Factors underlying treatment decision-making for localized prostate cancer in the U.S. and Canada: A scoping review using principal component analysis

Mustafa Andkhoie, MPH; Desneige Meyer, MPH; Michael Szafron, PhD

School of Public Health, University of Saskatchewan, Saskatoon, SK, Canada

Cite as: *Can Urol Assoc J* 2019;13(7):E220-5. http://dx.doi.org/10.5489/cuaj.5538

Published online November 20, 2018

Abstract

Introduction: The purpose of this research is to gather, collate, and identify key factors commonly studied in localized prostate cancer (LPC) treatment decision-making in Canada and the U.S.

Methods: This scoping review uses five databases (Medline, EMBASE, CINAHL, AMED, and PsycInfo) to identify relevant articles using a list of inclusion and exclusion criteria applied by two reviewers. A list of topics describing the themes of the articles was extracted and key factors were identified using principal component analysis (PCA). A word cloud of titles and abstracts of the relevant articles was created to identify complementary results to the PCA.

Results: This review identified 77 relevant articles describing 32 topics related to LPC treatment decision-making. The PCA grouped these 32 topics into five key factors commonly studied in LPC treatment decision-making: 1) treatment type; 2) socioeconomic/demographic characteristics; 3) personal reasons for treatment choice; 4) psychology of treatment decision experience; and 5) level of involvement in the decision-making process. The word cloud identified common phrases that were complementary to the factors identified through the PCA.

Conclusions: This research identifies several possible factors impacting LPC treatment decision-making. Further research needs to be completed to determine the impact that these factors have in the LPC treatment decision-making experience.

Introduction

Prostate cancer is one of the most commonly diagnosed invasive cancers in Canada and the U.S.[1-4] Localized prostate cancer (LPC), i.e., cancer contained within the prostate gland, accounts for about 79% of all prostate cancers diagnosed in North America.[1] The progression of LPC to the metastatic stage has a substantial negative impact on the relative survival of the patients (the five-year relative survival decreases from 100% to 30%).[1] Therefore, monitoring of the disease and undergoing necessary treatment(s) are important to prevent metastasis.

The most common treatment types for LPC are active surveillance or watchful waiting (AS/WW), radiation therapy, surgery (prostatectomy), and hormonal therapy.[5] Each treatment has different side effects (including incontinence and erectile dysfunction), impacting the quality of life for patients and their families.[6-8] Therefore, it is necessary for physicians to make sure treatment choices align with patient needs and preferences. Studies on treatment decision-making focus on specific patient profiles, for example, ethnic and racial minorities, different age groups, and specific treatment types.[9-16] While there is research describing treatment decision-making for varying LPC patient profiles, there is no literature comprehensively identifying common factors underlying treatment decision-making.

The purpose of this research is to gather, collate, and identify key factors commonly studied in LPC treatment decision-making in Canada and the U.S.

Methods

Following the scoping review process of Arksey and O'Malley, we reviewed the literature to identify key factors for LPC treatment decision-making in Canada and the U.S.[17] The following steps were taken to compile the list of relevant articles:

1. One of the reviewers compiled the list of references from five databases (Medline, EMBASE, CINAHL, AMED and PsycInfo) using the search terms listed in Table 1.
2. The same reviewer from Step 1 removed the duplicates in the list of references.
3. The same reviewer from Step 1 removed references outside the inclusion countries/timeframes and references that were not full-text, peer-reviewed articles, and compiled a list of peer-reviewed articles.
4. Two reviewers independently applied the inclusion/exclusion criteria listed in Table 2 to the titles and

Table 1. Search terms used in the databases

Terms describing prostate cancer	Terms describing treatment decision-making
Prostatic neoplasms	Decision-making
Prostate cancer	Patient preference
Prostatic AND neoplasms	Patient participation
(prostat* adj6 (cancer* or carcinom* or tumor* or tumour* or neoplasm* or adenocarcinom* or intraepithelial))	Decision support techniques
	Preferences
	Client participation
	Decision support systems
	Consumer participation
	Decision-making support
	Choice behavior

Table 2. Inclusion/exclusion criteria

Inclusion criteria	Exclusion criteria
Peer-reviewed articles	Commentaries, news, abstracts
English language	Editorials, case studies, reviews
Specific to LPC	Duplicate articles
Exclusively regarding LPC	
Specific to treatment decision-making	
Timeframe: September 1997 to August 2016	
Country of the corresponding author: the U.S. or Canada[66]	

LPC: localized prostate cancer.

abstracts of the peer-reviewed articles and compiled a list of full-text review articles.

5. Both reviewers independently conducted a full-text article review and applied the inclusion/exclusion criteria to the list compiled in Step 4, and compiled a list of relevant articles.

The two reviewers discussed and resolved any disagreements to include/exclude articles in the fourth and fifth steps. The levels of agreement between the two reviewers in the fourth and fifth steps were assessed using the Cohen Kappa statistic.

Two methodologies were then used to identify the key factors commonly studied in LPC treatment decision-making:

1. Principal component analysis (PCA): Both reviewers discussed and agreed upon the general topics identified within the relevant articles from Step 5. A PCA with Promax oblique rotation (loadings greater than 0.275 and less than -0.275 were grouped together) and a parallel analysis (with 1000 Monte Carlo simulation repetitions) were used to identify the underlying LPC treatment decision-making factors from these general topics.[18-20]
2. Word cloud: A word cloud was created as a qualitative approach to identify complementary results to the PCA (first method) using word frequencies in the titles and abstracts of the relevant articles.

All authors discussed and agreed upon the interpretations of the key factors identified. The Cohen Kappa statistic was calculated using IBM SPSS Statistics 22.0. PCA was conducted in Stata IC 12.1. Word Cloud was created in NVivo for Mac 11.4.1.

Results

In Step 1, the list of references from the five databases contained 1861 items. Next, after duplicates were removed, 1200 articles remained. In Step 3, 559 articles were excluded (details in Fig. 1) and a list of 641 peer-reviewed articles remained. In Step 4, out of the remaining 641 articles, both reviewers agreed 89 articles needed full-text article review (Cohen Kappa statistic 0.789; $p<0.001$). Upon full-text review of these articles, 77 articles were retained (Cohen Kappa statistic 0.689; $p<0.001$). Among the retained articles, 55 (71%) were from the U.S. and 22 (29%) from Canada. After the review, 32 general topics studied regarding LPC treatment decision-making were identified and are listed in Table 3.

Applying PCA to the 32 identified topics resulted in five overarching factors (Table 3) — treatment type, socioeconomic/demographic characteristics, personal reasons for treatment choice, psychology of treatment decision experience, and level of involvement in the decision-making process — based on the five highest eigenvalues that were generated from the PCA.

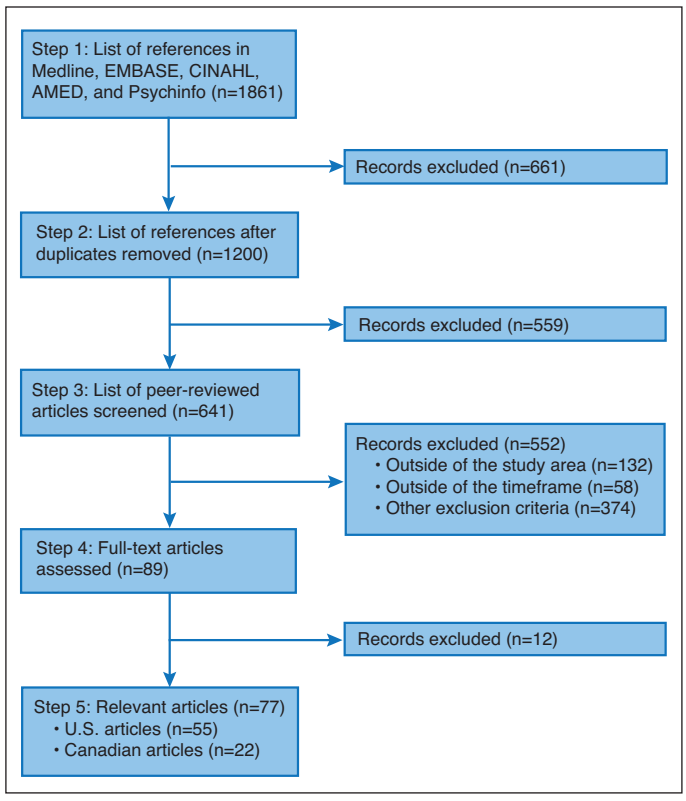

Fig. 1. Methodology of identifying relevant studies for the scoping review and the results at each step.

Table 3. Key factors and their associated general topics extracted from the reviewed relevant articles

Key factors (eigenvalue)	General topics	Loadings
Treatment types (4.36)[9-16,21-23,26-28,30-35,40,42,46,48-51,54,57,58,60,65,67-86]	Surgery (prostatectomy)	0.4643
	Radiation therapy	0.4093
	Active surveillance/watchful waiting	0.3717
	Brachytherapy	0.3636
	Hormonal therapy	0.2812
Socioeconomic/demographic factors (3.15)[10,12,14,15,21,30-35,40, 47,49-53,58,68-71,73,75,76,79,82,84-88]	Sociodemographic factors	0.4482
	Monetary influences - cost, insurance	0.3944
	Race	0.3688
	Epidemiological studies on decision-making	0.3436
	Age	0.2766
Personal reasons for treatment choice (2.51)[9-16,21-24,27-30,32,33,38-45,47-51,55,59,60,62,67-73,75-78,80,82-91]	Personal decision-making factors	0.4479
	Inconvenience and timing	0.3665
	Utilities and side effects	0.3267
	Fear of death/need for cure	0.3227
	Patient use of decision aids	-0.2893
	Actual or perceived health state/risk	0.2852
Psychology of treatment decision experience (2.34)[9,12,13,15,16,23,27,29, 30,33,34,39-44,46-55,57,58,60,62,65, 67,73,75,76,80-82,84,85,88,89,92]	Confidence, regret and satisfaction	0.4664
	Stress/difficulty in decision-making	0.4338
	Psychology and coping factors	0.3488
	Marital status	0.3344
	Post-treatment quality of life	0.3203
Levels of involvement in decision-making (2.04)[11-13,15,16,21-30,33,35,38-41,43-49,51,52,54,55,57-65,67-77,79-93]	Physician role and influence	0.4894
	Shared/informed decision-making: active/passive	0.3808
	Behavior models using economic theories	-0.3649
	Information and knowledge	0.3438
	Partner/family/friend participation and views	0.3038

Note: Principal component analysis accounted for six other topics ("spirituality," "multidisciplinary practice," "consulting multiple providers," "discordant decisions," "complementary and alternative medicine," and "health literacy") partially within all five key factors.

Associated with the highest eigenvalue (see Table 3 for values), the PCA grouped the LPC treatment type (including surgery and radiation therapy) as an overarching factor. Interestingly, LPC treatment type also emerged as the most frequently mentioned topic in the word cloud. Therefore, both methodologies complement each other and show "treatment type" as a frequently studied LPC treatment decision-making factor in the literature.

Associated with the second highest eigenvalue, the PCA grouped age, income, race, insurance coverage, and location where patients live as another overarching factor. These socioeconomic/demographic characteristics pertain to patient-level information. From the word cloud (Fig. 2), topics including "age," "African-American," "Caucasian," "education," and "demographic" emerged, which are complimentary to the identified socioeconomic/demographic characteristics.

Similarly, regarding the third highest eigenvalue, the PCA grouped six different reasons for treatment choice as a third overarching factor (see Table 3 for the list of topics under this factor). These reasons pertain to patient-level reasons for choosing or avoiding a treatment option. Based on the word cloud (Fig. 2), topics including "side effects," "time," "aid," "months," and "personal" emerged, which are complimentary to this identified key factor.

With respect to the fourth highest eigenvalue, the PCA grouped factors pertaining to patients' psychological experiences during the LPC treatment decision-making process (before and after the decision) as a fourth overarching factor. The topics within this factor include uncertainty faced by patients before the treatment or regret/satisfaction of the decision after the treatment (see Table 3 for other topics within this factor). The list of words, including "regret," "satisfaction," "conflict," "quality of life," "uncertainty," "determined," and "impact," in the word cloud (Fig. 2) are related to the psychology of treatment decision experience.

Lastly, the PCA grouped the topics associated with the level of involvement for patients, their families, friends, and the healthcare providers as a fifth overarching factor. There were several topics within the word cloud (Fig. 2) strongly suggestive of the topics associated with the roles in LPC treatment decision-making process, including "influence," "physician," "urologist," "partners," "considered," "consultation," "role," "knowledge," "control," "support," and "involvement."

Discussion

The PCA computed eigenvalues for each factor. These eigenvalues are a measure of the amount of variation in the information collected from the relevant articles regarding decision-making themes: the higher the eigenvalue, the more frequently articles expressed topics associated with the factor. The eigenvalues do not provide information on the level of importance of the factors. For example, the factor "treatment type" (as discussed later) had the highest eigenvalue in the PCA, which does not imply it is the most important LPC treatment decision-making factor. In general, a factor having a higher eigenvalue does not imply it is more important than factors with lower eigenvalues.

Based on these eigenvalues, our analysis identified five factors commonly studied regarding LPC treatment decision-making, including treatment type, patient socioeconomic/demographic characteristics, personal reasons of patients, psychological factors, and involvement level with the decision-making process. While the scoping review results cannot be used to determine the importance of each of these factors, we hypothesize that they influence LPC treatment decision-making.

Fig. 2. Word cloud showing the most frequent words appearing in the titles and abstracts of the articles.

Regarding how treatment type may be involved in LPC treatment decision-making, some research suggest patients prefer surgery or radiation therapy due to the perception level regarding side effects and perceived treatment invasiveness.[12,14-16,21-23] Patients tend to prefer information on side effects or survival, which are different for each treatment type.[24-26] Other work suggests patients might avoid invasive treatments or choose complementary alternative medicine (CAM) or AS/WW because: 1) they prefer to avoid the side effects of curative treatments; 2) they are waiting for improvements in curative treatment options; and 3) they perceive curative treatments to be inconvenient or a burden.[9,11,13,27-29]

In terms of socioeconomic/demographic characteristics, some research studied the roles that age, race, income, education, type of insurance coverage, and where one lives might have in LPC treatment decision-making.[10,14,30-35] For example, African-Americans with high-risk LPC in the U.S. are less likely to receive treatment than Caucasians.[36,37] Other research suggests the availability of insurance can reduce these racial disparities.[36,37] Some patients not undergoing any treatment within six months of diagnosis were more likely to be older age (over 75), non-Caucasians and living in areas with fewer urologists.[31]

Personal reasons for a LPC treatment decision include survival probability, urinary function, rectal function, and ability to work.[24-26] Some of the articles in this review contained decision aid tools available for educating patients about these personal reasons and assisting patients in making informed decisions.[38-45]

Psychological experiences are a fourth factor that the PCA identified. These experiences include such things as feelings of stress, regret, uncertainty, and questions regarding quality of life.[33,46-49] There were reports of decisional regret among men with treatment side effects, such as sexual, bowel, or urinary dysfunction.[33,46-49] Patients who felt they were poorly informed or were not prepared enough regarding their treatments reported to have increased risk of regrets and psychological distress.[13,33,39,40,46,47,49-56] Men who were more actively involved in the decision-making and had greater knowledge of LPC were less likely to report decisional stress and had higher satisfaction.[57]

The last factor identified by the PCA was level of patient involvement. Some LPC patients prefer an active or collaborative role with their physician in their treatment decision-making.[13,15,30,38,58-63] When healthcare providers included patients in the treatment decision-making process, patients reported higher levels of satisfaction.[64] Further, when patients discussed their treatment with physicians, families, and friends, they reported an improved state of mind and ability to cope with their cancer diagnosis.[65]

Assessing the importance of each of the factors is needed because of their implications for improving patient decision-making experience and healthcare provider knowledge. Further studies are needed to identify the role, if any, that each of these factors has in LPC treatment decision-making. Further studies are also needed to see how the five factors interact with each other in shaping the LPC decision-making experience for patients. For those factors found to influence LPC treatment decision-making, interventions and policies could be developed to improve the decision-making experience for patients.

Conclusions

Our review identifies that there are five factors common to the LPC treatment decision-making literature: treatment type, socioeconomic/demographic characteristics of the patients, personal reasons of patients, psychological factors, and level of involvement in the decision-making process. Our study provides a basis for future research identifying the importance of each factor and how they interact with each other in shaping the LPC treatment decision-making experience for patients. This future research has the potential to inform interventions and improve the LPC treatment decision-making experience for patient care.

Competing interests: The authors report no competing personal or financial interests related to this work.

Acknowledgement: The authors would like to thank Saskatoon TELUS Motorcycle For Dad for providing the funding to support this research.

This paper has been peer-reviewed.

References

1. SEER.Cancer.gov. Bethesda, MD: National Cancer Institute [cited 2018 Apr 5]. Available at: https://seer.cancer.gov/statfacts/html/prost.html. Accessed July 4, 2018.
2. ProstateCancer.ca. Toronto, ON: Prostate Cancer Canada, Inc.; 2018 [cited 2018 Apr 5]. Available at: http://www.prostatecancer.ca/Prostate-Cancer/About-Prostate-Cancer/Statistics. Accessed July 4, 2018.
3. Cancer.org. Atlanta, GA: American Cancer Society, Inc.; 2018 [updated 2018 Jan 4; cited 2018 Apr 5]. Available at: https://www.cancer.org/content/cancer/en/cancer/prostate-cancer/about/key-statistics/. Accessed July 4, 2018.
4. Cancer.ca. Toronto, ON: Canadian Cancer Society, Inc.; 2018 [cited 2018 Apr 5]. Available at: http://www.cancer.ca/en/cancer-information/cancer-type/prostate/statistics/?region=sk. Accessed July 4, 2018.
5. Cancer.gov. Bethesda, MD: National Cancer Institute [cited 2018 Apr 5]. Available at: https://www.cancer.gov/types/prostate/patient/prostate-treatment-pdq. Accessed July 4, 2018.
6. Fridriksson JO, Folkvaljon Y, Nilsson P, et al. Long-term adverse effects after curative radiotherapy and radical prostatectomy: Population-based nationwide register study. *Scand J Urol* 2016;50:338-45. https://doi.org/10.1080/21681805.2016.1194460
7. Cancer.ca. Toronto, ON: Canadian Cancer Society, Inc.; 2018 [cited 2018 Apr 5]. Available at: http://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/chemotherapy-and-other-drug-therapies/hormonal-therapy/side-effects-of-hormonal-therapy/?region=bc. Accessed July 4, 2018.
8. Roth AJ, Weinberger MI, Nelson CJ. Prostate cancer: Quality of life, psychosocial implications, and treatment choices. *Future Oncol* 2008;4:561-8. https://doi.org/10.2217/14796694.4.4.561
9. Volk RJ, McFall SL, Cantor SB, et al. "It's not like you just had a heart attack": Decision-making about active surveillance by men with localized prostate cancer. *Psychooncology* 2014;23:467-72. https://doi.org/10.1002/pon.3444
10. Kim F, Werahera P, Sehrt D, et al. Ethnic minorities (African American and Hispanic) males prefer prostate cryoablation as aggressive treatment of localized prostate cancer. *Can J Urol* 2014;21:7305-11.
11. Gorin MA, Soloway CT, Eldefrawy A, et al. Factors that influence patient enrollment in active surveillance for low-risk prostate cancer. *Urology* 2011;77:588-91. https://doi.org/10.1016/j.urology.2010.10.039
12. Xu J, Dailey R, Eggly S, et al. Men's perspectives on selecting their prostate cancer treatment. *J Natl Med Assoc* 2011;103:468-78. https://doi.org/10.1016/S0027-9684(15)30359-X
13. Davison BJ, Goldenberg SL. Patient acceptance of active surveillance as a treatment option for low-risk prostate cancer. *BJU Int* 2011;108:1787-93. https://doi.org/10.1111/j.1464-410X.2011.10200.x
14. Xu J, Janisse J, Ruterbusch J, et al. **Racial differences in treatment decision-making for men with clinically localized prostate cancer: A population-based study.** *J Racial Ethn Health Disparities* 2016;3:35-45. https://doi.org/10.1007/s40615-015-0109-8
15. Sidana A, Hernandez DJ, Feng Z, et al. Treatment decision-making for localized prostate cancer: What younger men choose and why. *Prostate* 2012;72:58-64. https://doi.org/10.1002/pros.21406
16. Hall JD, Boyd JC, Lippert MC, et al. Why patients choose prostatectomy or brachytherapy for localized prostate cancer: Results of a descriptive survey. *Urology* 2003;61:402-7. https://doi.org/10.1016/S0090-4295(02)02162-3
17. Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19-32. https://doi.org/10.1080/1364557032000119616
18. Horn JL. A rationale and test for the number of factors in factor analysis. *Psychometrika* 1965;30:179-85. https://doi.org/10.1007/BF02289447
19. Zwick WR, Velicer WF. Comparison of five rules for determining the number of components to retain. *Psychol Bull* 1986;99:432-42. https://doi.org/10.1037/0033-2909.99.3.432
20. Franklin SB, Gibson DJ, Robertson PA, et al. Parallel analysis: A method for determining significant principal components. *J Veg Sci* 1995;6:99-106. https://doi.org/10.2307/3236261
21. Holmboe E, Concato J. Treatment decisions for localized prostate cancer: Asking men what's important. *J Gen Intern Med* 2000;15:694-701. https://doi.org/10.1046/j.1525-1497.2000.90842.x
22. Zeliadt SB, Moinpour CM, Blough DK, et al. Preliminary treatment considerations among men with newly diagnosed prostate cancer. *Am J Manag Care* 2010;16:e121-30.
23. Gwede CK, Pow-Sang J, Seigne J, et al. Treatment decision-making strategies and influences in patients with localized prostate carcinoma. *Cancer* 2005;104:1381-90. https://doi.org/10.1002/cncr.21330
24. Feldman-Stewart D, Brennenstuhl S, Brundage MD. The information needed by Canadian early-stage prostate cancer patients for decision-making: Stable over a decade. *Patient Educ Couns* 2008;73:437-42. https://doi.org/10.1016/j.pec.2008.07.008
25. Feldman-Stewart D, Brundage MD, Hayter C, et al. What questions do patients with curable prostate cancer want answered? *Med Decis Making* 2000;20:7-19. https://doi.org/10.1177/0272989X0002000102
26. Snow SL, Panton RL, Butler LJ, et al. Incomplete and inconsistent information provided to men making decisions for treatment of early-stage prostate cancer. *Urology* 2007;69:941-5. https://doi.org/10.1016/j.urology.2007.01.027
27. Davison BJ, Oliffe JL, Pickles T, et al. Factors influencing men undertaking active surveillance for the management of low-risk prostate cancer. *Oncol Nurs Forum* 2009;36:89-96. https://doi.org/10.1188/09.ONF.89-96
28. Davison BJ, Breckon E. Factors influencing treatment decision making and information preferences of prostate cancer patients on active surveillance. *Patient Educ Couns* 2012;87:369-74. https://doi.org/10.1016/j.pec.2011.11.009
29. White MA, Verhoef MJ. Decision-making control: Why men decline treatment for prostate cancer. *Integr Cancer Ther* 2003;2:217-24. https://doi.org/10.1177/1534735403256411
30. Hurwitz LM, Cullen J, Elsamanoudi S, et al. A prospective cohort study of treatment decision-making for prostate cancer following participation in a multidisciplinary clinic. *Urol Oncol* 2016;34:233.e17-25. https://doi.org/10.1016/j.urolonc.2015.11.014
31. Hamilton AS, Wu XC, Lipscomb J, et al. Regional, provider, and economic factors associated with the choice of active surveillance in the treatment of men with localized prostate cancer. *J Natl Cancer Inst Monogr* 2012;2012:213-20. https://doi.org/10.1093/jncimonographs/lgs033
32. Harlan SR, Cooperberg MR, Elkin E, et al. Time trends and characteristics of men choosing watchful waiting for initial treatment of localized prostate cancer: Results from CaPSURE. *J Urol* 2003;170:1804-7. https://doi.org/10.1097/01.ju.0000091641.34674.11
33. Berry DL, Ellis WJ, Russell KJ, et al. Factors that predict treatment choice and satisfaction with the decision in men with localized prostate cancer. *Clin Genitourin Cancer* 2006;5:219-26. https://doi.org/10.3816/CGC.2006.n.040
34. Rice K, Hudak J, Peay K, et al. Comprehensive quality-of-life outcomes in the setting of a multidisciplinary, equal access prostate cancer clinic. *Urology* 2010;76:1231-8. https://doi.org/10.1016/j.urology.2010.03.087
35. Hosain GM, Sanderson M, Du XL, et al. Racial/ethnic differences in treatment discussed, preferred, and received for prostate cancer in a tri-ethnic population. *Am J Mens Health* 2012;6:249-57. https://doi.org/10.1177/1557988311432467
36. Mahal BA, Ziehr DR, Aizer AA, et al. Racial disparities in an aging population: The relationship between age and race in the management of African-American men with high-risk prostate cancer. *J Geriatr Oncol* 2014;5:352-8. https://doi.org/10.1016/j.jgo.2014.05.001
37. Mahal BA, Ziehr DR, Aizer AA, et al. Getting back to equal: The influence of insurance status on racial disparities in the treatment of African-American men with high-risk prostate cancer. *Urol Oncol* 2014;32:1285-91. https://doi.org/10.1016/j.urolonc.2014.04.014
38. Davison BJ, Szafron M, Gutwin C, et al. Using a web-based decision support intervention to facilitate patient-physician communication at prostate cancer treatment discussions. *Can Oncol Nurs J* 2014;24:241-7. https://doi.org/10.5737/1181912x244241247
39. Davison BJ, Goldenberg SL, Wiens KP, et al. Comparing a generic and individualized information decision support intervention for men newly diagnosed with localized prostate cancer. *Cancer Nurs* 2007;30:E7-15. https://doi.org/10.1097/01.NCC.0000290819.22195.d6
40. Kim SP, Knight SJ, Tomori C, et al. Health literacy and shared decision making for prostate cancer patients with low socioeconomic status. *Cancer Invest* 2001;19:684-91. https://doi.org/10.1081/CNV-100106143
41. Feldman-Stewart D, Brundage MD, Van Manen L, et al. Patient-focused decision-making in early-stage prostate cancer: Insights from a cognitively based decision aid. *Health Expect* 2004;7:126-41. https://doi.org/10.1111/j.1369-7625.2004.00271.x
42. Feldman-Stewart D, Tong C, Siemens R, et al. The impact of explicit values clarification exercises in a patient decision aid emerges after the decision is actually made: Evidence from a randomized controlled trial. *Med Decis Making* 2012;32:616-26. https://doi.org/10.1177/0272989X11434601
43. Taylor KL, Davis KM, Lamond T, et al. Use and evaluation of a CD-ROM-based decision aid for prostate cancer treatment decisions. *Behav Med* 2010;36:130-40. https://doi.org/10.1080/08964289.2010.525263
44. Davison BJ, Degner LF. Empowerment of men newly diagnosed with prostate cancer. *Cancer Nurs* 1997;20:187-96. https://doi.org/10.1097/00002820-199706000-00004
45. Jenkinson J, Wilson-Pauwels L, Jewett MA, et al. Development of a hypermedia program designed to assist patients with localized prostate cancer in making treatment decisions. *J Biocommun* 1998;25:2-11.
46. Clark JA, Talcott JA. Confidence and uncertainty long after initial treatment for early prostate cancer: Survivors' views of cancer control and the treatment decisions they made. *J Clin Oncol* 2006;24:4457-63. https://doi.org/10.1200/JCO.2006.06.2893
47. Berry DL, Wang Q, Halpenny B, et al. Decision preparation, satisfaction and regret in a multicenter sample of men with newly diagnosed localized prostate cancer. *Patient Educ Couns* 2012;88:262-7. https://doi.org/10.1016/j.pec.2012.04.002
48. Davison BJ, Goldenberg SL. Decisional regret and quality of life after participating in medical decision-making for early-stage prostate cancer. *BJU Int* 2003;91:14-7. https://doi.org/10.1046/j.1464-410X.2003.04005.x

49. Morris BB, Farnan L, Song L, et al. Treatment decisional regret among men with prostate cancer: Racial differences and influential factors in the North Carolina Health Access and Prostate Cancer Treatment Project (HCaP-NC). *Cancer* 2015;121:2029-35. https://doi.org/10.1002/cncr.29309
50. Ross L, Howard D, Bowie J, et al. Factors associated with men's assessment of prostate cancer treatment choice. *J Cancer Educ* 2016;31:301-7. https://doi.org/10.1007/s13187-015-0837-9
51. Goh AC, Kowalkowski MA, Bailey DE Jr, et al. Perception of cancer and inconsistency in medical information are associated with decisional conflict: A pilot study of men with prostate cancer who undergo active surveillance. *BJU Int* 2012;110:E50-6. https://doi.org/10.1111/j.1464-410X.2011.10791.x
52. Orom H, Penner LA, West BT, et al. Personality predicts prostate cancer treatment decision-making difficulty and satisfaction. *Psychooncology* 2009;18:290-9. https://doi.org/10.1002/pon.1385
53. Mollica MA, Underwood W 3rd, Homish GG, et al. Spirituality is associated with better prostate cancer treatment decision-making experiences. *J Behav Med* 2016;39:161-9. https://doi.org/10.1007/s10865-015-9662-1
54. Cegala DJ, Bahnson RR, Clinton SK, et al. Information seeking and satisfaction with physician-patient communication among prostate cancer survivors. *Health Commun* 2008;23:62-9. https://doi.org/10.1080/10410230701806982
55. Davison BJ, Goldenberg SL, Gleave ME, et al. Provision of individualized information to men and their partners to facilitate treatment decision making in prostate cancer. *Oncol Nurs Forum* 2003;30:107-14. https://doi.org/10.1188/03.ONF.107-114
56. Davison BJ, Degner L, Gleave M, et al. Providing individualized information utilizing a computerized decision support intervention. *Oncol Nurs Forum* 2007;34:205-6.
57. Orom H, Biddle C, Underwood W 3rd, et al. What is a "good" treatment decision? Decisional control, knowledge, treatment decision-making, and quality of life in men with clinically localized prostate cancer. *Med Decis Making* 2016;36:714-25. https://doi.org/10.1177/0272989X16635633
58. Palmer NR, Tooze JA, Turner AR, et al. African-American prostate cancer survivors' treatment decision-making and quality of life. *Patient Educ Couns* 2013;90:61-8. https://doi.org/10.1016/j.pec.2012.08.007
59. Davison BJ, Gleave M, Goldenberg L, et al. Assessing information and decision preferences of men with prostate cancer and their partners. *Cancer Nurs* 2002;25:42-9. https://doi.org/10.1097/00002820-200202000-00009
60. Diefenbach MA, Dorsey J, Uzzo R, et al. Decision-making strategies for patients with localized prostate cancer. *Semin Urol Oncol* 2002;20:55-62. https://doi.org/10.1053/suro.2002.30399
61. Feldman-Stewart D, Capirci C, Brennenstuhl S, et al. Information for decision-making by patients with early-stage prostate cancer: A comparison across 9 countries. *Med Decis Making* 2011;31:754-66. https://doi.org/10.1177/0272989X10395029
62. Wong F, Stewart D, Dancey J, et al. Men with prostate cancer: Influence of psychological factors on informational needs and decision making. *J Psychosom Res* 2000;49:13-9. https://doi.org/10.1016/S0022-3999(99)00109-9
63. Davison BJ, Parker PA, Goldenberg SL. Patients' preferences for communicating a prostate cancer diagnosis and participating in medical decision-making. *BJU Int* 2004;93:47-51. https://doi.org/10.1111/j.1464-410X.2004.04553.x
64. Zeliadt SB, Penson DF, Moinpour CM, et al. Provider and partner interactions in the treatment decision-making process for newly diagnosed localized prostate cancer. *BJU Int* 2011;108:851-6; discussion 6-7. https://doi.org/10.1111/j.1464-410X.2011.10540.x
65. Christie KM, Meyerowitz BE, Giedzinska-Simons A, et al. Predictors of affect following treatment decision-making for prostate cancer: Conversations, cognitive processing, and coping. *Psychooncology* 2009;18:508-14. https://doi.org/10.1002/pon.1420
66. Man JP, Weinkauf JG, Tsang M, et al. Why do some countries publish more than others? An international comparison of research funding, English proficiency and publication output in highly ranked general medical journals. *Euro J Epidemiol* 2003;19:811-7. https://doi.org/10.1023/B:EJEP.0000036571.00320.b8
67. Henrikson NB, Ellis WJ, Berry DL, et al. «It's not like I can change my mind later»: Reversibility and decision timing in prostate cancer treatment decision-making. *Patient Educ Couns* 2009;77:302-7. https://doi.org/10.1016/j.pec.2009.03.017
68. Berger ZD, Yeh JC, Carter HB, et al. Characteristics and experiences of patients with localized prostate cancer who left an active surveillance program. *Patient* 2014;7:427-36. https://doi.org/10.1007/s40271-014-0066-z
69. Sommers BD, Beard CJ, D'Amico AV, et al. Decision analysis using individual patient preferences to determine optimal treatment for localized prostate cancer. *Cancer* 2007;110:2210-7. https://doi.org/10.1002/cncr.23028
70. Jani AB, Hellman S. Early prostate cancer: Hedonic prices model of provider-patient interactions and decisions. *Int J Radiat Oncol Biol Phys* 2008;70:1158-68. https://doi.org/10.1016/j.ijrobp.2007.07.2349
71. Mazur DJ, Hickam DH, Mazur MD. How patients' preferences for risk information influence treatment choice in a case of high risk and high therapeutic uncertainty: Asymptomatic localized prostate cancer. *Med Decis Making* 1999;19:394-8. https://doi.org/10.1177/0272989X9901900407
72. Holmes-Rovner M, Montgomery JS, Rovner DR, et al. Informed decision-making: Assessment of the quality of physician communication about prostate cancer diagnosis and treatment. *Med Decis Making* 2015;35:999-1009. https://doi.org/10.1177/0272989X15597226
73. Meghani SH, Lee CS, Hanlon AL, et al. Latent class cluster analysis to understand heterogeneity in prostate cancer treatment utilities. *BMC Med Inform Decis Mak* 2009;9:47. https://doi.org/10.1186/1472-6947-9-47
74. Underwood W 3rd, Orom H, Poch M, et al. Multiple physician recommendations for prostate cancer treatment: A Pandora's box for patients? *Can J Urol* 2010;17:5346-54.
75. Jung OS, Guzzo T, Lee D, et al. Out-of-pocket expenses and treatment choice for men with prostate cancer. *Urology* 2012;80:1252-7. https://doi.org/10.1016/j.urology.2012.08.027
76. Xu J, Neale AV, Dailey RK, et al. Patient perspective on watchful waiting/active surveillance for localized prostate cancer. *J Am Board Fam Med* 2012;25:763-70. https://doi.org/10.3122/jabfm.2012.06.120128
77. Ramsey SD, Zeliadt SB, Fedorenko CR, et al. Patient preferences and urologist recommendations among local-stage prostate cancer patients who present for initial consultation and second opinions. *World J Urol* 2011;29:3-9. https://doi.org/10.1007/s00345-010-0602-y
78. Bosco JL, Halpenny B, Berry DL, et al. Personal preferences and discordant prostate cancer treatment choice in an intervention trial of men newly diagnosed with localized prostate cancer. *Health Qual Life Outcomes* 2012;10:123. https://doi.org/10.1186/1477-7525-10-123
79. Jang TL, Bekelman JE, Liu Y, et al. Physician visits prior to treatment for clinically localized prostate cancer. *Arch Internal Med* 2010;170:440-50. https://doi.org/10.1001/archinternmed.2010.1
80. O'Rourke ME, Germino BB. Prostate cancer treatment decisions: a focus group exploration. *Oncol Nurs Forum* 1998;25:97-104.
81. Orom H, Homish DL, Homish GG, et al. Quality of physician-patient relationships is associated with the influence of physician treatment recommendations among patients with prostate cancer who chose active surveillance. *Urol Oncol* 2014;32:396-402. https://doi.org/10.1016/j.urolonc.2013.09.018
82. Wagner SE, Drake BF, Elder K, et al. Social and clinical predictors of prostate cancer treatment decisions among men in South Carolina. *Cancer Causes Control* 2011;22:1597-606. https://doi.org/10.1007/s10552-011-9836-2
83. Cowen ME, Miles BJ, Cahill DF, et al. The danger of applying group-level utilities in decision analyses of the treatment of localized prostate cancer in individual patients. *Med Decis Making* 1998;18:376-80. https://doi.org/10.1177/0272989X9801800404
84. Berry DL, Ellis WJ, Woods NF, et al. Treatment decision-making by men with localized prostate cancer: The influence of personal factors. *Urol Oncol* 2003;21:93-100. https://doi.org/10.1016/S1078-1439(02)00209-0
85. Ramsey SD, Zeliadt SB, Arora NK, et al. Unanticipated and underappreciated outcomes during management of local stage prostate cancer: A prospective survey. *J Urol* 2010;184:120-5. https://doi.org/10.1016/j.juro.2010.03.023
86. Song L, Chen RC, Bensen JT, et al. Who makes the decision regarding the treatment of clinically localized prostate cancer-the patient or physician? Results from a population-based study. *Cancer* 2013;119:421-8. https://doi.org/10.1002/cncr.27738
87. Davison BJ, Breckon EN. Impact of health information-seeking behavior and personal factors on preferred role in treatment decision-making in men with newly diagnosed prostate cancer. *Cancer Nurs* 2012;35:411-8. https://doi.org/10.1097/NCC.0b013e318236565a
88. Underhill ML, Hong F, Berry DL. When study site contributes to outcomes in a multicenter randomized trial: A secondary analysis of decisional conflict in men with localized prostate cancer. *Health Qual Life Outcomes* 2014;12:159. https://doi.org/10.1186/s12955-014-0159-3
89. O'Rourke M, Germino B. From two perspectives to one choice: Blending couple and individual views of prostate cancer treatment selection. *J Family Nurs* 2000;6:231-51. https://doi.org/10.1177/107484070000600303
90. Boon H, Brown JB, Gavin A, et al. Men with prostate cancer: Making decisions about complementary/alternative medicine. *Med Decis Making* 2003;23:471-9. https://doi.org/10.1177/0272989X03259815
91. Boon H, Westlake K, Deber R, et al. Problem-solving and decision-making preferences: No difference between complementary and alternative medicine users and non-users. *Complement Ther Med* 2005;13:213-6. https://doi.org/10.1016/j.ctim.2005.05.002
92. Symes Y, Lixin S, Heineman RG, et al. Involvement in decision making and satisfaction with treatment among partners of patients with newly diagnosed localized prostate cancer. *Oncol Nurs Forum* 2015;42:672-9. https://doi.org/10.1188/15.ONF.672-679
93. Colella KM, DeLuca G. Shared decision-making in patients with newly diagnosed prostate cancer: A model for treatment education and support. *Urol Nurs* 2004;24:187-91.

Correspondence: Dr. Michael Szafron, School of Public Health, University of Saskatchewan, Saskatoon, SK, Canada; michael.szafron@usask.ca