiveness of the erectile aids. Another important lesson from the Mishel et al study is that symptom-management education may be more effective if it is available over an extended period (Mishel et al offered participants telephone sessions over 8 consecutive weeks). This is an important distinction as symptoms vary over time, based on the type of treatment selected.<sup>25</sup>

### Psychoeducational Groups

Another intervention that focused on disease-specific outcomes, and general HRQOL, randomized men to 1 of 3 groups: education, education plus discussion, or usual care.<sup>9</sup> Education sessions were offered over 6 weeks and consisted of 1-hour lectures on prostate-cancer biology, epidemiology, follow-up treatment, symptom management, and partner issues. Men also received printed materials summarizing the lectures. Men in the education plus discussion group received an additional 45-minute discussion group after each lecture, facilitated by a male clinical psychologist. The study focused on general and disease-specific HRQOL, prostate-cancer knowledge, an index of positive health behaviors mentioned in the lectures, and a standard measure of depression. The education plus discussion intervention was generally more effective than the control condition. Men in the education conditions reported significantly better outcomes for prostate-cancer knowledge, physical functioning, positive health behaviors, and sexual bother. No significant differences were found in sexual or urinary functioning. There was a differential effect by educational level, with less educated men benefiting more from the intervention.<sup>9</sup>

### Nurse Case-Manager Intervention

Maliski et al<sup>26</sup> provided an intervention for low-income men with prostate cancer, using a nurse case-manager format. They based their intervention on Self-Efficacy Theory, with the primary goal of empowering patients by increasing self-efficacy. Unlike other studies reviewed in this article, the 7 nurse case managers were not providing patients with a standard intervention. As a first step toward developing a standardized intervention, Maliski et al used retrospective record review to examine characteristics of intervention strategies used by nurse case managers. The interventions employed by the nurse case managers included assessment of patient needs and the best strategy to meet those needs, facilitation of successful self-action by patients, advocacy for patients' needs and concerns, coordination between care providers, teaching new knowledge and skills (including sexual rehabilitation), emotional support, collaborative problem-solving, and tracking patients. Although this is an important and promising approach to describe intervention

strategies currently in use, it would be difficult to replicate the intervention with other patients until it has been better specified.

### Dyadic Support

Another nurse-led intervention study focused on the impact of dyadic support for men who had not attended a prostate-cancer support group.<sup>27</sup> This study is particularly important because many men are unwilling or unable to seek support for psychosocial or physical concerns from a support group.<sup>28,29</sup> Men who provided support to study participants were prostate-cancer survivors who had attended prostate-cancer support groups and were experienced in giving and receiving support about prostate-cancer concerns. The primary purpose of the intervention was to provide social support and lessen depression related to prostate-cancer treatment and side-effects. Results showed improvements in depression at 4 weeks for treatment-group subjects and significantly better self-efficacy at 8 weeks for treatment-group men, who also reported significantly less sexual bother and a trend toward better sexual functioning at 8 weeks than men in the control group.

## INTERVENTIONS THAT SPECIFICALLY TARGET SEXUAL REHABILITATION

### Psychoeducational Intervention for Men and Their Partners

Canada et al<sup>30</sup> developed a 4-session psychoeducational intervention for men treated for localized prostate cancer with surgery or radiation and their partners. Each session included both didactic information about sexual side-effects, and behavioral homework and skill-building exercises to improve couple communication and increase sexual stimulation. Men were randomized to attend either with their partner or alone. Partners in the patient-only condition still completed homework. Results were not affected by the partner's attendance. Men completing the intervention experienced significant reductions in male overall distress and male global sexual function, and their female partners increased global sexual function at 3 months. Over time, these improvements lessened. Men who completed the intervention reported increasing use of ED treatments over time.

### Nurse-Led Computerized/Telephone Intervention

Another patient-education program led by nurses used a computerized questionnaire to determine which symptoms required intervention.<sup>31</sup> Men and their partners were randomized to receive the intervention or standard care. Intervention sessions were scheduled monthly. The first 2 sessions were completed in person, and the 4 remaining sessions were completed by telephone. Sessions included both the patient and his partner. Sexual symptoms and side-effects were the most commonly reported concern among men in the study. Men in the treatment group were offered a videotape that offered models of how to discuss sexual problems with a partner. The nurse interventionist offered further information about communication skills and ED treatments. Treatment-group participants reported significant improvements in sexual functioning and bother at 4, 7, and 12 months postbaseline compared with control-group men.

### Sexual Counseling for Erectile Rehabilitation

A unique study by Titta et al<sup>32</sup> focused specifically on facilitating intracavernous injection therapy for ED in men treated for localized prostate cancer or muscle-invasive bladder cancer. Participants in this intervention were offered didactic information about how to use injections and randomized to receive either didactic information alone or didactic information plus telephone-based, short-term psychodynamic sexual counseling. Over time,

men in the sexual-counseling group were significantly less likely to stop using injection therapy, even though rates of side-effects (eg, pain or bruising) were similar in the 2 groups. Both groups had good response to injections and significantly improved erectile functioning scores over the 18-month follow-up period.

### Group-Based Stress Management

On the basis of their work with patients living with other chronic illnesses, Molton et al<sup>33</sup> adapted their cognitive behavioral stress-management program to assist men treated for localized prostate cancer to improve their sexual functioning, whereas also improving psychosocial outcomes. The intervention included 10 group sessions encompassing both information about the restoration of sexual functioning, and relaxation exercises, and cognitive, behavioral, and interpersonal skills necessary to cope with life stressors. Sexual functioning was measured at baseline and postintervention. Men receiving the intervention reported significantly better sexual functioning than men in the control condition, who completed a 4-hour workshop that taught the same stress-management skills as the longer intervention. Interpersonal sensitivity, described by Molton et al as “a problematic interpersonal style characterized by being “too sensitive” to others, a tendency to perceive and elicit criticism, and a chronic perception of rejection and abandonment,” moderated the intervention effects. Post hoc analysis showed that men with greater interpersonal sensitivity showed greater pre-postimprovement in sexual functioning after completing the 10-week intervention, compared with men in the intervention group with lower interpersonal sensitivity.

## COMMON THEMES

### Global Versus Specific Goals

A number of common themes emerged from the studies reviewed here. First, most interventions have focused primarily on psychosocial outcomes. For example, Mishel et al based their intervention on Uncertainty in Illness Theory and emphasized the reduction of uncertainty in patients and their partner or other designated person. Such programs have had mixed effects on sexual outcomes. Mishel et al<sup>21</sup> reported that their intervention reduced sexual bother and improved urinary functioning, but they did not find significant differences in sexual functioning. Lepore et al<sup>9</sup> also reported significant decreases in sexual bother but no effect of their intervention on urinary or sexual functioning.

Interventions involving sexual rehabilitation as the primary goal have had better results than interventions focusing on more general goals. Short-term changes in sexual functioning were reported by Canada et al<sup>30</sup> and Molton et al.<sup>33</sup> In the intervention by Canada et al, improvements in sexual functioning faded over time. Molton et al did not report long-term results. Both Titta et al<sup>32</sup> and Giesler et al<sup>31</sup> reported continued improvements in sexual functioning at 12 months or longer after baseline. Giesler et al offered their intervention over a 6-month period. It may be that offering patient education over an extended period increases the efficacy of the intervention.

### Treatment Implementation Characteristics (Intensity, Frequency, and Duration)

Adherence to ED treatment recommendations can be problematic. Many studies have reported the necessity of trying successive treatments to achieve better sexual functioning and rates of ED treatment use as time since prostate-cancer treatment increases.<sup>34,35</sup> Thus, it was particularly gratifying that Canada et al reported higher rates of ED treatment use 6 months after enrollment in men who completed their intervention.<sup>30</sup> In the case of the study by Titta et al,<sup>32</sup> the investigators focused on intracavernous injection. Most

studies and general practice in ED clinics start with less invasive treatments (ie, oral medications) and progress to more invasive treatments when patients fail oral medications. However, such an approach offers men the negative experiences of either obtaining no response to ED treatment or having a positive response that then diminishes over time. Such experiences could be problematic from the perspective of Self-Efficacy Theory because they may reduce a man's confidence that ED treatment can be successful, Bandura's concept of outcome efficacy.<sup>36</sup> The intervention reported by Titta et al bypassed treatment approaches that may or may not be effective for men treated for localized prostate cancer, bypassing the possible negative consequences of ED-treatment failure.

Interventions varied in length, from 4 to 10 sessions spread over a month to 6 months. Although the length of the intervention was the same for all participants, Giesler et al described a program that was adaptive in that it focused on the symptoms most problematic for each participant. The particulars are unclear; however, the intervention described by Maliski et al was also tailored to each participant's concerns. Other studies offered the same interventions to each participant. In times when resources are hard to find, longer interventions that address multiple symptoms (eg, Molton et al) might be difficult to sustain. In other conditions, a stepped-care approach, motivated in part by cost considerations, has been shown to work.<sup>37-39</sup> The approach by Giesler et al could be further adapted to adapt not just intervention content but also amount of intervention received to a patient's needs for sexual rehabilitation.

### Moderators of Treatment

A participant's response to an intervention is based not only on clinical characteristics such as whether he had a nerve-sparing prostatectomy or not, but also on sociodemographic and psychologic characteristics. Lepore et al found men with little education benefited more from the psychosocial intervention than men with more education. In particular, less-educated men showed significantly greater improvements in physical functioning, positive health behaviors, and sexual bother. Similarly, a study using Cancer of the Prostate Strategic Urologic Research Endeavor data from 3 Veterans Affairs medical centers showed that men with limited formal education had poorer HRQOL over a 2-year period after prostate-cancer treatment, after controlling for other sociodemographic and clinical variables, than men with a high level of education.<sup>40</sup> Thus, men with limited education may be in greater need of sexual-rehabilitation interventions than men with a high level of education, but it is important to ensure that patient-education materials are targeted to the appropriate reading level. Readability of materials and health literacy of the target audience are particularly a concern with men treated for prostate cancer. African American men, a group with a significantly high prevalence of prostate cancer, are over-represented among lower-health-literacy men with prostate cancer.<sup>41,42</sup>

Low sexual desire may result from some prostate cancer treatments. The level of desire in men treated with surgery generally remains unchanged but is typically lower for men on androgen deprivation therapy.<sup>10,43</sup> Some studies also have reported reductions in level of desire for men treated with radiation.<sup>44</sup> Low desire is difficult to treat, particularly for prostate cancer survivors because pharmacologic treatment usually involves testosterone, which is controversial because of the possibility of cancer recurrence, and because low desire is sometimes mistaken for ED.<sup>45-47</sup>

Other personal characteristics also may be important predictors of response to sexual-rehabilitation programs or predictive of the need for intervention. Molton et al showed that men with high levels of interpersonal sensitivity reported greater gains in sexual functioning than men with low levels. Dahn et al reported significantly poorer HRQOL among men treated for prostate cancer who had high sexual desire and low erectile functioning than among men

with low desire and low erectile functioning.<sup>8</sup> Thus, another feasibility consideration may be targeting sexual-rehabilitation efforts to men who are the most likely to benefit from such interventions (men with high interpersonal sensitivity) or men who may be most likely to report poor general HRQOL—those who have a substantial mismatch between level of desire and erectile ability. Though other areas of disease management have benefited from research trying to understand how to match patients to the optimal treatment, little has been done in cancer survivorship. The work by Molton et al and Dahn et al provides an excellent start in understanding who might benefit most from sexual-rehabilitation efforts.

### Missing Voices

Another area of sexual rehabilitation in need of further research and clinical efforts is in helping gay men reestablish their sexual lives after cancer.<sup>48</sup> No published data suggest that gay men are diagnosed with prostate cancer at any different rate than their heterosexual counterparts. Estimates suggest that approximately 5000 gay men may be diagnosed with prostate cancer in a year and that 50,000 or more gay men are living with prostate cancer and its treatment-related side-effects.<sup>48</sup> Prostate cancer affects gay men in many of the same ways as heterosexual men, but some of their concerns may differ. For example, the average age of men diagnosed with prostate cancer is 70 years old.<sup>49</sup> Thus, gay men with prostate cancer are typically older and may have more concerns about disclosing their sexuality to healthcare providers than younger gay men who may feel more comfortable being open about their sexuality.<sup>50</sup> Such reluctance may also preclude gay men diagnosed with prostate cancer from involving their partners in healthcare decisions and treatment planning, in contrast with their heterosexual counterparts. Many gay men report that healthcare providers fail to ask about sexual orientation during initial consultations and assume they are heterosexual.<sup>50</sup> Older gay men might be less likely than younger gay men to insist on including partners in the face of opposition or even lack of support for inclusion by healthcare providers.<sup>51</sup> Gay men who are not partnered may lack not only a supportive partner but also other family-support systems enjoyed by heterosexual men. Such men also have the same challenges that single heterosexual men face when seeking sexual rehabilitation of not having a primary partner with whom they have long-established trust and affection.<sup>52</sup> Support from peers also may be difficult to obtain. The number of support groups specifically for gay men with prostate cancer is limited to half a dozen in large cities. Gay men in other areas are forced to find a support group open to having gay men participate,

remain closeted, rely on internet-based support groups, or be socially isolated.<sup>51</sup> After treatment, some sexual functioning and dysfunction may be similar for gay and straight men; but gay men have some particular concerns. For example, sexual rehabilitation may be focused on creating erections rigid enough for vaginal penetration. However, anal penetration requires a greater degree of rigidity than vaginal intercourse.<sup>51,53</sup> Moreover, research on communication between gay men with prostate cancer and their partners is lacking to inform whether or not, and if so how, sexual risk taking for HIV infection changes with cancer treatment-related sexual dysfunction.

### A BIOPSYCHOSOCIAL MODEL OF CANCER-SYMP TOM MANAGEMENT

Keeping in mind the reports of sexual-rehabilitation interventions already in the literature, we now shift our focus to proposing a biopsychosocial model of prostate-cancer symptom management. It is based on 2 theoretical and conceptual frameworks, the University of California San Francisco Symptom Management Model (SMM) and Self-Efficacy Theory and informed by results from the studies reviewed above.<sup>36,54</sup> The original SMM was published in 1994 and revised in 2001.<sup>55,56</sup> The symptom experience includes an individual's perception of a symptom, evaluation of the meaning of the symptom, and response to a symptom. The symptom-management-strategies dimension includes the specifics of the intervention (ie, what, when, why, where, how much, and to whom). The outcomes dimension specifies that outcomes emerge from the symptom-management strategies, and from the symptom experience. The outcome dimension focuses on 8 factors (ie, functional status, emotional status, self-care, costs, HRQOL, morbidity and comorbidity, and mortality).

Self-Efficacy Theory has been used in numerous psychosocial interventions for patients with chronic diseases<sup>57-59</sup> and is highly compatible with the SMM. It holds that 2 important determinants of behavior are outcome efficacy (confidence that an outcome can be affected) and self-efficacy (confidence that one can personally accomplish an outcome).<sup>36</sup> In the SMM, self-efficacy would be considered part of the symptom experience; for example, men who repeatedly fail to have an erection sufficient for intercourse are likely to have low confidence in their ability to have an erection the next time they want to have sex. This experience of ED erodes their confidence and makes it less likely that they will attempt sex in the future. For some men, their ED limits showing affection to their

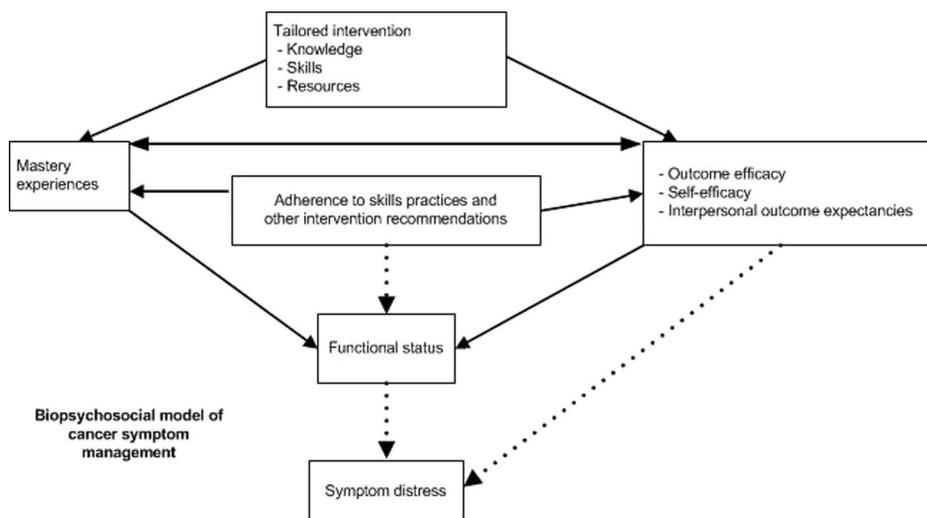


FIGURE 1. A biopsychosocial model of prostate cancer symptom management.

partner for fear their partner will want intercourse, which the man cannot provide.<sup>34</sup>

Figure 1 shows our adaptation of the SMM and Self-Efficacy Theory to the specific case of prostate-cancer symptom management, including sexual rehabilitation. Interventions derived from this model should provide participants with the knowledge, skills, and resources that will lead to a set of mastery experiences as participants begin to manage their symptoms effectively, leading to stronger beliefs that prostate-cancer symptoms can be managed (Bandura's concept of outcome efficacy) and that they are capable of managing their symptoms (self-efficacy). Staff providing rehabilitation interventions can help patients increase their sense of a supportive environment by assisting them with their symptom management work (interpersonal outcome expectancies). Like the interventions published by Maliski et al,<sup>26</sup> Weber et al,<sup>27</sup> and Lepore et al,<sup>9</sup> our model views increasing self efficacy as an integral part of symptom management.

As participants master symptom-management tasks, they improve their functional status. We hypothesize that men who improve their functional status will have reduced symptom distress and that men who are adherent with interventions are more likely to reduce their symptom distress than men who are not adherent with the intervention. Adherence also is likely to increase the number of mastery experiences that a participant has and his sense of outcome and personal efficacy. Previous work in men with advanced cancer suggests that men with a large number of symptoms report more distress than men with fewer symptoms.<sup>60</sup> Our model is based on the premise that this relationship between functional status and symptom distress exists and that providing rehabilitation for treatment-related side-effects and other symptoms will reduce both symptom distress and general levels of distress. Similar to the approaches by Mishel et al and Giesler et al, our model is focused on reducing symptom distress.

## CONCLUSIONS

Many studies have described the substantial impact of prostate-cancer treatment on sexual functioning. In this article, we have summarized the limited number of intervention studies developed for sexual rehabilitation of prostate-cancer survivors. A number of common themes emerged. Several interventions have focused primarily on psychosocial symptoms, with sexual rehabilitation as a secondary goal. Interventions that focused on sexual rehabilitation as a primary goal had better results. One intervention was tailored to address the symptoms of greatest concern to the participants. Developing such tailored interventions may be a way to increase "face validity" of the intervention with participants by closely linking the intervention to what they report as their primary concerns and could be linked with a stepped-care approach to increase the likelihood of developing cost-effective interventions that can be sustained past the end of a funded study.

Although clinical characteristics are important, others such as personality traits, literacy level, or the lack of congruence between sexual desire and functioning, may be important determinants of who needs rehabilitation efforts the most and who is most likely to benefit from them. Research is needed to understand how gay men are affected by prostate cancer and its treatment, and how sexual-rehabilitation efforts could be tailored to their particular needs. Finally, we have proposed a conceptual model for prostate-cancer-symptom research informed by psychologic and nursing theories and the published research on sexual rehabilitation in prostate-cancer survivors.

Further work is needed to build on the published work reviewed here to encourage sexual-rehabilitation efforts to focus on populations with greatest need because of psychologic makeup, low

health literacy, or other characteristics that may put a prostate-cancer survivor at risk for low HRQOL. Physicians should recognize the importance of sexual rehabilitation programs and actively refer their patients to such programs. Mental health providers and nurses should provide sexual rehabilitation interventions to patients and work with their physician colleagues to provide effective medical interventions supported by patient education materials at the appropriate reading level. Such efforts will address concerns raised in the IOM report by helping men move smoothly from being a patient to a survivor, armed with the necessary tools and support needed to live well after cancer.

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