

The Cost of Bottling It Up: Emotion Suppression as a Mediator in the Relationship Between Anger and Depression Among Men with Prostate Cancer

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Background: Prostate cancer is a risk factor for major depressive disorder. Recent psycho-oncology research suggests a potential role for male-specific mood-related symptoms in this relationship. Gender socialisation experiences may reinforce men's anger and emotion suppression responses in times of distress, and anger and emotion suppression may be implicated in pathways to, and maintenance of depression in prostate cancer.

Patients and Methods: Data were collected online from men with a self-reported diagnosis of prostate cancer (N=100; mean age 64.8 years). Respondents provided information regarding diagnosis and treatment, in addition to current experience of major depression and male-specific externalising symptoms.

Results: Prostate cancer diagnosis in the last 12 months occurred for 35.4% of the sample. Elevated major depression symptoms were observed for 49% of respondents, with 14% endorsing past 2-week suicide ideation. Parallel mediation analysis (99% CIs) controlling for prostatectomy and active surveillance indicated men's emotion suppression mediated the relationship between anger and depression symptoms ($R^2=0.580$). Trichotomised emotion suppression scores with control variables yielded a large multivariate effect ($p<0.001$, partial $\eta^2=0.199$). Univariate moderate-sized effects were observed for emotion suppression comparisons for symptoms of depressed mood and sleep disturbance, and a large effect observed for guilt-proneness.

Conclusion: Findings highlight the salience of anger in the experience of depression symptoms for men with prostate cancer. The mediating role of emotion suppression, which in turn was strongly linked to men's feelings of guilt, suggests potential assessment and intervention targets. Future work should examine the role of androgen deprivation therapy and other treatments including active surveillance on the relationship between anger and depression in men with prostate cancer. Consideration of interventions focused on emotion processing skills in psycho-oncology settings may help reduce men's reliance on emotion suppression as a strategy for coping with feelings of anger or guilt in the context of prostate cancer.

Keywords: prostate, depression, anger, emotion suppression

Men diagnosed with prostate cancer have a heightened risk for major depressive disorder,^{1,2} with rates exceeding those seen in the general male population.^{3,4} This finding has been linked to the unmet psychosocial needs of this population following diagnosis,⁵ in addition to prostate cancer-related symptoms,⁶ and treatment-induced side effects including sexual dysfunction and urinary incontinence.⁷⁻⁹ Even those men on active surveillance are at high risk for depression¹⁰ whereby a decline

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in quality of life can be expected in the first 6 months following diagnosis.¹¹ Depression among men with prostate cancer is also associated with the loss of masculine identity.¹² Amid efforts to ensure depression does not go undetected or untreated in men with prostate cancer,⁴ symptom screening is recommended.¹³ Such approaches are essential given men with depression have an increased risk of prostate cancer mortality¹⁴ and suicide.¹⁵

A diagnosis of major depression is made on the basis of the nine diagnostic criteria per DSM-5¹⁶ or ICD-10.¹⁷ There is growing concern that these diagnostic criteria may inaccurately reflect men's experiences of mood disturbance, and therefore insufficiently identify men with an underlying mood disorder.^{18,19} Studies support the existence of a phenotypic variant of depression in men,^{20,21} characterised by externalising and atypical symptoms including anger,²² substance use,²³ risk-taking²⁴ and emotion suppression.²⁵ These symptom domains tend to be socially sanctioned for men as reflecting culturally informed and affirmed dominant Western masculine norms (as opposed to vulnerable emotions of sadness).²⁶ It is unclear whether this range of externalising and atypical symptoms reflect problematic coping strategies and a predisposing risk factor for depression in men, or should instead be considered part of the prodromal phase on a unique manifestation of depression in men. There is evidence suggesting that such symptoms may be a unique feature of men's depression,²¹ especially in the context of recent depressogenic negative life events that may precipitate major mood disturbance.²⁷ Nonetheless, it is important to recognise that this research area is in a nascent stage and draws debate.²⁸

Regardless of the role of externalising symptoms in men's depression, in the context of oncology—and prostate cancer more specifically—the emotion and expression of negative affect (such as anger) has been identified as particularly important.^{29,30} Amid growing literature on the role of anger in other cancers, such as breast cancer,^{31–34} recent calls have been made to further anger-based research in the context of prostate cancer.³⁵ Importantly, research has shown an association between morbidity and suppression of negative emotion^{36–38} and a link has been reported between prostate cancer and suppression of anger,³⁹ though corroborating evidence at present is sparse.⁴⁰ While psychodynamic theory has long posited that anger turned inwards can precipitate depression,⁴¹ anger has largely been ignored by other treatment models in the conceptualisation and treatment of emotional disorders such as depression.⁴² This negligence has

occurred despite the fact that anger predicts negative consequences, greater symptom severity and worse treatment response for such conditions.⁴³

In the context of potential linkages between anger and depression in men with prostate cancer, the present study explored five putative male-specific coping strategies (emotion suppression, drug use, alcohol use, somatisation, risk-taking) as parallel mediators⁴⁴ in the relationship between anger and symptoms of major depressive disorder. Consistent with previous research,^{45,46} significant associations were expected between externalising and atypical symptoms of depression. Based on the findings of others,^{36,39} it was hypothesised that emotion suppression would mediate the relationship between anger and depression, and that alcohol and drug use may also be implicated (as external coping strategies) in this relationship.

Method

Design and Patients

Secondary analysis was undertaken on data previously used for a psychometric study based on a cross-sectional online survey, with the detailed method reported elsewhere.⁴⁷ In brief, recruitment occurred online in 2017 via a prostate cancer help website and social media channels. Participants were recruited as part of a convenience sample of 100 Canadian men with prostate cancer.

Materials

Participants provided background information including country and province, age, employment status, education level, sexual identity, cultural affiliation, year diagnosed with prostate cancer and year treated, prostate cancer treatment(s), and current treatment. Data for symptoms of major depressive disorder (MDD) were collected via the PHQ-9.⁴⁸ The PHQ-9 items reflect the MDD diagnostic criteria in the DSM-V (American Psychological Association [APA], 2013). Respondents indicated how often (0="not at all", 1="several days", 2="more than half the days" and 3="nearly every day") they had experienced any of the listed symptoms over the previous 2 weeks (see [Table 1](#) for items). Total scores reflect symptom severity: mild depression (total scores 5–9), moderate depression (total scores 10–14), moderately severe depression (total scores 15–19) and severe depression (total scores 20–27) with the scale demonstrating internal consistency in the present sample ($\alpha=0.89$). Previous research has established the reliability and validity of the PHQ-9.⁴⁹ Male-specific

Table I Demographic and Outcomes for Total Sample and by Emotion Suppression Grouping

		Total (N=100)	Emotion Suppression Group			Inferential	
			Low (n=28)	Moderate (n=42)	High (n=30)	Statistic	p
Background variables							
Age (years)	M (SD)	64.81 (7.17)	65.96 (6.35)	65.74 (7.60)	62.43 (6.95)	F=2.43	0.094
Current treatment	(%, n)	33.0 (33)	32.1 (9)	31.0 (13)	36.7 (11)	$\chi^2=0.27$	0.873
Prostatectomy	(%, n)	54.0 (54)	46.4 (13)	69.0 (29)	40.0 (12)	$\chi^2=6.84$	0.033
Androgen deprivation	(%, n)	18 (18)	17.9 (5)	23.8 (10)	10.0 (3)	$\chi^2=2.26$	0.323
Active surveillance	(%, n)	22.0 (22)	21.4 (6)	22.7 (5)	36.7 (11)	$\chi^2=6.19$	0.044
Past year diagnosis	(%, n)	35.0 (35)	21.4 (6)	35.7 (15)	48.3 (14)	$\chi^2=4.50$	0.106
Years since diagnosis	M (SD)	4.59 (5.07)	5.79 (5.71)	4.83 (5.17)	4.59 (5.06)	F=2.12	0.127
Comorbidity	(%, n)	38.0 (38)	35.7 (10)	31.0 (13)	50.0 (15)	$\chi^2=2.78$	0.249
Clinical variables							
PHQ-9 Total	M (SD)	5.85 (5.57)	2.14 (2.65)	5.45 (5.29)	9.87 (5.46)	F=19.29	<0.001
Suicide ideation	(%, n)	14 (14)	0 (0)	28.6 (4)	33.3 (10)	$\chi^2=14.57$	<0.001
Alcohol Use	M (SD)	2.51 (4.97)	0.96 (3.67)	2.07 (4.49)	4.57 (6.03)	F=4.37	0.015
Anger	M (SD)	3.53 (5.18)	1.32 (2.57)	2.48 (3.91)	7.07 (6.69)	F=12.88	<0.001
Emotion Suppression	M (SD)	8.73 (7.73)	0.64 (0.87)	7.05 (3.47)	18.63 (7.73)	F=232.79	<0.001
Drug Use	M (SD)	1.03 (3.24)	0.36 (1.06)	1.19 (3.84)	1.43 (3.64)	F=0.89	0.416
Somatic Symptoms	M (SD)	5.14 (5.35)	1.96 (3.70)	5.55 (5.44)	7.53 (5.24)	F=9.41	<0.001
Risk-Taking	M (SD)	1.30 (2.61)	0.36 (1.70)	1.05 (2.15)	2.53 (3.38)	F=5.92	0.004

Note: Bolded text denotes significant at $p<0.05$.

Abbreviations: M, Mean; SD, Standard deviation.

depression symptoms were assessed via the Male Depression Risk Scale (MDRS-22),^{45,46} which comprises 22 items and six subscales assessing anger ($\alpha=0.92$), alcohol use ($\alpha=0.91$), drug use ($\alpha=0.91$), emotion suppression ($\alpha=0.88$), somatisation ($\alpha=0.67$), risk-taking ($\alpha=0.59$). MDRS-22 items refer to the previous four weeks (0="not at all" to 7="almost always"). The MDRS-22 has been cross-nationally validated,^{45,46} and demonstrates test-retest validity and sensitivity to change.²⁷

Procedure

Ethics review was approved by the University of British Columbia (H12-00573). The survey was launched in January 2017, focussing on the issue of depression in men with prostate cancer. Participation provided an opportunity for respondents to be entered into a \$500 cash prize draw by completing the survey. The survey was embedded in an online prostate cancer psychosocial resource (www.ifiwere.com.ca) and was available for 3 months through April 2017. The survey landing page provided details about the study including informed consent, confidentiality regards respondent's demographic data and its separate password-protected storage from their survey responses. On completion of the survey, respondents were provided a URL link to the men's depression website www.headsupguys.org

Data Analysis

Parallel mediation analysis was conducted using the PROCESS macro version 3.2.01⁴⁴ in SPSS 25.0. The model tested five male-specific symptoms (emotion suppression, drug use, alcohol use, somatisation, risk-taking) as parallel mediators in the relationship between anger (predictor variable) and symptoms of major depressive disorder (dependent variable; PHQ-9 total score). The model included covariates, identified according to subgroup differences for emotion suppression (the potential covariates were; age, active surveillance, comorbidity, current treatment, recency of diagnosis, prostatectomy) and reported 99% confidence intervals for the bootstrapped estimates conducted with 10,000 resamples. To further explore effects in a sensitivity analysis, emotion suppression scores were trichotomised, with the three groups subsequently used in a between-subjects MANCOVA, with the nine individual symptoms of depression (as assessed by the PHQ-9) examined as dependent variables. As per the mediation analysis, covariates were entered where group differences existed. In order to identify the unique contribution of emotion suppression on individual depression symptoms, the remaining male-specific symptoms were also entered as covariates (eg, anger, drug use, alcohol use, somatisation, risk-taking). Effect sizes were

reported using the partial eta-squared coefficient, following accepted interpretation of small (partial $\eta^2=0.01-0.05$), medium (partial $\eta^2=0.06-0.13$) and large (partial $\eta^2\geq 0.14$) effects.⁵⁰

Results

The mean age of participants was 64.8 years (range 47–85 years). A total of 35.4% of the sample reported a prostate cancer diagnosis in the last 12 months. Elevated major depression symptoms (PHQ-9 ≥ 5) were observed for 49%, with 14% endorsing past 2-week suicide ideation. Other demographic data are presented in Table 1.

Parallel mediation analysis was conducted including the two control variables with a significant between-group difference (eg, prostatectomy, surveillance). The model accounted for a large portion of variance in depression symptoms ($R^2=0.580$). As predicted, emotion suppression was a significant mediator (indirect effect = 0.327, $p<0.001$) in the relationship between anger and depression symptoms. For a one-unit increase in men's anger, depression increased by 0.327 units through the mediating effect of emotion suppression. No other male-specific coping strategies were significant mediators and the covariates were not significant in the model (see Table 2). When examined as unique predictors of depression (excluding covariates,) anger accounted for 34.6% of variance in depression symptoms with emotion suppression accounting for an additional 15.4% beyond that accounted for by anger.

MANCOVA with the individual depression symptoms indicated a significant, large multivariate effect of emotion suppression $\lambda=0.660$, $F(18, 164)=2.101$, $p<0.001$, partial $\eta^2=0.187$, with anger a significant multivariate covariate ($p=0.039$, partial $\eta^2=0.187$). Figure 1 depicts this multivariate effect whereby symptoms of depression varied according to severity of emotion suppression. At the univariate (eg, individual symptom) level, significant effects were seen for depressed mood ($p<0.001$ partial $\eta^2=0.155$; anger as covariate $p=0.023$, partial $\eta^2=0.064$), sleep disturbance ($p=0.033$, partial $\eta^2=0.073$; anger as covariate $p=0.022$, partial $\eta^2=0.057$), and guilt proneness ($p<0.001$, partial $\eta^2=0.223$; anger as covariate $p=0.006$, partial $\eta^2=0.081$). Bonferroni corrected post hoc analysis indicated five significant sub-group comparisons at the symptom level for these three symptom domains (see Figure 1).

Discussion

The principal findings of the present study revealed a significant association between anger and depressive

Table 2 Coefficients for Direct and Indirect Effects of Anger Predicting Depression Through Male-Specific Symptoms as Potential Mediators (99% CIs)

	B	SE	t	P
DV: Emotion Suppression				
Anger	0.807	0.129	6.246	0.004
Active surveillance [#]	1.889	1.929	0.979	0.330
Prostatectomy [#]	0.525	1.599	0.743	0.743
Model summary	$F(3, 96)=14.798$, $R^2=0.316$, $p<0.001$			
DV: Depression				
Anger	0.285	0.111	2.580	0.012
Emotion suppression	0.327	0.063	5.176	<0.001
Drug use	0.223	0.122	1.838	0.070
Alcohol use	-0.157	0.082	-1.919	0.058
Somatisation	0.146	0.082	1.784	0.079
Risk-taking	0.083	0.203	0.411	0.682
Active surveillance [#]	-0.761	1.186	-0.642	0.523
Prostatectomy [#]	-1.743	0.973	-1.792	0.076
Model summary	$F(8, 91)=15.740$, $R^2=0.581$, $p<0.001$			
Bootstrap estimate				
Indirect effects	Effect	SE	Lower CI	Upper CI
DV: Depression				
Anger through Emotion suppression	0.241	0.078	0.058	0.470
Anger through Drug use	0.007	0.023	-0.051	0.094
Anger through Alcohol use	-0.036	0.033	-0.165	0.012
Anger through Somatic symptoms	0.060	0.044	-0.036	0.206
Anger through Risk-taking	0.027	0.087	-0.181	0.315

Notes: [#]covariate, N=100, CI=99% confidence interval (10,000 resamples), bold-face text indicates statistically significant values at $p<0.01$.

Abbreviation: DV, Dependent variable.

symptoms among men with prostate cancer, and that emotion suppression is a reliable mediator of this relationship. Emotion suppression accounted for an additional 15% of depression variance beyond anger, with the two variables accounting for large (50%) proportion of variance in depression for this sample. This was a robust finding given that four other mediators were examined simultaneously, in addition to controlling for the effects of covariates. While it is not clear from the present data whether participants were specifically suppressing anger or other negative emotions (eg, sadness, guilt), the present findings do align with the notion that anger turned inward may precipitate depression.⁴¹ Further research should seek to explore (and indeed differentiate) suppression of negative emotion versus anger more specifically. Nonetheless, present findings suggest that the potential importance of considering constricted or internalised anger in the

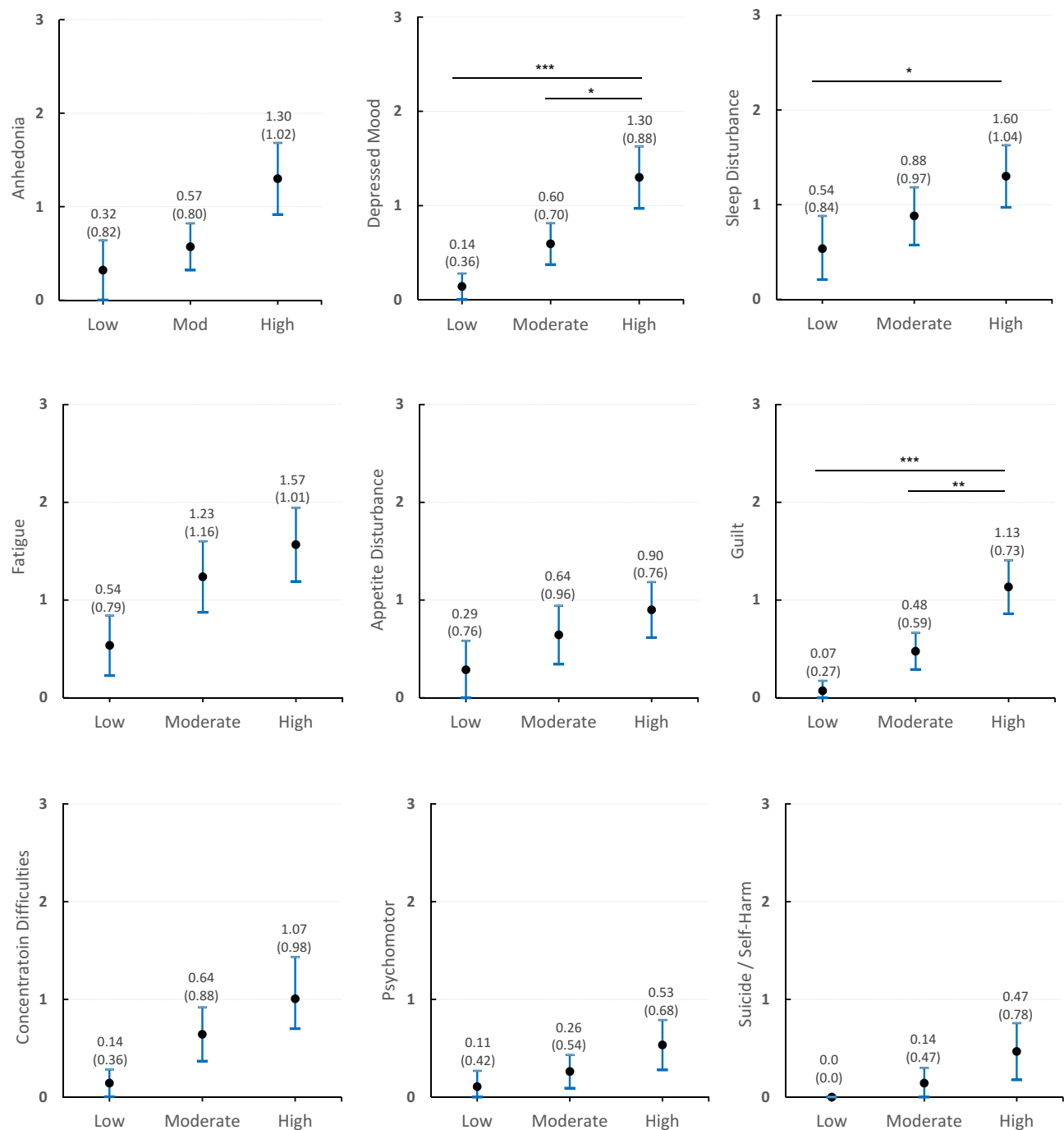


Figure 1 Mean depression symptoms (with 95% CIs) by emotion suppression group including Bonferroni corrected post hoc tests.

Notes: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; Y-axis represents PHQ-9 response scale (over previous 2-weeks); 0="Not at all", 1="Several days", 2="More than half the days", 3="Almost every day". Several "apparent" group differences did not survive Bonferroni correction.

psychosocial context of prostate cancer. The findings additionally point to the critical role of emotion suppression as a mechanism through which anger influences the development of depressive symptoms. Recent survey research with a sample of 4000 adult men from the US, UK, Canada and Australia reported that a large proportion of respondents regretted sharing their emotions with others, conceding that

they would be unlikely to do so again as a consequence of that decisional regret.⁵¹ While that sample did not specifically include men with prostate cancer, this outcome is concerning in light of the present study which suggests that suppressing (rather than sharing or reappraising strong emotions such as anger) can lead to more severe mood-related symptoms consistent with depression.

The multivariate effect was robust across the nine depression symptoms, with corrected post hoc tests revealing significant group differences across three of the symptom domains (depressed mood, sleep disturbance and guilt proneness). While the proportion of respondents endorsing past 2-week suicide or self-harm ideation differed across the groups, there were no differences for the adjusted mean comparisons of suicide or self-harm ideation. Nonetheless, that 0% of the low emotion suppression group reported recent suicide or self-harm ideation whereas 28.6% and 33.3% of the moderate and high groups did, suggests that emotion suppression may be problematic for men with prostate cancer.

While longitudinal designs are needed to corroborate the temporal relationship between anger and depression in prostate cancer, the present findings have a range of practical implications. Prostate cancer can result in a loss of masculine identity for men,¹² and perceptions of diminished masculine identity can be triggered by a sense of dependence, loss of control and feelings of weakness.⁵² It is possible that anger and emotion suppression may be operating as socially sanctioned emotional responses for men with prostate cancer, in part offering ways to retain (albeit problematically) these gender-related changes, or overcoming a sense of “wounded” masculinity.⁵³ Educating men that suppressing distressing emotions, like anger, may increase the likelihood of experiencing major depression and open the door to developing more adaptive responses to distress. Acceptance-based approaches may be useful for men with a tendency to suppress emotions, as early work has shown positive effects for such approaches in reducing avoidance in men with a prostate cancer diagnosis.⁵⁴ Supporting emotion-based skill development in this population is also likely to assist. For example, helping men more adaptively process anger-based emotions could help mitigate aggressive responses to feeling angry that often lead to negative consequences (eg, impaired interpersonal relationships, perceived coercion),⁵⁵ and thereby potentially reduce the burden of depression among men with prostate cancer. Any gender and age-sensitised approaches should be mindful of socialisation processes that may contribute to men’s reluctance to making changes. Hence, leveraging and working with (rather than attempting to change) masculine norms may be important in implementing sensitised strength-based approaches for men with prostate cancer, while considering key social determinants and health inequities among sub-groups of men.⁵⁶

In terms of limitations, as the present sample did not provide data on previous mental health diagnoses (including

previous depression diagnosis or treatment), it is not possible to determine the rate of relapses versus incident cases of depression. Similarly, related mental disorders such as generalised anxiety and substance dependence were not assessed. While half (54%) of the sample reported prostatectomy and the average time elapsed since first prostate diagnosis was 4.6 years, findings for the anger–emotion suppression–depression relationship may be further influenced and/or moderated by factors such as social support, dispositional optimism and response to treatment or side-effects. It is recommended that future work examine these factors in larger samples, including a specific focus on those men receiving treatment modalities and combinations including androgen deprivation therapy. Further, it is widely known that there is significant overlap between symptoms of anxiety and symptoms of depression;⁴³ thus future research should assess for comorbid anxiety symptoms in men with prostate cancer. From a design perspective, the present data were drawn from Canadian-based men and the research design was cross-sectional in nature, recruiting a self-selected online population. Longitudinal and geographically representative cross-country data would provide a more comprehensive test of the present mediation effect, as would use of a larger sample to ensure generalisability across the prostate cancer survivor population. Additionally, future work should consider an adjunctive non-online approach to data collection to ensure men without ready internet access (eg, men aged >70 years) are also able to participate.

In seeking to better understand the psychosocial experiences of men with prostate cancer, emotion suppression appears a salient factor in the anger–depression relationship. Given men with prostate cancer are at markedly higher risk of depression and suicide attempt, greater emphasis on exploring the utilization of different psychosocial approaches is needed. Taking a gendered lens to the assessment and treatment of mood-related symptoms of depression, including externalised or atypical presentations, may support improved outcomes in this population. The links between anger, emotion suppression and depression in the context of prostate cancer require further attention.

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Disclosure

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