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Short communication

### Colorectal cancer screening: Associations between information provision, attitudes and intended participation

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#### ABSTRACT

**Objective:** Properly informing target audiences is crucial in population-based screening programs. We aimed to evaluate the impact of information about CRC screening on attitudes and intended participation in a screening-naïve population.

**Methods:** 614 persons (aged 55–75 years) received a survey. Information on CRC and screening was provided piece by piece, and per piece its impact on attitudes and intended participation was assessed. All persons received the same information content, but the sequence of information differed per condition: information on the high mortality rate of colorectal cancer was presented in the first or the second piece. Educational levels, the extent people considered future consequences, and value concordance between attitudes and intentions were assessed.

**Results:** 436 persons (response 71%) completed the survey. Overall most respondents reported positive attitudes towards CRC screening (78%) and intentions to participate in CRC screening (83%), independent of sequence of information provision. Intentions about participation were value concordant in the majority (88%). Results were similar in low educated groups.

**Conclusion:** Providing balanced information about CRC screening (also addressing negative effects) did not impede value concordance and high rates of intended participation.

**Practice implications:** High rates of screening intentions are possible without omitting threatening health information in communication materials.

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#### 1. Introduction

Colorectal cancer (CRC) is the second most common cause of cancer-related deaths in high income countries [1–3]. CRC screening is effective in reducing disease-specific mortality [4–6], as survival rates are high if detected early, and fecal immunochemical blood testing (FIT) is highly effective in detecting CRC [7].

Informed decision-making is an important objective in cancer screening [3] [8–11]. Informed decisions are based on relevant knowledge, concordant with values and behaviorally implemented [12]. Lower levels of informed decisions among non-participants in CRC screening [13,14] can be related to insufficient knowledge<sup>14</sup> [15], e.g. unawareness that CRC may not have symptoms, [14] or to barriers such as embarrassment and worries about risks of the test [14–16].

Current evidence regarding effective strategies to enhance informed decision-making without impacting CRC screening uptake in vulnerable groups is conflicting. Some decision aids for adults with lower educational levels were found to increase knowledge and informed decision-making [17], but also to reduce

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participation [17,18]. This highlights the dilemma between enabling informed decision-making and increasing screening uptake [17,19]. Alternatively, informed participation could be pursued by framing information so that it facilitates informed decision-making and encourages participation simultaneously. To enhance informed participation, improved understanding is needed on the effect of informing strategies within socioeconomic subpopulations [13,18,20].

As no CRC screening program had been introduced in the Netherlands yet, the unique opportunity arose to assess respondents' initial reactions to screening information. Our objectives were to evaluate how information on various aspects of CRC screening affected attitudes and intended participation in a screening naive population, to assess the impact of the sequence of the information, and to assess whether attitudes and intentions aligned ('value concordance') [21–23].

**2. Methods**

In January 2013, a survey was conducted among 620 members of a Dutch online research panel, aged 55–75 years. To provide a sample reflective of the Dutch population panel members were selected according to gender and educational level. Data of respondents who reported a history of CRC (testing) were excluded (Fig. 1).

Based on decision aids guidelines [24] we developed a set of five pieces of information (part 1 to 5, Appendix A), addressing e.g. the high rate of CRC mortality (which may be perceived as threatening) or the existence of CRC screening. We focused on screening through the FIT test with a 2-year interval, aligning the soon to be introduced screening program [25]. Respondents were randomly assigned to an information version; information about CRC mortality was presented either first or second. Subsequent to each piece of information, attitudes and intended participation were assessed. Attitude was assessed with two questions [26]; respondents were asked 1) whether for them, having CRC screening within the following 3 months was important (1 'very unimportant' to 7 'very important'), and 2) whether they considered having this test frightening (1 'very frightening' to 7 'very assuring'). Scores were transformed to range 0–100; 0–44 classified as negative, 45–55 neutral, and 56–100 positive [26]. Intended participation was assessed by asking: "Based on the

information you received so far, would you participate in colorectal screening?" (1 'certainly no' to 7 'certainly yes'). Scores 0–44 were classified as unlikely participation, 45–55 as undecided participation, and 56–100 as likely participation. Value concordance was constructed when respondents had received all information and operationalized as having positive attitudes toward getting screened combined with likely participation, having neutral attitudes combined with undecided participation or having negative attitudes combined with unlikely participation (Fig. 2).

We assessed generic quality of life (QoL) with the global health status and the QoL items from the EORTC QLQ-C30 [27,28]. Higher scores (range 0–100) indicate better health status and quality of life [29]. The four statements of 'Consideration of future consequences' relate to e.g. the extent people are willing to make sacrifices now to attain (health) gain later (rated 1–7)[30]. Higher scores indicate more consideration of future health consequences [31].

Pearson chi-square tests were used to assess differences for categorical and dichotomous variables, and Man-Whitney U tests for continuous variables [32]. Clinical relevance of changes was operationalized as  $\geq 0.5$  standard deviation [33]. Independent factorial ANOVAS (using bootstrapping to allow analysis of non-normally distributed residuals) and cross-tabulation with chi-square tests were used to control for educational level and level of consideration of future consequences. Analyses were conducted in SPSS (version 21).

**3. Results**

A total of 436 panel members (70%) returned completed surveys. Data of 12 respondents was excluded due to a CRC (testing) history. Gender and educational level were reflective of the Dutch population. Global quality of life was comparable to the Dutch population aged 60–69 (Table 1). Most respondents preferred a directive communication in decision-making (Table 1).

Attitude scores indicated positive attitudes (Fig. 3). Only information about colonoscopy led to a significantly less positive attitude ( $p \leq 0.01$  in each condition), although these changes were not clinically relevant. Overall, 55 (13%) reported negative

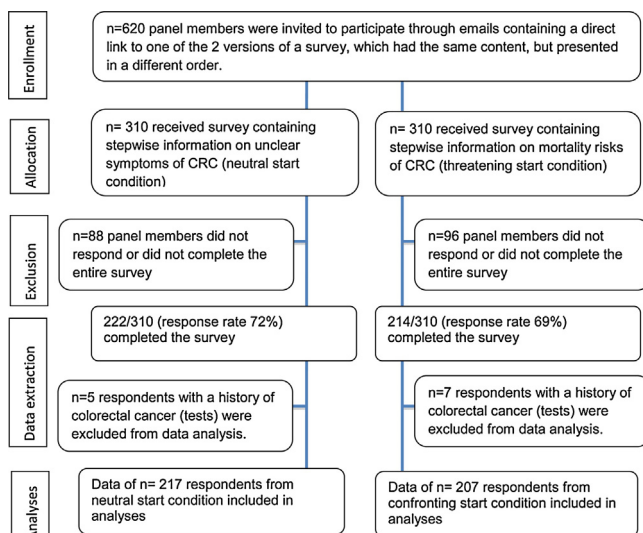


Fig. 1. Flow chart of data-collection.

		Attitude		
		Positive (+)	Neutral (+-)	Negative (-)
Intention to participate	Likely (+)	76.2*	4.2	2.6
	Undecided (+-)	1.7	3.3*	1.7
	Unlikely (-)	0.0	1.7	8.7*

Fig. 2. Relationship between attitude and intended participation after providing all information in the total study population (n = 424), in percentages. \*Grey cells reflect valueconcordant decisions; white cells reflect decisions that are not value concordant.

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