




Determinants of cancer screenings participation in Queensland: a scoping review

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ABSTRACT

Introduction. Cancer screening programmes for cervical, breast, and colorectal cancer have successfully reduced mortality rates among target groups. However, a large proportion of women and men are unscreened. **Aim.** This review aims to provide an overview of the literature regarding the determinants of cancer screening participation among target groups in Queensland. **Methods.** Electronic databases were searched for studies on determinants of cancer screening participation in Queensland. Retrieved studies were screened, and eligible articles were selected for data extraction. Both peer-reviewed and grey literature studies were included. The determinants of cancer screening participation were classified according to the I-Change model. **Results.** Sixteen out of 75 articles were selected and analysed. Information factors, such as the lack of tailored strategies, determined cancer screening participation. Age, gender, cultural beliefs, fear and past experiences were the most reported predisposing factors to cancer screening participation. Lack of knowledge, misconceptions, low awareness, timely access to service, privacy and confidentiality were mainly reported awareness and motivation factors. Encouragement from health professionals, providing more information and interactions with communities would result in different effects on cancer screening participation among the target groups. **Discussion.** The I-Change model is a valuable tool in mapping the current determinants of cancer screening participation programs. Further research may be needed to fully understand the barriers and facilitators of cancer screening programs.

Keywords: bowel cancer, breast screening, cancer screening, cervical screening, determinants, primary healthcare, queensland, target groups.

Background

Cancer is the second leading cause of premature deaths globally in 134 out of 183 countries.¹ In 2020, over 19.3 million new cancer cases were diagnosed, with nearly 10.0 million deaths.¹ Female breast cancer (2.3 million), lung (2.2 million) and prostate (1.4 million) cancers were the most commonly diagnosed in 2020 globally.¹ Available data indicated 151 000 new cancer diagnosed cases in Australia and almost 49 000 deaths in 2021.² There are three population-based cancer screening programs in Australia: (1) the National Cervical Screening Program (NCSP), (2) BreastScreen Australia, and (3) the National Bowel Cancer Screening Program (NBCSP).³ These screening programs aim to improve health outcomes by detecting cancer early and reducing the risk of developing the disease, thus improving survival benefits.^{3–6} However, despite the clinical evidence about the importance of cancer screening, participation in cancer screening programs in Queensland remains low. The World Health Organization (WHO) recommended that at least 70% of a target cohort population be screened to offer adequate protection.^{7–9} However, the most recent available data indicated national cancer screening participation rates in Australia (2018–2019) were 44.0, 55.0 and 46.0%, respectively, for bowel, breast and cervical cancer screening.¹⁰ These findings indicate generally low participation nationally. Furthermore, there are variations in the participation rates across the country. For example, in Queensland,

WHAT GAP THIS FILLS

What is already known: Cancer screening programs (cervical, breast, and bowel) participation is generally low, especially in regional and rural areas in Queensland, Australia.

What this study adds: This scoping review provides a suggested approach to understanding the known determinants of cancer screening participation to help influence the uptake among target populations.

seven Primary Health Network (PHN) regions' breast cancer screening participation rates ranged from 52.0% in Brisbane North PHN to 62.0% in Northern Queensland PHN in 2018–2019.¹⁰ However, all fall below the 70.0% effective rate for the three cancer screening programs.¹⁰ Previous studies suggested pre-screening reminders, general practice endorsement and more culturally personalised reminders for non-participants and screening tests will improve participation, knowledge, personal attitudes and beliefs, demographic factors, social economic status and access.^{7,8,11,12} As noted above, high participation rates are essential for cancer screening programs to be effective. To our knowledge, there is no review published on factors associated with cancer screening participation in Queensland to date. Thus, it is crucial to understand and identify factors influencing low participation in cancer screening programs in Queensland. This study performs a scoping literature review investigating the determinants of non-attendance to breast, cervical and bowel cancer screening programs. The review aims to provide an overview of available literature to better understand the existing evidence in Queensland. The reviewed results would help design population-based health promotion programs about participating in the national cancer screening programs.

Methods

Search strategy

The evidence search utilised the Joanna Briggs Institute three-stage search strategy (identifying initial keywords and analysing text words, database-specific searches and review of reference lists of identified studies).¹³ The first stage was the initial search using Mesh terms, free text search and key concept terms in PubMed and CINAHL to help identify types of studies potentially available for analysis. The titles and abstracts of texts were analysed with the retrieved articles (see Fig. 1).

The second stage involved a detailed search across the following electronic databases: MEDLINE (PubMed), CINAHL, Cochrane and ProQuest. All the identified key concept terms were combined in this second stage detailed search (cancer screening programs or mass screening OR breast

screening or bowel screening OR cervical screening) AND (determinants OR barriers OR factors) AND (Queensland). The investigation was iterative and additional keywords and sources were incorporated into the search strategy.

In the third stage, reference lists of identified reports and articles were also searched for additional studies. Additional searches were also done in ResearchGate and Google Scholar. Finally, a final step was searching for grey literature in Google and databases on websites of organisations concerned with population health and cancer screening programs in Queensland, Australia (see Fig. 1).

Study types

All relevant articles, including grey literature published from June 2005 to December 2021, evaluated the determinants, or described the cancer screening participation rates, in Queensland.

Study selection

The titles and abstracts of all papers identified in the electronic databases were manually assessed using the inclusion and exclusion criteria. In the next phase, all full-text articles were extracted and reviewed. The first and second authors agreed on the final list of studies deemed fit.¹³ Articles were included if they focussed on participation in the national cancer screening program and barriers to the cancer screening program in Queensland, Australia. Articles and reports published between January 2005 and December 2021 were assessed. Non-English language articles were excluded.

Charting of data

All selected studies were charted according to the evidence source, including peer-reviewed primary studies, literature reviews and grey literature. The extracted results were further mapped guided by the population (populations), concept (determinants of screening participation) and context mnemonic (prevention programs).¹³ We used Microsoft Excel to document full text selected extracts mapped by relevant characteristics such as authors, type of study, study state, sampling methods, outcomes and duration. The charting process was iterative and continually updated by the first author.

Several models of human behaviour have been used to predict health behaviour, such as screening attendance. The theory of planned behaviour and reasoned action are widely used models to predict human behaviour.^{14,15} This study adopted the Integrated Model for Behavioural Change (I-Change model, see Fig. 2) to analyse the determinants of cancer screening participation.^{8,16} The I-Change model assumes a behaviour change process depends on awareness, motivation and action. The process is determined by different factors such as predisposing factors (biological factors-gender, genetics), behavioural factors (lifestyles), environmental

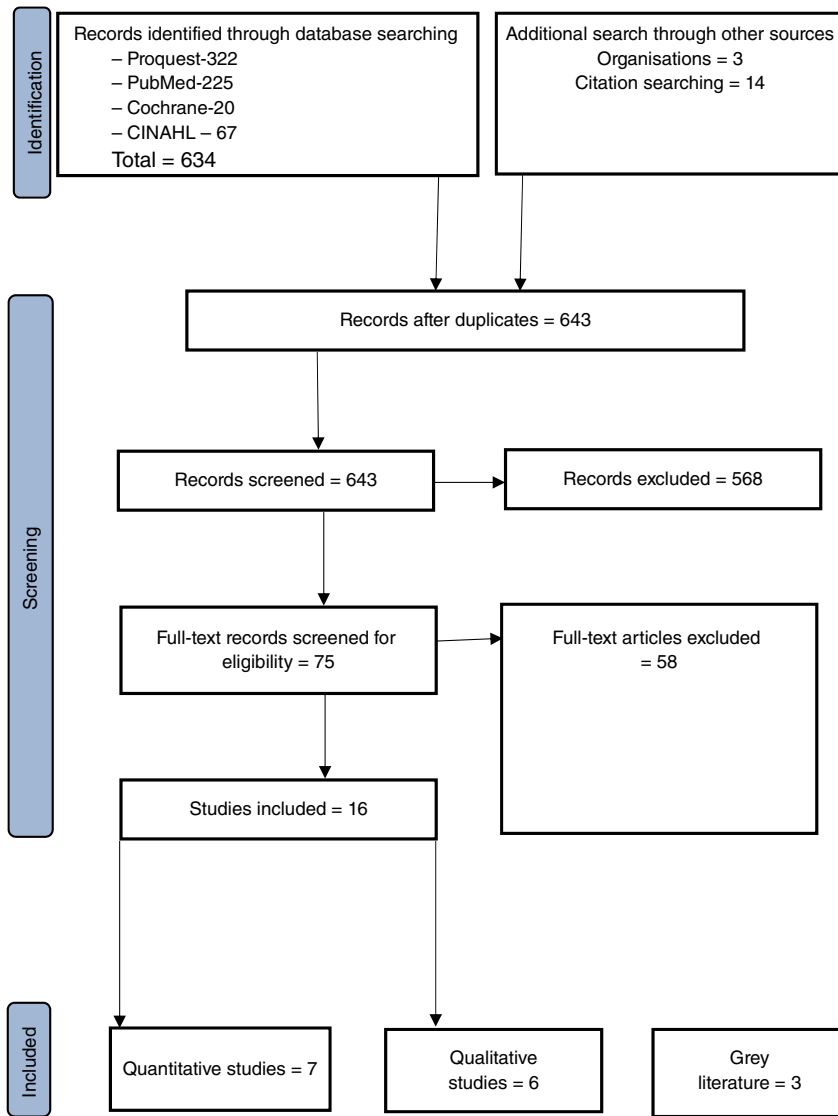


Fig. 1. PRISMA flowchart. Adapted from the PRISMA guidelines (Tricco et al. 2018).⁴³

factors (social and cultural factors-policies, cultural practices) and information factors (messages, sources used and channels).¹⁶⁻¹⁸ The I-Change model aims to enhance healthcare workers' understanding of individual behaviours and provide targeted interventions and treatment plans to help alter cancer screening behaviours.

Results

Studies retrieved

A total of 634 abstracts were screened, resulting in 75 full-text articles assessed for eligibility. An additional search for grey literature was conducted via organisational websites and Google search; however, no further studies were added. Table 1 shows the characteristics of the 16 papers in the review.

The studies identified many factors that may hinder or encourage people to participate in cancer screening programs. We mapped these factors according to the I-Change model. Table 2 provides an overview of the cancer screening participation determinants documented in the articles.

Predisposing factors

Most studies reported on predisposing factors associated with cancer screening participation. For the three cancer screening programs, age, ethnicity, gender and cultural beliefs displayed a relationship with the involvement in cancer screening in Queensland.¹⁹⁻³² For cervical and breast screening programmes, ethnicity and women from non-English speaking background (Aboriginal and Torres Strait Islander and culturally and linguistically diverse (CALD)) were reported as determinants of lower screening uptake.^{19,21,23,25,27,28} Younger age is also a determinant of low screening participation in the

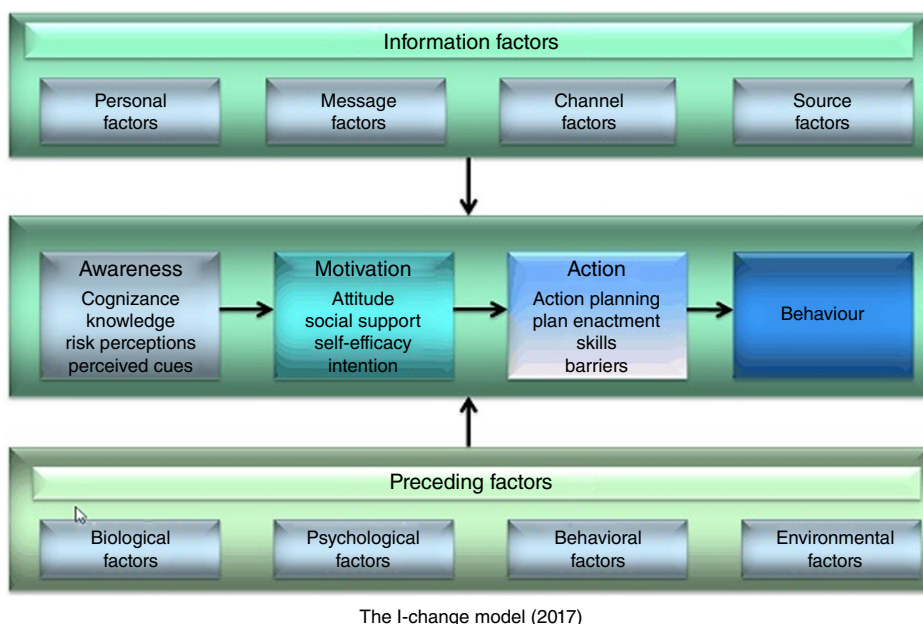


Fig. 2. The Integrated Behaviour Change Model.¹⁶

Table 1. Study characteristics.

Author	Year	Location	Study type	Study population	Sample size	Screening type
Hughes et al. ³²	2005	Queensland	Quantitative	Women and men aged 50–74 years	3358	Bowel screening
Viertel Centre for Research in Cancer, QLD Cancer Council ³³	2005	Queensland	Quantitative	Men and women aged 20–75 years	9419	Cancer KAP
Manderson and Hoban ³¹	2006	Queensland	Qualitative	Indigenous women	547	Cervical screening
Byrnes et al. ³⁰	2007	Queensland	Quantitative	Women aged 18–69 years	1540	Cervical screening
Viertel Centre for Research in Cancer, QLD Cancer Council ³³	2008	Queensland	Quantitative	People aged 20–75 year		Bowel screening
Prior ²⁹	2009	Queensland	Qualitative	Indigenous women	49	Cancer screening
Youlden et al. ³⁵	2009	Queensland	Quantitative	Women	202 000	Breast screening
Whop et al. ²⁷	2016	Queensland	Quantitative	Women aged 20–69 years	1 334 795	Cervical screening
Cullerton et al. ²⁸	2016	Queensland	Qualitative	Men and women aged 18+ years	159	Bowel/Breast/Cervical screening
Anaman et al. ²⁶	2017	Queensland	Qualitative	Women	19	Cervical screening
Dasgupta et al. ¹⁹	2019	Queensland	Quantitative	women	1 091 174	Cervical screening
Meiklejohn et al. ²³	2019	Queensland	Qualitative	Men and women aged 18+ years	50	Bowel/Breast/Cervical screening
Nagendiram et al. ²⁰	2020	Queensland	Qualitative	Indigenous women	28	Cervical screening
Dasgupta et al. ²¹	2020	Queensland	Quantitative	Women	963 611	Cervical screening
Butler et al. ²²	2020	Queensland	Qualitative	Indigenous women	50	Cervical screening
Dagupta et al. ²⁵	2021	Queensland	Quantitative	Women aged 20–60 years	1 107 233	Cervical screening

state.^{19,21,25,27,30,32} Women are more likely to comply with self-sampling kits than men.^{32,33} In addition, women living in rural and very remote areas in Queensland showed decreased participation rates compared to those in cities and outer regional areas.^{19,21,25,30,32}

Psychological and emotional issues that impacted non-participation in the cancer screening programs in Queensland include safety concerns, feeling of embarrassment, confidentiality and cultural beliefs.^{19–29,31–35} For cervical screening, cultural and religious beliefs were significant barriers to

Table 2. Determinants of cancer screening participation by the I-Change model in Queensland.

Factors	Descriptions	Breast screening	Cervical screening	Bowel screening
Predisposing factors	Age, gender, cultural beliefs, urban/rural, ethnicity, country of origin.	Refs 25,28,29,31,33	Refs 19–25,27,28,30,32–34	Refs 19,20
Information factors	Lack of tailored strategies, lack of information.	Refs 35	Refs 25,27,28,35	Refs 19,35
Awareness factors	Misconceptions, low awareness, lack of knowledge.	Refs 29,35	Refs 25,28,29,31,33,35	Refs 29,35
Motivation factors	Cost and timely access to service, fatalistic attitudes, privacy and confidentiality, effective reminder system, intention to participate in future screening, culturally sensitive services, compliance with follow-up among those with a positive test, location (rural/remote areas), cultural safety.	Refs 20,29,35	Refs 20,27,29,30,35	Refs 19,20,29,35
Ability factors	Forgot to make an appointment, language barrier, low health literacy.	Refs 29,35	Refs 21,22,25,31–33	Refs 19,29,35

participation in CALD and Indigenous women.^{26,31} In addition, women in rural and remote areas are disadvantaged in accessing cervical cancer screening.^{19,21,25,27} Time constraints and costs were cited in two studies.^{19,20} Difficulties accessing consistent health professionals was another concern, especially in rural areas in Queensland.²³

Information factors

Several studies discussed the lack of information, health promotion activities and non-general practice based invitation as contributing to low cancer screening participation and non-attendance. For example, an intervention study reported active recruitment and promotion of cancer screening programs targeting first-time screeners increased participation.³² Developing culturally appropriate health literacy information and strategies have also been identified as a key consideration, especially in Aboriginal and Torres Strait Islander people and CALD minority communities.^{23,26,27} For example, Anaman-Torgbor *et al.*²⁶ suggested it is essential to build the competence of health professionals providing cervical screening services in African communities and provide information to address the misperceptions about cervical cancer causation and screening practices.

Awareness factors

Eleven studies discussed awareness factors, such as lack of knowledge, cultural perceptions and salience in communities, as determinants of low screening participation.^{19–28,33} A community study among Indigenous women in a small regional Queensland town found that respondents reported cancer silence in the community due to a lack of information and awareness.²³ Similarly, a study among African women in Queensland found lack of knowledge about cervical cancer and their belief systems have contributed to low screening participation.²⁸ Finally, several studies reported that most women forgot their scheduled screening appointments because of long intervals. This suggested continuous active engagement of primary healthcare services, particularly in rural and remote areas, to remind women when their screening appointment is due, may improve screening participation.^{22,25,30,32}

Motivation factors

Fatalistic attitude, spiritual forces, culturally based factors, privacy and confidentiality, timely access to service and fear of receiving abnormal results were motivational factors discussed in six studies.^{20,22,23,29,31–33} Most Queenslanders believe it is vital to check for different types of cancer even if there are no symptoms (98% for cervical cancer, 98% for breast cancer and 80% for colorectal cancer).³³ Concerning bowel and breast cancer screening, increased knowledge was significantly associated with positive attitudes towards the possibility of screening participation in the future.²⁸ For cervical screening, privacy and

confidentiality, invasiveness, embarrassment and accessing culturally sensitive services motivated social issues.^{22,25,28} Fear of the screening procedure, pain associated with the examination (cervical examination), fear of the test result and negative experiences were associated with less motivation for cervical cancer screening.^{23,28,29,33–35}

Ability factors

Most studies discussed action factors. For example, the new 5-yearly national cervical screening program makes women miss appointments due to the more extended screening intervals.²⁰ Access to culturally appropriate screening services, especially for cervical screening, plain language and information and building trusting relationships with health professionals are critical factors in commencing and continuing screening.^{19–29,31,32}

Discussion

This review describes the current literature on the determinants of participation in the three national cancer screening programs in Queensland. The studies included in this review vary in methods, target age, sample size and cancer screening methods. In addition, the tools used to measure the determinants of cancer screening participation vary in different studies.

The I-Change model used in the review provides a valuable framework to conceptualise and identify factors influencing cancer screening participation. In addition, the I-Change model has been widely used to evaluate health behaviour.^{8,36} Findings from this review could help identify women and men who are less likely to participate in the national cancer screening program in Queensland. Additionally, results from the study could guide the development of health promotion programs targeting men and women eligible to participate in the cancer screening programs in Queensland. Furthermore, this review's lessons may apply to other states in Australia and Oceania.

Most studies described the predisposing factors of women from Indigenous, CALD, rural/remote and lower socioeconomic backgrounds as having the lowest participation in cancer screening programs in Queensland. This may suggest that community-level educational programs be designed to focus on changing attitudes toward promoting women cancer screening health outcomes.

The review found that limited health literacy, personal demographic characteristics and information design are information barriers to participation in cancer screening programs. For example, lower health literacy is independently associated with perceived confidence in cancer screening participation in adults and directly impacts information seeking.^{37–39} This implied that reliance on printed communication when inviting low-literate adults might be challenging.

Therefore, a targeted intervention should be implemented to increase low health literacy, especially among Indigenous, CALD and adults in rural/remote areas. This study also revealed limited knowledge and lack of awareness about the benefits of cancer screening programs and service providers seem to be a challenge in Queensland. These issues are consistent across studies,^{19,20,24,28,29,33,34} indicating the importance of health promotion and education in cancer screening programs. Nonetheless, knowledge is influenced by other factors such as culture, religious beliefs and fatalistic misconceptions about cervical, breast or bowel cancer.^{11,40}

Overcoming these barriers may increase adherence to cancer screening programs in Queensland. The I-Change model adopted in this review predicts that cancer screening behaviour depends on awareness, motivation and action. Furthermore, the model suggested that awareness, motivation and action are influenced by information people receive, psychological status, personal beliefs and cultural and social environment. Several methods of increasing cancer screening participation are suggested in the review, such as a need for information about the benefits and procedures of cancer screening; such information should be culturally tailored to the target groups.^{19,25–28,30,31,33} The review also shows that community-based educational interventions developed in collaboration and determination of Indigenous people in all aspects of implementation and service delivery are promising.^{23,26,30,31,41} Clear communication between health professionals and clients can address many misconceptions and fear about cancer screening;^{19,26,27} whether by telephone, in person or personalised screening text message reminders, or clients' preferred language, especially among CALD communities. Additionally, greater involvement of general practitioners could increase cancer screening participation.³⁰ For example, general practitioners could use digital tools, such as GoShare Health, PenCS CAT and Topbar, to monitor, recall and engage with patients to complete their screenings.³⁰ People in the rural and remote areas of Queensland have lower levels of access to primary health care. The use of digital tools ensures equitable access to primary healthcare services.⁴²

There are several limitations to this review. First, this review primarily included Queensland and did not include research from other parts of Australia and internationally. Therefore, the findings may not be generalised regarding cultural differences, access to services and primary healthcare systems in cancer screening participation programs. Secondly, there is the possibility that valuable information may be overlooked since the search did not allow any room for studies conducted outside of Queensland.

Conclusion

This review discussed why some women and men do not participate in the national cancer screening programs by

looking at Queensland. Using the I-Change model, we found that low levels of information and health literacy, especially a lack of understanding of the benefits of cancer screening programs and their link to overall health outcomes, are the leading causes of this health behaviour. In addition, socio-cultural factors, psychological issues and geographical location contribute to the region's low levels of screening participation. While the review findings might not be generalised for other regions, it still provides some suggestions for primary care health policymakers and providers to increase participation in this essential preventive service as a 1% participation increase might save thousands of lives.

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Data availability. The data that support this study will be shared upon reasonable request to the corresponding author.

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