APS Australian Psychological Society

Taylor & Francis
Taylor & Francis Group

🔓 OPEN ACCESS | Check for updates

Predicting men's intentions to seek help for cancer symptoms: a comparison of the Theory of Planned Behaviour and the Health Belief Model

Jennifer A. Fish [ID][a,b,c], Ivanka Prichard [ID][d], Kerry Ettridge[c,e], Elizabeth A. Grunfeld[f] and Carlene Wilson[a,g,h]

[a]Flinders Health & Medical Research Institute, College of Medicine & Public Health, Flinders University, Adelaide, Australia; [b]Rosemary Bryant Ao Research Centre, Clinical & Health Sciences, University of South Australia, Adelaide, Australia; [c]School of Psychology, Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, Australia; [d]College of Nursing & Health Sciences, Caring Futures Institute, Flinders University, Adelaide, Australia; [e]Health Policy Centre, South Australian Health & Medical Research Institute, Adelaide, Australia; [f]Department of Psychological Sciences, Birkbeck, University of London, London, UK; [g]Olivia Newton John Cancer and Wellness Research Centre, Austin Health, Heidelberg, Australia; [h]School of Psychology and Public Health, La Trobe University, Melbourne, Australia

ABSTRACT

Objective: Targeted behavioural interventions are needed to address psychosocial factors leading to slower help-seeking for cancer symptoms among men. This study compared the variance in men's help-seeking intentions explained by the Theory of Planned Behaviour and Health Belief Model.

Method: A cross-sectional survey of 127 men was conducted, testing symptom knowledge and theory-derived constructs from the Theory of Planned Behaviour (attitudes, perceived norms, perceived behavioural control) and Health Belief Model (susceptibility, severity, benefits, barriers). The outcome variable was intention to seek help for cancer symptoms. Separate and combined hierarchical regressions tested the relative predictive power of the two models, potential overlap in variance explained, and the most salient constructs within the models.

Results: Separate regressions (controlling for age and symptom knowledge) showed each model explained 10–12% variance in men's help-seeking intentions over and above the adjusted variables. The combined regression indicated symptom knowledge, perceived benefits, and perceived behavioural control were significant predictors of men's intentions (35% total variance explained).

Conclusions: The Theory of Planned Behaviour and Health Belief Model may not be optimal models for explaining men's help-seeking intentions for cancer symptoms, however, select constructs are important correlates. Future interventions may usefully target symptom knowledge, health beliefs, and control beliefs.

KEY POINTS

What is already known about this topic:
(1) Men are more likely to postpone seeking medical advice for cancer symptoms than women internationally.
(2) Behavioural interventions are required to address psychosocial barriers and improve men's help-seeking behaviour.
(3) Interventions with a theoretical foundation are most effective.

What this study adds:
(1) The first study to test the utility of the Theory of Planned Behaviour and Health Belief Model for explaining men's intentions to seek help for cancer symptoms.
(2) Men's help-seeking intentions were insufficiently explained by the two traditional social cognitive models; however, several psychological constructs were significant correlates.
(3) Results indicated that future interventions designed to improve men's help-seeking for cancer symptoms should aim to increase symptom knowledge and perceived behavioural control and promote the benefits of help-seeking.

Introduction

The burden of cancer is enduring and increasing worldwide, with higher mortality among men than women globally (Australian Institute of Health and Welfare, 2021; Bray et al., 2018; Ferlay et al., 2018). Among men, the leading causes of cancer death worldwide are cancer types with poor prognosis, including lung, liver, and stomach cancers, followed by types with higher survival rates, including colorectal and prostate cancers (Bray et al., 2018). Prognosis can be influenced by several

factors including stage of disease at diagnosis. Early diagnosis and treatment of localised cancer is important for survival (Neal et al., 2015).

There has been concern about men's slower help-seeking for a range of health issues (Oliffe et al., 2020), including cancer (Evans et al., 2005; Oberoi et al., 2014). A recent survey of 16,778 adults in the UK found that men were significantly less likely to seek help with a General Practitioner (GP) for cancer-linked symptoms than women (Hannaford et al., 2020). To improve men's help-seeking intentions and behaviours, targeted interventions that improve secondary prevention are required. Interventions that are theoretically guided appear more effective than those that are atheoretical across a range of health issues (Glanz & Bishop, 2010). This study aims to test and compare the utility of two health models for explaining men's help-seeking intentions.

Social cognitive models of behaviour have demonstrated usefulness for predicting a range of health behaviours (Conner & Norman, 2015) and provide a framework from which to understand and test determinants of men's help-seeking behaviour. Previous research has confirmed several psychosocial factors from these models as potential determinants: social norms, perceived behavioural control, and health beliefs (Carbone et al., 2009; Fish et al., 2019; Oberoi et al., 2016; Saab et al., 2017). The finding that these specific constructs influence men's help-seeking for cancer symptoms highlights the potential applicability of both the Theory of Planned Behaviour (Ajzen, 1991; Fishbein & Ajzen, 2010) and the Health Belief Model (Rosenstock, 1974), notwithstanding significant overlap between these.

The Theory of Planned Behaviour (Ajzen, 1991; Fishbein & Ajzen, 2010) defines behaviour as an outcome of a deliberative cognitive process and proposes seeking medical advice is predicted by two proximal determinants: intention to act and perceived behavioural control. Intention to act is an essential characteristic of help-seeking behaviour, and one that differentiates it from help-*receiving* (Cornally & McCarthy, 2011). Perceived behavioural control refers to one's beliefs about their capacity to seek medical help and is theorised to predict behaviour directly and indirectly by interaction with intentions. According to the model, intention to seek help is influenced by two other determinants: an individual's attitude towards help-seeking and perceptions about the normality of the behaviour (Ajzen, 1991; Fishbein & Ajzen, 2010). The predictive strength of each determinant is hypothesised to vary across contexts and behaviours (Ajzen, 1991).

Rosenstock's (1974) original version of the Health Belief Model proposed that health behaviours were predicted by health beliefs. Thus, an individual is likely to

seek medical advice for a potential cancer symptom if they perceive cancer to be a serious (or severe) threat to which they are susceptible, that the symptom is consistent with cancer, and that the benefits of help-seeking outweigh the potential costs. The model consists of affective (perceived threat) and cognitive (evaluation of costs and benefits) influences on behaviour. It also proposes that health belief constructs predict behaviour directly, and therefore the model does not include an intermediate variable. However, it has been proposed that including an intention construct would likely improve the model (Conner & Norman, 2015), and recent studies, including the current one, have included this measure.

For the last twenty years, there has been debate about the value of the Theory of Planned Behaviour and the Health Belief Model. Some scholars have highlighted the profusion of correlational tests of the models and limited evidence of predictive validity, calling for more complex causal models (Armitage & Conner, 2000; Carpenter, 2010; Ogden, 2015; Sniehotta et al., 2014). However, meta-analytic reviews provide some support for the predictive utility of these models (Conner, 2015). For example, a meta-analysis of 237 prospective tests of the Theory of Planned Behaviour showed moderate to large effect sizes for the prediction of intention and health behaviour (McEachan et al., 2011).

In response to criticisms of these models, it is now common practice to test extended social cognitive models that incorporate constructs considered important to specific health behaviours (Conner, 2015). In male-specific studies, extended Theory of Planned Behaviour models have been usefully applied to help-seeking for sexual concerns (Hyde et al., 2020, 2016) and psychological concerns (Smith et al., 2008). These models have also been successfully utilised to explain help-seeking for cancer symptoms in female- and mixed-gender samples (Hunter et al., 2003; Van Osch et al., 2007). For example, Van Osch et al. (2007) found perceived advantages of help-seeking, self-efficacy, perceived susceptibility to cancer, and intention to seek help significantly predicted timely anticipated medical help-seeking in their final regression model (26% of variance explained). Further research is warranted to determine whether these models are useful for explaining men's help-seeking for cancer symptoms specifically, and whether other constructs should be added to increase the utility of the models.

Stage process models of help-seeking have also been influential in explaining help-seeking for cancer symptoms, which propose help-seeking involves perceiving a bodily change, symptom appraisal, decision-making, and intentional action (Scott & Walter, 2010). The Model of Pathways to Treatment (Scott et al., 2013)
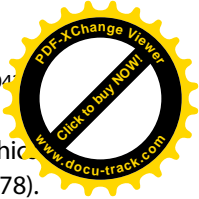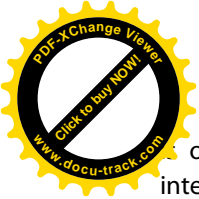
one prominent model that suggests an appraisal interval (i.e., detect bodily change and perceive a reason to seek help) precedes the help-seeking interval that culminates in medical consultation. Although inferring illness from a bodily change is not crucial for help-seeking to occur, symptom knowledge and recognition can be important for progressing through the appraisal interval and entering the help-seeking interval. There is strong evidence for a link between a low level of symptom knowledge and slower help-seeking for cancer symptoms among men (Fish et al., 2015). Symptom knowledge is not included in the social cognitive models tested in this study, but may be a useful addition to increase the predictive utility of the models for explaining men's help-seeking. Consequently, this study adjusts for the potential influence of symptom knowledge.

Current study

Comparative research on the relative predictive power of the Theory of Planned Behaviour and the Health Belief Model is required to determine which variables, and potentially which theory, may be most useful for explaining men's help-seeking for cancer symptoms. Models will be extended to test for the additional influence of symptom knowledge and to enable a more accurate estimate of the variance in men's intentions to seek help for cancer symptoms explained by the Theory of Planned Behaviour and Health Belief Model.

Although previous research in other health domains and samples suggests that the Theory of Planned Behaviour is a more useful model than the Health Belief Model in predicting health behaviours (Carpenter, 2010; Conner & Norman, 2015), there has been no research directly comparing their predictive validity for men's help-seeking for cancer symptoms. Constructs from both theories have been associated with men's help-seeking for cancer symptoms (Carbone et al., 2009; Fish et al., 2019; Oberoi et al., 2016; Saab et al., 2017). Consequently, the primary objective of this cross-sectional study was to conduct separate and combined model testing to determine: a) the relative predictive power of the two models for the prediction of variance in intention to seek help for cancer symptoms among men, b) the potential overlap in the variance explained by the models, and c) the most salient construct(s) within the models.

Method

This cross-sectional survey study was part of a multi-method research programme investigating men's help-seeking for cancer symptoms. Ethics approval was provided by the Social and Behavioural Research Ethics Committee at Flinders University (project number 7078).

Participants

Non-probability, self-selection sampling was used in this anonymous online survey. Males and females aged 18 years or over were eligible to participate in the survey. Survey respondents were excluded if they reported a cancer history or looking up symptoms online while completing the survey. Only male respondents were included in this study because of the overarching objective to inform secondary cancer prevention interventions designed to improve men's help-seeking behaviour. Social cognitive models were selected based on their alignment with previous research into men's help-seeking for cancer symptoms. Of those male respondents who commenced the survey and met the eligibility criteria ($n = 158$), 127 (80.38%) completed the component of the survey that measured theoretical constructs and were included in this study.

Setting

The study was advertised through public spaces, a local university, community organisations, and local councils in South Australia. Promotional information was shared through social media, emails to member lists (organisations and councils only), printed flyers, and snowball sampling through participants. Community and university-based sampling were used to overcome the difficulty of recruiting men into psychological studies and to achieve a sample broadly representative of the male population (Alto et al., 2018).

The survey was programmed using Qualtrics Survey Software). Potential participants were informed that survey submission was considered informed consent. Participants were given the opportunity to enter a prize draw (ten vouchers valued $25) on completion of the survey as a thank you for their time, which was advertised in the promotional information and participant information sheet. The average amount of time required to complete the survey was 50 minutes (duration recorded by Qualtrics). Recruitment occurred between March and September 2016.

Measures

Socio-demographic characteristics
Gender, age, postcode, relationship status, sexual identity, education, current work status, and cancer history were assessed in the survey (see supplementary materials for survey items).

Symptom knowledge

The Warning Signs section of the Cancer Awareness Measure (Stubbings et al., 2009) was adapted to assess symptom knowledge. Participants were asked whether 13 different symptoms could be a sign of cancer. Eleven symptoms were common cancer symptoms, including: persistent unexplained fatigue, unexplained lump or swelling, persistent unexplained pain, unexplained bleeding, persistent unexplained cough or hoarseness, persistent change in bowel habits, persistent change in bladder habits, persistent difficulty swallowing, change in the appearance of a mole, sore that does not heal, and unexplained weight loss (Cancer Council SA, 2015; Stubbings et al., 2009). The remaining two symptoms, unexplained hair loss and weight gain, are not commonly indicative of cancer and were included as "distractors" to determine whether participants could correctly distinguish between symptoms (De Nooijer et al., 2002). Correct responses were summed to reach a total symptom knowledge score (score range: 0–13), with higher scores indicating greater awareness of symptoms. Scale internal consistency was good ($\alpha = .73$).

Theory of planned behaviour

Questions to measure Theory of Planned Behaviour constructs were constructed according to the recommendations of Fishbein and Ajzen (2010) and guided by Conner and Sparks (2005). When possible, items followed the format set by previous research on help-seeking for cancer symptoms (Hunter et al., 2003), with 5-point scales used throughout the survey for consistency. Although Fishbein and Ajzen (2010) recommend the use of 7-point scales, research evidence indicates minimal differences in data quality produced by 5- and 7-point scales (Revilla et al., 2014).

The variable attitude towards help-seeking was assessed with four semantic differential items. Polar adjectives included: bad/good, unpleasant/pleasant, unenjoyable/enjoyable, and foolish/wise. Item responses were averaged to establish an attitude score (range: 1–5). Higher scores indicated a more positive attitude towards help-seeking for cancer symptoms. Scale reliability was acceptable, but low ($\alpha = .54$).

Perceived norms were assessed using items addressing both descriptive and injunctive normative beliefs. Participants responded to normative beliefs (e.g., "My [referent] would visit a doctor if they noticed a symptom that might be cancer") for four different referents: male friends, female friends, family, and spouse (if applicable). Responses ranged from 1 (definitely not) to 5 (definitely) for all items. Due to a large positive correlation between mean descriptive and injunctive normative beliefs ($r = .67$, $p < .001$), a higher-order variable of perceived

norms was used in analyses, as suggested by Fishbein and Ajzen (2010). All normative belief item scores were averaged to create an overall "perceived norms" score (range: 1–5). Higher scores indicated that participants perceived help-seeking behaviour to be normal within their social network and sensed social pressure to seek help for cancer symptoms. Scale internal consistency was high ($\alpha = .80$).

Perceived behavioural control over visiting a doctor was assessed using three items. Two items used 5-point strongly disagree to strongly agree scales (e.g., "If I wanted to visit a doctor I could"). One item asked participants to estimate how easy it would be for them to visit a doctor on a 5-point scale from 1 (very difficult) to 5 (very easy). Item scores were averaged to give an overall control score (range: 1–5), with higher scores indicating greater perceived control over help-seeking behaviour. Scale reliability was acceptable, but low ($\alpha = .61$).

Health belief model

Health Belief Model questions were derived from items included in previous research to assess Health Belief Model constructs for cancer screening in the general population (Bish et al., 2000; Champion, 1984), with items adapted to fit the current context of intended help-seeking for cancer symptoms. Items assessed: perceived susceptibility to cancer (6 items), perceived severity of cancer (8 items), perceived benefits of help-seeking (5 items), and perceived barriers to help-seeking (6 items). Responses were scored on a scale of 1 (strongly disagree) to 5 (strongly agree). Subscale item responses were averaged (score range: 1–5), with higher scores indicating greater perceived susceptibility, severity, costs, and benefits. Internal consistency was acceptable across Health Belief Model variables (α range: .65-.80).

Outcome variable: intention to seek help for cancer symptoms

Participants were asked to estimate their likelihood of visiting a doctor for eleven cancer symptoms (see above for list of symptoms). Responses ranged from 1 (very unlikely) to 5 (very likely). Item scores were averaged (range: 1–5), with higher scores indicating a greater likelihood of help-seeking for common cancer symptoms. Internal consistency was high ($\alpha = .93$).

Statistical methods

Analyses were conducted in IBM SPSS Statistics 25. Four participants (3%) were missing item level data; these participants were retained in the dataset and available item analysis was used during scoring of variables and assessment of reliability (Parent, 2013). To detect

medium effect size, at power = .80, α = .05, and with nine regression variables (combined theoretical regression model only), 113 participants were required. Analyses were sufficiently powered to detect medium to large effect sizes. Significance levels were set at $p < .05$.

Exploratory tests revealed non-normal distribution for some variables, as well as non-normal standardised residuals and several outliers. Consequently, more robust methods of analysis were required, and bootstrapping was used on regression analyses (Field, 2013; Wright et al., 2011). Bootstrapped analyses used 1000 samples and calculated 95% bias corrected and accelerated confidence intervals (BCa CI).

Correlation analyses were run between intention to seek help for cancer symptoms, socio-demographic characteristics, symptom knowledge, and theory-derived predictor variables to assess potential relationships and confounds. A series of bootstrapped hierarchical multiple regressions were used to test the separate and combined predictive power of the Theory of Planned Behaviour and Health Belief Model for explaining men's help-seeking intentions, and to compare the relative contribution to explained variance in intentions to seek help of each variable. Age and symptom knowledge were entered in Step 1 and theory-derived variables were entered in Step 2 of each regression analysis. For the combined model, theory-derived variables were entered simultaneously in Step 2 because of limited evidence that one theory would have greater predictive power than the other for explaining men's intentions to seek help.

Results

Data from 127 men were analysed in this study[1] (see, Table 1 for sample characteristics). Participants' mean (*M*) age was 54.99 years (Standard Deviation [*SD*] = 15.96 years; range: 19–90) and median age was 55.00 years. This sample was older than the general population of Australian males (Australian Institute of Health and Welfare, 2019), more educated (Australian Bureau of Statistics, 2017), and men who were single were under-represented (Australian Institute of Health and Welfare, 2011). Intention to seek help for cancer symptoms was high (*M* = 4.19, *SD* = 0.71).

Associations between socio-demographic characteristics, symptom knowledge, and theory-derived variables

Correlation analyses indicated intention to seek help for cancer symptoms was significantly and positively correlated with age (see, Table 2), however, was not significantly associated with the remaining socio-demographic

characteristics. Age was also significantly negatively correlated with perceived severity and perceived barriers to help-seeking, and positively correlated with perceived benefits of help-seeking and attitude towards help-seeking. Consequently, age was controlled for in regression analyses.

Small to medium sized significant correlations were observed between intention to seek help for cancer symptoms and symptom knowledge, perceived behavioural control, perceived norms, perceived benefits, and perceived barriers. Intention to seek help was not significantly correlated with attitudes towards help seeking, perceived susceptibility, and perceived severity. For completeness, all variables were retained in regression analyses for model testing.

Social cognitive predictors of help-seeking intentions

Three bootstrapped hierarchical multiple regressions were run to test the separate and combined predictive utility of the two models. In each analysis, average intention to seek help for cancer symptoms was the outcome variable. Age and symptom knowledge were entered and controlled in Step 1, and theory-derived variables were entered in Step 2. For the third regression (combined model), theory-derived variables were entered simultaneously in Step 2.

Age and symptom knowledge
Across all three bootstrapped regression models, age and symptom knowledge explained a significant 20% of

Table 1. Socio-demographic characteristics of participants (N = 127).

Characteristic	*n*	(%)
Area of residence:		
Metropolitan	92	(72.44)
Regional or remote	35	(27.56)
Relationship status:		
Single[†]	21	(16.54)
In a relationship	106	(83.46)
Sexual identity:		
Heterosexual	122	(96.06)
Gay or homosexual	3	(2.36)
Bisexual	2	(1.57)
Highest level of education completed:		
Primary education	1	(0.79)
Secondary education	28	(22.05)
Tertiary education	98	(77.17)
Work status:		
Employed (full or part-time)	91	(71.65)
Retired	31	(24.41)
Unemployed or other	5	(3.94)
Ethnicity:		
White	73	(57.48)
European	40	(31.50)
Asian	5	(3.94)
Mixed or other	9	(7.09)

[†]Single includes participants identifying as single, widowed, separated, and divorced.

Table 2. Means, standard deviations, and inter-correlations between age, symptom knowledge, and theory-derived variables (N = 127).

Variables	M (SD)	1	2	3	4	5	6	7	8	9	10
1. Age	54.99 (15.96)	-									
2. Symptom knowledge	9.07 (2.60)	.03	-								
3. Attitude to help-seeking	3.35 (0.68)	**.31****	−.04	-							
4. Perceived norms	4.28 (0.56)	.12	**.18***	−.07	-						
5. Perceived behavioural control	4.43 (0.63)	.16	.10	.14	**.31****	-					
6. Susceptibility	2.57 (0.77)	−.13	−.11	−.04	−.07	−.06	-				
7. Severity	3.05 (0.65)	**−.32****	**−.18***	−.07	−.12	**−.20***	**.39****	-			
8. Benefits	4.37 (0.52)	**.36****	.05	**.21***	**.31****	**.34****	−.15	−.16	-		
9. Barriers	2.03 (0.65)	**−.30****	−.10	−.13	**−.23***	**−.58****	**.28****	**.38****	**−.47****	-	
10. Intention to seek help	4.19 (0.71)	**.27****	**.36****	.12	**.23****	**.37****	.02	−.15	**.40****	**−.28****	-

* p < .05; ** p < .01.

the variance in intention to seek help for cancer symptoms, with a medium effect size, R^2 = .20, $F(2, 124)$ = 15.04, p < .001, f^2 = .25. Age (β = .26, p = .008) and symptom knowledge (β = .35, p = .003) were both significant predictors of the outcome, indicating that as age and symptom knowledge increased, intention to seek help also increased.

Theory of planned behaviour

In Step 2, adding the three Theory of Planned Behaviour variables explained an additional 10% of variance in help-seeking intention, $F_{Change}(3, 121)$ = 5.39, p = .002. Age (p = .04), symptom knowledge (p = .01), and perceived behavioural control (p = .001) significantly predicted help-seeking intentions controlling for other variables (see, Table 3 for standardised coefficients). The final model explained 29% of variance in intention to seek help for cancer symptoms, $F(5, 121)$ = 9.89, p < .001.

Health belief model

The four Health Belief Model variables entered in Step 2 explained an additional 12% of variance, $F_{Change}(4, 120)$ = 5.09, p = .001. Symptom knowledge (p = .003)

Table 3. Bootstrapped hierarchical multiple regressions of intention to seek help for cancer symptoms utilising a TPB-only model, HBM-only model, and combined theoretical model (N = 127) [†].

Predictor in Step 2 of regression	TPB β	HBM β	Combined β
Age	**.20***	.13	.14
Symptom knowledge	**.31***	**.34****	**.33****
Attitude to help-seeking	.04	-	.01
Perceived norms	.07	-	.01
Perceived behavioural control	**.28****	-	**.24****
Susceptibility	-	.15	.13
Severity	-	−.02	−.01
Benefits	-	**.30***	**.27***
Barriers	-	−.10	.04
R^2_{Change}	**.10****	**.12****	**.16****
Total variance explained (R^2)	**.29****	**.31****	**.35****
Effect size (f^2)	.41	.45	.54

[†]Bootstrapped results for coefficients reported based on 1000 bootstrap samples; TPB = Theory of Planned Behaviour; HBM = Health Belief Model.
* p < .05; ** p < .01.

and perceiving benefits of help-seeking (p = .01) significantly predicted intention to seek help after controlling for other variables. The final model explained a significant 31% of variance in intention to seek help, $F(6, 120)$ = 9.07, p < .001.

Combined model

With all variables entered in Step 2, an additional 16% of variance was explained, $F_{Change}(7, 117)$ = 4.03, p = .001. Symptom knowledge (p = .006), perceived behavioural control (p = .007), and perceiving benefits of help-seeking (p = .046) were significant predictors of help-seeking intentions controlling for other variables. The final model explained a significant 35% of variance in intention to seek help for cancer symptoms, $F(9, 117)$ = 7.05, p < .001.[2]

Discussion

This study examined the predictive power of the Theory of Planned Behaviour and Health Belief Model for the prediction of variance in men's intentions to seek help for cancer symptoms. The traditional models explained only a small amount of variance (10–12%) in men's help-seeking intentions after controlling for age and symptom knowledge, which suggests neither of the models sufficiently explain men's help-seeking intentions. This is in accordance, in part, with the meta-analysis conducted by McEachan et al. (2011), which highlighted low variance explained for detection behaviours (15%; e.g., general health check, cervical screening with healthcare professional, breast self-examination) by the Theory of Planned Behaviour.

Nevertheless, bootstrapped regression results indicated age and three psychological predictors were significantly correlated with help-seeking intentions; symptom knowledge, perceived behavioural control, and perceived benefits of help-seeking were positive predictors of men's intentions. This new evidence suggests that an individual's increasing age, their cancer awareness, their perception that visiting a doctor

would be beneficial, and their perception that they could easily access or attend medical services are important determinants of intending to seek help for cancer symptoms. The effect of age may also occur through psychological influences not included in this study, such as concern about health or greater familiarity with and trust in doctors (Hardie & Critchley, 2008; Robb et al., 2009). These results provide support for broader criticisms of the Theory of Planned Behaviour and other social cognitive models, which recommend applying extended models and call for the use of more complex explanatory models (e.g., Conner, 2015; Sniehotta et al., 2014).

Symptom knowledge was the strongest correlate of men's help-seeking intentions across regression models. This is consistent with a recent meta-analysis of 47 studies investigating psychological predictors of help-seeking intervals for cancer symptoms, which showed on average greater symptom knowledge was associated with a shorter help-seeking intervals among mixed-gender samples (Petrova et al., 2020). Consequently, interventions designed to improve help-seeking for cancer symptoms among men should aim to increase symptom knowledge.

The finding that perceived behavioural control was an important predictor of men's intentions to seek help for cancer symptoms is partly in contrast, however, to prior research on intentions to seek medical advice for sexual dysfunction within a cancer context (Hyde et al., 2020, 2016). Although these two studies observed associations between perceived behavioural control and intentions to seek help for sexual dysfunction among prostate cancer survivors, subjective norms and attitudes towards help-seeking were the strongest predictors of men's help-seeking intentions. This suggests the predictive strength of determinants is likely to vary across symptom- and disease-specific contexts among men.

Perceiving benefits to visiting a doctor for a cancer symptom was also significantly correlated with men's help-seeking intentions. This is in accordance with previous research conducted on a mixed-gender general population (Van Osch et al., 2007). Regression results for the combined model suggested that the predictive strength of perceived behavioural control and perceived benefits to help-seeking was comparable, suggesting future secondary cancer prevention interventions may usefully target both health and control beliefs.

Implications for practice

Increases in symptom knowledge, perceived benefits of help-seeking, and perceived behavioural control were reliably associated with increases in men's intentions to seek medical advice for cancer symptoms. This points to several important cognitive processes involved in men's help-seeking that have implications for practice.

First, healthcare systems are increasingly standardised, with limited access, consultation lengths, and individualised support (Ziebland et al., 2019). Addressing resource allocation within the healthcare system may improve access to healthcare professionals, which may increase perceived behavioural control among men. Considering many healthcare systems are overstretched and resources are limited, it may be more pragmatic if men can discuss health issues with primary care nurses in the first instance before making an appointment with a GP (Tookey et al., 2018). Men may feel more comfortable discussing bodily changes and potential symptoms with nurses than with GPs (Cromme et al., 2016), and nurses are well placed to have discussions with men about symptoms and provide advice about help-seeking (Skrobanski et al., 2019). Further research is required to understand how nurses can support men's help-seeking and to develop professional development resources to ensure nurses have the required knowledge and skills.

Interventions that target patients and GPs may be beneficial. GPs may require training in effective and responsive communication that aids appropriate help-seeking among men, which would be usefully implemented in combination with public cancer awareness campaigns that target health and behavioural beliefs (Tookey et al., 2018). For example, interventions designed to increase perceived behavioural control may attempt to change existing control beliefs (e.g., "work commitments would make it difficult for me to visit a doctor") or introduce new salient beliefs (e.g., "after hours clinic appointments would enable me to visit a doctor"[Conner & Sparks, 2005]).

Finally, previous research has highlighted that many men informally disclose symptoms to spouses and family members before seeking professional medical advice (Fish et al., 2015). Consequently, secondary cancer prevention campaigns may valuably target men's families to improve symptom knowledge, introduce new salient beliefs about the benefits of help-seeking for cancer symptoms, and to advocate for men to seek help (Robertson et al., 2008). For example, the Stand by Your Man intervention run by Prostate Cancer UK (2014) asked women to support the men in their lives by increasing knowledge about warning signs, early diagnosis, and treatment.

Study limitations

The limitations of this study should be considered when interpreting the results. The extent to which

anticipated behaviour within hypothetical scenarios reflects actual behaviour when cancer symptoms are experienced is unknown, although meta-analyses suggest a weak relationship between intention and health-related behaviour (Rhodes & Dickau, 2012; Webb & Sheeran, 2006). Nonetheless, exploring predictors of behavioural intention is a commonly used approach in help-seeking and health behaviour research (De Nooijer et al., 2003; Smith et al., 2008).

High self-reported intention in the current study might indicate unrealistic optimism about help-seeking behaviour, high cognisance of symptoms that could be indicative of cancer, or a high level of health concern. In this case, results may not reflect the views of men who do not seek help. A related limitation was the lack of sociodemographic diversity in the sample. Participants were predominantly White or European, highly educated, employed, heterosexual, urban-dwelling, and in a relationship. Findings may not generalise to men from other ethnic backgrounds, single men, men living in rural areas, or men from various sexual- or gender-diverse backgrounds. However, the sample achieved in this study enabled the adequate exploration of these models in the context of men's help-seeking, noting that men are typically more difficult to engage in research than women (e.g., Korkeila et al., 2001), and willingness to seek help could be considered a sensitive topic for some men (Courtenay, 2000).

Conclusions

Men's self-reported intention to seek help for cancer symptoms was insufficiently explained by the Theory of Planned Behaviour and Health Belief Model. However, several social cognitive processes were associated with men's intentions to seek help for cancer symptoms. Symptom knowledge was the most influential factor associated with men's help-seeking intentions, in comparison to social cognitive and demographic variables. Perceived benefits of help-seeking and perceived behavioural control were also important correlates. These constructs should be investigated further through longitudinal or experimental studies to produce the high-level evidence required to inform intervention design.

Notes

1. Results for female participants are provided in Supplementary Materials.
2. A more refined model was also tested that included only significant predictors from the first two regression models (i.e., age, symptom knowledge, perceived benefits, and perceived behavioural control). The refined model

explained 34% of variance in men's intentions to seek help and the same significant predictors were observed. These supplementary results show that the large number of variables included in the combined theoretical regression did not inflate the variance explained. The full combined theoretical model is reported for completeness.

ORCID

Jennifer A. Fish ⓘD http://orcid.org/0000-0002-9795-3152
Ivanka Prichard ⓘD http://orcid.org/0000-0001-8892-9129

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alto, K. M., McCullough, K. M., & Levant, R. F. (2018). Who is on Craigslist? A novel approach to participant recruitment for masculinities scholarship. *Psychology of Men & Masculinity*, *19*(2), 319–324. https://doi.org/10.1037/men0000092

Armitage, C. J., & Conner, M. (2000). Social cognition models and health behaviour: A structured review. *Psychology & Health*, *15*(2), 173–189. https://doi.org/10.1080/08870440008400299

Australian Bureau of Statistics. (2017). *Australians pursuing higher education in record numbers*. Media release.

Australian Institute of Health and Welfare. (2011). *The health of Australia's males (Cat. no. PHE 141)*.

Australian Institute of Health and Welfare. (2019). *The health of Australia's males (Cat. no: WEB 199)*.

Australian Institute of Health and Welfare. (2021). *Cancer in Australia 2021. Cancer series no. 133 (Cat. No. CAN 144)*.

Bish, A., Sutton, S., & Golombok, S. (2000). Predicting uptake of a routine cervical smear test: A comparison of the health belief model and the theory of planned behaviour. *Psychology & Health*, *15*(1), 35–50. https://doi.org/10.1080/08870440008400287

Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. (2018). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36

cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, *68*(6), 394–424. https://doi.org/10.3322/caac.21492

Cancer Council SA. (2015). *I want to cut my cancer risk: Finding cancer early*. https://www.cancersa.org.au/information/i-want-to-cut-my-cancer-risk/finding-cancer-early

Carbone, S., Walker, G. A., Burney, S., & Newton, F. (2009). The symptom recognition and help-seeking experiences of men in Australia with testicular cancer: A qualitative study. *Qualitative Research Journal*, *9*(1), 43–59. https://doi.org/10.3316/QRJ0901043

Carpenter, C. J. (2010). A meta-analysis of the effectiveness of Health Belief Model variables in predicting behavior. *Health Communication*, *25*(8), 661–669. https://doi.org/10.1080/10410236.2010.521906

Champion, V. L. (1984). Instrument development for health belief model constructs. *Advances in Nursing Science*, *6*(3), 73–85. https://doi.org/10.1097/00012272-198404000-00011

Conner, M. (2015). Extending not retiring the theory of planned behavior: A commentary on Sniehotta, Presseau and Araújo-Soares. *Health Psychology Review*, *9*(2), 141–145. https://doi.org/10.1080/17437199.2014.899060

Conner, M., & Norman, P. (2015). Predicting and changing health behaviour: A social cognition approach. In M. Conner, and P. Norman (Eds.), *Predicting and changing health behaviour: Research and practice with social cognition models* (3rd ed., pp. 1–29). Open University Press.

Conner, M., & Sparks, P. (2005). Theory of planned behaviour and health behaviour. In M. Conner, and P. Norman (Eds.), *Predicting health behaviour: Research and practice with social cognition models* (2nd ed., pp. 170–222). Open University Press.

Cornally, N., & McCarthy, G. (2011). Help-seeking behaviour: A concept analysis. *International Journal of Nursing Practice*, *17*(3), 280–288. https://doi.org/10.1111/j.1440-172X.2011.01936.x

Courtenay, W. H. (2000). Constructions of masculinity and their influence on men's well-being: A theory of gender and health. *Social Science & Medicine*, *50*(10), 1385–1401. https://doi.org/10.1016/S0277-9536(99)00390-1

Cromme, S. K., Whitaker, K. L., Winstanley, K., Renzi, C., Smith, C. F., & Wardle, J. (2016). Worrying about wasting GP time as a barrier to help-seeking: A community-based, qualitative study. *British Journal of General Practice*, *66*(648), e474–e482. https://doi.org/10.3399/bjgp16X685621

de Nooijer, J., Lechner, L., & de Vries, H. (2002). Early detection of cancer: Knowledge and behavior among Dutch adults. *Cancer Detection and Prevention*, *26*(5), 362–369. https://doi.org/10.1016/S0361-090X(02)00121-6

de Nooijer, J., Lechner, L., & de Vries, H. (2003). Social psychological correlates of paying attention to cancer symptoms and seeking medical help. *Social Science & Medicine*, *56*(5), 915–920. https://doi.org/10.1016/s0277-9536(02)00098-9

Evans, R. E. C., Brotherstone, H., Miles, A., & Wardle, J. (2005). Gender differences in early detection of cancer. *Journal of Men's Health & Gender*, *2*(2), 209–217. https://doi.org/10.1016/j.jmhg.2004.12.012

Ferlay, J., Ervik, M., Lam, F., Colombet, M., Mery, L., Piñeros, M., & Bray, F. (2018). *Global Cancer Observatory: Estimated incidence, mortality and prevalence in Australia*. International Agency for Research on Cancer. https://gco.iarc.fr/today/fact-sheets-populations

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. SAGE.

Fish, J. A., Prichard, I., Ettridge, K., Grunfeld, E. A., & Wilson, C. (2015). Psychosocial factors that influence men's help-seeking for cancer symptoms: A systematic synthesis of mixed methods research. *Psycho-Oncology*, *24*(10), 1222–1232. https://doi.org/10.1002/pon.3912

Fish, J. A., Prichard, I., Ettridge, K., Grunfeld, E. A., & Wilson, C. (2019). Understanding variation in men's help-seeking for cancer symptoms: A semi-structured interview study. *Psychology of Men & Masculinities*, *20*(1), 61–70. https://doi.org/10.1037/men0000152

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press.

Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, *31*, 399–418. https://doi.org/10.1146/annurev.publhealth.012809.103604

Hannaford, P. C., Thornton, A. J., Murchie, P., Whitaker, K. L., Adam, R., & Elliot, A. M. (2020). Patterns of symptoms possibly indicative of cancer and associated help-seeking behaviour in a large sample of United Kingdom residents – The USEFUL study. *PLoS ONE*, *15*(1), e0228033. https://doi.org/10.1371/journal.pone.0228033

Hardie, E. A., & Critchley, C. R. (2008). Public perceptions of Australia's doctors, hospitals and health care systems. *Medical Journal of Australia*, *189*(4), 210–214. https://doi.org/10.5694/j.1326-5377.2008.tb01985.x

Hunter, M. S., Grunfeld, E. A., & Ramirez, A. J. (2003). Help-seeking intentions for breast-cancer symptoms: A comparison of the self-regulation model and the theory of planned behaviour. *British Journal of Health Psychology*, *8*(3), 319–333. https://doi.org/10.1348/135910703322370888

Hyde, M. K., Opozda, M., Laurie, K., Vincent, A. D., Oliffe, J. L., Nelson, C. J., & Chambers, S. K. (2020). Men's sexual help-seeking and care needs after radical prostatectomy or other non-hormonal, active prostate cancer treatments. *Supportive Care in Cancer*, *29*, 2699–2711. https://doi.org/10.1007/s00520-020-05775-5

Hyde, M. K., Zajdlewicz, L., Wootten, A. C., Nelson, C. J., Lowe, A., Dunn, J., & Chambers, S. K. (2016). Medical help-seeking for sexual concerns in prostate cancer survivors. *Sexual Medicine*, *4*(1), e7–e17. https://doi.org/10.1016/j.esxm.2015.12.004

Korkeila, K., Suominen, S., Ahvenainen, J., Ojanlatva, A., Rautava, P., Helenius, H., & Koskenvuo, M. (2001). Non-response and related factors in a nation-wide health survey. *European Journal of Epidemiology*, *17*, 991–999. https://doi.org/10.1023/a:1020016922473

McEachan, R. R. C., Conner, M., Taylor, N. J., & Lawton, R. J. (2011). Prospective prediction of health-related behaviours with the Theory of Planned Behaviour: A meta-analysis. *Health Psychology Review*, *5*(2), 97–144. https://doi.org/10.1080/17437199.2010.521684

Neal, R. D., Tharmanathan, P., France, B., Din, N. U., Cotton, S., Fallon-Ferguson, J., & Emery, J. (2015). Is increased time to diagnosis and treatment in symptomatic cancer 285 associated with poorer outcomes? Systematic review. *British Journal of Cancer*, *112*, S92–S107. https://doi.org/10.1038/bjc.2015.48
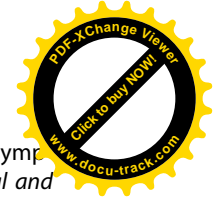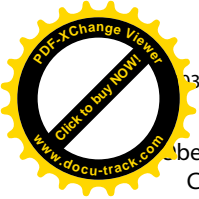
Oberoi, D. V., Jiwa, M., McManus, A., & Hodder, R. (2014). Colorectal cancer: Applying a gender lens. *Quality in Primary Care*, *22*, 71–79. http://primarycare.imedpub.com/

Oberoi, D. V., Jiwa, M., McManus, A., Hodder, R., & de Nooijer, J. (2016). Help-seeking experiences of men diagnosed with colorectal cancer: A qualitative study. *European Journal of Cancer Care*, *25*(1), 27–37. https://doi.org/10.1111/ecc.12271

Ogden, J. (2015). Time to retire the theory of planned behaviour?: One of us will have to go! A commentary on Sniehotta, Presseau and Araújo-Soares. *Health Psychology Review*, *9*(2), 165–167. https://doi.org/10.1080/17437199.2014.898679

Oliffe, J. L., Rossnagel, E., Bottorff, J. L., Chambers, S. K., Caperchione, C., & Rice, S. M. (2020). Community-based men's health promotion programs: Eight lessons learnt and their caveats. *Health Promotion International*, *35*(5), 1230–1240. https://doi.org/10.1093/heapro/daz101

Parent, M. C. (2013). Handling item-level missing data: Simpler is just as good. *The Counseling Psychologist*, *41*(4), 568–600. https://doi.org/10.1177/0011000012445176

Petrova, D., Okan, Y., Salamanca- Fernández, E., Domínguez-López, S., Sánchez, M.-J., & Rodríguez-Barranco, M. (2020). Psychological factors related to time to help-seeking for cancer symptoms: A meta-analysis across cancer sites. *Health Psychology Review*, *14*(2), 245–268. https://doi.org/10.1080/17437199.2019.1641425

Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2014). Choosing the number of categories in agree–disagree scales. *Sociological Methods & Research*, *43*(1), 73–97. https://doi.org/10.1177/0049124113509605

Rhodes, R. E., & Dickau, L. (2012). Experimental evidence for the intention–behavior relationship in the physical activity domain: A meta-analysis. *Health Psychology*, *31*(6), 724–727. https://doi.org/10.1037/a0027290

Robb, K., Stubbings, S., Ramirez, A., Macleod, U., Austoker, J., Waller, J., & Wardle, J. (2009). Public awareness of cancer in Britain: A population-based survey of adults. *British Journal of Cancer*, *101*, S18–S23. https://doi.org/10.1038/sj.bjc.6605386

Robertson, L. M., Douglas, F., Ludbrook, A., Reid, G., & van Teijlingen, E. (2008). What works with men? A systematic review of health promoting interventions targeting men. *BMC Health Services Research*, *8*(1), 1–9. https://doi.org/10.1186/1472-6963-8-141

Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. *Health Education Monographs*, *2*(4), 328–335. https://doi.org/10.1177/109019817400200403

Saab, M. M., Landers, M., & Hegarty, J. (2017). Exploring awareness and help-seeking intentions for testicular symptoms among heterosexual, gay, and bisexual men in Ireland: A qualitative descriptive study. *International Journal of Nursing Studies*, *67*, 41–50. https://doi.org/10.1016/j.ijnurstu.2016.11.016

Scott, S., & Walter, F. (2010). Studying help-seeking for symptoms: The challenges of methods and models. *Social and Personality Psychology Compass*, *4*(8), 531–547. https://doi.org/10.1111/j.1751-9004.2010.00287.x

Scott, S., Walter, F., Webster, A., Sutton, S., & Emery, J. (2013). The model of pathways to treatment: Conceptualization and integration with existing theory. *British Journal of Health Psychology*, *18*(1), 45–65. https://doi.org/10.1111/j.2044-8287.2012.02077.x

Skrobanski, H., Ream, E., Poole, K., & Whitaker, K. L. (2019). Understanding primary care nurses' contribution to cancer early diagnosis: A systematic review. *European Journal of Oncology Nursing*, *41*, 149–164. https://doi.org/10.1016/j.ejon.2019.06.007

Smith, J. P., Tran, G. Q., & Thompson, R. D. (2008). Can the theory of planned behavior help explain men's psychological help-seeking? Evidence for a mediation effect and clinical implications. *Psychology of Men & Masculinity*, *9*(3), 179–192. https://doi.org/10.1037/a0012158

Sniehotta, F. F., Presseau, J., & Araújo-Soares, V. (2014). Time to retire the theory of planned behaviour. *Health Psychology Review*, *8*(1), 1–7. https://doi.org/10.1080/17437199.2013.869710

Stubbings, S., Robb, K., Waller, J., Ramirez, A., Austoker, J., Macleod, U., & Wardle, J. (2009). Development of a measurement tool to assess public awareness of cancer. *British Journal of Cancer*, *101*, S13–S17. https://doi.org/10.1038/sj.bjc.6605385

Tookey, S., Renzi, C., Waller, J., von Wagner, C., & Whitaker, K. L. (2018). Using the candidacy framework to understand how doctor-patient interactions influence perceived eligibility to seek help for cancer alarm symptoms: A qualitative interview study. *BMC Health Services Research*, *18*(1), 1–8. https://doi.org/10.1186/s12913-018-3730-5

van Osch, L., Lechner, L., Reubsaet, A., de Nooijer, J., & de Vries, H. (2007). Passive cancer detection and medical help seeking for cancer symptoms: (in)adequate behavior and psychosocial determinants. *European Journal of Cancer Prevention*, *16*(3), 266–274. https://doi.org/10.1097/01.cej.0000236241.10125.00

Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, *132*(2), 249–268. https://doi.org/10.1037/0033-2909.132.2.249

Wright, D. B., London, K., & Field, A. P. (2011). Using bootstrap estimation and the plug-in principle for clinical psychology data. *Journal of Experimental Psychopathology*, *2*(2), 252–270. https://doi.org/10.5127/jep.013611

Ziebland, S., Rasmussen, B., MacArtney, J., Hajdarevic, S., & Sand Andersen, R. (2019). How wide is the Goldilocks Zone in your health system? *Journal of Health Services Research & Policy*, *24*(1), 52–56. https://doi.org/10.1177/1355819618790985