
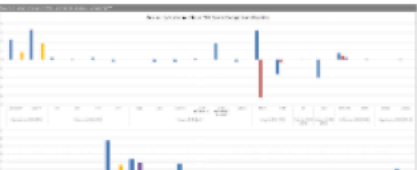


# Patient-Reported Outcomes Associated with Cancer Screening: A Systematic Review



**Patient-Reported Outcomes Associated with Cancer Screening: A Systematic Review**  
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<p><b>Background</b></p> <ul style="list-style-type: none"> <li>Cancer screening has not been evaluated across reproductive and family life for the general population of women.</li> <li>Objective: (1) Review literature regarding patient-reported outcomes associated with cancer screening for select cancer types with associated literature data on screening that helps make more sense of the high-stakes options (understanding through empirical data).</li> <li>Psychological and social aspects of screening can be qualified through patient-reported outcome measures (PROMs). These metrics of self-reported patient experience can directly impact the quality of public health decisions for patients.</li> <li>The objective of this review is to evaluate the evidence base on patient-reported outcomes of cancer screening.</li> </ul>	<p><b>Results</b></p> <ul style="list-style-type: none"> <li>Of studies (2012), 20 observational studies were included in this review (Figure 1).</li> <li>7 studies were identified in a secondary psychosocial aspect of cancer screening (Figure 2).</li> <li>Research priorities (Figure 3):</li> <li>Research concerning reproductive symptoms adds 1 month after mammography positive or PP result. Mixed for breast and 3 months.</li> <li>How cancer screening can be improved with better screening results is currently unknown.</li> <li>Research priorities (Figure 4):</li> <li>Research on social stigma/embarrassment of reproductive symptoms.</li> </ul>	<p><b>Results</b></p> <p><b>Results (Figure 1)</b></p> <ul style="list-style-type: none"> <li>Of studies (2012), 20 observational studies were included in this review (Figure 1).</li> <li>7 studies were identified in a secondary psychosocial aspect of cancer screening (Figure 2).</li> <li>Research priorities (Figure 3):</li> <li>Research concerning reproductive symptoms adds 1 month after mammography positive or PP result. Mixed for breast and 3 months.</li> <li>How cancer screening can be improved with better screening results is currently unknown.</li> <li>Research priorities (Figure 4):</li> <li>Research on social stigma/embarrassment of reproductive symptoms.</li> </ul>	<p><b>Results</b></p> <p><b>Higher risk of cancer subpopulation</b></p> <ul style="list-style-type: none"> <li>Higher risk subgroups reported more cancer symptoms, distress, and anxiety during the screening process (Figure 5).</li> </ul>
<p><b>Methods</b></p> <ul style="list-style-type: none"> <li>A literature search was conducted using MEDLINE and PsycINFO between Jan 2010 and Aug 2020.</li> <li>Search terms related cancer cancer screening symptoms (e.g., anxiety, distress, worry, PPQOL, patient-reported outcomes (PRO)).</li> <li>Inclusion criteria: (1) Studies with participants (2) present in randomized controlled trials (RCTs) or observational studies of cancer screening that include at least 10 self-reported PROMs (3) cancer-related patient screening independent of oncology (4) in English (5).</li> <li>Exclusion criteria: (1) Abstracts (2) based on previously published data (3) not peer-reviewed (4) not in English.</li> </ul>		<p><b>Conclusions</b></p> <ul style="list-style-type: none"> <li>Overall, the psychosocial aspects of cancer screening in the self-reported experience of screening research.</li> <li>The literature has not been a primary focus in cancer screening research, and more studies are needed to understand the impact of screening on the quality of life of patients, particularly in those at risk of cancer or PP screening results.</li> <li>Higher risk subgroups reported more cancer symptoms, distress, and anxiety during the screening process compared to lower risk subgroups (5).</li> <li>Research on social stigma/embarrassment of reproductive symptoms is currently a research priority.</li> </ul>	

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## BACKGROUND

- Cancer screening tests are often offered to individuals who are asymptomatic and 'healthy',<sup>1</sup> thus, the potential psychological impact of screening is important to evaluate.
- While the US Preventive Services Task Force (USPSTF) recommends single-cancer screening for select cancer types,<sup>2-7</sup> multi-cancer early detection tests are currently being developed to enable earlier detection of multiple cancer types simultaneously through a standard blood draw.
- Psychological and social aspects of screening can be quantified through patient-reported outcome measures (PROMs), which consists of self-reported questionnaires or measures that directly report the status of a patients' health condition from the patient.<sup>8</sup>
- The objective of this review is to evaluate the evidence regarding the psychosocial effects of cancer screening.

## RESULTS

- 31 studies (12 RCTs; 19 observational studies) were included in this review (Figure 1).
- 7 constructs were identified in assessing the psychosocial impact of cancer screening (Figure 2).

### **Anxious symptoms** (Figure 3)

- There was a temporary increase in anxious symptoms within 2 months after screening following positive or FP results, followed by a decrease after 3 months.
- More anxious symptoms were reported while waiting for screening results or immediately after screening.

### **Depressive symptoms** (Figure 4)

- There were minimal changes in levels of depressive symptoms or mood, but an increase in depressive symptoms was seen directly following FP or positive test results, even at 2 weeks.

## RESULTS

### Distress (Figure 5)

- Clinically and statistically significant increases in distress were reported in the indeterminate group even at 2 months from baseline.
- At 2 months, clinically significant and higher levels of distress were reported in those with indeterminate, compared to negative, results.

### Worry (Figure 6)

- Fear of cancer or cancer worry increased shortly after screening or receiving abnormal results, and returned to baseline after 3 months.

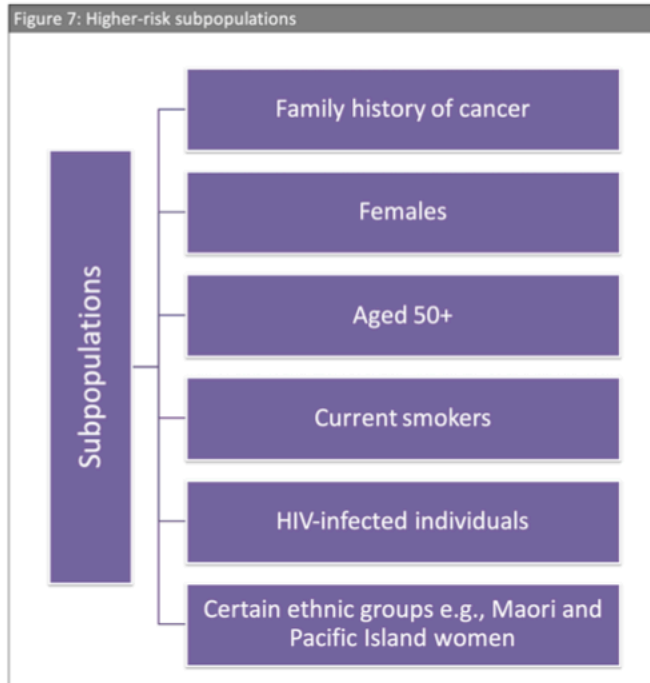
### Functional status and well-being, Preference-weighted health status, Other psychosocial measures

- Minimal changes in functional status and well-being and preference-weighted health status were observed following cancer screening.
- High satisfaction levels were reported while waiting for test results.
- Minimal discomfort was reported while waiting for test results.

# RESULTS

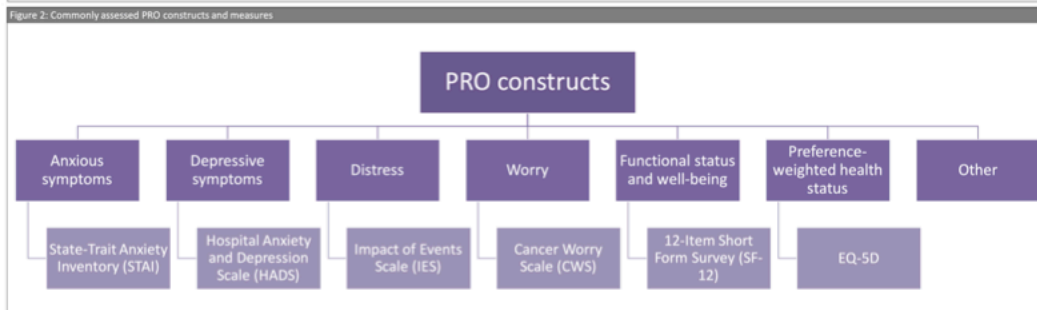
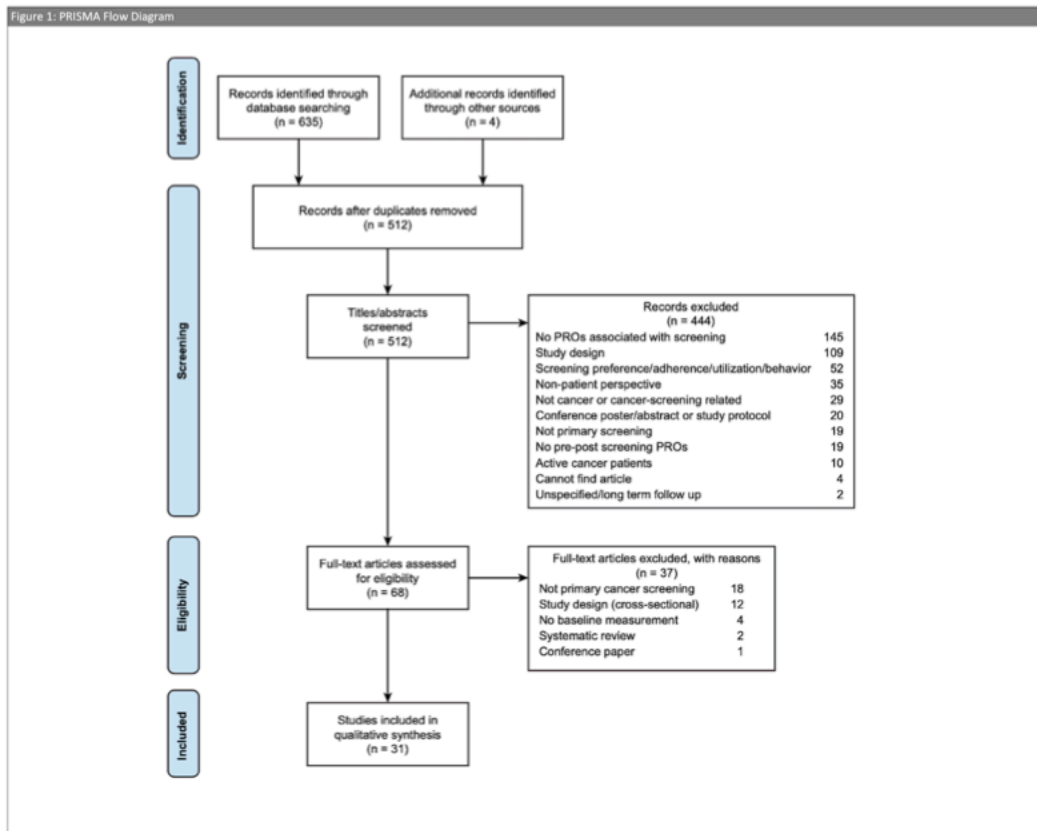
## Higher-risk of cancer subpopulations

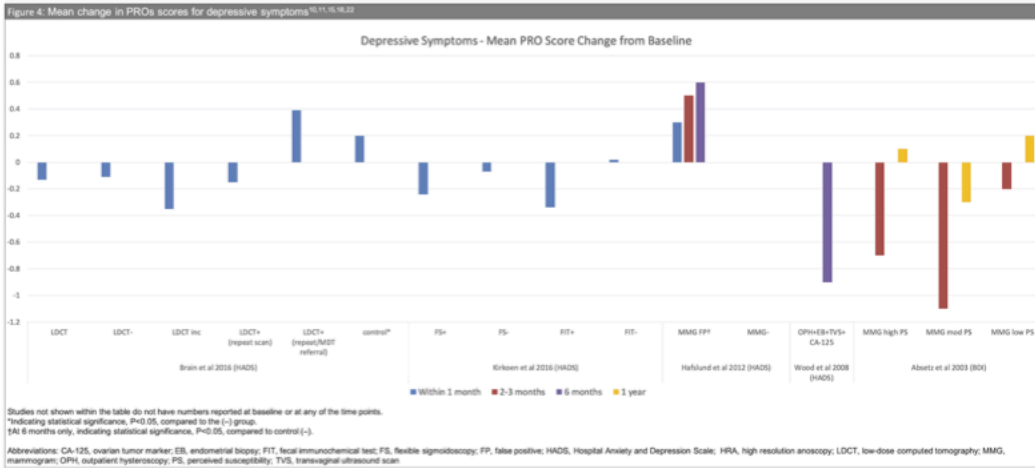
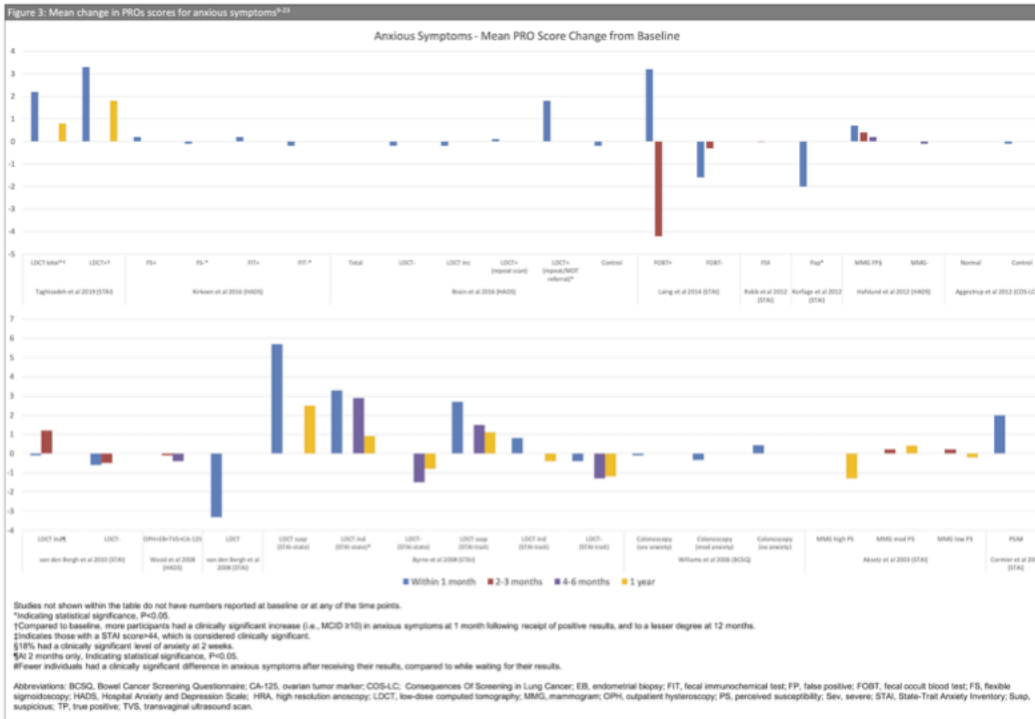
- Higher-risk individuals reported more anxious symptoms, distress, and worry during the screening process (Figure 7).

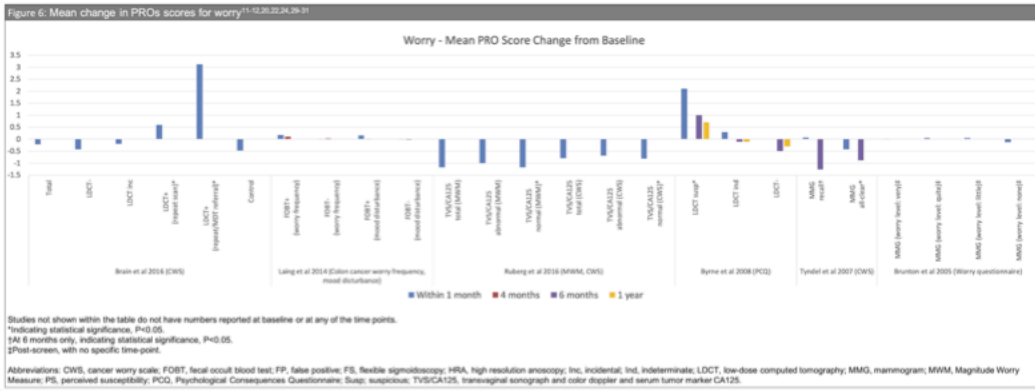


## METHODS

- A systematic literature review was conducted using MEDLINE and EMBASE between Jan 2000 to Aug 2020
- Search terms included cancer, cancer screening, symptoms (e.g., anxiety, distress, worry), PROMs, patient-reported outcomes (PROs)
- Inclusion criteria: Publications with participants  $\geq 18$  years old in randomized controlled trials (RCTs) or observational studies of cancer screening either inside or outside of the US, self- assessment of PROs before and within 1 year of screening, including receipt of results (e.g., false positive (FP))
- Exclusion criteria: Publications that focused on previously or currently diagnosed cancer patients, assessed a diagnostic evaluation, included PROMs completed by a proxy or assessing treatments or interventions associated with screening, or consisted of non-longitudinal (e.g., cross-sectional) studies









## CONCLUSIONS

- Overall, the psychosocial impact of cancer screening is low and short-lived, regardless of screening test result.
- Our review found there was a temporary increase in anxious symptoms, distress, and worry directly after or within 2 month following the screening exam, from before the exam at baseline, particularly in those with indeterminate or FP screening results.
- Higher-risk individuals experienced increased anxious symptoms and distress during the screening process compared to individuals at regular risk; more attention to individuals with a higher risk of cancer is recommended.
- As more novel screening tests, including multi-cancer early detection tests, are developed, further research is warranted to assess multiple psychosocial outcomes with validated measures in cancer screening trials, and improve the interpretability of clinical trial results by dichotomizing PROM scores or reporting the minimal important difference.

## DISCLOSURES

This study was funded by GRAIL, Inc. AK, KCC, CK are employees of GRAIL, Inc, with equity in the company. DLP serves as a consultant to GRAIL, Inc and received funding for this study.

# ABSTRACT

## OBJECTIVE(S)

Multi-cancer early detection tests are currently being developed to enable earlier detection of multiple cancer types. As reflected in patient-reported outcomes (PROs), the psychosocial impact of existing single-cancer screenings is unknown. Our aim is to evaluate the impact of primary cancer screening on PROs.

## METHODS

A systematic review was conducted using MEDLINE, EMBASE, and reference lists of articles from January 2000 to August 2020 for relevant publications assessing the psychosocial impact of primary cancer screening before and after the screening process (up to 1 year), including after receiving abnormal results. Studies with patients undergoing only secondary screening or diagnostic evaluation, or with active cancer, were excluded.

## RESULTS

A total of 31 studies were included, and reflected PRO assessments associated with lung, breast, colorectal, anal, ovarian, cervical, prostate, and pancreatic cancer screening procedures. Anxiety was the most commonly assessed construct, using the State-Trait Anxiety Inventory. Cancer-specific distress and health-related quality of life (HRQOL) were also assessed using a broad range of validated and unvalidated measures. Overall, individuals tolerated screening procedures well with no major psychosocial effects. Of note, higher levels of anxiety, distress, and worry were present while waiting for screening results and following indeterminate results that required further testing, which also decreased individuals' HRQOL. These negative psychosocial effects were, however, not long-lasting and returned to baseline, typically by 1 year. Furthermore, individuals with higher cancer risk, including current smokers and those with a family or personal history of cancer, tended to have higher levels of anxiety and distress throughout the screening process, even after receiving results.

## CONCLUSIONS

The psychosocial impact of cancer screening is relatively low overall and short-lived, but can be significant. Individuals with a higher risk of cancer tend to experience more anxiety and distress during the screening process; thus, more attention to this group is recommended.

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