



Original Research

Shared decision-making tool development for colorectal cancer screening: A co-creative process with general practitioners and underserved people

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ABSTRACT

Objectives: European guidelines stress the importance of informed decision-making in colorectal cancer (CRC) screening. However, tailored tools that facilitate this process among underserved people and general practitioners (GPs) in Flanders are still lacking. This study aimed to co-create a shared decision-making (SDM) tool for CRC screening with both underserved populations and GPs, capturing their needs and preferences for content, design, and delivery.

Study design: Qualitative study.

Methods: Two rounds of six focus group discussions with underserved people, and five local quality group meetings with GPs were conducted in different areas of Flanders, Belgium. Qualitative data were analyzed using a Modified-Grounded Theory Analytical (M-GTA) approach to identify key themes.

Results: Findings revealed four core themes. The first theme, 'Recognizing the Barriers to Screening', identifies challenges such as a lack of time, staff, and tools to facilitate preventive talks, as well as language and literacy barriers for underserved people in CRC screening. The second theme, 'Learning from Existing Tools', highlights successful elements like visuals and simple language and limitations such as low accessibility and poor navigation. The third theme, 'Determining the Content and Design', reveals that GPs seek user-friendly tools for at-home viewing, while underserved people value personalised and clear information about CRC risk factors and screening costs. The final theme, 'Identifying Strategies for Integration', stresses the importance of a structured, personalised, collaborative care approach in using the SDM tool for preventive talks in practice.

Conclusion: Enhancing the accessibility and relevance of SDM tools, particularly in content and design tailored to both underserved people and GPs, is the key to overcoming barriers such as language and health literacy. Nonetheless, further testing is needed to confirm the effectiveness of the SDM tool in supporting SDM in CRC screening.

1. Introduction

Colorectal cancer (CRC) ranks third as the most common cancer worldwide, with an estimated 1.9 million new cases and 930,000 deaths in 2020.¹ Notably, the highest death rates of CRC were reported in

Europe.² Globally, the incidence rates of CRC in older adults, specifically aged 50 and above, have been decreasing in recent years, largely due to the effectiveness of population-based CRC screening programmes.^{3,4,5} These programmes, guided by established screening guidelines in Europe and the United States (U.S.), have been successful in detecting

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and removing precancerous lesions and early-stage cancers, particularly in people over the age of 50.⁶ In Flanders (Belgium's northern region), CRC screening was initiated via a biennial Faecal Immunochemical Test (FIT) from October 2013 onwards. In 2022, the programme targeted 2,138,119 people aged 50–74 years⁷

In Flanders, CRC incidence decreased from 69.8 to 51.1 per 100,000 people between 2012 and 2019.⁴ Additionally, the 5-year relative survival rate for screen-detected CRCs was significantly higher (93.8 %) than for CRCs in never-invited cases (66.7 %), adjusted for lead time bias.⁴ However, despite the effectiveness of CRC screening, there is an ongoing challenge in getting underserved people involved.⁸ Underserved people, often marginalized due to socio-economic disparities, are confronted by multifaceted and unique barriers hindering their access to CRC screening.^{9,10} These barriers often include fear of cancer, embarrassment to talk about CRC screening and difficulty understanding the Dutch language.⁸ As a result, the uptake of FIT screening in Flanders remains suboptimal (~50 %), with lower participation rates observed particularly among people from lower-income groups (~28 %), and non-Belgian nationalities (ranging from 14 % to 33 %).^{8,9}

The European guidelines recommend that people invited for CRC screening should be able to make an informed choice about participating in screening.¹¹ For people to reach the point to be able to make such a decision, one should be equipped to (1) understand that a choice must be made, (2) understand the instructions, (3) understand the potential harms and benefits of screening, (4) evaluate the importance of this and (5) apply this information to one's personal situation.^{12,13} Shared decision-making (SDM) tools can significantly aid in this process as these are designed to facilitate informed and collaborative decision-making talks between healthcare providers and patients. These tools present evidence-based information about various screening options, risks, and benefits while considering the values and preferences of both clinicians and underserved people considering screening.¹⁴ These tools are specifically effective in improving knowledge about screening options, increasing the proportion of people intending to screen and reducing decisional conflict among underserved people.^{10,14,15}

Despite strong evidence of the SDM tool's effectiveness, factors such as insufficient training and potential resistance from clinicians, including general practitioners (GPs), towards embracing new tools or methodologies hinder the effective integration of SDM tools.¹⁶ Additionally, the limited time available during healthcare consultations often restricts the depth of discussion necessary for effective SDM.^{14,15,16} Clinicians might also be reluctant to comply with patient preferences when they clash with their own recommendations.^{17,18} This highlights a potential barrier to SDM, wherein clinician biases or preferences could inadvertently overshadow patient choices. On another note, the complexity of medical information can overwhelm patients, hindering their active participation in the decision-making process.^{16,19} Structural limitations within healthcare systems, such as resource constraints and organizational barriers, posed additional challenges to the integration of SDM and SDM tools in practice.^{16,20}

In Flanders, there is still a lack of available SDM tools for CRC screening tailored to the unique needs and preferences of underserved people. This study aimed to develop an SDM tool that combines a video-based decision aid and a risk estimator for CRC to support informed screening choices. Specifically, this SDM tool was developed to address health literacy barriers and enhance SDM practices. Through a co-creative process with GPs and underserved people, the study captured their needs and preferences regarding the tool's content, design, and delivery, ensuring its relevance and usability.

2. Methods

2.1. Initial preparation

The core development team was comprised of experts in CRC screening, SDM, social epidemiology, health communication,

information and communication technology, and artificial intelligence. Their diverse expertise ensured comprehensive guidance in various project phases (Fig. 1). All aspects of the study received approval from the medical ethical commission of the University Hospital Antwerp (UZA), University of Antwerp (Reference: 3590 - BUN B3002022000101) and ensured informed consent from participants. Furthermore, the study adhered to the COREQ checklist to ensure comprehensive and transparent reporting of this qualitative study (see Supplementary Materials, Appendix A).

2.2. Evidence synthesis

As a preparation for the tool development, we performed two systematic reviews, published in separate reports. The first review used a mixed methods design to synthesize evidence from quantitative and qualitative studies regarding SDM tools for cancer screening.¹⁵ The second review evaluated individualised risk prediction models for CRC, focusing on their performance, clinical usability, and potential clinical utility.²¹

2.3. SDM tool development

We developed an SDM tool that combines a video-based decision aid for CRC screening (see Section 2.3.2) and a personalised risk prediction model for CRC. However, in this paper, we only report the details of the development for the video-based decision aid's content and design, specifically the MGT-A results from the co-creation sessions. Details on the development of a personalised risk prediction model for CRC will be presented in an upcoming report.

2.3.1. Conceptual framework

The SDM tool development was guided by the Belgian Centre for Evidence-Based Medicine (CEBAM) screening recommendations to ensure content relevance and adherence to high-quality standards.^{22,23} We also developed a framework based on published literature to conceptualize the SDM tool's content, format, and delivery strategy before starting the co-creation process, a collaborative method involving underserved people and GPs in the design.¹⁵ This allowed us to present a beta version to underserved people for formative testing, enabling them to provide specific feedback despite having no prior knowledge of SDM tools for CRC screening.

2.3.2. Video-based decision aid

The initial draft of the video-based decision aid for CRC screening was developed based on the insights and previous experiences of experts, including epidemiologists and health communication researchers, as well as a review of the relevant literature¹⁵ (see Table 1 for the detailed description of the design and content of the decision aid). It was further refined based on the results from the co-creation sessions with underserved people and GPs. The decision aid was made available in multiple languages and featured high-quality visuals to ensure clarity and engagement.

2.4. Recruitment of participants and Co-creation sessions

Purposive sampling was used to recruit participants, including GPs practicing in Flanders and underserved people who face barriers to healthcare access, such as low socioeconomic status, limited health literacy, language barriers, or migrant backgrounds. Participants included those with basic Dutch proficiency or migrant backgrounds. Additionally, recruitment of underserved people was facilitated through the support of Atlas and Ligo, organizations that provide social support and integration services.

Co-creation sessions were held to explore underserved people's experiences with the existing invitation letter and the newly developed video-based decision aid for CRC screening (see Supplementary

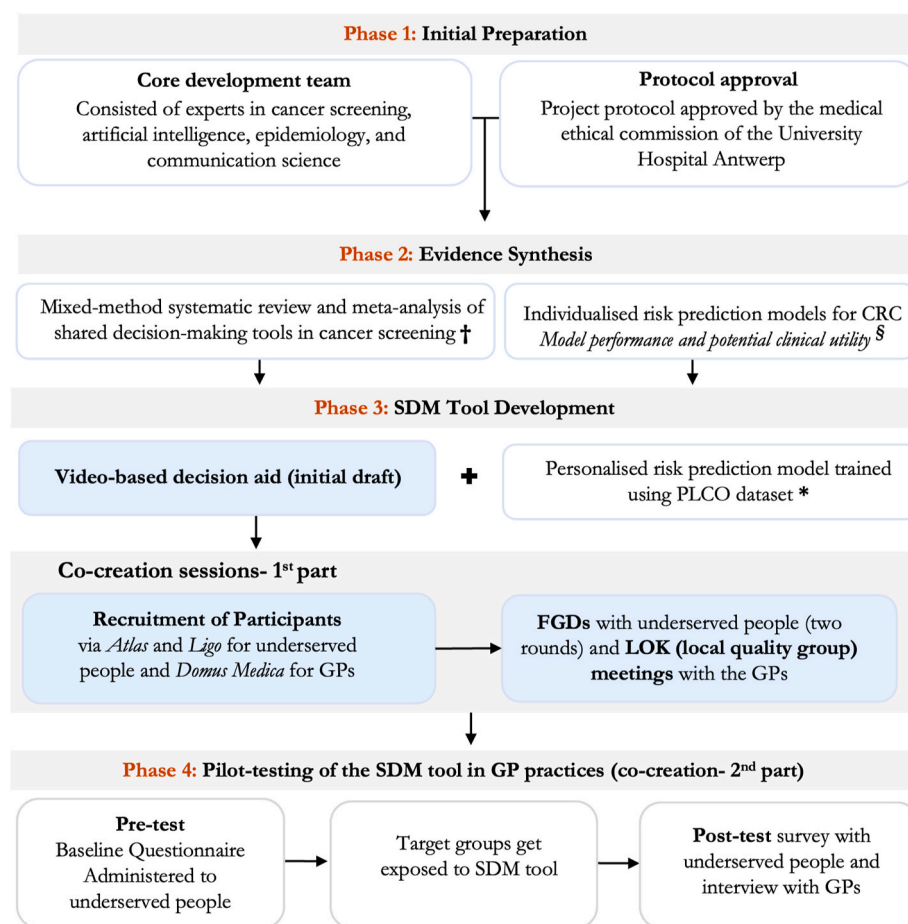


Fig. 1. Detailed overview of the shared decision-making tool development phases, with Phase 3 (highlighted in blue) representing the primary focus of this report. Symbols indicate reports published in separate manuscripts: † Details published in [15], § Details published in [22], * Accepted for publication in *Gastrointestinal Disorders* (DOI pending). Abbreviations: FGDs, Focus Group Discussions; SDM, Shared Decision-Making; PLCO, Prostate, Lung, Colorectal and Ovarian cancer screening; GPs, General Practitioners. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

Materials, Appendix C for the co-creation guide). For GPs, we discussed their perspectives on potentially integrating the developed SDM tool into practice. These sessions aimed to gather feedback to refine the video-based decision aid's content, design, and delivery strategies based on their needs and preferences.

2.4.1. Focus group discussions with underserved people

A series of six FGDs with underserved people were conducted-organized in two rounds. They were held at six different locations supported by Atlas and Ligo to ensure broad representation of underserved people and in-depth insights regarding their experiences and perspectives. Health communication experts (S.T. and L.V.B.), trained in moderating FGDs with underserved people, led the discussions, exploring participants' thoughts, feelings, and needs regarding CRC screening and the decision aid. A trained student (A.V.) assisted by noting observations and non-verbal cues. Roleplaying, storytelling, and visual aids were used to facilitate expression. Verbal consent was obtained following an explanation of the study, as approved by the Ethics Committee, due to participants' limited reading proficiency.

In the first round of FGDs, 75 participants shared their CRC screening experiences and reviewed the video-based decision aid's content and design (Table 2). After learning about CRC through storytelling, participants viewed the decision aid. In the second round, 69 participants provided feedback on the decision aid one week later. FGDs were conducted across six districts in Antwerp, Belgium, each lasting 120 min, excluding breaks.

2.4.2. LOK meetings with GPs

Recruiting GPs posed a challenge due to the lack of full reimbursement for their time, a crucial factor for participation in Flanders. To incentivize participation, we partnered with Domus Medica, Flanders' largest GP association, to offer a free mandatory training session for accreditation as a benefit for GPs joining the co-creation session. This strategy addressed reimbursement concerns and secured the involvement of 50 GPs in LOK meetings, where independent GPs collaborate to improve care quality through training and peer review (Table 2).

The LOK meetings were conducted in five different locations over multiple practices in Flanders due to enabled us to capture a wide range perspective from GPs. During ensuing discussions, we introduced the ORIENT project, engaging GPs in conversations about their current approaches to preventive talks with underserved people regarding CRC screening.

2.5. Data analysis

All conversations were audio-recorded, transcribed, and qualitatively analyzed (S.T., L.V.B., W.v.d.V., A.V.). Familiarization with transcripts, field notes, and interview guides was conducted before open coding. A native Dutch speaker (W.v.d.V.) verified the English translations of participant quotes. M-GTA, a flexible qualitative analysis method, was used to identify key considerations for developing and integrating the SDM tool for CRC screening.²⁴ Analysis involved open and selective coding, with two researchers (D.J.H., W.v.d.V.) independently coding the data. To enhance credibility, reflections from

Table 1
Overview of the initial content reflected in the video-based decision aid for CRC screening before co-creation sessions.

Components	Detailed description
Design	The video was created using a combination of still images and animated objects. The initial draft was 5 min long and included a voice-over. Originally, it was available only in Dutch (B1 level) with an English auto-translate feature. The video can be accessed through a provided link.
Content	
Introduction to the intestines and their function.	Explains the intestines' location, role in digestion, and importance for overall health.
Polyps and their impact.	Describes how some people develop symptomless polyps in their intestines, which can lead to illness.
Colon cancer awareness.	Highlights the seriousness of colon cancer, affecting both genders, primarily aged 50 to 74, and its mortality rate in Belgium.
Prevention and lifestyle recommendations.	Provides lifestyle advice to reduce colon cancer risk, including avoiding smoking and alcohol intake, maintaining a healthy weight, eating well, and exercising.
Importance of colon cancer screening.	Introduces colon cancer screening as a critical measure for early detection and preventing the progression to cancer.
Screening programme details.	Details of the screening programme, including eligibility and the process of receiving and using a free home screening kit.
How to participate in screening.	Briefly mentions the steps to use the screening kit, with a focus on following the included instructions.
Encouragement to consult healthcare providers.	Urges viewers to discuss screening with their doctors, facilitating informed decision-making about participation.

Table 2
Overview of focus group discussions (FGDs) with underserved people and local quality group (LOK) meetings with general practitioners (GPs).

FGDs with Underserved People			LOK meetings with GPs	
Location	Round 1 n	Round 2 n	Location	n
Hoboken	11	10	Hombeek	9
Kiel	9	13	Diksmuide-Esen	11
Borgerhout	13	11	Stekene	9
Luchtbal	15	14	Leuven	11
Linkeroever	18	8	Beveren	10
Antwerp Centre	9	13	–	–
Total Participants	75	69	Total Participants	50

LOK, a Dutch abbreviation for “local quality group”. FGDs, Focus Group Discussions, GPs, General Practitioners, n, number of participants per session.

moderators were triangulated with themes developed by independent analysts. Data saturation was reached, with no new themes emerging during the second FGDs with underserved people and the fifth LOK meeting with GPs.

3. Results

3.1. Findings from the co-creation session

Findings from the M-GTA identified four dominant themes, presented in a hierarchical structure to outline a step-by-step process for developing of a tailored SDM tool in CRC screening for GPs and underserved people (Fig. 2). Representative quotes for each theme and subtheme are also presented in Table 3.

3.1.1. THEME 1: Recognizing barriers to screening

3.1.1.1. Subtheme 1.1: Barriers to a preventive talk (faced by GPs). GPs

highlighted several salient barriers to preventive talks, including the lack of (1) time, (2) nurses or staff in GP practices, (3) available tools, and (4) a structured approach. Most GPs reported the hassle of manually checking each patient’s participation in CRC screening. The most salient barriers faced by GPs were difficulties in conveying risk to patients without visual aids or guides, especially that some no longer remembered how to interpret and convey relative or absolute risks.

3.1.1.2. Subtheme 1.2: Barriers to screening participation (faced by underserved people). Underserved people had mostly faced difficulties accessing screening invitation letters due to social barriers, such as a limited understanding of the Dutch language. Many participants were unfamiliar with the official government invitation for CRC screening. Some did not receive the letters due to shared letterboxes, while others mistook them for advertisements (Table 3).

3.1.1.3. Subtheme 1.3: Knowledge gaps about CRC screening (faced by underserved people). The cost of colonoscopy was considered the most important piece of information that was not clearly communicated to underserved people (Table 3). Participants also expressed a need for clearer explanations about how the screening process works and its frequency. Additionally, misconceptions about the risks and benefits of screening, often due to confusing it with the experiences of friends and family during chemotherapy, made them hesitant to participate in screening.

3.1.2. THEME 2: Learning from Existing Tools

3.1.2.1. Subtheme 2.1. What works (learnings by GPs). There were very few tools available to GPs for guiding preventive talks, with only two specific tools mentioned. However, some GPs expressed satisfaction with tools that presented information in simple language, easily understood by underserved people, and effectively guided them through the basic rules of screening. Several GPs also shared their interest in engaging visuals, such as the use of pictograms for communicating cancer risk.

3.1.2.2. Subtheme 2.2. What doesn’t work (learnings by GPs). GPs repeatedly reported that information and resources were dispersed across various platforms, making the tools challenging to use during consultations (Table 3). Additionally, many tools required extensive reading, which rendered them time-consuming. Most GPs also shared an inapplicable delivery of the SDM tool, such as having patients view video-based decision aids for CRC screening in the waiting room, citing privacy concerns, the need for sufficient time to digest the information, and the disruptive nature of this approach.

3.1.3. THEME 3: Determining the content and design

3.1.3.1. Subtheme 3.1: What matters most to GPs. GPs emphasized the need for easy access and convenience in tool design, preferring tools available in multiple formats with minimal effort required when used (Table 3). GPs valued retaining authority to guide patients’ best interests, preferred flexible formats for at-home viewing, simple guides on screening basics, and enhanced visuals to aid risk communication and understanding of CRC risks (Supplementary material, Figs. S1–D).

3.1.3.2. Subtheme 3.2: What matters most to underserved people. During formative testing of the video-based decision aid, participants demonstrated better understanding when it presented relatable visuals (Supplementary material, Figs. S1–A), colours (e.g., green to indicate positive, red to indicate negative), and emoticons such as smiley or sad faces to portray positive or negative feelings (Supplementary material, Figure S1–C, S1–D). However, some found certain words in the decision aid confusing and suggested using simpler terms for easier

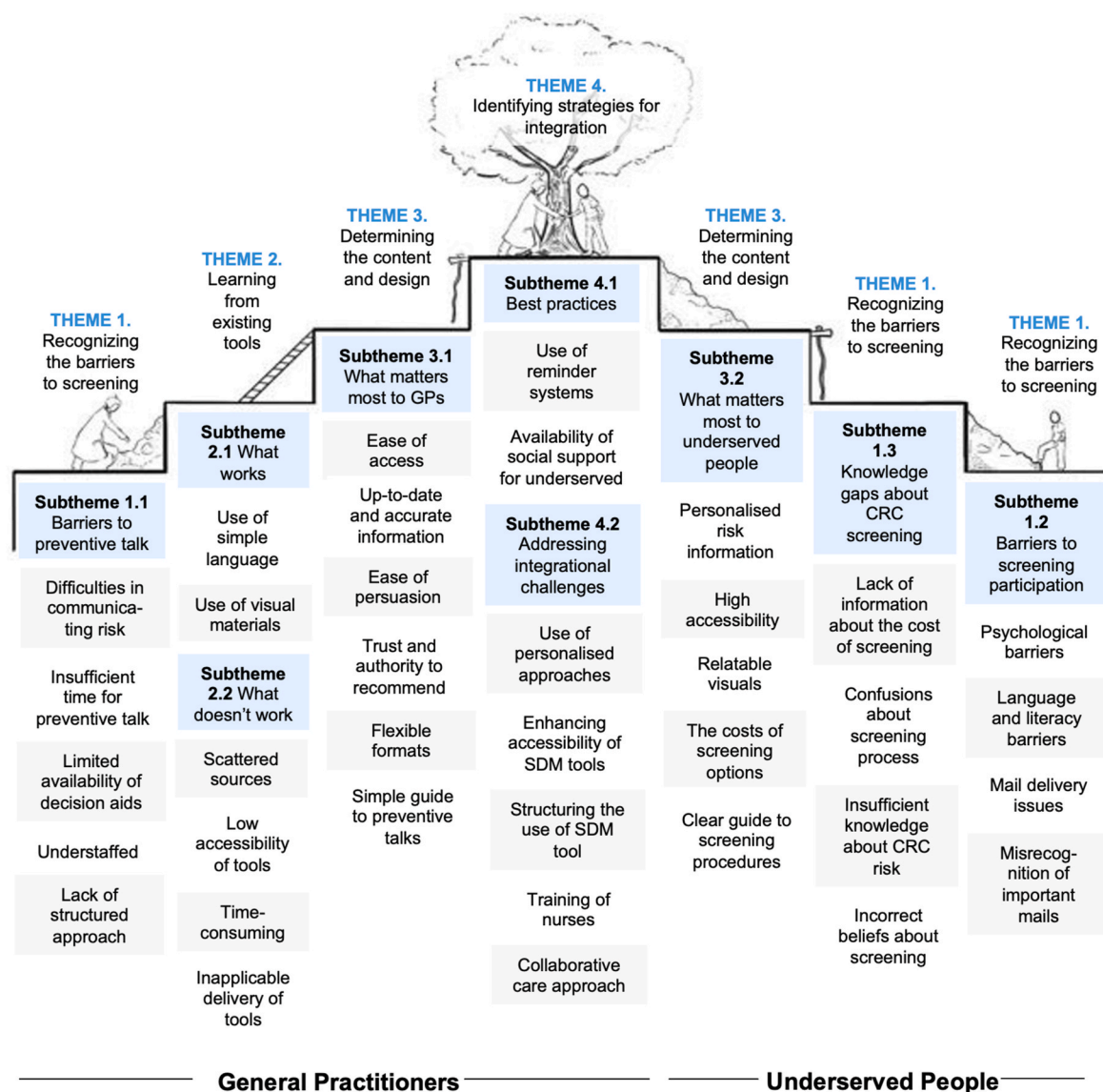


Fig. 2. A thematic framework outlining the key components involved in the development and integration of a tailored shared decision-making (SDM) tool for underserved populations and general practitioners.

comprehension, such as replacing "dirty" and "worry" in Dutch ("vies" and "zorgen maken") with "not clean" and "stress" ("niet proper" and "stress hebben"). The modified video-based decision aid can be viewed via this link, presented in a duration of ~4 min: <https://bibopp-acc.vito.be/orient/video>.

3.1.4. THEME 4: Identifying strategies for integration

3.1.4.1. Subtheme 4.1. Best practices. One GP reported implementing a systematic approach to preventive talks and practices, developing a reminder system, integrating preventive checks into routine appointments, and systematically tracking screening participation (Table 3). On another note, many underserved individuals developed effective practices for handling difficult information through social support systems, including family, peers, and known social support organizations.

3.1.4.2. Subtheme 4.2. Addressing integrational challenges. Several strategic approaches were proposed by GPs for integrating the SDM tool for CRC screening into practice (Fig. 2). The most salient strategies included having an accessible screening tool for easy information access, a structured approach to SDM tool integration, and a collaborative care

model where nurses assist patients with the tool and conduct initial preventive talks before GP involvement.

4. Discussion

This study aimed to systematic development of an SDM tool for CRC screening using a co-creative process with GPs and underserved people in Flanders, Belgium. Findings from the M-GTA reveal four core themes that served as a guiding framework to achieve this goal. The first theme, 'Recognizing the Barriers to Screening,' identified barriers faced by GPs, such as time constraints, lack of support staff, and tools, such as decision aids, for preventive talks. These findings resonate with existing review, which similarly highlights time pressures and workload as common barriers to the effective preventive talks, and these barriers were often caused by the heavy administrative load and the need to attend to other patients.^{25,26,27} Moreover, these barriers relate to our second theme, 'Learning from Existing Tools,' as GPs seek simple, engaging, and easy-to-navigate and easy-to-find tools but report negative experiences with current tools due to non-user-friendly designs and poor navigation.

Meanwhile, underserved people expressed difficulty in understanding invitation letters for CRC screening due to low language and health

Table 3
Example quotes from the participants with their respective themes and subthemes.

Themes Subtheme	Example quotes from participants
Recognizing the barriers to screening Barriers to preventive talk Difficulties in communicating risk to patients	"I feel like when we need to pass on knowledge from articles, these are too difficult for us as doctors ... We then have to give an interpretation about the risk and I'm not good at this. I can't handle the numbers well ... you might end up telling the patient stupid things." ~ LOK with GPs
Recognizing the barriers to screening Barriers to screening participation Psychological barriers: Fear of the procedure, distress about the idea of screening	"Why didn't I participate? I was scared, and I also feared that it could get worse ... I know people who had already gone through that" Another participant stated, "No, I do not want to participate. It is stressful." ~ FGDs with underserved people
Recognizing the barriers to screening Knowledge gaps about CRC screening Lack of information about the cost of colonoscopy	"... So, the FIT test is free, but if after the test I find out I have cancer, then the colonoscopy is no longer free. If I have colorectal cancer, how much will I have to pay?" ~ FGDs with underserved people (Note: This quotation also represents concerns about colonoscopy cost under screening participation gaps and barriers)
Learning from Existing Tools What works Use of simple language	"I use the app estatine.be (https://www.statines.kce.be/nl/index.html). It is very simple and shows, 'Out of 100 people who take this, two will die, and if you don't take it ...'. Another GP shared, 'Thuisarts.nl is used more often. It uses good language for the patient and explains things simply. Many basic rules are covered that we might forget to mention, even though they are logical.' ~ LOK with GPs
Learning from Existing Tools What doesn't work Scattered sources/decision aids, and low accessibility	"There are not many good aids, and if they are available, they are scattered everywhere ... For colorectal cancer screening, you have to look for these decision aids in various places, assuming you even know they exist." ~ LOK with GPs
Determining the content and design What matters most to GPs Flexible formats	"... Ideally, I'd like to offer something tangible, such as a flyer equipped with a QR code. The idea is for patients to first watch a video at home, followed by scheduling an appointment. This link should be available on the website of the participating practice." ~ LOK with GPs
Determining the content and design What matters most to underserved people Personalised risk information	Participant: Can I ask something? That colon cancer ... if your parents have one? Moderator: Yes, you have a higher chance of colon cancer. Is there someone in your family who has cancer? Participant: My husband's family ... his mother died of colon cancer. ~ FGDs with underserved people (Note: The participant struggled with Dutch, making it hard to ask questions clearly. She was concerned about the familial risk of colon cancer for herself and her husband.)
Identifying strategies for integration Best practices Use of reminder systems	"Every year, we send call letters to our patients with a reminder: 'Look, you can have a [smear] test done.' With a prescription for the pill (up to 50 years), I always check if they have had a [smear] test done. If you do this very systematically and keep track, it's not so much work anymore. We also do this with tetanus. Everyone who turns 25, we invite. The response to this is very good. The idea to outsource this to the nursing staff is a good idea." ~ LOK with GPs
Identifying strategies for integration Best practices Social support for underserved	Participant: I help myself, and my children [referring to who can help them understand the invitation letter for screening]. If the lady comes with the letter and I do not know what it is, I find other people to help me. Moderator: Do you have someone who will help you if you get letters? Participants: Yes, the organization 'child and family' helps a lot with letters. ~FGDs with underserved people
Identifying strategies for integration Addressing integrational challenges Collaborative care approach	"For patients, it would be more straightforward. They come to us when they are ill. But then there's the nurse, who checks everything, sets everything straight, and for the results, you see the doctor. Having such a system could be a significant advantage. Perhaps what we need is a nurse who can truly concentrate on these aspects [referring to preventive talks and the use of SDM tool]." ~ LOK with GPs

literacy, which is the most salient barrier to screening participation. Previous studies have highlighted similar barriers faced by underserved people, including limited language literacy, low socio-economic status, and misconceptions regarding the risks and benefits of screening.^{15,26,28,29} These studies reveal that underserved people often encounter difficulties in effectively communicating their needs and preferences, particularly when engaging in discussions that are not in their first language.¹⁵

Studies have shown that decision aids are most effective when they are user-friendly and integrate seamlessly into clinical workflows.^{15,30} However, producing a useable decision aid remains a challenge for underserved people and GPs, especially with the introduction of complex topics like cancer prevention and advanced technologies such as machine learning models for estimating cancer risk. Because of these challenges, we emphasize the importance of our third theme, 'Determining the Content and Design,' which focuses on engaging users in co-creative process. Supporting the co-creative process, a study by Steen et al. (2011) identified several benefits of this approach in the development and design of a new intervention, including improved creativity, better alignment of services with users' needs, enhanced user satisfaction, and organizational innovation.³¹ Thus, we were able to achieve these benefits and accurately identify the priorities of both GPs and underserved people by employing a co-creative approach in our study — allowing us to tailor the content and design of the video-based decision aid for CRC screening to better meet their specific needs and preferences.

4.1. Strengths and limitations

This study has several strengths. To ensure meaningful participation from underserved people, researchers employed non-verbal communication techniques, storytelling, and visual aids to facilitate engagement and expression, particularly among participants with language and health literacy barriers. Additionally, the separation of FGDs with underserved people and LOK meetings with GPs ensured that one group's perspectives did not overshadow the other, allowing both patient and provider needs to be adequately represented in the co-creation process.

Furthermore, the conduct of two rounds of FGDs further strengthened the findings from the qualitative analysis by allowing for comparisons between the first and second rounds, ensuring that emerging themes were validated and refined. This iterative approach enabled the incorporation of participant feedback, leading to a more robust and user-informed decision aid. Additionally, reaching data saturation through multiple discussions across different locations enhanced the depth, and credibility of the findings. This provided a richer understanding of barriers, preferences, and expectations surrounding CRC screening and the video-based decision aid.

Despite these strengths, this study has several limitations, which warrant cautious interpretation of the findings. First, while underserved people contributed significantly to the co-creation of the video-based decision aid for CRC screening, language barriers and limited familiarity with CRC prevention concepts constrained their insights. Social desirability bias may have further influenced responses, particularly among underserved people who might have been reluctant to voice concerns openly in a group setting. Additionally, recruitment through

Atlas and Ligo meant that most participants were migrants with low health literacy, while non-migrant underserved people with low socioeconomic status and healthcare access barriers were underrepresented. This may limit the decision aid's applicability to broader underserved groups.

Selection bias among GPs may have also influenced the findings. By linking the co-creation session to accreditation requirements, we may have overrepresented GPs who are either more motivated to fulfill continuing education credits or already engaged in quality improvement and innovation—factors that could make them more receptive to decision aids. Conversely, GPs less inclined to seek additional accreditation or those facing time and resource constraints may have been underrepresented, potentially limiting insights into barriers that could arise in busier or less-resourced practices. Consequently, the tool's feasibility and acceptance might be overestimated, since the sample comprises GPs who were incentivized (and possibly more predisposed) to adopt novel interventions.

Finally, although the content and design of the decision aid reflect a balanced representation of both underserved people and provider needs, the identification of strategies for integrating the tool into clinical practice was predominantly shaped by GP perspectives. Since discussions on implementation strategies were largely informed by GPs, there is a potential provider-centered bias that may not fully align with the preferences of underserved people regarding how the tool should be introduced and used in real-world settings.

4.2. Conclusion

The findings of this study underscore the necessity of accessible decision aids in supporting SDM for CRC screening, particularly among underserved people who face language barriers, limited health literacy, and structural challenges in CRC screening. Informed decision-making is a cornerstone of patient-centered care, yet many individuals in vulnerable situations struggle to understand screening options, risks, and benefits. Through co-creation with GPs and underserved people, this study identified key content, design, and delivery considerations essential for developing an SDM tool for CRC screening that aligns with the needs of both target groups. However, for broader use, the tool must be further adapted to diverse linguistic and socio-economic settings. As the integration strategies were largely shaped by GPs, it is vital that patient-driven preferences are also prioritized to ensure the tool is not only practical for providers but also meaningful for those it seeks to support. Wider accessibility may be achieved through translation, cultural adaptations, and improved digital access, expanding its reach to a broader population.

Future research is needed to evaluate the effectiveness of the decision aid in real-world settings, particularly among non-migrant underserved people, who were underrepresented in this study. Their exclusion limits the generalizability of the findings, as barriers to CRC screening extend beyond language-related challenges to include socioeconomic constraints, healthcare access limitations, and cultural perceptions of screening. Additionally, expanding providers recruitment to include those less engaged in preventive care and clinicians with more diverse backgrounds is crucial, as their perspectives may reveal additional implementation challenges that were not fully captured in this study.

Author statements

Ethical approval

All aspects of the study received approval from the medical ethical commission of the University Hospital Antwerp (UZA), University of Antwerp (Reference: 3590 - BUN B3002022000101) and ensured informed consent from participants.

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Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.puhe.2025.02.029>.

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