

Psychosocial factors that influence men's help-seeking for cancer symptoms: A systematic synthesis of mixed methods research

Fish, J.A. , Prichard, I. , Ettridge, K. , Grunfeld, E. A. and Wilson, C.

Author post-print (accepted) deposited by Coventry University's Repository

Original citation & hyperlink:

Fish, J.A. , Prichard, I. , Ettridge, K. , Grunfeld, E. A. and Wilson, C. (2015) Psychosocial factors that influence men's help-seeking for cancer symptoms: A systematic synthesis of mixed methods research. *Psycho-Oncology*, volume 24 (10): 1222-1232

<http://dx.doi.org/10.1002/pon.3912>

DOI 10.1002/pon.3912

ISSN 1057-9249

ESSN 1099-1611

Publisher: Wiley

This is the peer reviewed version of the following article: Fish, J.A. , Prichard, I. , Ettridge, K. , Grunfeld, E. A. and Wilson, C. (2015) Psychosocial factors that influence men's help-seeking for cancer symptoms: A systematic synthesis of mixed methods research. *Psycho-Oncology*, volume 24 (10): 1222-1232, which has been published in final form at <http://dx.doi.org/10.1002/pon.3912>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving.

Copyright © and Moral Rights are retained by the author(s) and/ or other copyright owners. A copy can be downloaded for personal non-commercial research or study, without prior permission or charge. This item cannot be reproduced or quoted extensively from without first obtaining permission in writing from the copyright holder(s). The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the copyright holders.

This document is the author's post-print version, incorporating any revisions agreed during the peer-review process. Some differences between the published version and this version may remain and you are advised to consult the published version if you wish to cite from it.

Psychosocial factors that influence men's help-seeking for cancer symptoms: A systematic synthesis of mixed methods research

Ms Jennifer A. Fish*, BPsych (Hons)

PhD Candidate,

Flinders Centre for Innovation in Cancer,

School of Medicine,

Flinders University

Postal address: GPO Box 2100, Adelaide, South Australia 5001

E-mail address: fish0133@flinders.edu.au

t +61 424 188817

*Corresponding author

Dr Ivanka Prichard, BBehSc (Hons), PhD

Lecturer, Social Health Sciences,

School of Health Sciences,

Flinders University

Dr Kerry Ettridge, BPsych (Hons), PhD

Senior Research Officer,

Population Health Research Group,

South Australian Health & Medical Research Institute

Prof Elizabeth A. Grunfeld, BSc, MSc, PhD

Professor of Health Psychology,

Faculty of Health & Life Sciences,

Coventry University

Prof Carlene Wilson, BA (Hons), PhD, MBA

Cancer Council SA Chair in Cancer Prevention (Behavioural Science),

Flinders Centre for Innovation in Cancer,

School of Medicine,

Flinders University

Abstract

Objective: Effectiveness of cancer control partly depends upon early identification and treatment. Men appear to be more likely to delay help-seeking for symptoms, resulting in later diagnosis. This review aims to provide a mixed research synthesis of the psychosocial barriers to and facilitators of help-seeking for cancer symptoms among men.

Methods: Systematic methods were followed, including a predefined research question and search strategy. Searches retrieved 7131 international records from online databases: MEDLINE (n=3011), PubMed (n=471), SCOPUS (n=896), Informit (n=131), PsychINFO (n=347), and Web of Science (n=2275). Forty studies were eligible for inclusion in the review (25 qualitative studies, 11 quantitative studies, and four mixed-method studies).

Results: There was strong observational evidence for several psychosocial barriers to men's help-seeking behaviour: low cancer knowledge and inaccurate symptom interpretation, embarrassment and fear, and conformity to masculine gender role norms. The strongest facilitating factor associated with men's help-seeking behaviour was encouragement and support of spouses and family members. The majority of research was qualitative and used small samples, making generalisations to the wider population difficult.

Conclusions: Men's help-seeking for cancer symptoms is influenced by several psychosocial factors, which in part, may be gender-specific. Health promotion initiatives to improve help-seeking behaviour among men should aim to increase cancer knowledge, reduce embarrassment and fear, address social norms deterring timely help-seeking, and acknowledge informal help-seeking with spouses and family members. Increasing the theoretical grounding of research could aid cohesion across the research area and the design of effective health promotion interventions.

Keywords: cancer, oncology, help-seeking, gender, systematic review

Background

Cancer is one of the leading causes of death, with over 8 million cancer deaths recorded in 2012 [1]. The impact of cancer is significant, affecting individuals and families, as well as the broader community and healthcare system. Prevention strategies may reduce the burden of cancer, including early detection and treatment [2], which have been associated with improved prognosis [3]. Early detection may be achieved through asymptomatic cancer screening or early diagnosis following timely medical help-seeking for symptoms.

There has been increasing concern regarding late diagnosis of cancer in men. Research has shown that a considerable proportion of men delay help-seeking for male-specific cancers, including prostate [4, 5], testicular [6, 7], and penile [8] cancers. Although evidence has been mixed, some studies have also found men to delay medical help-seeking significantly more than women for non-gender specific cancers [9-12]. Consequently, there has been increased research interest in the medical help-seeking behaviour of men, as well as the psychosocial predictors of their help-seeking for cancer symptoms.

Medical help-seeking behaviour has been conceptualised in a variety of ways [13, 14]. Stage process models of help-seeking theorise that help-seeking behaviour involves problem perception, problem appraisal, decision-making, and intentional action [14]. It has also been proposed that help-seeking must include interpersonal communication, which may be with a formal (i.e., healthcare professional) or informal (e.g., family or friends) source [13]. Theoretically, each stage of the help-seeking process is influenced by a variety of psychosocial factors that vary according to stage of process [14]. Psychosocial factors may be risk factors for delayed help-seeking (i.e., barriers) or protective factors for timely help-seeking behaviour (i.e., facilitators) [14].

This paper conceptualises help-seeking according to the Aarhus statement [15], which was developed to guide the design and interpretation of research concerned with early diagnosis of cancer. The Aarhus statement defines the ‘patient interval’ as the time from when bodily changes/symptoms are noticed by an individual until the date of first presentation to a clinician. This time period is divided into an ‘appraisal interval’ and a ‘help-seeking interval’. The help-seeking interval occurs from the moment a bodily change/symptom is interpreted as requiring medical advice until the act of seeking medical help with a healthcare professional. The help-seeking interval is therefore differentiated from the appraisal interval (i.e., individual detects and interprets bodily changes) but also subsumes it. This review considers psychosocial factors that impact on both appraisal and help-seeking intervals, but not the appraisal interval solely.

Over the past decade a number of reviews have been published in this area. Although informative, previous reviews have predominantly been either too broad or narrow in scope. For example, Galdas and colleagues [16] reviewed factors that influence men’s health-related help-seeking behaviour. They found evidence from male-specific literature supporting

traditional masculinity as a key factor influencing help-seeking behaviour. Yousaf and colleagues' [17] systematic review of barriers associated with men's medical and psychological help-seeking found restricted emotional expression, embarrassment, anxiety, and fear to be the strongest barriers to help-seeking [17]. Both reviews impart insights into men's health-related help-seeking behaviour broadly, but neither provides a comprehensive review of male help-seeking specifically for cancer symptoms. Arguably, help-seeking for cancer symptoms may be distinctive due to perceptions about disease severity and the ambiguity of some warning signs (e.g., fatigue and unusual weight loss).

Other reviews have explored the factors influencing help-seeking for cancer symptoms, but have been narrow in focus. For instance, reviews have explored psychosocial factors associated with help-seeking without a gender analysis [18, 19], have examined male-specific help-seeking for specific forms of cancer [20, 21], examined only qualitative evidence [22], or selectively examined the research literature (i.e., review was not systematic) [9]. In order to advance research, inform cancer prevention initiatives, and facilitate early diagnosis of cancer in men, a comprehensive systematic review is needed. Accordingly, the aim of this review was to present a mixed research synthesis of the psychosocial barriers to and facilitators of help-seeking for cancer symptoms among men. The primary research question was: what are the psychosocial factors that influence medical help-seeking for cancer symptoms in men?

Methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was followed in reporting for this review [23]. The research question, concepts, search strategy, and selection criteria were predefined, and methods for data analysis, critical appraisal, and synthesis were outlined following confirmation of the types of research included in the review.

Search strategy

Research concepts were defined to examine the psychosocial factors that influence medical help-seeking for cancer symptoms in men, and included "cancer", "help-seeking", and "males". A search strategy was developed in consultation with a medical research librarian to increase search sensitivity. The following search string was adapted for six core databases: (cancer* OR oncolog* OR tumour* OR tumor* OR carcinoma* OR malignan* OR neoplas* OR melanoma* OR sarcoma* OR leukemia* OR leukaemia*) AND (helpseeking OR help-seeking OR self-refer* OR patient delay OR patient lag OR delayed diagnosis OR awareness OR ((healthcare* OR care* OR help* OR service*) adj3 (seek* OR participat* OR acceptance OR uptake OR utilisation))) AND (men OR male OR males OR gender* OR manhood OR masculin*) AND LANGUAGE (English). Databases included MEDLINE (from 1946-), PubMed (excluding MEDLINE; from 1946-), SCOPUS (Social Sciences and Humanities subject areas; from 1823-), PsychINFO (from 1806-), Informit

(temporal coverage unknown), and Web of Science (SCI-EXP and SSCI; from 1900-). The search was performed on 12th March 2014.

Selection criteria

Studies were included if they examined real or anticipated help-seeking behaviour in the context of cancer symptoms, and investigated psychosocial factors associated with help-seeking behaviour in men. Both gender comparative studies and studies sampling males exclusively were eligible for inclusion in the review, as well as studies using mixed-samples (e.g., prostate disease including prostate cancer) or sampling the general population. All methodologies and methods were included.

For all searches, an automatic exclusion restricted papers to English language. Manual exclusion criteria included female-only studies, studies in which male specific results could not be extracted, studies with a majority of participants under the age of 18 years, case studies, reviews, commentaries, and conference abstracts. Studies that examined the pathway to treatment broadly were included; as well as studies that examined appraisal and help-seeking intervals concurrently. Studies that examined the appraisal interval solely were excluded. In addition, studies that examined cancer prevention broadly or cancer screening solely were excluded.

Study selection

In total, 7131 records were retrieved from searches on MEDLINE (n=3011), PubMed (n=471), SCOPUS (n=896), Informit (n=131), PsychINFO (n=347) and Web of Science (n=2275; see Figure 1 for PRIMSA diagram). The number of records totalled 5873 following removal of duplicates. All titles and abstracts were screened for relevance according to the inclusion and exclusion criteria, resulting in 5686 being excluded. Of the 188 full-text articles assessed for potential eligibility, 152 were excluded with reasons recorded and 36 were included in this review.

A forwards and backwards reference search was carried out on all included studies on MEDLINE, SCOPUS, and Web of Science, as well as searching of digital theses, reference lists of relevant reviews, and an author search. All titles and abstracts were screened for relevance according to the inclusion and exclusion criteria. An additional four articles were identified for this review through further searching.

Data synthesis

Data extraction and synthesis were conducted by the first author. All included studies were imported into NVivo 10 (QSR International Pty Ltd), and relevant findings were extracted and detailed according to research method (e.g., qualitative or quantitative; Supplementary Tables 1 and 2 respectively). For mixed-method studies, findings were extracted and reported according to the relevant method (i.e., qualitative or quantitative) [24]. Qualitative and quantitative findings were synthesised separately and according to factor type

(i.e., barrier or facilitator). A barrier was defined as a risk factor associated with delayed medical help-seeking, whereas a facilitator was defined as a protective factor associated with timely medical help-seeking. Qualitative and quantitative findings were integrated during interpretation and discussion.

Critical appraisal

Studies were critically appraised for methodological quality, using three adapted critical appraisal instruments specifically designed for each method. Items were predominantly taken from the Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields [25], supplemented with items and detail from the Evaluation Tool for Qualitative Studies [26], and guidelines provided by O’Cathain and colleagues [27]. An average quality rating score was calculated for each study (score range 0-1) [25]. A score $\leq .50$ was considered low quality, and indicated a substantial number of checklist criteria had not been fulfilled. A score between $.51$ and $.80$ was considered medium quality and a score $> .80$ was considered high quality. To assess inter-rater reliability, a subset of included articles ($n=13$) were critically appraised by the first author and an independent research associate. A good level of inter-rater reliability was observed using a single-measures intraclass correlation ($ICC=.74$, 95% CI $[.35, .91]$) [28]. To improve reliability, discrepancies in item scoring were discussed and appraisal instruments were revised by the first author, followed by independent critical appraisal for the same studies by both researchers. An excellent level of inter-rater reliability was found on the second set of scores ($ICC=.86$, 95% CI $[.60, .96]$), and the remaining studies were appraised for quality by the first author. Quality judgements are reported as supplementary information for synthesis and interpretation of findings. No studies were excluded or weighted in the results on the basis of quality scores.

Results

Forty studies were included in the review (25 qualitative, 11 quantitative, and four mixed-method). Methodological heterogeneity was high across studies. Qualitative evidence was extracted from 25 qualitative studies and three mixed-method studies (Supplementary Table 1). Qualitative research methods included interview ($n=20$), focus group ($n=3$), and focus group plus interview ($n=2$). Quantitative evidence was extracted from 11 quantitative studies and one mixed-method study (Supplementary Table 2). All quantitative research methods were observational; research methods included survey/ structured interview ($n=11$), and clinical data analysis ($n=1$). Research objectives and outcomes (e.g., recall of actual help-seeking behaviour vs. anticipated help-seeking behaviour) differed across studies, and consequently, statistical and analytical heterogeneity were also high. The majority of articles were rated as medium quality ($n=25$), with 14 rated as high quality, and one qualitative study rated as low quality (Supplementary Tables 1 and 2). Higher quality ratings indicate more rigorous methodology and relevant results [29].

The characteristics of the studies and samples were varied (Supplementary Tables 1 and 2). Research was conducted in a range of locations, including Europe (n=29), Australia/New Zealand (n=6), USA (n=4), and Iran (n=1). The majority of research conducted in Europe was done in the United Kingdom/Ireland (n=20), with the remaining studies predominantly conducted in high-income countries from Western Europe. Samples varied according to size (qualitative range: 6-115, quantitative range: 23-2208), gender (male-only n=24, mixed-gender n=16), age (range: 15-92+ years), cancer site (male-specific and non-gender specific cancers), and diagnostic cut-off period (for retrospective studies). Ethnicity of participants was infrequently reported across studies.

A range of psychosocial barriers and facilitators were associated with men's help-seeking for cancer symptoms (Supplementary Tables 3 and 4). Psychosocial factors were categorised according to themes: knowledge and awareness of cancer (i.e., previously knowing about cancer and symptoms), symptom recognition and interpretation (i.e., noticing and explaining bodily changes/symptoms), emotions (i.e., feelings towards a situation), attitudes (i.e., learned response to people and situations) and health beliefs (i.e., beliefs about health problems), coping processes (i.e., ways of dealing with stressors), social norms (i.e., group expectations about group members' behaviour), social support (i.e., resources provided by others to assist with coping), family and relationship health, and health system factors (i.e., how a system operates and is perceived to operate by individuals) [30].

Qualitative synthesis

Psychosocial barriers to help-seeking

Knowledge and awareness of cancer symptoms were associated with men's help-seeking behaviour, with a low level of cancer awareness or knowledge associated with delayed help-seeking for cancer symptoms in twelve studies [6, 31-41]. This barrier was found across a range of cancer samples, including prostate [34, 36, 41], testicular [6, 32, 38], male breast [35], and head and neck [33] cancer. Low level of risk perception was also found to be a barrier in one study [40].

Symptom recognition and appraisal were commonly found to influence men's help-seeking behaviour. Symptom mildness and/or a gradual progression in symptom were associated with delayed help-seeking in seven studies [32, 34-36, 42-44]. Another related barrier was symptom misattribution, with eight studies reporting that some respondents initially attributed their symptoms to benign conditions [32, 33, 38, 42-46]. Other symptom related barriers to help-seeking were uncertainty regarding symptom [38], sporadic symptoms [43, 46], low level of attentiveness to body or health [47], previous benign diagnosis [43], trivialisation of symptoms [41], absence of an additional symptom [43], and the location of symptom [46].

Emotional factors were negatively associated with men's help-seeking behaviour. Thirteen studies found feelings of embarrassment and/or shame to be barriers to help-seeking

for cancer symptoms [6, 31, 32, 34, 37, 38, 42-44, 46, 48-50], predominantly in male-specific cancers such as testicular [6, 32, 38, 42, 44, 46, 48] and prostate cancer [34, 37, 49, 50]. Fear and anxiety were associated with delayed help-seeking in seven studies [6, 31, 36, 40, 42, 44, 51]. Specific fears reported across studies included: cancer [31, 36, 40, 44], health professionals [31, 36], examination [36, 42], treatment or treatment side effects [36, 42, 44], hospitalisation [36], and perceived hypochondria [42, 51]. Other concerns included examination in a sacred area of the body for Maori men [50], and body image in men affected by testicular cancer [32, 44].

Attitudes and health beliefs were associated with men's help-seeking behaviour. Conflicting responsibilities were associated with men's delayed help-seeking in seven studies, suggesting a low prioritisation of health among some males [32, 40, 42, 43, 47, 50, 52]. Five studies described employment as impacting on help-seeking [32, 42, 47, 50, 52]; men were aware of their symptoms but were too busy to visit the doctor, were too busy to detect symptoms, or there was pressure from within the workplace to continue working. One study reported family responsibility as impeding help-seeking [32]. Optimism was a barrier to help-seeking in seven studies; some men believed their symptoms would go away without intervention [32, 38, 40, 43, 46, 48, 50]. Other barriers to help-seeking were fatalism [31, 42, 53], and beliefs that cancer affects older people [32, 38] or would never happen to them [54]. Two coping strategies were associated with delayed help-seeking: denial [6, 38, 41, 53] and avoidant coping [36, 52].

Social normative factors were frequently reported as barriers to men's help-seeking. Thirteen studies reported at least one masculine gender role norm as inhibiting appropriate help-seeking behaviour [31, 36, 38-40, 42-44, 48-51, 55]. The most commonly reported masculine gender role norm influencing help-seeking was machismo [31, 36, 39, 40, 42, 49-51]; men who wanted to appear strong and in control feared appearing weak if they sought help. Additional masculine gender role norms that negatively impacted on help-seeking behaviour were stoicism [43, 55] and self-reliance [31, 41, 43, 53]. The perception of health as a feminine issue also appeared to delay help-seeking for cancer symptoms among men in eight studies [31, 36, 39, 44, 47, 49, 51, 52]. Other social normative factors included difficulty with communication due to social norms [37, 40], taboos around men's health and discussing health [38, 51], the marginalisation of men's health [38], and social status of symptom (e.g., prostate symptoms were perceived as less serious than other symptoms, such as heart symptoms) [36].

Two social support factors were found to influence men's help-seeking behaviour. Emotional protection of others was found to be a barrier, with respondents indicating that they did not want to burden their families with a potential illness [34, 38]. Disclosing symptoms to others was a barrier in three studies [38, 41, 43], with friends reassuring respondents that their symptoms were normal or benign in two studies [38, 41].

Cultural factors were seldom explored across studies. Four of the included qualitative studies explicitly examined ethnicity as a factor related to help-seeking for cancer symptoms [37, 40, 50, 56]. Absence of culturally sensitive healthcare and information were found to inhibit help-seeking among Maori [50] and Aboriginal and/or Torres Strait Islander men [37]. Maori men affected by prostate symptoms reported reservations about being examined in a sacred area of the body and did not feel culturally safe in seeking help [50]. Machismo was reportedly a greater barrier to help-seeking for Irish men in comparison to White British men [40].

Health system and service factors associated with delayed help-seeking included perceived lack of access [6, 41], inadequate culturally appropriate healthcare and information [37, 50], perceived long wait times and short appointments [31, 40], concerns about confidentiality [37], and concerns regarding loss of dignity or respect with healthcare professionals [31]. Two studies found respondents felt disconnected from health service providers (e.g., due to lack of attention from healthcare professionals) [31, 51]. Moreover, some men reported a previous negative experience with the healthcare system [31], or a low level of previous contact with the system [32, 53]. Financial cost was a barrier in one study [31].

Psychosocial facilitators of help-seeking

The most frequently reported factor positively associated with men's help-seeking behaviour was social support from spouses or family members, which was found to facilitate timely help-seeking in fifteen studies [32-34, 36, 38, 41, 44-48, 50, 51, 53, 57]. Similarly, disclosing symptoms to friends was found to facilitate help-seeking in three studies [38, 41, 43]. In addition to social support, perceiving help-seeking as a social norm (e.g., where significant others are described as comfortable seeking help) was found to facilitate help-seeking behaviour in one study [50].

Perceived symptom severity/prolonged symptoms were found to facilitate help-seeking in twelve studies [32, 33, 36-38, 41, 43-46, 51, 57]. Changes in symptom [45], alternative explanation for symptom [43], previous benign diagnosis [43], and type of symptom [39] were also found to facilitate men's help-seeking. Furthermore, in support of the importance of cancer knowledge, seven studies found higher levels of cancer knowledge to facilitate timely help-seeking [32, 34, 36, 41, 42, 51, 56]. Knowledge was gained through a variety of channels, including informal knowledge through friends and family [32, 34, 36, 41, 42], or a cancer-related death of a significant other [41].

Several family and relationship health factors were found to facilitate men's help-seeking for cancer symptoms. A belief in the importance of family health was found to be an enabling factor for Maori [50], African, and Afro-Caribbean men [56]. Perceiving the symptom to impact on a partner or family member [34, 50] and concern among prostate cancer patients over future sexual functioning [56] facilitated timely help-seeking for some men.

A small number of additional factors were positively associated with men's help-seeking. Contradictory emotional factors that facilitated timely help-seeking were lack of an emotional response to symptom or medical help-seeking [32, 47], as well as worry about a symptom [27]. Optimism/low risk perception was associated with timely help-seeking for cancer symptoms [43]. Health service and system factors found to facilitate help-seeking in men were having private health insurance [36], trust in expert assessment [47], and culturally appropriate healthcare (e.g., increasing clients' perception of being culturally safe with healthcare professionals) [50].

Quantitative synthesis

Psychosocial barriers to help-seeking

A range of knowledge and symptom recognition factors were associated with help-seeking behaviour across quantitative studies. A low level of cancer knowledge was associated with delayed help-seeking in men affected by penile cancer [8]. Symptom mildness and symptom misattribution were associated with help-seeking delay among men affected by testicular [58] and colorectal cancer [10]. Not being aware of a symptom also contributed to help-seeking delay in one study [58]. In one questionnaire study [59], 54% (n=101) of mixed-gender respondents who had noticed changes to a mole or freckle in the past year did not seek help, with men more likely than women to report being unsure what to do in response to the change.

Emotions were also associated with men's delayed help-seeking for cancer symptoms. Fear was a barrier to timely help-seeking in two studies [8, 60], with African American men more likely to report fear than White men ($p<.01$) [60]. In one study of men affected by colorectal cancer, a low level of concern about symptoms and concern about bothering health professionals were associated with help-seeking delay [10]. Embarrassment was associated with delayed help-seeking behaviour in men with penile cancer symptoms [8].

Psychological barriers, such as attitudes and health beliefs, were associated with men's help-seeking for cancer symptoms. Conflicting responsibilities or not having time to see a doctor were barriers to help-seeking for men affected by prostate [60] and colorectal cancer [10]. Optimism was associated with delayed help-seeking in two studies [8, 60], with African American men more likely than White men ($p<.01$) to believe a symptom would go away [60]. In one study, delayed help-seeking of nine months or more was found in men who held a belief that cancer is incurable (i.e., fatalism), a good appraisal of health status, and low levels of depression and state anxiety [61].

Several quantitative studies explored intention to seek help for cancer symptoms, as well as anticipated barriers to help-seeking [62-64]. Symptom mildness, trivialisation of symptoms, embarrassment, and fear were associated with anticipated delays in help-seeking for urinary symptoms [62]. Specific fears included cancer, treatment, and treatment side effects [62]. Concerns about what a doctor might discover and wasting a doctor's time were

also reported as barriers to seeking medical advice [63]. Other anticipated barriers included, perceived difficulty making an appointment with health-professionals [63], a negative attitude towards health professionals/system [62], and being 'too busy to make time' to see a doctor [64].

Psychosocial facilitators of help-seeking

Several varied psychosocial factors were associated with more timely help-seeking behaviour in quantitative studies. Encouragement or perceived support from a partner was associated with help-seeking behaviour in two studies [65, 66]. Information seeking was associated with more timely help-seeking behaviour (less than 3 weeks; $p < .02$) in men affected by prostate cancer [67]. In one quantitative study that explored intention to seek help for urinary symptoms, prostate cancer awareness and symptom severity were associated with intention to seek medical help [62].

Discussion

The aim of this paper was to review the psychosocial barriers to and facilitators of help-seeking for cancer symptoms among men. Overall, a range of psychosocial factors were found to influence help-seeking behaviour, with strong observational evidence for a number of emerging factors: the impact of symptom knowledge and interpretation, embarrassment and fear, conformity to gender role norms, and conflicting responsibilities. Almost all studies were considered of sound quality (medium to high quality), however, methodological heterogeneity was high across the included studies and integrated findings should be interpreted with caution.

Symptom knowledge and symptom interpretation were frequently associated with men's help-seeking behaviour across studies. Just under half of the included studies found evidence for an aspect of cancer knowledge or awareness to influence help-seeking behaviour [6, 8, 31-42, 51, 56, 62]. Low levels of cancer knowledge were associated with delayed help-seeking, while a higher level appeared to facilitate timely help-seeking. These findings are in line with non-gender specific [18, 19, 22] and female-specific research [68] that has found knowledge of cancer warning signs to influence help-seeking behaviour. This suggests that the significance of this factor is widespread and may not be gender-specific. Furthermore, symptom interpretation influenced men's help-seeking behaviour. Perceived symptom mildness and misattribution were frequently recurring barriers [10, 32-36, 38, 42-46, 58, 62], with studies commonly finding respondents wrongly attributed cancer symptoms to benign illness and self-monitored symptoms until they were severe and required medical attention. Although symptom recognition is an important factor in help-seeking behaviour, behavioural research has indicated that symptom recognition is not always associated with seeking help among men and women [69, 70]. This suggests other psychosocial factors are likely to impact help-seeking intentions and behaviour, such as attitudes towards cancer [14, 70].

Overall, embarrassment [6, 8, 31, 32, 34, 37, 38, 42-44, 46, 48-50, 62] and fear/anxiety [6, 8, 31, 36, 40, 42, 44, 51, 60, 62, 63] were dominant emotional factors negatively influencing men's help-seeking for cancer symptoms. This is in line with the wider literature, in which fear of severe disease, medical consultation, and embarrassment has been associated with delayed health-related help-seeking in both men and women [17, 19, 22]. In this review, fear of embarrassment was predominantly reported in studies sampling men affected by cancers of the reproductive organs. Smith and colleagues [22] have also shown fear of embarrassment to be a barrier to help-seeking in both men and women, particularly for symptoms in a sexual area. A unique finding in this review was that embarrassment was often expressed concomitantly with masculine gender role norms and perceived gender differences in health and health behaviours across qualitative studies.

Conformity to masculine gender role norms [31, 36, 38-40, 42-44, 48-51, 55] and perceived gender differences in health [31, 36, 39, 44, 47, 49, 51, 52] appeared to be important barriers to men's help-seeking, which is consistent with the wider health-related help-seeking literature [16]. A considerable number of men indicated that masculine gender role norms influence decisions to seek help for medical symptoms. This was often related to perceptions of gender differences in health and health behaviours across qualitative studies, in which men considered medical help-seeking behaviour to be a feminine activity [31, 36, 39, 44, 47, 49, 51, 52]. Women were commonly seen as knowing their bodies more intimately than men, to be more comfortable disclosing health issues, and to be more psychologically at ease seeking help for illness.

These findings are in line with theories of masculine gender role socialisation and male help-seeking [71, 72], which propose men perceive social pressure to conform to dominant masculine gender role norms (e.g., independence, control) that are in contrast to the help-seeking process [71, 72]. Deviation from dominant gender role norms may lead to gender role conflict, a psychological state that can lead to emotional, cognitive and/or behavioural problems [73], including risky health behaviours. Recent research has highlighted the importance of context for masculine gender role ideals [74]. It is theorised that masculinities interact with contextual factors, such as age, class, culture, and illness characteristics, to influence health behaviour [74]. This is illustrated by one qualitative study, where Irish men were found to be more reluctant than white British men to talk about cancer and health due to "macho" Irish culture, which was linked to historical and social contextual factors [40].

Encouragement and support of spouses and family members was commonly associated with timely help-seeking behaviour [32-34, 36, 38, 41, 44-48, 50, 51, 53, 57, 65, 66]. While this is in line with non-gender specific reviews [19, 75], this factor appeared to be distinctly gender-specific. For example, disclosure of a symptom to a healthcare professional was seen as a threat to masculinity, but disclosure to a female spouse was considered acceptable and non-threatening. Hale and colleagues [36] argued that pressure from female

partners to consult with a healthcare professional provides men with an acceptable excuse for help-seeking and may prevent men from feeling that their masculinity is compromised.

The frequent disclosure of symptoms to female romantic partners also highlights the occurrence of informal help-seeking behaviour. During the help-seeking interval, it is proposed that an individual considers and selects an appropriate source of help based on level of personal comfort and/or consideration of knowledge [13]. Many men from the included studies appeared to consider women as knowledgeable and experienced in the health domain. As such, female spouses and family members may play an important intermediary or “gate-keeper” role in men’s health by checking symptoms, collecting or providing information, prompting help-seeking, and maintaining gender role norms.

Men also commonly perceived conflicting responsibilities as inhibiting medical help-seeking, which may indicate a low prioritisation of health [10, 32, 40, 42, 43, 47, 50, 52, 60, 64]. Furthermore, some studies reported that work responsibilities impacted on the ability of men to seek help from a medical professional [42, 47, 50, 52]. The association between low prioritisation of health and delayed help-seeking behaviour has also been observed in women affected by cancer [76], suggesting that this factor may not be gender specific. Future research might explore conflicting responsibilities further by investigating the value of employment and health among men, and whether this is associated with conformity to masculine gender role norms.

Differences in results were also observed between qualitative and quantitative research studies. Across both qualitative and quantitative studies, evidence was found for the importance of cancer knowledge and symptom interpretation, conflicting responsibilities, fear and embarrassment. Evidence also emerged in qualitative research about the importance of social normative and health system factors, but these factors were not observed in quantitative research. Future research in men’s help-seeking could build on findings from qualitative research using quantitative methods to test the limits and generalisability of observations arising from the former.

Limitations of existing research and future directions

There is growing evidence of a number of psychosocial factors associated with men’s help-seeking for cancer symptoms, but there are significant limitations with existing research that limit the strength of this evidence. First, a majority (n=34) of studies included in this review explored factors associated with help-seeking through open-ended questions and reported descriptive results, and as such the predictive strength of emerging psychosocial factors are unknown [14]. The different goals of quantitative and qualitative research, and the associated epistemological frameworks, may explain why strong themes regarding social norms and masculinity were found across qualitative studies, but masculinity variables were not examined in the quantitative research. Validated measures focused on perceptions of masculinity and their impact on behaviour [77-79] could be utilised in future studies to test the predictive strength of masculinity variables in relation to real or anticipated help-seeking

for cancer symptoms. Furthermore, a mixed-method approach (i.e., using both qualitative and quantitative methods concurrently or sequentially) may assist in exploring the underlying processes involved in men's help-seeking behaviour [80].

Second, research in this area has largely been independent of theory. Theoretical grounding provides a context for generating interventions that may redress problems with help-seeking. Evidence for an increasingly wide range of factors associated with help-seeking behaviour has emerged, therefore the application and testing of health behaviour models is required to identify the pathway of influence in order to assist with the design of effective health promotion interventions [14].

Third, the two main research designs used across studies (i.e., retrospective and anticipated help-seeking designs) have limitations. Retrospective designs may have resulted in recall errors due significant time elapsed since initial symptom or diagnosis [14]. Also, several quantitative studies investigated anticipated barriers to help-seeking for hypothetical symptoms, which may not accurately reflect real barriers to help-seeking due to the influence of unforeseen factors [14]. While these designs have limitations, they appear to be predominantly used due to ethical concerns regarding prospective designs. Future retrospective studies may include calendar landmarking instruments to improve accuracy of recall [14, 81], or use verification procedures.

Finally, only a minority of included studies explored variation between different groups of men (e.g., based on ethnicity, age), limiting generalisability. The qualitative studies reviewed commonly used small samples, and only one quantitative study examined differences between men [60]. It is reasonable to propose that psychosocial factors associated with help-seeking behaviour in men may differ according to a variety of demographic or socio-cultural factors [71, 74]. For example, masculine gender role norms were found to be recurring barriers to help-seeking for cancer symptoms in men, but the reported role norms (e.g., machismo) are arguably Western traditional concepts [16].

Despite these limitations, preliminary evidence suggests that cancer prevention initiatives to improve men's help-seeking behaviour should aim to increase cancer knowledge, reduce embarrassment and fear, address social norms deterring timely help-seeking, and acknowledge informal help-seeking. Cancer prevention strategies may attempt to address gender role norms deterring help-seeking by normalising or reframing men's help-seeking, or alternatively, by targeting health promotion messages at spouses and family members. An example of this approach is the Stand by Your Man campaign run in the UK, which asked women to encourage the men in their lives to increase their cancer knowledge and talk more frequently about health issues [82]. Future health promotion initiatives should consider targeting the range of psychosocial factors found to influence men's help-seeking for cancer symptoms.

Conclusion

This review provides an overview of psychosocial barriers and facilitators found to influence help-seeking for cancer symptoms among men. Cancer prevention initiatives to improve men's help-seeking behaviour should aim to increase cancer knowledge, reduce strong emotions such as embarrassment and fear, and address social norms deterring timely help-seeking. Moreover, the design of cancer prevention interventions should acknowledge informal help-seeking with spouses and family members. Future research should examine variation between men, use statistical hypothesis testing based on factors emerging from qualitative research, and increase the theoretical grounding of research.

Acknowledgements

No funding received.

References

1. Globocan. Estimated incidence, mortality and prevalence worldwide in 2012: all cancers. [Internet]; 2012 [cited 23 August 2014]; Available from: <http://globocan.iarc.fr>.
2. Jemal, A., Bray, F., Center, M.M., Ferlay, J., Ward, E., and Forman, D. Global cancer statistics. *CA: A Cancer Journal for Clinicians* 2011; **61**: 69-90. doi: 10.3322/caac.20107.
3. Etzioni, R., Urban, N., Ramsey, S., McIntosh, M., Schwartz, S., Reid, B., Radich, J., Anderson, G., and Hartwell, L. The case for early detection. *Nature Reviews Cancer* 2003; **3**: 243-252. doi: 10.1038/nrc1041.
4. Keeble, S., Abel, G.A., Saunders, C.L., McPhail, S., Walter, F.M., Neal, R.D., Rubin, G.P., and Lyratzopoulos, G. Variation in promptness of presentation among 10,297 patients subsequently diagnosed with one of 18 cancers: evidence from a national audit of cancer diagnosis in primary care. *International Journal of Cancer* 2014; **135**: 1220-1228. doi: 10.1002/ijc.28763.
5. Forbes, L.J.L., Warburton, F., Richards, M.A., and Ramirez, A.J. Risk factors for delay in symptomatic presentation: a survey of cancer patients. *British Journal of Cancer* 2014; **111**: 581-588. doi: 10.1038/bjc.2014.304.
6. Connolly, S.S., Daly, P.J.A., Floyd Jr, M.S., Collins, I.M., Grainger, R., and Thornhill, J.A. Terminology and details of the diagnostic process for testis cancer. *The Journal of Urology* 2011; **185**: 876-880. doi: 10.1016/j.juro.2010.11.007.
7. Vasudev, N.S., Joffe, J.K., Cooke, C., Richards, F., and Jones, W.G. Delay in the diagnosis of testicular tumours - changes over the past 18 years. *British Journal of General Practice* 2004; **54**: 595-597.
8. Skeppner, E., Andersson, S.-O., Johansson, J.-E., and Windahl, T. Initial symptoms and delay in patients with penile carcinoma. *Scandinavian Journal of Urology and Nephrology* 2012; **46**: 319-325. doi: 10.3109/00365599.2012.677473.
9. Evans, R.E.C., Brotherstone, H., Miles, A., and Wardle, J. Gender differences in early detection of cancer. *Journal of Men's Health & Gender* 2005; **2**: 209-217. doi: 10.1016/j.jmhg.2004.12.012.
10. Young, C.J., Sweeney, J.L., and Hunter, A. Implications of delayed diagnosis in colorectal cancer. *Australian and New Zealand Journal of Surgery* 2000; **70**: 635-638. doi: 10.1046/j.1440-1622.2000.01916.x.
11. Porta, M., Gallen, M., Belloc, J., and Malats, N. Predictors of the interval between onset of symptoms and first medical visit in patients with digestive tract cancer. *International Journal of Oncology* 1996; **8**: 941-949. doi: 10.3892/ijco.8.5.941.
12. van Osch, L., Lechner, L., Reubsaet, A., de Nooijer, J., and de Vries, H. Passive cancer detection and medical help seeking for cancer symptoms: (in)adequate behavior and psychosocial determinants. *European Journal of Cancer Prevention* 2007; **16**: 266-274 doi: 10.1097/01.cej.0000236241.10125.00.
13. Cornally, N. and McCarthy, G. Help-seeking behaviour: a concept analysis. *International Journal of Nursing Practice* 2011; **17**: 280-288. doi: 10.1111/j.1440-172X.2011.01936.x.
14. Scott, S. and Walter, F. Studying help-seeking for symptoms: the challenges of methods and models. *Social and Personality Psychology Compass* 2010; **4**: 531-547. doi: 10.1111/j.1751-9004.2010.00287.x.
15. Weller, D., Vedsted, P., Rubin, G., Walter, F.M., Emery, J., Scott, S., Campbell, C., Andersen, R.S., Hamilton, W., Olesen, F., Rose, P., Nafees, S., van Rijswijk, E., Hiom, S., Muth, C., Beyer, M., and Neal, R.D. The Aarhus statement: improving design and reporting of studies on early cancer diagnosis. *British Journal of Cancer* 2012; **106**: 1262-1267. doi: 10.1038/bjc.2012.68.
16. Galdas, P.M., Cheater, F., and Marshall, P. Men and health help-seeking behaviour: literature review. *Journal of Advanced Nursing* 2005; **49**: 616-623. doi: 10.1111/j.1365-2648.2004.03331.x.
17. Yousaf, O., Grunfeld, E.A., and Hunter, M.S. A systematic review of the factors associated with delays in medical and psychological help-seeking among men. *Health Psychology Review* 2013: 1-13. doi: 10.1080/17437199.2013.840954.
18. Almuammar, A., Dryden, C., and Burr, J.A. Factors associated with late presentation of cancer: a limited literature review. *Journal of Radiotherapy in Practice* 2010; **9**: 117-123. doi: 10.1017/S146039690999029X.
19. Macleod, U., Mitchell, E.D., Burgess, C., Macdonald, S., and Ramirez, A.J. Risk factors for delayed presentation and referral of symptomatic cancer: evidence for common cancers. *British Journal of Cancer* 2009; **101**: S92-S101. doi: 10.1038/sj.bjc.6605398.
20. Braybrook, D.E., Witty, K.R., and Robertson, S. Men and lung cancer: a review of the barriers and facilitators to male engagement in symptom reporting and screening. *Journal of Men's Health* 2011; **8**: 93-99. doi: 10.1016/j.jomh.2011.03.002.

21. Mason, O.J. and Strauss, K. Studying help-seeking for testicular cancer: some lessons from the literature (Part 2). *International Journal of Men's Health* 2004; **3**: 111-127.
22. Smith, L.K., Pope, C., and Botha, J.L. Patients' help-seeking experiences and delay in cancer presentation: a qualitative synthesis. *The Lancet* 2005; **366**: 825-831. doi: 10.1016/S0140-6736(05)67030-4.
23. Moher, D., Liberati, A., Tetzlaff, J., and Altman, D.G. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *British Medical Journal* 2009; **339**: b2535. doi: 10.1136/bmj.b2535.
24. Heyvaert, M., Maes, B., and Onghena, P. Mixed methods research synthesis: definition, framework, and potential. *Quality & Quantity* 2013; **47**: 659-676. doi: 10.1007/s11135-011-9538-6.
25. Kmet, L.M., Lee, R.C., and Cook, L.S. Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields. In *Health Technology Assessment Initiative series*. Alberta Heritage Foundation for Medical Research: Edmonton, 2004; 1-22.
26. Long, A.F. and Godfrey, M. An evaluation tool to assess the quality of qualitative research studies. *International Journal of Social Research Methodology* 2004; **7**: 181-196. doi: 10.1080/1364557032000045302.
27. O'Cathain, A., Murphy, E., and Nicholl, J. The quality of mixed methods studies in health services research. *Journal of Health Services Research & Policy* 2008; **13**: 92-98. doi: 10.1258/jhsrp.2007.007074.
28. Cicchetti, D.V. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment* 1994; **6**: 284-290. doi: 10.1037/1040-3590.6.4.284.
29. Hill, A. and Spittlehouse, C. What is critical appraisal? Hayward Medical Communications, 2001; **3**: 1-8.
30. Gerrig, R., Zimbardo, P., Campbell, A., Cumming, S., and Wilkes, F., *Psychology and life (2nd Australasian edition)*. Pearson Education Australia: Sydney, 2011
31. Buckley, J. and Ó Tuama, S. 'I send the wife to the doctor' – Men's behaviour as health consumers. *International Journal of Consumer Studies* 2010; **34**: 587-595. doi: 10.1111/j.1470-6431.2010.00908.x.
32. Carbone, S., Walker, G.A., Burney, S., and Newton, F. The Symptom recognition and help-seeking experiences of men in Australia with testicular cancer: a qualitative study. *Qualitative Research Journal* 2009; **9**: 43-59. doi: 10.3316/QRJ0901043.
33. Carroll, W.R., Kohler, C.L., Carter, V.L., Hannon, L., Skipper, J.B., and Rosenthal, E.L. Barriers to early detection and treatment of head and neck squamous cell carcinoma in African American men. *Head & Neck* 2009; **31**: 1557-1562. doi: 10.1002/hed.21125.
34. Forbat, L., Place, M., Hubbard, G., Leung, H., and Kelly, D. The role of interpersonal relationships in men's attendance in primary care: qualitative findings in a cohort of men with prostate cancer. *Supportive Care in Cancer* 2014; **22**: 409-415. doi: 10.1007/s00520-013-1989-y.
35. France, L., Michie, S., Barrett-Lee, P., Brain, K., Harper, P., and Gray, J. Male cancer: a qualitative study of male breast cancer. *The Breast* 2000; **9**: 343-348. doi: 10.1054/brst.2000.0173.
36. Hale, S., Grogan, S., and Willott, S. Patterns of self-referral in men with symptoms of prostate disease. *British Journal of Health Psychology* 2007; **12**: 403-419. doi: 10.1348/135910706x118413.
37. Adams, M.J., Collins, V.R., Dunne, M.P., Kretser, D.M.d., and Holden, C.A. Male reproductive health disorders among Aboriginal and Torres Strait Islander men: a hidden problem? *The Medical Journal of Australia* 2013; **198**: 33-38. doi: 10.5694/mja12.10490.
38. Mason, O.J. and Strauss, K. Testicular cancer: passage through the help-seeking process for a cohort of UK men (part 1). *International Journal of Men's Health* 2004; **3**: 93-110. doi: 10.3149/jmh.0302.93.
39. O'Brien, R., Hunt, K., and Hart, G. 'It's caveman stuff, but that is to a certain extent how guys still operate': men's accounts of masculinity and help seeking. *Social Science & Medicine* 2005; **61**: 503-516. doi: 10.1016/j.socscimed.2004.12.008.
40. Scanlon, K., Harding, S., Hunt, K., Petticrew, M., Rosato, M., and Williams, R. Potential barriers to prevention of cancers and to early cancer detection among Irish people living in Britain: a qualitative study. *Ethnicity & Health* 2006; **11**: 325-341. doi: 10.1080/13557850600628307.
41. Taghipour, A., Vydellingum, V., and Faithfull, S. Discovering a sequential social process of prostate cancer detection: A socio-epidemiological study of Iranian men's perspectives. *HealthMED* 2011; **5**: 41-50.
42. Chapple, A., Ziebland, S., and McPherson, A. Qualitative study of men's perceptions of why treatment delays occur in the UK for those with testicular cancer. *British Journal of General Practice* 2004; **54**: 25-32.

43. Emery, J.D., Walter, F.M., Gray, V., Sinclair, C., Howting, D., Bulsara, M., Bulsara, C., Webster, A., Auret, K., Saunders, C., Nowak, A., and Holman, C.D.A. Diagnosing cancer in the bush: a mixed-methods study of symptom appraisal and help-seeking behaviour in people with cancer from rural Western Australia. *Family Practice* 2013; **30**: 294-301. doi: 10.1093/fampra/cms087.
44. Gascoigne, P., Mason, M.D., and Roberts, E. Factors affecting presentation and delay in patients with testicular cancer: results of a qualitative study. *Psycho-Oncology* 1999; **8**: 144-154. doi: 10.1002/(sici)1099-1611(199903/04)8:2<144::aid-pon349>3.0.co;2-p.
45. Ramos, M., Arranz, M., Taltavull, M., March, S., Cabeza, E., and Esteva, M. Factors triggering medical consultation for symptoms of colorectal cancer and perceptions surrounding diagnosis. *European Journal of Cancer Care* 2010; **19**: 192-199. doi: 10.1111/j.1365-2354.2008.00998.x.
46. Sandén, I., Larsson, U.S., and Eriksson, C. An interview study of men discovering testicular cancer. *Cancer Nursing* 2000; **23**: 304-309. doi: 10.1097/00002820-200008000-00008.
47. Hajdarevic, S., Schmitt-Egenolf, M., Brulin, C., Sundbom, E., and Hörnsten, Å. Malignant melanoma: gender patterns in care seeking for suspect marks. *Journal of Clinical Nursing* 2011; **20**: 2676-2684. doi: 10.1111/j.1365-2702.2011.03788.x.
48. Carpentier, M.Y., Fortenberry, D.J., Ott, M.A., Brames, M.J., and Einhorn, L.H. Perceptions of masculinity and self-image in adolescent and young adult testicular cancer survivors: implications for romantic and sexual relationships. *Psycho-Oncology* 2011; **20**: 738-745. doi: 10.1002/pon.1772.
49. Chapple, A. and Ziebland, S. Prostate cancer: embodied experience and perceptions of masculinity. *Sociology of Health & Illness* 2002; **24**: 820-841. doi: 10.1111/1467-9566.00320.
50. Willams, P.N., Gray, M.A., Ka'ai, T.M., Moorfield, J.C., Mcpherson, K.M., Weinstein, P., and Nacey, J.N. Maori men's perceptions and experiences of health seeking for prostate health problems in New Zealand. *Pacific Health Dialog* 2003; **10**: 71-78.
51. George, A. and Fleming, P. Factors affecting men's help-seeking in the early detection of prostate cancer: implications for health promotion. *Journal of Men's Health & Gender* 2004; **1**: 345-352. doi: 10.1016/j.jmhg.2004.10.009.
52. Leydon, G.M., Bynoe-Sutherland, J., and Coleman, M.P. The journey towards a cancer diagnosis: the experiences of people with cancer, their family and carers. *European Journal of Cancer Care* 2003; **12**: 317-326. doi: 10.1046/j.1365-2354.2003.00418.x.
53. Eadie, D. and MacAskill, S. Symptom awareness and cancer prevention: exploratory findings from an at-risk population. *Health Education* 2008; **108**: 332-345. doi: doi:10.1108/09654280810884205.
54. de Nooijer, J., Lechner, L., and de Vries, H. A qualitative study on detecting cancer symptoms and seeking medical help; an application of Andersen's model of total patient delay. *Patient Education and Counseling* 2001; **42**: 145-157. doi: 10.1016/s0738-3991(00)00104-x.
55. Tod, A.M., Craven, J., and Allmark, P. Diagnostic delay in lung cancer: a qualitative study. *Journal of Advanced Nursing* 2008; **61**: 336-343. doi: 10.1111/j.1365-2648.2007.04542.x.
56. Anderson, B., Marshall-Lucette, S., and Webb, P. African and Afro-Caribbean men's experiences of prostate cancer. *British Journal of Nursing* 2013; **22**: 1296-1307. doi: 10.12968/bjon.2013.22.22.1296.
57. Vaartio, H., Kiviniemi, K., and Suominen, T. Men's experiences and their resources from cancer diagnosis to recovery. *European Journal of Oncology Nursing* 2003; **7**: 182-190. doi: 10.1016/S1462-3889(03)00006-1.
58. Attard, G. Delay in treatment of testicular tumours in the army. *Journal of the Royal Army Medical Corps* 1985; **131**: 140-141.
59. Douglass, H.M., McGee, R., and Williams, S. Are young adults checking their skin for melanoma? *Australian and New Zealand Journal of Public Health* 1998; **22**: 562-567. doi: 10.1111/j.1467-842X.1998.tb01439.x.
60. Talcott, J.A., Spain, P., Clark, J.A., Carpenter, W.R., Do, Y.K., Hamilton, R.J., Galanko, J.A., Jackman, A., and Godley, P.A. Hidden barriers between knowledge and behavior. *Cancer* 2007; **109**: 1599-1606. doi: 10.1002/cncr.22583.
61. Chojnacka-Szawłowska, G., Kościelak, R., Karasiewicz, K., Majkiewicz, M., and Kozaka, J. Delays in seeking cancer diagnosis in relation to beliefs about the curability of cancer in patients with different disease locations. *Psychology & Health* 2013; **28**: 154-170. doi: 10.1080/08870446.2012.700056.
62. Fitzpatrick, P., Corcoran, N., and Fitzpatrick, J.M. Prostate cancer: how aware is the public? *British Journal of Urology* 1998; **82**: 43-48. doi: 10.1046/j.1464-410x.1998.00685.x.
63. Robb, K., Stubbings, S., Ramirez, A., Macleod, U., Austoker, J., Waller, J., Hiom, S., and Wardle, J. Public awareness of cancer in Britain: a population-based survey of adults. *British Journal of Cancer* 2009; **101**: S18-S23. doi: 10.1038/sj.bjc.6605386.

64. Waller, J., Robb, K., Stubbings, S., Ramirez, A., Macleod, U., Austoker, J., Hiom, S., and Wardle, J. Awareness of cancer symptoms and anticipated help seeking among ethnic minority groups in England. *British Journal of Cancer* 2009; **101**: S24-S30. doi: 10.1038/sj.bjc.6605387.
65. Pedersen, A.F., Olesen, F., Hansen, R.P., Zachariae, R., and Vedsted, P. Social support, gender and patient delay. *British Journal of Cancer* 2011; **104**: 1249-1255. doi: 10.1038/bjc.2011.87.
66. Swetter, S.M., Layton, C.J., Johnson, T.M., Brooks, K.R., Miller, D.R., and Geller, A.C. Gender differences in melanoma awareness and detection practices between middle-aged and older men with melanoma and their female spouses. *Archives of Dermatology* 2009; **145**: 488-490. doi: 10.1001/archdermatol.2009.42.
67. Sunny, L., Hopfgarten, T., Adolfsson, J., and Steineck, G. Predictors for the symptomatic prostate cancer patient's delays in seeking care. *European Journal of Cancer* 2008; **44**: 733-739. doi: 10.1016/j.ejca.2008.01.017.
68. Ramirez, A.J., Westcombe, A.M., Burgess, C.C., Sutton, S., Littlejohns, P., and Richards, M.A. Factors predicting delayed presentation of symptomatic breast cancer: a systematic review. *The Lancet* 1999; **353**: 1127-1131. doi: 10.1016/S0140-6736(99)02142-X.
69. Sheikh, I. and Ogden, J. The role of knowledge and beliefs in help seeking behaviour for cancer: a quantitative and qualitative approach. *Patient Education & Counseling* 1998; **35**: 35-42. doi: 10.1016/S0738-3991(98)00081-0.
70. de Nooijer, J., Lechner, L., and de Vries, H. Early detection of cancer: knowledge and behavior among Dutch adults. *Cancer Detection and Prevention* 2002; **26**: 362-369. doi: 10.1016/S0361-090X(02)00121-6.
71. Addis, M.E. and Mahalik, J.R. Men, masculinity, and the contexts of help seeking. *American psychologist* 2003; **58**: 5-14. doi: 10.1037/0003-066X.58.1.5.
72. Courtenay, W.H. Constructions of masculinity and their influence on men's well-being: a theory of gender and health. *Social Science & Medicine* 2000; **50**: 1385-1401. doi: 10.1016/S0277-9536(99)00390-1.
73. O'Neil, J.M. Summarizing 25 years of research on men's gender role conflict using the Gender Role Conflict Scale: new research paradigms and clinical implications. *The Counseling Psychologist* 2008; **36**: 358-445. doi: 10.1177/0011000008317057.
74. Oliffe, J. Health Behaviors, Prostate Cancer, and Masculinities: A Life Course Perspective. *Men and Masculinities* 2009; **11**: 346-366. doi: 10.1177/1097184x06298777.
75. Chatwin, J. and Sanders, C. The influence of social factors on help-seeking for people with lung cancer. *European Journal of Cancer Care* 2013; **22**: 709-713. doi: 10.1111/ecc.12078.
76. Burgess, C., Hunter, M.S., and Ramirez, A.J. A qualitative study of delay among women reporting symptoms of breast cancer. *British Journal of General Practice* 2001; **51**: 967-971.
77. Mahalik, J.R., Locke, B.D., Ludlow, L.H., Diemer, M.A., Scott, R.P.J., Gottfried, M., and Freitas, G. Development of the Conformity to Masculine Norms Inventory. *Psychology of Men & Masculinity* 2003; **4**: 3-25. doi: 10.1037/1524-9220.4.1.3.
78. O'Neil, J.M., Helms, B.J., Gable, R.K., David, L., and Wrightsman, L.S. Gender-role conflict scale: college men's fear of femininity. *Sex Roles* 1986; **14**: 335-350. doi: 10.1007/BF00287583.
79. Eisler, R.M. and Skidmore, J.R. Masculine gender role stress: scale development and component factors in the appraisal of stressful situations. *Behavior Modification* 1987; **11**: 123-136. doi: 10.1177/01454455870112001.
80. Leech, N.L. and Onwuegbuzie, A.J. A typology of mixed methods research designs. *Quality & Quantity* 2009; **43**: 265-275. doi: 10.1007/s11135-007-9105-3.
81. Glasner, T. and van der Vaart, W. Applications of calendar instruments in social surveys: a review. *Quality and Quantity* 2009; **43**: 333-349. doi: 10.1007/s11135-007-9129-8.
82. ITV Network and Prostate Cancer UK. Standing by our men for Prostate Cancer UK. [Internet]; 2014 [cited 30 January 2015]; Available from: <http://www.itvmedia.co.uk/Prostate-Cancer>.

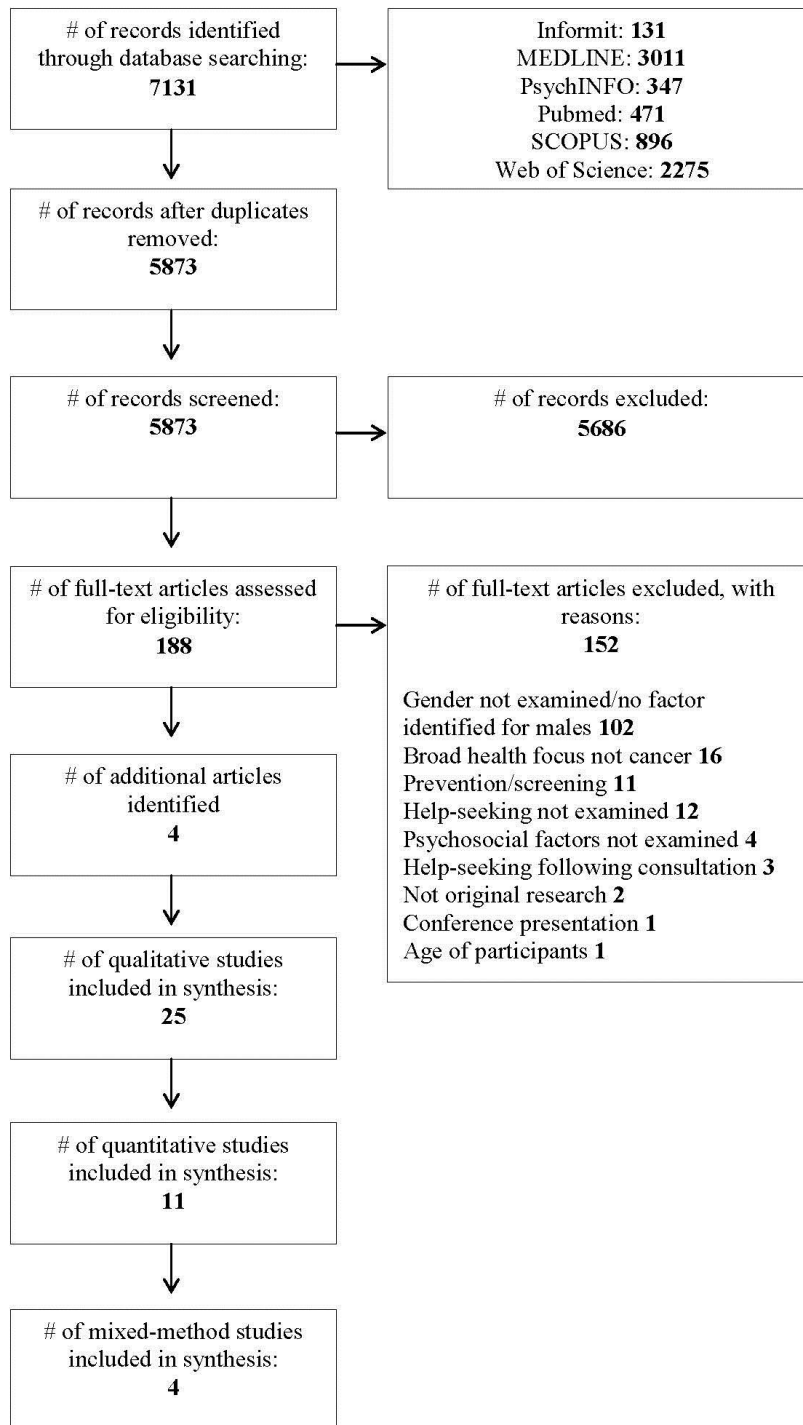


Figure 1. PRISMA flow diagram of study selection

Supplementary Table 1. Outline of included studies and data extracted: qualitative research

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Adams et al. [37] (2013, Australia)	Qualitative aspect of study: N=38 age range: 29-45 years general population ethnicity: Aboriginal and Torres Strait Islander (n=38) Focus groups n=20 (3 male-only groups, 1 female-only group) Interviews n=18 (all male)	Semi-structured interviews and focus groups Domains examined: -sexual and reproductive health issues -barriers to help-seeking for erectile dysfunction and prostate disease	<u>Barriers:</u> -Lack of understanding regarding symptom -Difficulties in communication with other males, partner, and/or health professional -Shame/embarrassment -Concern about confidentiality and stigma -Inadequate culturally appropriate healthcare <u>Facilitator:</u> -Symptom severity	Medium
Anderson et al. [56] (2013, England)	n=7 (all male) age range: 60-76 years (<i>M</i> =67) cancer site: prostate diagnosed within previous 3 years ethnicity: African (n=3) and Afro- Caribbean (n=4)	Semi-structured interviews Domains examined: -awareness of prostate cancer -perceptions of prostate cancer associated risks -cancer screening -factors influencing screening and help- seeking	<u>Facilitators:</u> -Recognising signs and symptoms of cancer -Importance of family health -Concern regarding future sexual functioning	Medium
Buckley & Tuama [31] (2010, Ireland)	n=18 (3 male-only groups) age range: 50-70 years general population	Focus groups Adapted from Eadie & MacAskill (2008) [55] Domains examined: -cancer awareness -help-seeking for cancer symptoms	<u>Barriers:</u> -Low level of cancer knowledge -Perceived gender differences in health behaviours and health-seeking - Masculine gender role norms (e.g., self- examination not masculine, self-reliance) -Embarrassment	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
		-health information campaigns	<ul style="list-style-type: none"> -Fear (e.g., cancer, doctor) -Fatalism -Self-reliance (e.g., self-diagnosis, self-medication) -Previous negative experience with health professional/system -Disconnection from health service providers -Concern over loss of dignity/respect -Perceived financial cost -Perceived long wait times 	
Carbone et al. [32] (2009, Australia)	n=11 (all male) age range: 28-44 years (<i>M</i> =35.3) cancer site: testicular diagnosed within previous 5 years	Semi-structured interviews Domains examined: -early symptoms -duration of symptoms -factors influencing help-seeking -help-seeking experiences	<u>Barriers:</u> <ul style="list-style-type: none"> -Optimism (e.g., symptom will go away) -Symptom misattribution -Low level of cancer knowledge -Belief that cancer affects older people -Symptom mildness -Conflicting responsibilities (e.g., family, work) -Low level of previous contact with health system -Embarrassment -Body image concerns (e.g., having testicle removed) <u>Facilitators:</u> <ul style="list-style-type: none"> -Informal cancer knowledge from family -Symptom severity -Prolonged symptoms -Comfortable help-seeking -Encouragement by partner or family member -Concern about symptom 	High

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Carpentier et al. [48] (2011, USA)	n=21 (all male) age range: 18-34 years (<i>M</i> =27.1) cancer site: testicular completed treatment within previous 3-36 months	Semi-structured interviews Domains examined: -quality of life -impact of cancer (general) -impact of cancer on current romantic relationships and sexual relationships	<u>Barriers:</u> -Embarrassment/discomfort disclosing -Optimism -Masculine gender role norms <u>Facilitator:</u> -Encouragement by partner	High
Carroll et al. [33] (2009, USA)	n=24 (all male) age range: 45-74 years (<i>M</i> =59) cancer site: head and neck ethnicity: African American (n=24)	Semi-structured interviews Domains examined: -patterns of tobacco use -cancer detection -treatment experiences	<u>Barriers:</u> -Symptom misattribution -Low level of cancer knowledge <u>Facilitators:</u> -Prolonged symptoms -Encouragement by family member	Medium
Chapple & Ziebland [49] (2002, UK)	n=52 (all male) age range: 50-85 years cancer site: prostate mixed stage of diagnosis ethnicity: White British (n=48), Caribbean (n=1), Nigerian (n=1), Indian (n=1), Former Czechoslovakia (n=1)	Unstructured interviews Respondents were invited to tell their pathway to treatment story Domains examined: -factors influencing help-seeking -expectations of treatment	<u>Barriers:</u> -Masculine gender role norms (e.g., machismo) -Perceived gender differences in health behaviours and health-seeking -Embarrassment	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Chapple et al. [42] (2004, UK)	n=45 (all male) age range: 21-55 years cancer site: testicular mixed stage of diagnosis ethnicity: White British (n=43), Canadian (n=1), Former Czechoslovakia (n=1)	Unstructured interviews Respondents were invited to tell their pathway to treatment story Domains examined: -factors influencing help-seeking delay	<u>Barriers:</u> -Symptom mildness -Symptom misattribution -Masculine gender role norms (e.g., machismo) -Embarrassment -Fear (e.g., treatment, being seen as a hypochondriac) -Fatalism -Conflicting responsibilities (e.g., work) <u>Facilitators:</u> -Information via media or pamphlets -Cancer awareness and knowledge -Informal cancer knowledge from family and friends	Medium
Connolly e al. [6] (2011, Ireland)	n=100 age range: 16-50 years (<i>M</i> =31) cancer site: testicular ethnicity: White (n=98), other (n=2)	Interview Domains examined: -clinical characteristics -diagnostic delay -patient dependent delay -prior knowledge of testicular cancer -factors influencing patient dependent delay	Of respondents (n=25) with a symptomatic interval exceeding the mean: <u>Barriers:</u> -Lack of awareness (n=11) -Fear (n=8) -Denial (n=6) -Embarrassment (n=3) -Lack of access to health professional (n=4)	Medium
de Nooijer et al. [54] (2001, Netherlands)	n=23 (mixed gender: male n=10, female n=13) male age range: 24-61 years female age range: 35-75 years male cancer sites: testicular (n=5), colon (n=4), melanoma (n=1) female cancer sites: breast (n=6), colon (n=2), melanoma (n=5)	Semi-structured interviews Respondents were invited to tell their pathway to treatment story Domains examined: -cancer awareness -experience of symptoms	<u>Barrier:</u> -Belief that cancer would never happen to them	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
		-symptom appraisal -factors influencing help-seeking -first medical consultation		
Eadie & MacAskill [53] (2008, Scotland)	n=57 (mixed gender: 4 male-only groups, 4 female-only groups) male age range: 40-70 years female age range: 40-70 years general population	Focus groups Domains examined: -cancer awareness -help-seeking for cancer symptoms -health information campaigns	<u>Barriers:</u> -Males more likely than females to deny fear of cancer and express fatalism -Females more likely than males to be familiar with healthcare services -Males (particularly rural) less likely than females to acknowledge health problems/symptoms -Males more likely than females to self-treat <u>Facilitator:</u> -Encouragement by family or friends	High
Emery et al. [43] (2013, Australia)	n=66 (mixed gender: male n=28, female n=38) Mean age = 60.5 years cancer sites: prostate (n=14), breast (n=24), colorectal (n=20), lung (n=8) majority diagnosed in previous 3 months	Semi-structured interviews Domains examined: -clinical characteristics -initial symptoms -symptom appraisal -factors influencing help-seeking	Of male respondents with longer (> 50 days; n=11) and shorter (<10 days; n=5) appraisal intervals: <u>Barriers:</u> -Symptom misattribution (n=11) -Symptom mildness (n=7) -Symptom progressed gradually (n=6) -Stoicism/machismo (n=6) -Intermittent symptom (n=5) -Absence of other symptom (n=4) -Self-reliance (n=4) -Previous benign diagnosis (n=3) -Optimism (n=3) -No symptom interference with work (n=3) -Embarrassment (n=2) -Competing demand (n=2) -Disclosure to others (n=1) <u>Facilitators:</u>	High

Authors (Year & Country)	Sample	Methods	Results	Quality rating
			<ul style="list-style-type: none"> -Symptom severity/subsequent symptom (n=8) -Disclosure to others (n=4) -Alternative explanation (n=1) -Previous benign diagnosis (n=1) -Optimism (n=1) 	
Forbat et al. [34] (2014, Scotland)	<p>n=30 (all male) cancer site: prostate diagnosed within previous year</p> <p>In addition, 19 partners interviewed</p>	<p>Semi-structured interviews</p> <p>Domains examined:</p> <ul style="list-style-type: none"> -awareness of risk factors and symptoms -pathway to treatment -initial symptoms -factors influencing help-seeking -interaction with healthcare system -PSA tests 	<p><u>Barriers:</u></p> <ul style="list-style-type: none"> -Emotional protection of others -Embarrassment -Symptom mildness -Low level of cancer knowledge <p><u>Facilitators:</u></p> <ul style="list-style-type: none"> -Encouragement from partners and friends -Symptom impact on partner -Informal cancer knowledge from family and friends 	Medium
France et al. [35] (2000, Wales)	<p>n=6 (all male) cancer site: breast treatment phase</p> <p>In addition, partners were invited to participate</p>	<p>Unstructured interviews</p> <p>Domains examined:</p> <ul style="list-style-type: none"> -physical experience of cancer -psychological experience of cancer -adjustment to condition -embarrassment about diagnosis -psychosocial support -impact of diagnosis 	<p><u>Barriers:</u></p> <ul style="list-style-type: none"> -Low level of male breast cancer knowledge -Symptom mildness 	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Gascoigne et al. [44] (1999, Wales)	n=6 (all male) age range: 20-59 years (<i>M</i> =39) cancer site: testicular In addition, four partners and one mother interviewed	Semi-structured interviews Domains examined: -initial symptoms -symptom appraisal -pathway to treatment -factors influencing help-seeking -interaction with healthcare system -cancer awareness -normal health behaviours	<u>Barriers:</u> -Symptom misattribution -Fear (e.g., cancer, castration) -Masculine gender role norms -Embarrassment -Body image concerns (e.g., having testicle removed) -Symptom mildness -Perceived gender differences in health behaviours and health-seeking <u>Facilitators:</u> -Encouragement by partners -Symptom severity	High
George & Fleming [51] (2004, Northern Ireland)	n=12 (all male) age range: 50-60+ years cancer site: prostate symptomatic and asymptomatic males	Semi-structured interviews Domains examined: -reasons for attending a prostate service -attitudes towards healthcare services and help-seeking -prostate cancer awareness and knowledge -experience of service -experience following interaction with service -ideas for future health promotion initiatives	<u>Barriers:</u> -Fear (e.g., cancer, being seen as a hypochondriac) -Masculine gender role norms (e.g., machismo) -Health as taboo subject for males -Perceived gender differences in health behaviours and health-seeking -Disconnection from health service provider <u>Facilitators:</u> -Cancer knowledge -Symptom severity -Encouragement by partners	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Hajdarevic et al. [47] (2011, Sweden)	n=30 (mixed gender: male n=15, female n=15) Mean male age = 56 years (SD=14.9) Mean female age = 55 years (SD=15.2) cancer site: malignant melanoma diagnosed in previous 2 years	Open-ended narrative interviews Domains examined: -initial symptoms -symptom appraisal -factors influencing help-seeking	<u>Barriers:</u> -Males more likely than females to express low level of attentiveness to body and health -Males more likely than females to report conflicting work responsibilities -Males perceived gender differences in health behaviours and health-seeking <u>Facilitators:</u> -Males more likely than females to seek help following encouragement by partners or friends -Males more likely than females to seek help quickly due to lack of emotional response to symptoms -Trust in expert assessment	High
Hale et al. [36] (2007, England)	n=20 (all male) age range: 51-75 years mixed sample: prostate disease, including prostate cancer diagnostic phase	Semi-structured interviews Domains examined: -health history -initial symptoms -response to symptoms -contact with health services	<u>Barriers:</u> -Perceived gender differences in health -Masculine gender role norms (e.g., machismo) -Low level of prostate knowledge -Avoidance of cancer knowledge due to anxiety -Social status of symptom -Fear (e.g., cancer, doctor, examination, hospitalization, and treatment side effects) -Symptom mildness <u>Facilitators:</u> -Symptom severity -Cancer knowledge gained by interpersonal communication -Encouragement by partners -Private health insurance	High

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Leydon et al. [52] (2003, UK)	<p>N=33</p> <p>Interviews n=17 (mixed gender: male n=5, female n=12) male age range: 45-74 years female age range: 35-66 years male cancer sites: bowel (n=1), prostate (n=1), lung (n=1), colorectal (n=1), stomach (n=1) female cancer sites: breast (n=6), ovarian (n=1), lung (n=1), leukaemia (n=2), colon (n=1), lymphoma (n=1) diagnosed in previous 2 years</p> <p>Focus groups n=16 (2 female-only groups, 1 mixed-gender group: males n=2, females n=5) diagnosed in previous 2 years</p>	<p>Semi-structured interviews</p> <p>Domains examined: -pathway to diagnosis -interaction with health system</p> <p>Focus groups</p> <p>Domains examined: -perceptions of healthcare system -barriers to accessing healthcare -financial and social costs</p>	<p><u>Barriers:</u> -Perceived gender difference in health behaviours and health-seeking -Conflicting responsibilities (e.g., work) -Reluctance to confront possibility of illness</p>	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Mason & Strauss [21] (2004, UK)	n=10 (all males) age range: 28-44 years cancer site: testicular Treatment phase	Semi-structured interviews Domains examined: -history of symptoms -response to symptoms -pathway to treatment -masculinity	<u>Barriers:</u> -Uncertainty regarding symptoms -Optimism (e.g., symptom will go away) -Symptom misattribution -Low level of cancer knowledge -Denial -Belief that older people get cancer -Emotional protection of others -Disclosure to friends -Embarrassment -Marginalisation of men's health -Masculine gender role norms -Taboos around genital health <u>Facilitators:</u> -Symptom progression/severity -Disclosure to partners or friends -Encouragement from partners and family	Medium
O'Brien et al. [39] (2005, UK)	n=55 (14 male-only groups) age range: 15-72 years (majority over 18 years) mixed sample: general population and men who had experienced ill health, including a prostate cancer group (n=4)	Focus groups Domains examined: -experience of health-related help- seeking -health-related discussion with other men	<u>Barriers:</u> -Low level of cancer knowledge -Perceived gender differences in health behaviours and health-seeking -Masculine gender role norms (e.g., machismo) <u>Facilitator:</u> -Type of symptom (e.g., testicular lump)	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
Ramos et al. [45] (2010, Spain)	n=12 (mixed gender: males n=7, females n=5) male age range: 45-82 years female age range: 49-79 years cancer site: colorectal diagnosed in previous 12 months	Semi-structured interviews Domains examined: -symptoms -symptom appraisal -response to symptoms -interaction with healthcare system	<u>Barrier:</u> -Symptom misattribution <u>Facilitators:</u> -Prolonged symptoms or changes in symptoms -Males more likely than females to seek help following encouragement by partner or family member	Medium
Sanden et al. [46] (2000, Sweden)	n=21 (all male) age range: 20-49 years cancer site: testicular post-treatment	Semi-structured interviews Domains examined: -initial symptoms -response to symptoms -subsequent actions	<u>Barrier:</u> -Optimism (e.g., symptom will go away) -Misattribution -Location of symptom (e.g., sexual organ) -Intermittent symptoms (e.g., pain) -Embarrassment <u>Facilitators:</u> -Encouragement from partner or family member -Symptom progression/severity	Low
Scanlon et al. [40] (2006, UK)	N=115 (mixed-gender; male n=47, female n=68) age range: 35-75 years general population ethnicity: Irish (n=58), White British (n=57) Interviews n=32 (mixed-gender) Focus groups n=86 (25 mixed-gender focus groups)	Focus groups Domains examined: -cancer beliefs -help-seeking behaviours Semi-structured interviews Domains examined: -factors influencing health -knowledge of cancer -beliefs about cancer prevalence -attitudes towards cancer prevention -experience with health services	<i>Whole sample</i> <u>Barriers:</u> -Males had lower level of cancer knowledge than females -Males less likely to consider cancer risk or discuss cancer than females -Optimism (e.g., symptom will go away) -Fear (e.g., cancer) -Conflicting responsibilities -Perceived long wait times and short appointments <i>Irish-specific</i> <u>Barriers:</u>	Medium

Authors (Year & Country)	Sample	Methods	Results	Quality rating
		-perceived factors influencing help-seeking	-Masculine gender role norms (e.g., machismo)	
Taghipour et al. [41] (2011, Iran)	n=12 (all male) age range: 55-80 years (<i>M</i> =67 years) cancer site: prostate	Semi-structured interviews Domains examined: -beliefs and feelings regarding cancer -experience of cancer	<u>Barriers:</u> -Low level of prostate knowledge -Perceiving symptoms as trivial -Denial -Self-reliance (e.g., self-monitoring, self-medication) -Inaccurate advice from friends -Inadequate referral system <u>Facilitators:</u> -Death of significant other due to cancer -Symptom severity -Disclosure to partner or family member -Help of partner or family member -Informal cancer knowledge from family and friends	Medium
Tod et al. [55] (2007, UK)	n=20 (mixed gender: male n=12, female n=8) age range: 47-81 years cancer site: lung majority diagnosed in previous six months	Semi-structured interviews Domains examined: -factors influencing delay in reporting symptoms	<u>Barrier:</u> -Stoicism	High

Authors (Year & Country)	Sample	Methods	Results	Quality rating
	In addition, 12 partners/friends participated in interviews			
Vaartio et al. [57] (2003, Finland)	n=8 (all male) age range: 42-64 years (<i>M</i> =53) diagnosed in previous 6-23 months (<i>M</i> =11) cancer sites: melanoma (n=2), stomach (n=1), lung (n=1), Hodgkin's disease (n=1), testicular (n=1), prostate (n=1), bladder (n=1)	Semi-structured interviews Domains examined: -cancer experiences -intrapersonal resources -extrapersonal resources	<u>Facilitators:</u> -Symptom severity - Encouragement from partner	Medium
Williams et al. [50] (2003, New Zealand)	n=20 (all male) age range: 40-70 years mixed sample: symptomatic of prostate disease (n=16) and asymptomatic (n=4) ethnicity: Maori (n=20)	Semi-structured interviews Domains examined: -importance of health -accessibility of prostate cancer information -feelings regarding help-seeking -quality of life -treatment types -family health	<u>Barriers:</u> -Inadequate culturally appropriate healthcare -Concerns regarding examination and treatment -Embarrassment/shame -Inadequate culturally appropriate information/ low level cancer knowledge -Optimism (e.g., symptom will go away) -Masculine gender role norms (e.g., machismo) -Conflicting responsibilities (e.g., work) <u>Facilitators:</u> -Culturally appropriate healthcare -Importance of family and family health -Encouragement by partner or family member -Symptom impact on family -Social norms (e.g., friends seeking help)	Medium

Supplementary Table 2. Outline of included studies and data extracted: quantitative research

Authors (Year)	Sample	Methods	Results	Quality rating
Attard [58] (1985, England)	n=23 (all male) cancer site: testicular	Retrospective analysis of clinical cases Variables examined: -clinical characteristics -factors influencing delay in help seeking -factors influencing delay in treatment	Patient delay contributed to treatment delay for six men: <u>Barriers:</u> -Did not think symptom was important as it was painless (n=3) -Attributed symptom to trauma (n=2) -Not aware of symptom (n=1)	Medium
Chojnacka-Szawłowska et al. [61] (2013, Poland)	N=301 (mixed sample: male n=115, female n=186) age range: 16–80 years (<i>M</i> =42, <i>SD</i> =12.2; majority over 18 years) cancer sites: breast n=140, bowel n=29, bronchial n=28, reproductive organs n=16, lymphoma n=15, head and neck n=15, gastric n=14, sarcoma n=6, laryngeal n=6, prostate n=8, urinary system n=4 diagnostic phase	Structured and unstructured interviews Measures: -State-Trait Anxiety Inventory -Beck Depression Inventory -Harris and Guten’s health appraisal scale Variables examined: -socio-demographic characteristics -clinical characteristics -symptom characteristics -cancer knowledge - health beliefs regarding curability of cancer -personal experience with cancer Respondents were invited to tell their pathway to treatment story	<u>Barriers:</u> - Considerable delay (more than 9 months) was found in men who held a belief that cancer is incurable, a good/very good self-appraisal of health, low levels of depression and state anxiety (29.1%, n=35)	Medium
Douglass et al. [59] (1998, New Zealand)	n=909 (mixed gender: male n=465, female n=444) sample age = 21 years general population	Self-administered questionnaire Variables examined: -sun behaviour	Of respondents who had noticed changes in a mole or freckle in the past 12 months (n=185), 54% (n=101) did not seek help <u>Barrier:</u>	High

Authors (Year)	Sample	Methods	Results	Quality rating
		<ul style="list-style-type: none"> -sun protection -knowledge of melanoma -skin checking and help-seeking -help seeking for skin cancer symptoms -reasons for delay 	<ul style="list-style-type: none"> -Men were more likely than women to report being unsure what to do 	
Fitzpatrick et al. [62] (1998, Ireland)	n=280 (all male) age range: 40-69 years (M=53.7) general population	<p>Interview questionnaire</p> <p>Variables examined:</p> <ul style="list-style-type: none"> -socio-demographic characteristics -willingness to attend a doctor with urinary symptoms -perception of attendance as urgent or important -awareness of prostate cancer -GP questioning about urinary symptoms -personal or family history of cancer 	<p>81% (n=226) would see a GP if they developed urinary symptoms</p> <p><u>Facilitator:</u></p> <ul style="list-style-type: none"> -Having heard of prostate cancer (adjusted OR=3.0, $p<.01$) <p>56% (n=156) would see a GP, and considered it urgent and important</p> <p><u>Facilitator</u></p> <ul style="list-style-type: none"> -Having heard of prostate cancer (adjusted OR=2.4, $p<.05$) <p>25% (n=70) would see a GP, but considered it not important or urgent</p> <p><u>Barriers:</u></p> <ul style="list-style-type: none"> -not important unless they had very severe symptoms with bleeding (44%) -merely an unimportant sign of ageing (23%) -embarrassment at attending a female GP with urinary complaints (3%) -fear of cancer and surgery (1.5%) <p>19% (n=54) would not see a GP if they developed urinary symptoms</p> <p><u>Barriers:</u></p> <ul style="list-style-type: none"> -dislike of doctors and hospitals (23%) -embarrassment (14%) 	Medium

Authors (Year)	Sample	Methods	Results	Quality rating
			-fear of side-effects of treatment (11%) -would only attend a GP if they had severe pain or bleeding (11%)	
Pedersen et al. [65] (2011, Denmark)	n=910 (mixed gender; male n=423, female n=487) Mean male age = 64.2 years (SD=12.8) Mean female age = 59.8 years (SD=14.7) cancer site: mixed	Self-administered questionnaire Variables examined: -socio-demographic characteristics -clinical characteristics -family history of cancer -patient delay -social support -disclosure	<u>Facilitator:</u> -Perceived partner support significantly reduced the likelihood of patient delay in men (adjusted RRR=0.54, 95% CI=0.34-0.85, p=.008)	High
Robb et al. [63] (2009, UK)	n=2208 (mixed gender: male n=968, female n=1240) age range: 16-65+ (majority over 18 years) general population ethnicity: White (n=2064; 93.5%), other (n=144; 6.5%)	Interview questionnaire Measures: -Cancer Awareness Measure Variables examined: -socio-demographic characteristics -awareness of cancer warning signs -anticipated delay -barriers to help seeking	<u>Barriers:</u> -Difficult making an appointment (37%) -Not wanting to 'waste the doctor's time' (36%) -Worry about what the doctor might find (34%)	High
Skeppner et al. [8] (2012, Sweden)	n=59 (all male) age range: 37-63 years (Mdn=61.5) cancer site: penile treatment phase In addition, 36 partners interviewed	Structured interviews Measures: -Hospital Anxiety and Depression Scale -International Index of Erectile Function-5 - Life Satisfaction-11 Domains examined:	Of men who delayed help-seeking more than 6 months: <u>Barriers:</u> -Embarrassment (n=17) -Lack of knowledge (n=7) -Thought symptom would disappear (n=7) -Fear of severe disease (n=2) -Did not think symptoms could be something severe (n=1)	Medium

Authors (Year)	Sample	Methods	Results	Quality rating
		<ul style="list-style-type: none"> -socio-demographic characteristics -clinical characteristics -initial symptoms -treatment seeking -sexual activity/function 		
Sunny et al. [67] (2008, Sweden)	n=219 (all male) age range: 50-80 years (<i>M</i> =71 years, <i>SD</i> =7.1) cancer site: prostate diagnosed in past 4 years	Self-administered questionnaire Variables examined: -socio-demographic characteristics -clinical characteristics -information seeking	<u>Facilitator:</u> -Men who obtained information from the internet were significantly more likely to delay help seeking less than 3 weeks than men who delayed help seeking for more than 3 weeks (adjusted OR=3.2, 95% CI=1.2-8.7, <i>p</i> <.02)	High
Swetter et al. [66] (2009, USA)	n=316 (mixed gender: male patient n=158, female spouses n=158) Mean male age = 63 years Mean female age = 59 years cancer site: melanoma diagnosed in past 3 months ethnicity: White (male n=97, female n=95), other (male n=61, female n=63)	Self-administered questionnaire Variables examined: -socio-demographic characteristics -clinical characteristics -skin cancer examination -skin cancer awareness and attitudes -medical access -source of health information	<u>Facilitator:</u> -80% of men agreed/strongly agreed that their female spouses ensured they went to see a physician	Medium
Talcott et al. [60] (2007, USA)	n=555 (all male) age range: 41-70+ cancer site: prostate diagnostic phase ethnicity: Caucasian n=348, African American n=207	Interview questionnaire Measure: Trust in Physician Scale Variables: -socio-demographic characteristics -clinical characteristics -screening history -access to care -health attitudes and beliefs	7% of overall sample had symptoms but delayed for >3 weeks <u>Barriers:</u> -African American men more often reported that they “thought the problem would go away” (85% versus 70%, <i>p</i> <.01) -African American men more often reported fear (11% versus 7%, <i>p</i> <.01) -4% of both groups reported delay because “they did not have time”	Medium

Authors (Year)	Sample	Methods	Results	Quality rating
		-trust in physician -factors influencing delayed help-seeking		
Waller et al. [64] (2009, England)	n=1500 (mixed gender) age range: 18-55+ general population ethnicity: Indian n=467 (males 50%), Pakistani n=333 (males 50%), Bangladeshi n=126 (males 52%), Caribbean n=252 (males 47%), African n=216 (males 48%), Chinese n=106 (males 51%)	Interview questionnaire Measure: Cancer Awareness Measure Variables: -socio-demographic characteristics -awareness of cancer warning signs -anticipated delay -barriers to help seeking	<u>Barrier:</u> -Males significantly more likely than females ($p=.02$) to indicate they were too busy to seek help for symptoms across all ethnic groups except for the African groups	High
Young et al. [10] (2000, Australia)	n=100 (mixed gender: male n=52, female n=48) age range: 43-92 years ($M=70.4$ years) cancer site: colorectal diagnostic phase In addition, relatives and caregivers interviewed	Structured interview Domains examined: -symptom history -help seeking for cancer symptoms -factors influencing delayed help seeking	patient delay >3 months (male n=16) <u>Barriers:</u> -Did not seek help until symptoms were severe (n=3) -Not concerned by their symptoms (n=2) -Misattribution (n=1) -Conflicting responsibilities (e.g., family) (n=1) -Concerns regarding bothering health professional (n=1)	High

Supplementary Table 3. Summary of psychosocial factors associated with men’s help-seeking for cancer symptoms: qualitative evidence

Themes	Barriers	Facilitators
Knowledge and awareness	<p>Low level awareness/knowledge of cancer [6, 31-41]</p> <p>Low level of risk perception [40]</p>	<p>Informal cancer knowledge of friends and family [32, 34, 36, 41, 42]</p> <p>Knowledge of cancer symptoms [42, 51, 56]</p> <p>Death of significant other due to cancer [41]</p>
Symptom recognition and interpretation	<p>Symptom mildness/gradual progression [32, 34-36, 42-44]</p> <p>Misattribution [32, 33, 38, 42-46]</p> <p>Intermittent symptom [43, 46]</p> <p>Absence of additional symptom [43]</p> <p>Location of symptom [46]</p> <p>Low attentiveness to health [47]</p> <p>Previous benign diagnosis [43]</p> <p>Trivialisation of symptom [41]</p> <p>Uncertainty regarding symptom [38]</p>	<p>Symptom severity/progression [32, 36-38, 41, 43, 44, 46, 51, 57]</p> <p>Prolonged symptom [32, 33, 45]</p> <p>Changes in symptom [45]</p> <p>Misattribution [43]</p> <p>Previous benign diagnosis [43]</p> <p>Type of symptom [39]</p>
Emotions	<p>Embarrassment/shame [6, 31, 32, 34, 37, 38, 42-44, 46, 48-50]</p> <p>Fear/ anxiety (e.g., cancer, treatment) [6, 31, 36, 40, 42, 44, 51]</p> <p>Body image concerns (e.g., removal of testicle) [32, 44]</p> <p>Concern about examination [50]</p>	<p>Concern about symptom [32]</p> <p>Lack of emotional response to symptom/help-seeking [32, 47]</p>
Attitudes and health beliefs	<p>Conflicting responsibilities/low prioritisation of health [32, 40, 42, 43, 47, 50, 52]</p> <p>Optimism (i.e., symptom will go away) [32, 38, 40, 43, 46, 48, 50]</p> <p>Fatalism (i.e., lack of control over outcome) [31, 42, 53]</p> <p>Belief that cancer affects older people [32, 38]</p> <p>Belief that cancer would never happen to them [54]</p>	<p>Optimism [43]</p>

Themes	Barriers	Facilitators
Coping processes	Denial (e.g., lack of symptom acknowledgement) [6, 38, 41, 53] Avoidance (e.g., possible illness, cancer information) [36, 52]	
Social norms	Masculine gender role norms (e.g., machismo) [31, 36, 38-40, 42-44, 48-51, 55] Perceived gender differences in health/health behaviours (e.g., women have more health issues) [31, 36, 39, 44, 47, 49, 51, 52] Self-reliance (e.g., self-treat) [31, 41, 43, 53] Difficulty disclosing/communicating (e.g., due to social norms) [37, 40] Taboos around health/discussing health [38, 51] Marginalisation of men's health [38] Status of symptom (e.g., lesser than other health issues) [36]	Help-seeking as social norm (i.e., significant others seek help) [50]
Social support	Disclosure to others (e.g., inaccurate advice) [38, 41, 43] Emotional protection of others [34, 38]	Encouragement by or support of partner/family member [32-34, 36, 38, 41, 44-48, 50, 51, 53, 57] Disclosure to others [38, 41, 43]
Family and relationship health		Importance of family health [50, 56] Symptom impact on partner/family [34, 50] Concern over future sexual functioning [56]
Health system	Lack of access [6, 41] Disconnection from health service providers [31, 51] Inadequate culturally appropriate healthcare and information [37, 50] Perceived long wait times and short appointments [31, 40] Low level of previous contact with health system [32, 53] Concerns about confidentiality [37]	Culturally appropriate healthcare [50] Private health insurance [36] Trust in expert assessment [47]

Themes	Barriers	Facilitators
	Concern about loss of dignity/respect with healthcare professionals [31] Previous negative experience with health system [31] Financial cost [31]	

Supplementary Table 4. Summary of psychosocial factors associated with men’s help-seeking for cancer symptoms: quantitative evidence

Themes	Barriers	Facilitators
Knowledge and awareness	Low cancer knowledge [8]	Information seeking [67] Cancer awareness [62]
Symptom recognition and interpretation	Symptom mildness (e.g., painless) [10, 58, 62] Misattribution [10, 58] Not aware of symptom [58] Trivialisation of symptom [62] Uncertainty regarding response to symptom [59]	Symptom severity [62]
Emotions	Embarrassment [8, 62] Fear/ anxiety (e.g., cancer, treatment) [8, 60, 62, 63] Concern about bothering health professional/wasting time [10, 63] Low level of depression and state anxiety [61] Low level of concern about symptom [10]	
Attitudes and health beliefs	Conflicting responsibilities/low prioritisation of health [10, 60, 64] Optimism (i.e., symptom will go away) [8, 60] Fatalism (e.g., belief that cancer is incurable) [61] Negative attitude towards health professionals and system [62] Good self-appraisal of health status [61]	
Social support		Encouragement/perceived support of partner [65, 66]
Health system	Perceived difficulty making an appointment [63]	