The role of Defensive Information Processing in population-based colorectal cancer screening uptake

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Research

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Background: Why focus on DIP

Evidence from theoretically based qualitative work (n=50) on screening uptake in Ireland

Non-users displayed reactions to invitation to be screened:

- Social influences: negative social influences
- Emotions: Anger, fear, burnout
- Environmental context and resources: negative salient events
- Beliefs about consequences: Fatalism, colostomy bag, surgery
- Beliefs about capabilities: lack of ability to test, ability to recognise illness, no symptoms

What is Defensive Information Processing?

Individuals do not always rationally process threatening information such as cancer risk, and they may engage in defensive information processing using a variety of strategies. The primary function of defences is to reduce negative psychological affect when individuals are faced with real or imagined threats (such as a cancer diagnosis). *McQueen et al, 2014*

- **Attention avoidance:** reducing awareness by opting-out (information & behaviour)
- **Blunting:** active mental disengagement through avoidance and accepted denial
- **Suppression**: acknowledging others risk but avoiding personal inferences through self-exemption beliefs and denial
- **Counter-argumentation:** arguing against the evidence; Message rejection & Normalise the risk

Methods: Survey

Survey of TTC-CRC-SP FIT-based screening programme in Dublin

Questionnaire designed based on qualitative findings using validated instruments

Postal survey with 2 reminders

Sample

Age 50-74

Non-users =3738 (F: 1908; M: 1830)

User = 3738 (F: 1908; M: 1830)

Methods: Survey

Questionnaire designed based on qualitative findings (informed by the theoretical domains framework)

Previous model

- Sex/ Age / Deprivation index
- Relationship status
- Fatalism Index
- Negative emotional attitudes
- Beliefs about cancer

Defensive Information Processing

- Opting out: Information
- Opting out: Behaviour
- Blunting
- Suppression: Self-exemption
- Suppression: Deny immediacy
- Counter arguing: Message rejection
- Counter arguing: Normalise the risk

Methods: Statistical analysis

- Confirmatory factor analysis (verify DIP structure)
- Pearson’s correlation (associations between subscales)
- Multivariable logistic regression
- Hosmer & Lemeshow test (model fit)
- Variable inflation factors tested (AIC & BIC)

Results

Response rate

- Users (53%)

  Male: 55% (n=1014)/ Female: 51% (n=974)

Non-users (8%)

Male: 10% (n=184)/ Female: 7% (n=127)

- Lower uptake in **males** and those living in areas of **greater deprivation**
- Mean scores on all defensiveness subscales were significantly higher in non-users

	Users		Non-users		
DIP subscales	**Mean**	**SD**	**Mean**	**SD**	P
Opting out:					
Informational	1.95	0.95	2.44	1.10	<0.001
Behavioural	2.65	1.01	3.08	1.05	<0.001
Blunting					
Blunting	2.72	1.09	3.11	1.18	<0.001
Supression					
Self-exemption	1.94	0.91	2.6	1.06	<0.001
Deny immediacy	1.83	0.75	2.44	0.89	<0.001
Counter arguing					
Message rejection	1.91	0.73	2.31	0.81	<0.001
Normalise the risk	2.64	1.03	2.92	1.01	<0.001

Results: Regression models

Predictors	Outcome: FIT-based colorectal cancer screening								
	Each subscale considered individually [a]			Subscales mutually adjusted [b]			Subscales mutually adjusted and added		
Defensiveness subscales	**AdjOR**	**95% CI**	**p [d]**	**AdjOR**	**95% CI**	**p [d]**	**AdjOR**	**95% CI**	**p [d]**
Opting out:									
Informational	0.65	0.58, 0.73	<0.001	0.89	0.76, 1.05	0.163	-	-	-
Behavioural	0.69	0.61, 0.78	<0.001	0.90	0.76, 1.06	0.201	-	-	-
Blunting:									
Blunting	0.74	0.66, 0.84	<0.001	1.17	0.99, 1.39	0.064	-	-	-
Suppression:									
Self-exemption	0.55	0.49, 0.62	<0.001	0.70	0.59, 0.82	<0.001	0.80	0.68, 0.96	<0.001
Deny immediacy	0.44	0.38, 0.51	<0.001	0.54	0.43, 0.66	<0.001	0.53	0.43, 0.65	<0.001
Counter-arguing:									
Message rejection	0.54	0.46, 0.63	<0.001	1.00	0.78, 1.28	0.972	-	-	-
Normalise the risk	0.78	0.69, 0.88	<0.001	1.06	0.90, 1.26	0.464	-	-	-

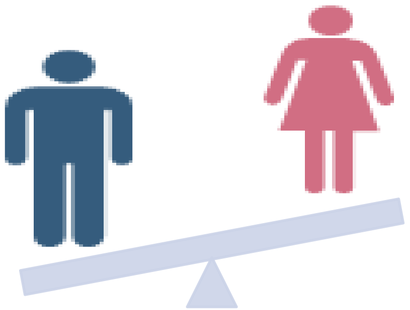
[a]Adjusted for sex , age and deprivation; [b] Mutually adjusted for all other DIP subscales, and for sex, age, deprivation; [c] Mutually adjusted for DIP subscales included and further adjusted for sex, age (within an interaction term with belief cancer can be cured), deprivation, and significant covariates from our previous analyses: fatalistic beliefs, an interaction term between the belief that the test was disgusting and taking the test was tempting fate, an interaction term between age and disagreement that cancer can be cured, and the influence of a partner; [d]Likelihood Ratio Tests for contribution of subscale to relevant model.

Greater defensiveness associated with reduced odds of participating

Discussion

Upstream factors: Socio demographic and economic factors

Gender



Age

Deprivation

Downstream factors: Behavioural

Fatalism

"Don't freak out—it's just a save-the-date."

Disgust

Tempting fate

"I begged you not to buy that book by Christopher Hitchens."

Downstream factors: Behavioural

Defensiveness: Suppression

Deny immediacy

- Deny immediacy to be tested focuses on putting the test off (i.e. “I will wait to get tested for colon cancer until…”)

Self-exemption

- Self-exemption focuses specifically on refusal (i.e. “I don’t need to be tested because…”).

Conclusions

Understand and address psychosocial barriers, such as defensiveness

- **Defensiveness is potentially modifiable**

- **Lack of consideration of future consequences of not taking part in screening**
  screening of limited relevance, or not immediately important

- **Context may evoke different defensive reactions**
  European screening vs US screening

Future interventions targeting DIP

- Two groups: Different behavioural interventions
- Some efficacy for financial incentives- Opt-out/ low SES (mailed FIT only)
- Narratives to reduce counter arguing (temper negative influences)
- Heighten public awareness to trajectory of disease

Paper and editorial forthcoming in Cancer

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Thank you

WEO
World Endoscopy Organization