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## Integrating Men's Health and Masculinity Theories to Explain Colorectal Cancer Screening Behavior

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### Abstract

Colorectal cancer (CRC) is the third most common cause of cancer deaths among men in the United States. Although CRC screening has been found to reduce CRC incidence and mortality, current screening rates among men are suboptimal due to various practical and psychosocial barriers. One potential barrier to CRC screening identified in qualitative studies with men is the threat to masculinity that endoscopic screening methods pose. Indeed, beliefs about masculinity have been predictive of other preventive health behaviors among men. In this review paper, we propose a novel conceptual framework to explain men's CRC screening behavior that integrates masculinity norms, gender role conflict, men's health care experiences, behaviors, and beliefs, and social and background variables. This framework has the potential to guide future research on men's CRC screening behaviors and other health behaviors and may inform gender-sensitive interventions which target masculinity beliefs to increase preventive health behaviors.

### Keywords

masculinity; men's health; colorectal cancer screening; gender role conflict

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Colorectal cancer (CRC) is the third most common cancer diagnosis and the third most common cause of cancer deaths among men in the United States (American Cancer Society, 2012). Despite screening methods to reduce CRC incidence and death, screening rates are unacceptably low with only 59% of eligible men reporting CRC screening consistent with national recommendations (Centers for Disease Control and Prevention, 2012; Levin et al., 2008; McQueen et al., 2009). For individuals at average risk for CRC (i.e., those lacking risk factors other than age), CRC screening starts at age 50 and includes six test options (Levin et al., 2008). Providers most frequently recommend colonoscopy and are unlikely to inform average risk patients about all available tests (McQueen et al., 2009). However, some men find endoscopic screening such as a colonoscopy to be embarrassing, invasive, and an affront to their masculinity (Bass et al., 2011; Beeker, Kraft, Southwell, & Jorgensen, 2000; Fernandez et al., 2008; Getrich et al., 2012; Goldman, Diaz, & Kim, 2009; Jones, Devers,

Kuzel, & Woolf, 2010; Thompson, Reeder, & Abel, 2011; Wackerbarth, Peters, & Haist, 2005; Winterich et al., 2011; Winterich et al., 2009).

Masculinity and gender role conflict have been examined as factors that influence men's health-promoting and risk behaviors (Addis & Mahalik, 2003; Courtenay, 2000a, 2011; Levant, Wimer, & Williams, 2011; Levant, Wimer, Williams, Smalley, & Noronha, 2009; Nicholas, 2000). Compared to women, men are more likely to endorse beliefs about masculinity (e.g., "I believe a person should always try to control his or her emotions") (Courtenay, McCreary, & Merighi, 2002, p. 223). Men's endorsement of traditional masculinity norms has predicted increased engagement in health risk behaviors, decreased engagement in health-promoting behaviors, and perceived barriers to health-promoting behaviors (Boman & Walker, 2010; Courtenay, 1999; Mahalik, Burns & Syzdek, 2007; Marcell, Ford, Pleck, & Sonenstein, 2007; Springer & Mouzon, 2011). Gender role conflict, which occurs when a man who holds male normative beliefs is confronted by a situation in which masculine norms are or may be breached, also has been positively associated with health risk behaviors and negative attitudes toward help-seeking (Blazina & Watkins, 1996; Eisler, Skidmore, & Ward, 1988; Good, Dell, & Mintz, 1989; Levant et al., 2009). For example, seeking help from a health professional for acute or preventive care may be viewed by some men as a violation of masculinity norms, resulting in avoidance of medical care (Addis & Mahalik, 2003; O'Brien, Hunt, & Hart, 2005). Similarly, the performance of cancer screenings, especially those that breach physical boundaries, may be perceived as a violation of masculine norms and generate gender role conflict. Unfortunately, few studies have considered the role of gender role conflict in health care behaviors (O'Neil, 2008). Additional research is needed to understand associations between health-promoting behaviors and gender role conflict (O'Neil, 2008).

In qualitative studies, men have voiced concerns that endoscopic CRC screening tests are an affront to masculinity norms and might affect their sexual orientation or place them in a vulnerable position (Bass et al., 2011; Beeker et al., 2000; Fernandez et al., 2008; Getrich et al., 2012; Goldman et al., 2009; Jones, Devers et al., 2010; Thompson et al., 2011; Wackerbarth et al., 2005; Winterich et al., 2011; Winterich et al., 2009). However, quantitative research has not examined the relationship between masculinity norms and CRC screening, and a framework has not been developed to conceptualize potential relationships between these variables. A testable framework which integrates masculinity norms, gender role conflict, and men's health care experiences, behaviors, and beliefs to understand their CRC screening behavior may be modified and applied to various preventive health behaviors among men (e.g., testicular cancer screening, prostate cancer screening, screening for sexually transmitted infections, sunscreen use). The aims of the current conceptual review paper are to: 1) provide an overview of men's risk of CRC and other cancers; 2) review established predictors of CRC screening; 3) describe four aspects of masculinity hypothesized to be associated with CRC screening; 4) propose a testable conceptual framework which integrates masculinity norms with men's health care experiences, health behaviors and beliefs, and emotions to guide future research on men's CRC screening behavior; and 5) present directions for future research based upon the proposed framework.

## Men's Cancer Risk

One in two men will be diagnosed with cancer and one in four men will die from cancer, whereas one in three women will be diagnosed with cancer and only one in five will die from cancer (American Cancer Society, 2011). Despite their increased risk of cancer, men report lower levels of cancer-related knowledge and worry, poorer attitudes toward cancer prevention, and lower rates of participation in cancer screening and other cancer preventive behaviors than women (Courtenay, 2011; Davis, Buchanan, Katz, & Green, 2012; Levant et

al., 2009; Nicholas, 2000). Men are less likely than women to seek cancer-related information, to practice testicular cancer self-examination (compared to women's rates of breast cancer self-examination), and to recognize cancer symptoms (Courtenay, 2011; Katz, Meyers, & Walls, 1995; Keeney, McKenna, Fleming, & McIlfatrick, 2010, 2011; Kelly et al., 2010). In addition, men have more risk factors associated with CRC and are more likely to delay the receipt of medical attention after developing CRC-related symptoms (Emmons et al., 2005; Young, Sweeney, & Hunter, 2000). Studies that compared self-reported colonoscopy with medical records found that men's self-reported colonoscopy rates were higher than their actual screening rates; men's over-reporting of colonoscopy may account for gender differences in CRC screening reported in prior studies (Griffin et al., 2009). Unfortunately, men's suboptimal CRC screening behaviors inhibit the prevention and early detection of CRC.

## Colorectal Cancer Screening

Researchers have applied a variety of health behavior theories with cognitive and/or social constructs to study CRC screening in men and women including the health belief model (HBM), transtheoretical model (TTM), precaution adoption process model (PAPM), dual process model (DPM), preventive health model (PHM), social cognitive theory (SCT), theory of reasoned action (TRA)/planned behavior (TPB), and the social norms approach (SNA) (Ajzen, 1991; Bandura, 1986; Brenes & Paskett, 2000; Burgess et al., 2011; Ferrer et al., 2011; Honda & Kagawa-Singer, 2006; Janz & Becker, 1984; Leventhal, Safer, & Panagis, 1983; Manne et al., 2003; Myers et al., 1994; Perkins & Berkowitz, 1986; Prochaska et al., 1994; Rawl, Menon, Champion, Foster, & Skinner, 2000; Rawl et al., 2005; Sieverding, Mattered, & Ciccarello, 2010; Sifri et al., 2010; Tabbarah, Nowalk, Raymond, Jewell, & Zimmerman, 2005; Weinstein, 1988; Weinstein & Sandman, 1992). In addition to CRC screening research testing the DPM which integrates cognitive and affective factors (Manne et al., 2003), research has examined the role of affect toward cancer, CRC, and screening (e.g., embarrassment, worry, fear, anticipated regret) in CRC screening decisions (Consedine, Magai, Krivoshekova, Ryzewicz, & Neugut, 2004; Consedine, Reddig, Ladwig, & Broadbent, 2011; Power et al., 2008; Rawl et al., 2000). Definitions of constructs from relevant health behavior theories included in the proposed framework are listed in Table 1.

Factors associated with CRC screening among both men and women include background (e.g., demographics and personal health history) and social support variables as well as health experiences, beliefs, and behaviors. Demographic variables predicting CRC screening completion include older age, being married, having health insurance, and higher levels of income and education (Cokkinides, Chao, Smith, Vernon, & Thun, 2003; Fleming, Schoenberg, Tarasenko, & Pearce, 2011; Guessous et al., 2010; Halbert et al., 2011; James et al., 2008; Tessaro, Mangone, Parkar, & Pawar, 2006). Personal health factors positively associated with CRC screening include family history of CRC (Tessaro et al., 2006), whereas medical co-morbidities have shown mixed associations with screening (Fleming et al., 2011; Lukin et al., 2012). Social support for receiving CRC screening has also been positively associated with CRC screening (Kremers, Mesters, Pladdet, van den Borne, & Stockbrugger, 2000). General health beliefs associated with CRC screening include endorsement of a future time orientation toward health care, positive attitudes toward preventive health care, and low cancer fatalism (Farrands, Hardcastle, Chamberlain & Moss, 1984; Jones, Devers, et al., 2010; Shelton, Jandorf, Ellison, Villagra, & DuHamel, 2011; Whitaker et al., 2011). General health behaviors predictive of CRC screening include up-to-date screening for other cancers, more frequent primary care provider (PCP) visits, having a usual source of health care, and engagement in other health-promoting behaviors (e.g., exercise) (Brouse, Wolf, & Basch, 2008; Guessous et al., 2010; Tabbarah et al., 2005; Tessaro et al., 2006). CRC-specific health beliefs positively associated with CRC screening

include self-efficacy to complete screening, perceived risk of developing CRC, and salience and coherence of CRC screening (Halbert et al., 2011; Myers et al., 1994; Tessaro et al., 2006). CRC-specific health care experiences positively associated with CRC screening include provider recommendation for CRC screening (Brouse et al., 2008; Jandorf et al., 2010).

Endorsement of affective factors (e.g., increased cancer fear, fear of pain, embarrassment, and negative attitudes toward CRC testing) has been associated with decreased likelihood of CRC screening in men and women (Beeker et al., 2000; Farraye et al., 2004; Feeley, Cooper, Foels, & Mahoney, 2009; Friedemann-Sanchez, Griffin, & Partin, 2007; Jandorf et al., 2010; Jones, Devers, et al., 2010; Jones, Woolf, et al., 2010; O'Malley et al., 2004). Among both men and women, concern about having a tube inserted in the rectum was a highly-ranked barrier to CRC screening among those overdue for screening and those who have never had endoscopic screening (Jones, Devers, et al., 2010). This apprehension about the invasiveness of endoscopic CRC screening tests echoes concerns expressed by some men in qualitative studies that such an invasive procedure would breach masculinity norms (e.g., indicate that one is gay, place one in a vulnerable position) (Bass et al., 2011; Jones, Devers, et al., 2010; Winterich et al., 2011). Given men's increased risk of CRC relative to women (American Cancer Society, 2011), it is vital that we understand the extent to which men's actual and perceived CRC risk, beliefs and affect regarding CRC and tests to screen for this disease, masculinity norms, and health care behaviors and experiences predict CRC screening.

## Masculinity Norms and Their Proposed Relationships to CRC Screening

In the United States, there are numerous masculinity norms that vary based upon race, socioeconomic status [SES], sexual orientation, and geographic region (Campbell & Bell, 2000; Courtenay, 2011). In the U.S., current traditional masculinity norms generally reflect those attributed to heterosexual, White, middle- or upper-class men (Courtenay, 2000b; Mahalik et al., 2003). However, American men of lower SES are more likely than their upper-class counterparts to adhere to traditional masculinity norms (Courtenay, 2011). Despite the existence of numerous definitions of masculinity, most consider "masculine" men to be those who: *take risks, show self-reliance, avoid behaviors and characteristics associated with femininity, disdain/avoid gay individuals, control their emotions, have power over women, prioritize winning, exhibit dominance, maintain primacy of work, pursue status, and embrace violence* (Brannon, 1976; Mahalik et al., 2003; Thompson, Pleck, & Ferrera, 1992; Walker, Tokar, & Fischer, 2000). Four masculinity norms (i.e., avoidance of femininity, risk-taking, heterosexual self-presentation, and self-reliance) proposed to be inversely associated with invasive CRC screening are described in detail below. Rationales for their hypothesized inverse relationship with screening are also provided.

Avoidance of femininity is a central tenant in traditional masculinity norms (Brannon, 1976; Mahalik et al., 2003). These norms suggest that men avoid beliefs and behaviors that may be perceived as feminine (Brannon, 1976). Help-seeking from medical professionals, including visits for CRC screening, may be seen as breaching masculine norms and/or trigger gender role conflict because some men may view help-seeking as weak or feminine (Addis & Mahalik, 2003; Courtenay, 2000a; O'Brien et al., 2005).

According to Brannon (1976), disdain of homosexuals is part of avoiding femininity; more recently, the term *heterosexual self-presentation* has been used to represent the ideal that masculine men should distance themselves from behaviors indicative of being gay (Parent & Moradi, 2009). Most conceptualizations of masculinity include aspects of heterosexual self-

presentation, disdain for homosexuality, and/or fear and hatred of gay and bisexual individuals (especially gay men) (Brannon, 1976; Mahalik et al., 2003; Parent & Moradi, 2009; Thompson et al., 1992). Given that men in qualitative studies have expressed concerns regarding the sexual connotation and threat to masculinity that endoscopic CRC screening imposes (Bass et al., 2011; Beeker et al., 2000; Fernandez et al., 2008; Getrich et al., 2012; Goldman et al., 2009; Jones, Devers et al., 2010; Thompson et al., 2011; Wackerbarth et al., 2005; Winterich et al., 2011; Winterich et al., 2009), this masculinity norm may be important to consider when studying endoscopic CRC screening.

The belief that men should be daring and engage in risk-taking is another central tenant of traditional masculinity which may be inversely related to CRC screening (Brannon, 1976). Men who endorse risk-taking norms may not perceive themselves as vulnerable to cancer or may not see the need to engage in health-promoting behaviors. The risk-taking masculinity norm, along with other masculinity norms, may be inversely related to CRC screening due to a lack of perceived risk of CRC.

Self-reliance connotes that men must be independent in their actions and thoughts (Brannon, 1976). Belief that one should be self-reliant may be associated with avoidance of health care. If one does not seek health care, one cannot receive a CRC screening recommendation. In addition, due to the sense of vulnerability associated with CRC screening (Winterich et al., 2011; Winterich et al., 2009), the relationship between self-reliance and endoscopic cancer screening may be important to consider. Thus, adherence to the self-reliance masculinity norm is proposed to be inversely associated with CRC screening.

Although it is plausible that four masculinity norms (i.e., avoidance of femininity, heterosexual self-presentation, risk-taking, and self-reliance) may be related to some men's willingness to complete endoscopic screening, these relationships have yet to be examined in quantitative research. In addition, a conceptual framework is needed to guide this research.

## Proposed Conceptual Framework

Based on prior research and theories related to men's attitudes toward CRC screening, masculinity, men's health, and CRC screening, a framework that integrates relevant concepts is proposed for future research on men's CRC screening behaviors (see Figure 1). The framework incorporates background variables, social support, masculinity, gender role conflict, and men's health care experiences, health behaviors, health beliefs (including general and CRC-specific beliefs), and affect to predict CRC screening behavior. In Figure 1, constructs in bold indicate that the relationship between the construct and CRC screening behavior has yet to be established.

A number of background variables (e.g., demographic variables such as age and race and personal health variables such as a family history of CRC and health literacy) that may influence CRC screening behavior are included in the proposed framework (Cokkinides et al., 2003; Fleming et al., 2011; Giovannucci, 2002; Green et al., 2012; Halbert et al., 2011; Haque et al., 2007; James et al., 2008; Shelton, et al., 2011; Tessaro et al., 2006). Background variables are proposed to be related to masculinity and gender role conflict as well as men's health care experiences, health behaviors, and health beliefs.

Four aspects of masculinity (i.e., self-reliance, avoidance of femininity, heterosexual self-presentation, and risk-taking) are proposed to be inversely associated with CRC screening behavior. These aspects of masculinity also are proposed to be associated with gender role conflict and men's health care experiences, health behaviors, health beliefs, and affect (e.g., fear of cancer and pain associated with CRC screening). It is hypothesized that higher levels

of these four aspects of masculinity will be associated with greater gender role conflict and with health care experiences, health behaviors, and beliefs associated with lower rates of CRC screening, such as fewer visits to the PCP and greater perceived barriers to screening (Kirzinger, Cohen, & Gindi, 2012; Wardle et al., 2000).

Gender role conflict, a concept closely related to masculinity, has been associated with engagement in health-risk behaviors and poorer attitudes toward help-seeking among men (Addis & Mahalik, 2003; Good et al., 1989; Levant et al., 2009). It is hypothesized that gender role conflict is an obstacle to the receipt of medical care and CRC screening. Furthermore, it is hypothesized that greater gender role conflict will be related to health care experiences, health behaviors, and beliefs associated with lower rates of CRC screening.

Links between men's health care experiences and health behaviors and CRC screening are proposed. Based upon prior research (Long et al., 2012; Tessaro et al., 2006), the proposed framework suggests that being screened for other cancers and practicing health-promoting behaviors (e.g., eating a nutritious diet, engaging in regular exercise, limiting alcohol consumption) will be associated with a greater likelihood of CRC screening completion among men, whereas engaging in CRC health risk behaviors (e.g., smoking) will be related to a reduced likelihood of CRC screening. In addition, it is hypothesized that having a regular PCP and a usual source of health care, making more visits to the PCP in the past year, and being exposed to CRC screening messages (e.g., cues to action) will be correlated with a greater likelihood of CRC screening (Ho, Lai, & Cheung, 2011; Rawl et al., in preparation; Tabbarah et al., 2005).

Men's health behaviors and health care experiences also are proposed to be related to affective factors (e.g., CRC worry) and health beliefs, including general health beliefs and CRC-specific beliefs. For example, having a regular PCP is hypothesized to be related to greater perceived risk of CRC and perceived benefits of CRC screening as well as general health beliefs such as positive attitudes toward cancer prevention and having a future time orientation toward health care (Brouse et al., 2008; Keeney et al., 2010). Such health beliefs in turn are proposed to be related to higher rates of CRC screening.

A number of CRC-specific belief variables from health behavior theories (e.g., HBM, PAPM, DPM, TPB) have been incorporated in the framework. Examples of such health beliefs include perceived benefits of receiving CRC screening, perceived barriers to CRC screening, perceived CRC risk, knowledge of CRC and CRC screening tests, perceived control over screening behavior, self-efficacy for CRC screening, and stage of readiness for CRC screening. In addition, the following cognitions expressed by men in qualitative studies (Bass et al., 2011; Beeker et al., 2000; Fernandez et al., 2008; Getrich et al., 2012; Goldman et al., 2009; Jones, Devers et al., 2010; Thompson et al., 2011; Wackerbarth et al., 2005; Winterich et al., 2011; Winterich et al., 2009) as well as research on prostate cancer screening (Paiva, Motta, & Griep, 2011) have been modified to reflect CRC screening and are included in the framework: "CRC screening can affect sexuality" and "CRC screening is not masculine." These beliefs are proposed to have reciprocal relationships with affective factors, such as embarrassment associated with CRC screening.

Negative affect associated with cancer and CRC screening has been suggested as a barrier to screening in both qualitative and quantitative research (Consedine et al., 2004; Consedine et al., 2011; Rawl et al., 2000). It is important to note that the relationship between affect and health behaviors is complex. For example, in prior research, a curvilinear relationship between worry and mammography has been demonstrated; that is, low and high levels of worry about breast cancer have been found to be barriers to mammography (Kash, Holland, Halper, & Miller, 1992; Lerman et al., 1993; Sutton, Bickler, Sancho-Aldridge, & Saidi,

1994). In the current framework, it is proposed that affect will be associated with CRC screening behavior in men (e.g., embarrassment will be inversely associated with CRC screening) (Feeley et al., 2009).

## Conclusion

In qualitative studies, men have expressed the belief that endoscopic CRC screening may challenge masculinity norms (Bass et al., 2011; Beeker et al., 2000; Fernandez et al., 2008; Getrich et al., 2012; Goldman et al., 2009; Jones, Devers et al., 2010; Thompson et al., 2011; Wackerbarth et al., 2005; Winterich et al., 2011; Winterich et al., 2009). Drawing upon prior quantitative and qualitative research, a framework incorporating cognitive and affective constructs, masculinity norms, and men's health-related experiences is offered to guide future research on CRC screening behavior as well as other health behaviors among men. Proposed interrelated predictors of CRC screening include background factors, social support, gender role conflict, men's health care experiences and health behaviors, health beliefs, affect, and masculinity norms.

The proposed framework makes a novel contribution to the literature because four specific masculinity norms are hypothesized to be associated with CRC screening (i.e., risk-taking, self-reliance, avoidance of femininity, and heterosexual self-presentation). In contrast, most studies examining relationships between men's health behaviors and masculinity norms have only assessed global masculinity rather than specific masculinity norms which may be differentially correlated with health behaviors (Boman & Walker, 2010; Mahalik & Burns, 2011; Mahalik et al., 2007; Marcell et al., 2007; Springer & Mouzon, 2011). In addition, two cognitions were included in the framework to reflect links between men's beliefs about masculinity norms and their willingness to engage in CRC screening (i.e., "CRC screening can affect sexuality" and "CRC screening is not masculine") (Paiva et al., 2011). Paiva and colleagues (2011) assessed a similar cognition when examining barriers to prostate cancer screening (i.e., "The prostate examination can affect masculinity") (p. 77). These researchers found that more than one-third of participants agreed with this statement about masculinity (Paiva et al., 2011), and, thus, cognitions linking masculinity beliefs to CRC screening behavior were included in the proposed framework.

The current framework is derived from empirically-tested health behavior theory and extensive evidence from qualitative cancer screening research (Burgess et al., 2011; Consedine et al., 2004; Consedine et al., 2011; Fernandez et al., 2008; Getrich et al., 2012; Goldman et al., 2009; Greiner et al., 2005; Jones, Devers et al., 2010; Myers et al., 1994; Power et al., 2008; Rawl et al., 2000; Rawl et al., 2005; Tabbarah et al., 2005; Thompson et al., 2011; Sieverding et al., 2010). However, quantitative studies are needed to test the proposed relationships in order to expand our understanding of the role of masculinity in men's CRC screening behavior. Furthermore, if empirical research supports the proposed framework's utility in explaining CRC screening behaviors, this framework could be used to guide studies examining the roles of these masculinity constructs in men's performance of other preventive health behaviors including, but not limited to, screening for other cancers, screening for sexually transmitted infections, healthy diet consumption, and sunscreen use.

Empirical support for the proposed framework would have a number of implications for future intervention research, clinical practice, and public health campaigns. Gender-specific CRC screening interventions could focus upon the barriers and benefits most salient to men. Messages tailored to gender and gender roles may promote CRC screening among non-adherent individuals (Friedemann-Sanchez et al., 2007). For example, for those men who adhere closely to traditional masculinity norms, tailored messages reminding them that CRC screening might result in the maintenance of independence or preservation of masculinity

norms that are important to them (e.g., primacy of work to support one's family) may promote CRC screening adherence (O'Brien et al., 2005). Public health campaigns aimed at encouraging men to complete cancer screenings could feature messages to counteract the beliefs that real men are not concerned about their health or vulnerable to disease and might feature age-appropriate masculine role models. Also, providers may be able to help male patients overcome their barriers to CRC screening by normalizing concerns, providing education, and encouraging CRC screening with masculinity and men's help-seeking beliefs in mind. In addition, if appropriate based upon an individual's risk for CRC, providers may be able to promote screening by offering less invasive CRC screening tests in addition to colonoscopy (i.e., guaiac fecal occult blood test or fecal immunochemical test). Research is necessary to explore whether male-specific CRC screening interventions tailored on masculinity and help-seeking beliefs as well as public health campaigns are efficacious in promoting CRC screening among men.

The proposed aspects of masculinity (i.e., self-reliance, avoidance of femininity, heterosexual self-presentation, and risk-taking) warrant examination in research on other types of cancer screening and other preventive health behaviors. Because much of the past research on masculinity and men's cancer screening behaviors has been qualitative, the broad term of "masculinity" has been used in past literature without an evaluation of specific aspects of masculinity which may influence men's cancer screening behavior (Bass et al., 2011; Beeker et al., 2000; Burgess et al., 2011; Fernandez et al., 2008; Getrich et al., 2012; Greiner et al., 2005; Jones, Devers et al., 2010; Wackerbarth et al., 2005; Winterich et al., 2011; Winterich et al., 2009). Similarly, in quantitative studies evaluating the relationship between masculinity norms and other types of preventive health behaviors among men (e.g., annual physician check-up, exercise, healthy diet, flu shot), global masculinity scores have been utilized (Mahalik & Burns, 2011; Mahalik et al., 2007; Marcell et al., 2007; Springer & Mouzon, 2011). However, it stands to reason that certain aspects of masculinity (e.g., self-reliance) may be related to men's preventive health behaviors, whereas others (e.g., winning, power over women) may not be related to these behaviors. If the proposed aspects of masculinity (i.e., self-reliance, avoidance of femininity, heterosexual self-presentation, and risk-taking) were found to be related to other preventive health behaviors in future research, gender-sensitive interventions could be extended to these additional behaviors. Interventions which take into account masculinity beliefs and are designed to improve multiple health behaviors may help decrease gender disparities in health outcomes.

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## References

- Addis ME, Mahalik JR. Men, masculinity, and the contexts of help seeking. *American Psychologist*. 2003; 58:5–14.10.1037/0003-066X.58.1.5 [PubMed: 12674814]
- Ajzen I. *The Theory of Planned Behavior*. Organizational Behavior and Human Decision Processes. 1991; 50:179–211.
- American Cancer Society. Lifetime risk of developing or dying from cancer. Learn about cancer. 2011. Retrieved from <http://www.cancer.org/Cancer/CancerBasics/lifetime-probability-of-developing-or-dying-from-cancer>
- American Cancer Society. *Cancer facts and figures 2012*. Atlanta, GA: American Cancer Society; 2012.
- Bandura, A. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall; 1986.



- Bass SB, Gordon TF, Ruzek SB, Wolak C, Ward S, Paranjape A, Ruggieri DG. Perceptions of colorectal cancer screening in urban African American clinic patients: Differences by gender and screening status. *Journal of Cancer Education*. 2011; 26:121–128.10.1007/s13187-010-0123-9 [PubMed: 20443096]
- Beeker C, Kraft JM, Southwell BG, Jorgensen CM. Colorectal cancer screening in older men and women: Qualitative research findings and implications for intervention. *Journal of Community Health*. 2000; 25:263–278.10.1023/A:1005104406934 [PubMed: 10868818]
- Blazina C, Watkins CE. Masculine gender role conflict: Effects on men's scores of psychological well-being, substance usage, and attitudes toward help-seeking. *Journal of Counseling Psychology*. 1996; 43:461–465.10.1037/0022-0167.43.4.461
- Boman EKO, Walker GA. Predictors of men's health care utilization. *Psychology of Men and Masculinity*. 2010; 11:113–122.10.1037/a0018461
- Brannon, R. The male sex role: Our culture's blueprint for manhood and what it's done for us lately. In: David, D.; Brannon, R., editors. *The forty-nine percent majority: The male sex role*. Reading, MA: Addison-Wesley; 1976. p. 1-48.
- Brenes GA, Paskett ED. Predictors of stage of adoption for colorectal cancer screening. *Preventive Medicine*. 2000; 31:410–416.10.1006/pmed.2000.0729 [PubMed: 11006067]
- Brouse CH, Wolf RL, Basch CE. Facilitating factors for colorectal cancer screening. *Journal of Cancer Education*. 2008; 23:26–31.10.1080/08858190701818283 [PubMed: 18444043]
- Burgess DJ, van Ryn M, Grill J, Noorbaloochi S, Griffin JM, Ricards J, Partin MR. Presence and correlates of racial disparities in adherence to colorectal cancer screening guidelines. *Journal of General Internal Medicine*. 2011; 26:251–258.10.1007/s11606-010-1575-7 [PubMed: 21088920]
- Campbell H, Bell MM. The question of rural masculinities. *Rural Sociology*. 2000; 65:532–546.10.1111/j.1549-0831.2000.tb00042.x
- Centers for Disease Control and Prevention. Cancer screening—United States, 2010. *Morbidity and Mortality Weekly Report*. 2012; 61:41–54. [PubMed: 22278157]
- Champion VL, Skinner CS, Menon U, Rawl S, Giesler RB, Monahan P, Daggy J. A breast cancer fear scale: Psychometric development. *Journal of Health Psychology*. 2004; 9:753–762.10.1177/1359105304045383 [PubMed: 15367754]
- Cokkinides VE, Chao A, Smith RA, Vernon SW, Thun MJ. Correlates of underutilization of colorectal cancer screening among U.S. adults, age 50 years and older. *Preventive Medicine*. 2003; 36:85–91.10.1006/pmed.2002.1127 [PubMed: 12473428]
- Consedine NS, Magai C, Krivoshekova YS, Ryzewicz L, Neugut AI. Fear, anxiety, worry, and breast cancer screening behavior: A critical review. *Cancer Epidemiology, Biomarkers, and Prevention*. 2004; 13:501–510.
- Consedine NS, Reddig MK, Ladwig I, Broadbent EA. Gender and ethnic differences in colorectal cancer screening embarrassment and physician gender preferences. *Oncology Nursing Forum*. 2011; 38:E409–417.10.1188/11.ONF.E409-E417 [PubMed: 22037340]
- Courtenay, W. *Dying to be men: Psychosocial, environmental, and biobehavioral directions in promoting the health of men and boys*. New York City: Rutledge; 2011.
- Courtenay WH. Better to die than cry? A longitudinal and constructionist study of masculinity and the health risk behavior of young American men. *Dissertation Abstracts International: Section A Humanities and Social Sciences*. 1999; 59:3207.
- Courtenay WH. Constructions of masculinity and their influence on men's well-being: A theory of gender and health. *Social Science and Medicine*. 2000a; 50:1385–1401.10.1016/S0277-9536(99)00390-1 [PubMed: 10741575]
- Courtenay WH. Engendering health: A social constructionist examination of men's health beliefs and behaviors. *Psychology of Men and Masculinity*. 2000b; 1:4–15.10.1037//1524-9220.1.1.4
- Courtenay WH, McCreary DR, Merighi JR. Gender and ethnic differences in health beliefs and behaviors. *Journal of Health Psychology*. 2002; 7:219–231.10.1177/1359105302007003216 [PubMed: 22114246]
- Davis JL, Buchanan KL, Katz RV, Green BL. Gender differences in cancer screening beliefs, behaviors, and willingness to participate: Implications for health promotion. *American Journal of Men's Health*. 2012; 6:211–217.10.1177/1557988311425853

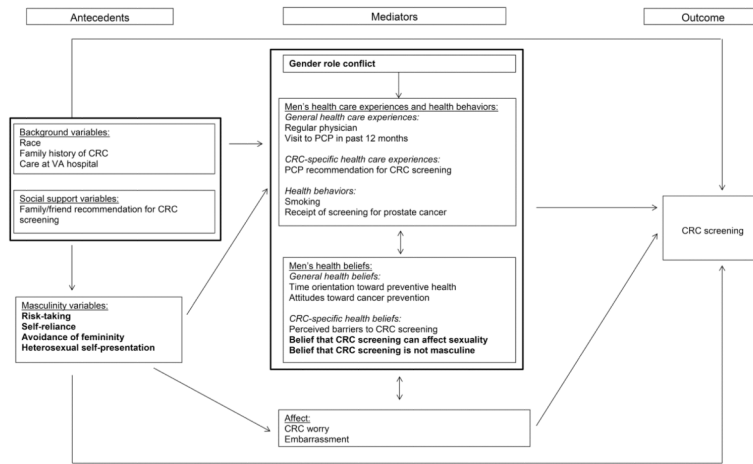
- Eisler RM, Skidmore JR, Ward CH. Masculine gender-role stress: Predictor of anger, anxiety, and health-risk behaviors. *Journal of Personality Assessment*. 1988; 52:133–141.10.1207/s15327752jpa5201\_12 [PubMed: 3361409]
- Emmons KM, McBride CM, Puleo E, Pollak KI, Marcus BH, Napolitano M, Fletcher R. Prevalence and predictors of multiple behavioral risk factors for colon cancer. *Preventive Medicine*. 2005; 40:527–534.10.1016/j.ypmed.2004.10.001 [PubMed: 15749134]
- Farrands PA, Hardcastle JD, Chamberlain J, Moss S. Factors affecting compliance with screening for colorectal cancer. *Journal of Public Health*. 1984; 6:12–19.
- Farraye FA, Wong M, Hurwitz S, Puleo E, Emmons K, Wallace MB, Fletcher RH. Barriers to endoscopic colorectal cancer screening: Are women different from men? *American Journal of Gastroenterology*. 2004; 99:341–349.10.1111/j.1572-0241.2004.04045.x [PubMed: 15046227]
- Feeley TH, Cooper J, Foels T, Mahoney MC. Efficacy expectations for colorectal cancer screening in primary care: Identifying barriers and facilitators for patients and clinicians. *Health Communication*. 2009; 24:304–315.10.1080/10410230902889241 [PubMed: 19499424]
- Fernandez ME, Wippold R, Torres-Vigil I, Byrd T, Freeberg D, Bains Y, Vernon SW. Colorectal cancer screening among Latinos from U.S. Cities along the Texas-Mexico border. *Cancer Causes and Control*. 2008; 19:195–206.10.1007/s10552-007-9085-6 [PubMed: 18038186]
- Ferrer RA, Hall KL, Portnoy DB, Ling BS, Han PK, Klein WM. Relationships among health perceptions vary depending upon stage of readiness for colorectal cancer screening. *Health Psychology*. 2011; 30:525–535.10.1037/a0023583 [PubMed: 21534672]
- Fleming ST, Schoenberg NE, Tarasenko YN, Pearce KA. Prevalence of colorectal cancer screening among a multimorbid rural Appalachian population. *Southern Medical Journal*. 2011; 104:811–816.10.1097/SMJ.0b013e31823a8879 [PubMed: 22089360]
- Friedemann-Sanchez G, Griffin JM, Partin MR. Gender differences in colorectal cancer screening barriers and information needs. *Health Expectations*. 2007; 10:148–160.10.1111/j.1369-7625.2006.00430.x [PubMed: 17524008]
- Getrich CM, Sussman AL, Helitzer DL, Hoffman RM, Warner TD, Sánchez V. on Behalf of RIOS Net Clinicians. Expressions of machismo in colorectal cancer screening among New Mexico Hispanic subpopulations. *Qualitative Health Research*. 2012; 22:546–559.10.1177/1049732311424509 [PubMed: 22138258]
- Giovannucci E. Modifiable risk factors for colon cancer. *Gastroenterology Clinics of North America*. 2002; 31:925–943.10.1016/S0889-8553(02)00057-2 [PubMed: 12489270]
- Goldman RE, Diaz JA, Kim I. Perspectives of colorectal cancer risk and screening among Dominicans and Puerto Ricans: Stigma and misperceptions. *Qualitative Health Research*. 2009; 19:1559–1568.10.1177/1049732309349359 [PubMed: 19776255]
- Good GE, Dell DM, Mintz LB. Male role and gender role conflict: Relations to help seeking in men. *Journal of Counseling Psychology*. 1989; 36:295–300.10.1037/0022-0167.36.3.295
- Green BB, Bogart A, Chubak J, Vernon SW, Morales LS, Meenan RT, Wang CY. Nonparticipation in a population-based trial to increase colorectal cancer screening. *American Journal of Preventive Medicine*. 2012; 42:390–397.10.1016/j.amepre.2011.11.014 [PubMed: 22424252]
- Greiner KA, Born W, Nollen N, Ahluwalia JS. Knowledge and perceptions of colorectal cancer screening among urban African Americans. *Journal of General Internal Medicine*. 2005; 20:977–983.10.1111/j.1525-1497.2005.0165.x [PubMed: 16307620]
- Griffin JM, Burgess D, Vernon SW, Friedemann-Sanchez G, Powell A, Van Ryn M, Partin M. Are gender differences in colorectal cancer screening rates due to differences in self-reporting? *Preventive Medicine*. 2009; 49:436–441.10.1016/j.ypmed.2009.09.013 [PubMed: 19765609]
- Guessous I, Dash C, Lapin P, Doroshenk M, Smith RA, Klabunde CN. Colorectal cancer screening barriers and facilitators in older persons. *Preventive Medicine*. 2010; 50:3–10.10.1016/j.ypmed.2009.12.005 [PubMed: 20006644]
- Halbert CH, Barg FK, Guerra CE, Shea JA, Armstrong K, Ferguson M, Troxel AB. Cultural, economic, and psychological predictors of colonoscopy in a national sample. *Journal of General Internal Medicine*. 2011; 26:1311–1316.10.1007/s11606-011-1783-9 [PubMed: 21732197]

- Haque R, Quinn VP, Habel LA, Enger SM, Sternfeld B, Van Den Eeden SK, Caan B. Correlates of screening sigmoidoscopy use among men in a large nonprofit health plan. *Cancer*. 2007; 110:275–281.10.1002/Cncr.22775 [PubMed: 17559138]
- Ho MY, Lai JY, Cheung WY. The influence of physicians on colorectal cancer screening behavior. *Cancer Causes and Control*. 22:1659–1668. [PubMed: 21971815]
- Honda K, Kagawa-Singer M. Cognitive mediators linking social support networks to colorectal cancer screening adherence. *Journal of Behavioral Medicine*. 2006; 29:449–460.10.1007/s10865-006-9068-1 [PubMed: 16958004]
- James AS, Hall S, Greiner KA, Buckles D, Born WK, Ahluwalia JS. The impact of socioeconomic status on perceived barriers to colorectal cancer testing. *American Journal of Health Promotion*. 2008; 23:97–100.10.4278/ajhp.07041938 [PubMed: 19004158]
- Jandorf L, Ellison J, Villagra C, Winkel G, Varela A, Quintero-Canetti Z, Duhamel K. Understanding the barriers and facilitators of colorectal cancer screening among low income immigrant Hispanics. *Journal of Immigrant and Minority Health*. 2010; 12:462–469.10.1007/s10903-009-9274-3 [PubMed: 19621259]
- Janz NK, Becker MH. The Health Belief Model: A decade later. *Health Education Quarterly*. 1984; 11:1–47. [PubMed: 6392204]
- Jones RM, Devers KJ, Kuzel AJ, Woolf SH. Patient-reported barriers to colorectal cancer screening: A mixed-methods analysis. *American Journal of Preventive Medicine*. 2010; 38:508–516.10.1016/j.amepre.2010.01.021 [PubMed: 20409499]
- Jones RM, Woolf SH, Cunningham TD, Johnson RE, Krist AH, Rothemich SF, Vernon SW. The relative importance of patient-reported barriers to colorectal cancer screening. *American Journal of Preventive Medicine*. 2010; 38:499–507.10.1016/j.amepre.2010.01.020 [PubMed: 20347555]
- Kash KM, Holland JC, Halper MS, Miller DG. Psychological distress and surveillance behaviors of women with a family history of breast cancer. *Journal of the National Cancer Institute*. 1992; 84:24–30. [PubMed: 1738170]
- Katz RC, Meyers K, Walls J. Cancer awareness and self-examination practices in young men and women. *Journal of Behavioral Medicine*. 1995; 18:377–384.10.1007/BF01857661 [PubMed: 7500328]
- Keeney S, McKenna H, Fleming P, McIlfatrick S. Attitudes to cancer and cancer prevention: What do people aged 35–54 years think? *European Journal of Cancer Care*. 2010; 19:769–777.10.1111/j.1365-2354.2009.01137.x [PubMed: 19708946]
- Keeney S, McKenna H, Fleming P, McIlfatrick S. An exploration of public knowledge of warning signs for cancer. *European Journal of Cancer Care*. 2011; 15:31–37.10.1016/j.ejon.2010.05.007
- Kelly B, Hornik R, Romantan A, Schwartz JS, Armstrong K, DeMichele A, Wong N. Cancer information scanning and seeking in the general population. *Journal of Health Communication*. 2010; 15:734–753.10.1080/10810730.2010.514029 [PubMed: 21104503]
- Kirzinger, WK.; Cohen, RA.; Gindi, RM. National Center for Health Statistics. Atlanta, GA: Centers for Disease Control and Prevention; 2012. Health care access and utilization among young adults aged 19–25: Early release of estimates from the National Health Interview Survey, January–September 2011.
- Kremers SP, Mesters I, Pladdet IE, van den Borne B, Stockbrugger RW. Participation in a sigmoidoscopic colorectal cancer screening program: A pilot study. *Cancer Epidemiology, Biomarkers, and Prevention*. 2000; 9:1127–1130.
- Lerman C, Daly M, Sands C, Balslem A, Lustbader E, Heggan T, Goldstein L, James J, Engstrom P. Mammography adherence and psychological distress among women at risk for breast cancer. *Journal of National Cancer Institute*. 1993; 85:1074–1080.10.1093/jnci/85.13.1074
- Levant RF, Wimer DJ, Williams C, Smalley KB, Noronha D. The relationships between masculinity variables, health risk behaviors and attitudes toward seeking psychological help. *International Journal of Men's Health*. 2009; 8:3–21.10.3149/jmh.0801.3
- Levant RF, Wimer DJ, Williams CM. An evaluation of the Health Behavior Inventory-20 (HBI-20) and its relationships to masculinity and attitudes towards seeking psychological help among college men. *Psychology of Men and Masculinity*. 2011; 12:26–41.10.1037/A0021014

- Leventhal H, Safer MA, Panagis DM. The impact of communications on the self-regulation of health beliefs, decisions, and behavior. *Health Education Quarterly*. 1983; 10:3–29. [PubMed: 6629788]
- Levin B, Lieberman DA, McFarland B, Andrews KS, Brooks D, Bond J, Winawer SJ. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: A joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *Cancer*. 2008; 58:130–160. CA.2007.0018 [pii].
- Long MD, Lance T, Robertson D, Kahwati L, Kinsinger L, Fisher DA. Colorectal cancer testing in the national Veterans Health Administration. *Digestive Diseases and Sciences*. 2012; 57:288–93.10.1007/s10620-011-1895-4 [PubMed: 21922220]
- Lukin DJ, Jandorf LH, Dhulkifl RJ, Thelemaque LD, Christie JA, Itzkowitz SH, Duhamel KN. Effect of comorbid conditions on adherence to colorectal cancer screening. *Journal of Cancer Education*. 2012; 27:269–276.10.1007/s13187-011-0303-2 [PubMed: 22351374]
- Mahalik JR, Burns SM. Predicting health behaviors in young men that put them at risk for heart disease. *Psychology of Men and Masculinity*. 2011; 12:1–12.10.1037/A0021416
- Mahalik JR, Burns SM, Syzdek M. Masculinity and perceived normative health behaviors as predictors of men's health behaviors. *Social Science and Medicine*. 2007; 64:2201–2209.10.1016/j.socscimed.2007.02.035 [PubMed: 17383784]
- Mahalik JR, Locke BD, Ludlow LH, Diemer MA, Scott RPJ, Gottfried M, Freitas G. Development of the Conformity to Masculine Norms Inventory. *Psychology of Men and Masculinity*. 2003; 4:3–25.10.1037//1524-9220.4.1.3
- Manne S, Markowitz A, Winawer S, Guillem J, Meropol NJ, Haller D, Duncan T. Understanding intention to undergo colonoscopy among intermediate-risk siblings of colorectal cancer patients: A test of a mediational model. *Preventive Medicine*. 2003; 36:71–84.10.1006/pmed.2002.1122 [PubMed: 12473427]
- Marcell AV, Ford CA, Pleck JH, Sonenstein FL. Masculine beliefs, parental communication, and male adolescents' health care use. *Pediatrics*. 2007; 119:e966–975.10.1542/peds.2006-1683 [PubMed: 17403834]
- McQueen A, Bartholomew LK, Greisinger AJ, Medina GG, Hawley ST, Haidet P, Vernon SW. Behind closed doors: Physician-patient discussions about colorectal cancer screening. *Journal of General Internal Medicine*. 2009; 24:1228–1235.10.1007/s11606-009-1108-4 [PubMed: 19763699]
- Myers RE, Ross E, Jepson C, Wolf T, Balshem A, Millner L, Leventhal H. Modeling adherence to colorectal cancer screening. *Preventive Medicine*. 1994; 23:142–151.10.1006/pmed.1994.1020 [PubMed: 8047519]
- Nicholas DR. Men, masculinity, and cancer: Risk-factor behaviors, early detection, and psychosocial adaptation. *Journal of American College Health*. 2000; 49:27–33.10.1080/07448480009596279 [PubMed: 10967881]
- O'Brien R, Hunt K, 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 and Medicine*. 2005; 61:503–516.10.1016/j.socscimed.2004.12.008 [PubMed: 15899311]
- O'Malley AS, Beaton E, Yabroff KR, Abramson R, Mandelblatt J. Patient and provider barriers to colorectal cancer screening in the primary care safety-net. *Preventive Medicine*. 2004; 39:56–63.10.1016/j.ympmed.2004.02.022 [PubMed: 15207986]
- O'Neil JM. Summarizing 25 years of research on men's gender role conflict using the Gender Role Conflict Scale - New research paradigms and clinical implications. *Counseling Psychologist*. 2008; 36:358–445.10.1177/0011000008317057
- Paiva EP, Motta MC, Griep RH. Barriers related to screening examinations for prostate cancer. *Revista Latino-Americana de Enfermagem*. 2011; 19:73–80.10.1590/S0104-11692011000100011 [PubMed: 21412632]
- Parent MC, Moradi B. Confirmatory factor analysis of the Conformity to Masculine Norms Inventory and development of the CMNI-46. *Psychology of Men and Masculinity*. 2009; 10:175–189.10.1037/a0015481

- Perkins HW, Berkowitz AD. Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions*. 1986; 21:961–976. [PubMed: 3793315]
- Powe BD. Fatalism among elderly African Americans. Effects on colorectal cancer screening. *Cancer Nursing*. 1995; 18:385–392. [PubMed: 7585493]
- Power E, Van Jaarsveld CH, McCaffery K, Miles A, Atkin W, Wardle J. Understanding intentions and action in colorectal cancer screening. *Annals of Behavioral Medicine*. 2008; 35:285–294.10.1007/s12160-008-9034-y [PubMed: 18575946]
- Prochaska JO, Velicer WF, Rossi JS, Goldstein MG, Marcus BH, Rakowski W, Fiore C, Harlow LL, Redding CA, Rosenbloom D, et al. Stages of change and decisional balance for 12 problem behaviors. *Health Psychology*. 1994; 13:39–46. [PubMed: 8168470]
- Rawl SM, Menon U, Champion VL, Foster JL, Skinner CS. Colorectal cancer screening beliefs: Focus groups with first-degree relatives. *Cancer Practice*. 2000; 8:32–37.10.1046/j.1523-5394.2000.81006.x [PubMed: 10732537]
- Rawl SM, Menon U, Champion VL, May FE, Loehrer P, Hunter C, Skinner CS. Do benefits and barriers differ by stage of adoption for colorectal cancer screening? *Health Education Research: Theory and Practice*. 2005; 20:137–148.10.1093/her/cyg110
- Rawl, SM.; Perkins, SM.; Tong, Y.; Krier, C.; Christy, SM.; Wang, HL.; Russell, K.; Huang, AM.; Rhyant, B.; Lloyd, F.; Willis, D.; Imperiale, T.; Myers, LJ.; Champion, VL.; Springston, J.; Skinner, CS. Computer-delivered tailored intervention improves colorectal cancer screening in low-income African Americans. (in preparation)Manuscript in preparation
- Shelton RC, Jandorf L, Ellison J, Villagra C, DuHamel KN. The influence of sociocultural factors on colonoscopy and FOBT screening adherence among low-income Hispanics. *Journal of Health Care for the Poor and Underserved*. 2011; 22:925–944.10.1353/hpu.2011.0074 [PubMed: 21841288]
- Sieverding M, Mattered U, Ciccarello L. What role do social norms play in the context of men’s cancer screening intention and behavior? Application of an extended theory of planned behavior. *Health Psychology*. 2010; 29:72–81.10.1037/a0016941 [PubMed: 20063938]
- Sifri R, Rosenthal M, Hyslop T, Andrel J, Wender R, Vernon SW, Cocroft J, Myers RE. Factors associated with colorectal cancer screening decision stage. *Preventive Medicine*. 2010; 51:329–331. [PubMed: 20600255]
- Springer KW, Mouzon DM. “Macho men” and preventive health care: Implications for older men in different social classes. *Journal of Health and Social Behavior*. 2011; 52:212–227.10.1177/0022146510393972 [PubMed: 21490311]
- Sutton S, Bickler G, Sancho-Aldridge J, Saidi G. Prospective study of predictors of attendance for breast screening in inner London. *Journal of Epidemiology and Community Health*. 1994; 48:65–73. [PubMed: 8138773]
- Tabbarah M, Nowalk MP, Raymund M, Jewell IK, Zimmerman RK. Barriers and facilitators of colon cancer screening among patients at faith-based neighborhood health centers. *Journal of Community Health*. 2005; 30:55–74.10.1007/s10900-004-6095-0 [PubMed: 15751599]
- Tessaro I, Mangone C, Parkar I, Pawar V. Knowledge, barriers, and predictors of colorectal cancer screening in an Appalachian church population. *Preventing Chronic Disease*. 2006; 3:A123. [PubMed: 16978498]
- Thompson EH, Pleck JH, Ferrera DL. Men and masculinities: Scales for masculinity ideology and masculinity-related constructs. *Sex Roles*. 1992; 27:573–607.10.1007/BF02651094 [PubMed: 12322226]
- Thompson L, Reeder T, Abel G. ‘I can’t get my husband to go and have a colonoscopy’: Gender and screening for colorectal cancer. *Health*. 2011; 16:235–249. [PubMed: 21602246]
- Wackerbarth SB, Peters JC, Haist SA. “Do we really need all that equipment?”: Factors influencing colorectal cancer screening decisions. *Qualitative Health Research*. 2005; 15:539–554.10.1177/1049732304273759 [PubMed: 15761097]
- Walker DF, Tokar DM, Fischer AR. What are eight popular masculinity-related instruments measuring? Underlying dimensions and their relations to sociosexuality. *Psychology of Men and Masculinity*. 2000; 1:98–108.10.1037//1524-9220.1.2.98

- Weinstein ND. The precaution adoption process. *Health Psychology*. 1988; 7:355–386. [PubMed: 3049068]
- Weinstein ND, Sandman PM. A model of the precaution adoption process: Evidence from home radon testing. *Health Psychology*. 1992; 11:170–180. [PubMed: 1618171]
- Winterich JA, Quandt SA, Grzywacz JG, Clark P, Dignan M, Stewart JH, Arcury TA. Men's knowledge and beliefs about colorectal cancer and 3 screenings: Education, race, and screening status. *American Journal of Health Behavior*. 2011; 35:525–534.10.5993/AJHB.35.5.2 [PubMed: 22040614]
- Winterich JA, Quandt SA, Grzywacz JG, Clark PE, Miller DP, Acuña J, Arcury TA. Masculinity and the body: How African American and White men experience cancer screening exams involving the rectum. *American Journal of Men's Health*. 2009; 3:300–309.10.1177/1557988308321675
- Whitaker KL, Good A, Miles A, Robb K, Wardle J, von Wagner C. Socioeconomic inequalities in colorectal cancer screening uptake: Does time perspective play a role? *Health Psychology*. 2011; 30:702–709. [PubMed: 21639637]
- Wardle J, Sutton S, Williamson S, Taylor T, McCaffery K, Cuzick J, Atkin W. Psychosocial influences on older adults' interest in participating in bowel cancer screening. *Preventive Medicine*. 2000; 31:323–334.10.1006/pmed.2000.0725 [PubMed: 11006057]
- Young CJ, Sweeney JL, Hunter A. Implications of delayed diagnosis in colorectal cancer. *Australian and New Zealand Journal of Surgery*. 2000; 70:635–638. [PubMed: 10976891]



**Figure 1.**

Proposed framework to explain men's CRC screening behavior.

CRC=Colorectal Cancer; PCP=Primary Care Provider. Constructs in bold denote untested relationships between the construct and CRC screening. Examples of each concept category are provided.

**Table 1**

Definitions of Cognitive and Affective Constructs Included in the Proposed Framework

<b>Construct term (associated health theory):</b>	<b>Definition:</b>	<b>Reference:</b>
Men's health beliefs:		
Perceived benefits (HBM/DPM)	Belief about the benefits of taking action to prevent an illness or risk	Janz & Becker, 1984; Leventhal et al., 1983
Perceived barriers (HBM/DPM)	Belief about the costs of taking action to prevent an illness or risk	Janz & Becker, 1984; Leventhal et al., 1983
Perceived risk/susceptibility (HBM/DPM/PHM)	Belief about susceptibility to an illness or risk	Janz & Becker, 1984; Leventhal et al., 1983; Myers et al., 1994
Cues to action (HBM)/Current and past experiences (DPM)	External prompts to engage in a behavior (e.g., PCP recommendation, reminder postcard) (HBM/DPM) as well as memories of others' health experiences (DPM)	Janz & Becker, 1984; Leventhal et al., 1983
Self-efficacy (HBM/SCT/PHM)	Belief that one is capable of completing the steps necessary to complete screening	Janz & Becker, 1984; Bandura, 1986; Myers et al., 1994
Knowledge (HBM/DPM)	Knowledge of the illness or risk and methods to prevent the illness or risk	Janz & Becker, 1984; Leventhal et al., 1983
Behavioral intention (TPB/TRA/PHM)	Resolve to complete a behavior	Ajzen, 1991; Myers et al., 1994
Subjective norms (TRA/TPB)/Social influences (SCT/PHM)	Belief that important others would approve of one performing the behavior or would perform the behavior themselves	Ajzen, 1991; Bandura, 1986; Myers et al., 1994
Perceived control (TRA/TPB)	Belief that one has control over the behavior	Ajzen, 1991
Descriptive norms (SNA)	What is perceived to be commonly done in a particular setting or within a particular group of individuals	Perkins & Berkowitz, 1986
Precontemplation stage (TTM)	One is not thinking about changing behavior in the next six months	Prochaska et al., 1994
Contemplation stage (TTM)	One is thinking about changing behavior in the next six months	Prochaska et al., 1994
Preparation stage (TTM)	One is preparing for behavior change in the near future (e.g., next month)	Prochaska et al., 1994
Action stage (TTM)	One has made behavior changes in the past six months	Prochaska et al., 1994
Maintenance stage (TTM)	One is able to continue the behavior without temptation of relapse	Prochaska et al., 1994
Decisional balance (TTM)	The process of weighing pros and cons (benefits and costs) when making a decision to engage in a behavior (or abstain from a behavior)	Prochaska et al., 1994
Response efficacy (PHM)/Outcome expectations (SCT)	Belief that behavior will reduce risk of disease	Myers et al., 1994; Bandura, 1986
Saliency (PHM)	Belief that behavior makes sense in one's life	Myers et al., 1994
Coherence (PHM)	Belief that behavior is in keeping with one's beliefs about health behavior	Myers et al., 1994
Cancer fatalism	Belief that a cancer diagnosis will inevitably result in death	Powe, 1995
Affect:		



<b>Construct term (associated health theory):</b>	<b>Definition:</b>	<b>Reference:</b>
Anticipated regret (DPM)	A negative emotion associated with the perception of how one might feel based upon actions or failure to act	Power et al., 2008; Leventhal et al., 1983
Fear of cancer/Worry about cancer/Distress (PHM/DPM)	The emotion associated with the perception that one is at risk of cancer and this diagnosis would be unpleasant	Champion et al., 2004; Myers et al., 1994; Leventhal et al., 1983
Fear or worry related to CRC screening (DPM/PHM)	The emotion associated with the perception that CRC screening would be painful or unpleasant	Rawl et al., 2000; Leventhal et al., 1983; Myers et al., 1994
Embarrassment (DPM)	An emotion associated with feeling bashful about a circumstance (e.g., CRC screening)	Consedine et al., 2011; Leventhal et al., 1983
CRC worry (DPM/PHM)	The emotion associated with concern over one's CRC risk	Consedine et al., 2004; Leventhal et al., 1983; Myers et al., 1994

*Note.* HBM=Health Belief Model; PHM=Preventive Health Model; DPM=Dual Process Model; SCT=Social Cognitive Theory; TPB=Theory of Planned Behavior; TRA=Theory of Reasoned Action; SNA=Social Norms Approach; TTM=Transtheoretical Model; PCP=Primary Care Provider; CRC=Colorectal Cancer.