E-health interventions for addressing syndemics in MSM
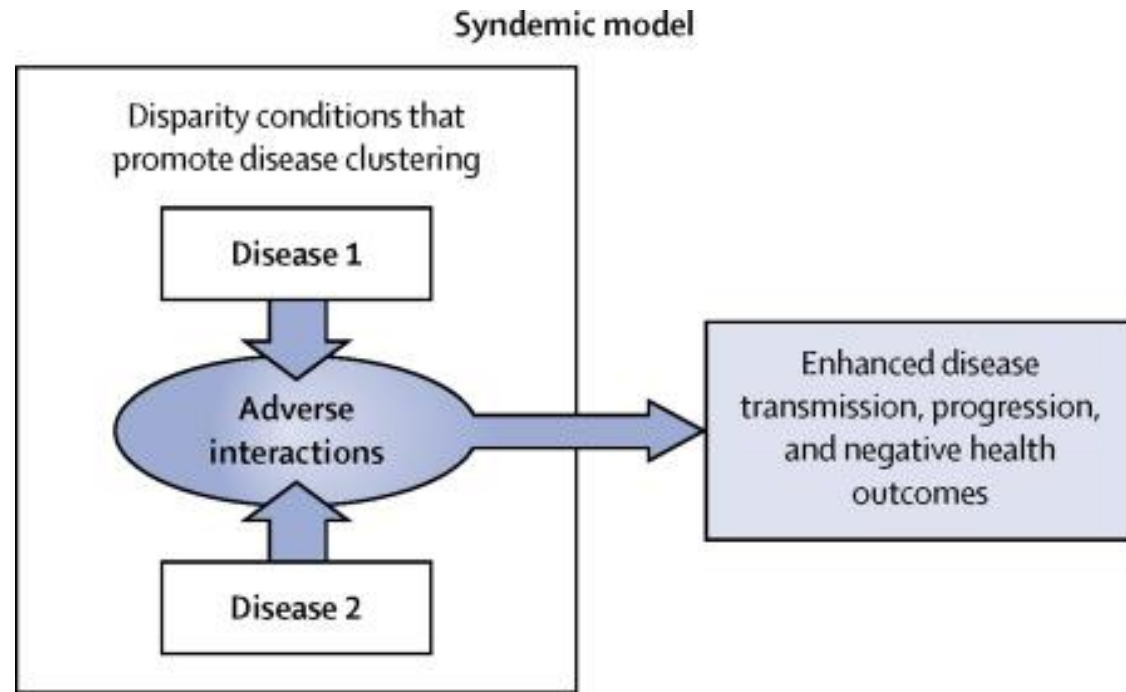
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Background

- MSM experience highest HIV/STI incidence of any group in the UK.

- Simultaneous, mutually reinforcing epidemics with associations between **HIV & STIs, common mental illness and substance use**.

- NIHR funded review investigating potential approaches.

Syndemic model

Disparity conditions that promote disease clustering

Disease 1

↓

Adverse interactions

↑

Disease 2

→ Enhanced disease transmission, progression, and negative health outcomes

Research aims & methods

To search systematically for, appraise the quality of, and synthesise evidence to address the following research questions:

- What approaches and theories of change do existing e-health interventions employ to prevent HIV, STIs, sexual risk behaviour, alcohol and drug use, or common mental illness symptoms among MSM?

- What factors relating to interventions, providers, participants or contexts promote or impede delivery or receipt of such interventions?

Studies synthesised through

- Typology of interventions

- Theory of change

- Process evaluation

- 18 included studies
- 9 addressed sexual health only, 2 mental health only, 3 sexual health and substance use, 4 all three.

Intervention types – time limited / modular

Time limited / modular

- Two main types: video games and modular interventions
- User engagement through activities, exercises, games, quizzes and selecting options from scripted dialogue
- Include aspects of tailoring interventions by need, goals and/or risk profiles

Video games

- Interventions delivered in a video game format
- Immerse users in a virtual environment and provide interactions.

Modular interventions

- Interactive, modular programmes
- Most common type

Non-interactive interventions

- Similar to time limited / modular interventions but without described interactive components

- More reliance on videos, SMS messaging

- Static programme / intervention messaging

- Interventions in this section were not well described

Time limited / modular interventions

			Intervention name (report author[s])	Outcomes addressed		
				SH	MH	SU
Interactive	Video games (n=3)	Immersive (n=2)	Gay Cruise (Kok 2006)	x		
			SOLVE (Christensen 2013)	x		
		Levels (n=1)	Rainbow SPARX (Lucassen 2015a/Lucassen 2015b)		x	
	Online modular (n=7)	Cognitive therapy (n=1)	Online Mindfulness-based Cognitive Therapy (Avellar 2016)		x	
		HIV prevention/ sexual health (n=4)	Hot and Safe M4M (Carpenter 2010)	x		
			WRAPP (Bowen 2007, Bowen 2008, Williams 2010, Schonnesson 2016)	x		
			Sexpulse (Rosser 2010/Wilkerson 2011)[1]	x		
			Keep it Up! (Mustanski 2013, Greene 2016, Mustanski 2017/Mustanski 2018)[1]	x		x
		Comprehensive sexual education for young people (n=2)	Queer Sex Ed (Mustanski 2015)	x		
			myDEx (Bauermeister 2017)	x	x	x
Non-interactive (n=3)		Video series (n=1)	Sex Positive! (Hirshfield 2016)	x	x	x
		Online modular (n=2)	Cognitive Vaccine Approach, tailored (Davidovich 2006)	x		
			Cognitive Vaccine Approach, non-tailored (Davidovich 2006)[2]	x		

Open-ended interventions

- Not designed as fixed, sequence bodies of learning that all participants worked through

- Delivered through SMS, websites, video and apps

Organised by user assessment

- Showed different content depending on demographic / behavioural profile completed through an assessment

General content

- Same content delivered to all users

- Self-monitoring of behaviours

- Some minimal elements of tailoring based on risk

Open-ended interventions

| Intervention category			Intervention name (report author[s])	Outcomes addressed		
				SH	MH	SU
Open-ended	Content organised by assessment (n=2)	SMS (n=1)	TXT-Auto (Reback 2017/Reback 2018)[1]	x		x
		Static website (n=1)	Internet-based Safer Sex Intervention (Milam 2014/Milam 2016)[1]	x		x
	General content (n=3)	SMS (n=1)	MOTIVES (Linnemayr 2018)	x	x	x
		Mobile app (n=1)	HealthMindr (Sullivan 2017)	x		
		Self-monitoring (n=1)	Smartphone Self-Monitoring (Swendeman 2015)	x	x	x
			Total	16	6	7

Theory of change review

Social cognitive theory

IMB model
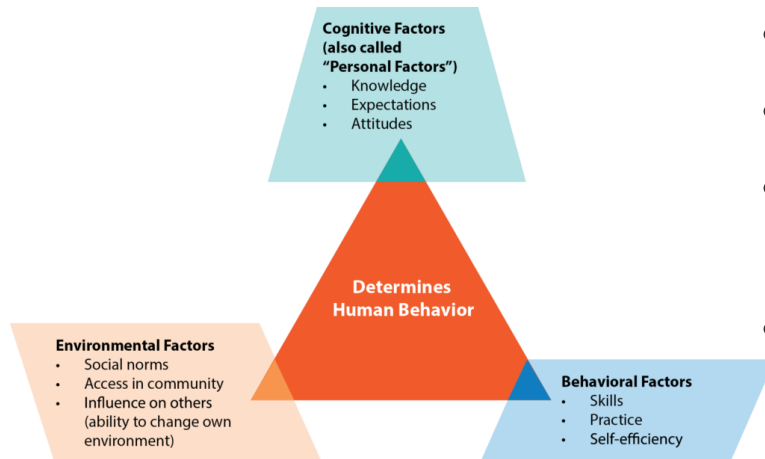
- 23 studies included in theory synthesis
- Social cognitive theory most common (n=7)
- Information-motivation-behavioural skills also common (n=6)
- Health belief model, theory of planned behaviour, social support theory and trans theoretical model also used.
- One study based on behavioural economics
- Three synthesised logic models
- Four studies not synthesised; 1 included insufficient detail, 3 did not fit theoretical groupings.
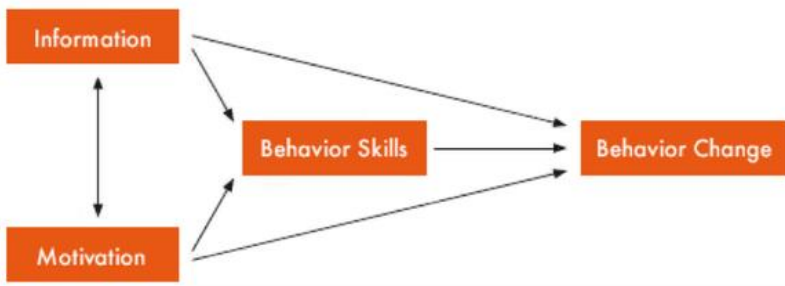
Social cognitive theory / IMB model synthesis
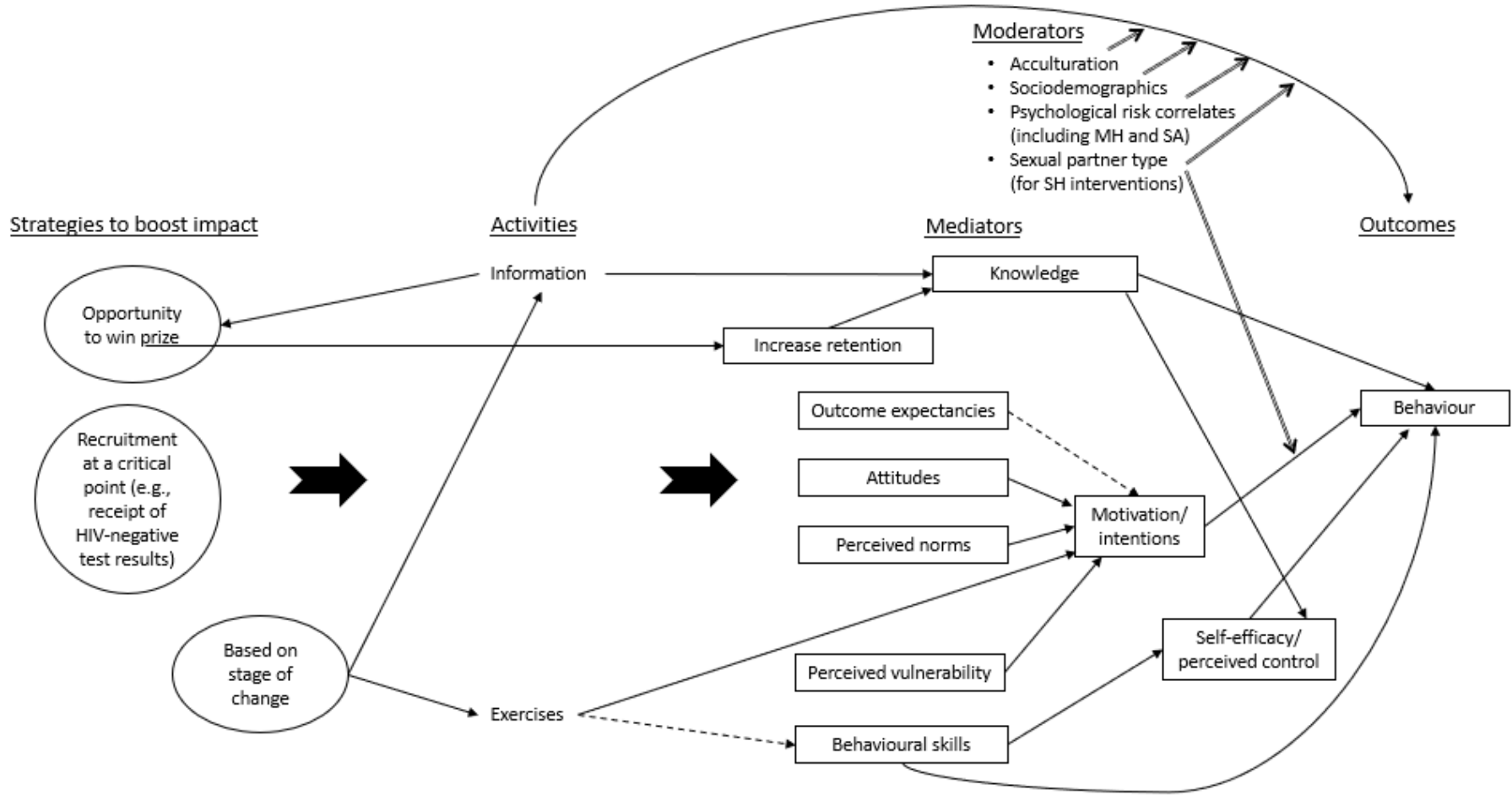
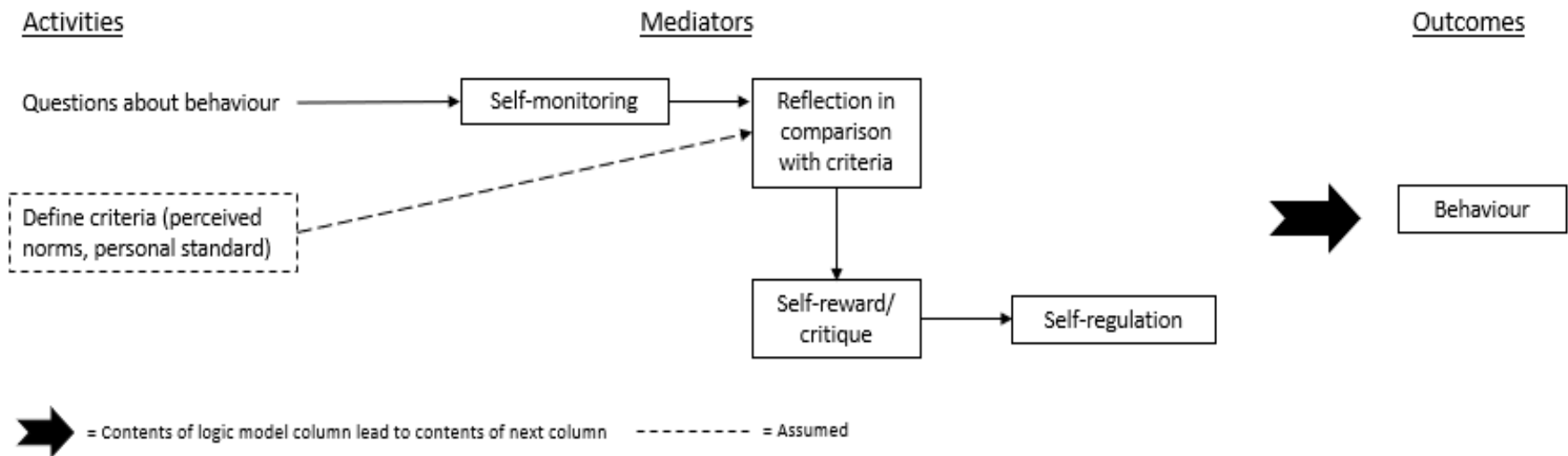Interventions n=10

Self-monitoring synthesised theory

Interventions n=2

Cognitive-behavioural synthesised theory

Interventions n=2

Other included themes
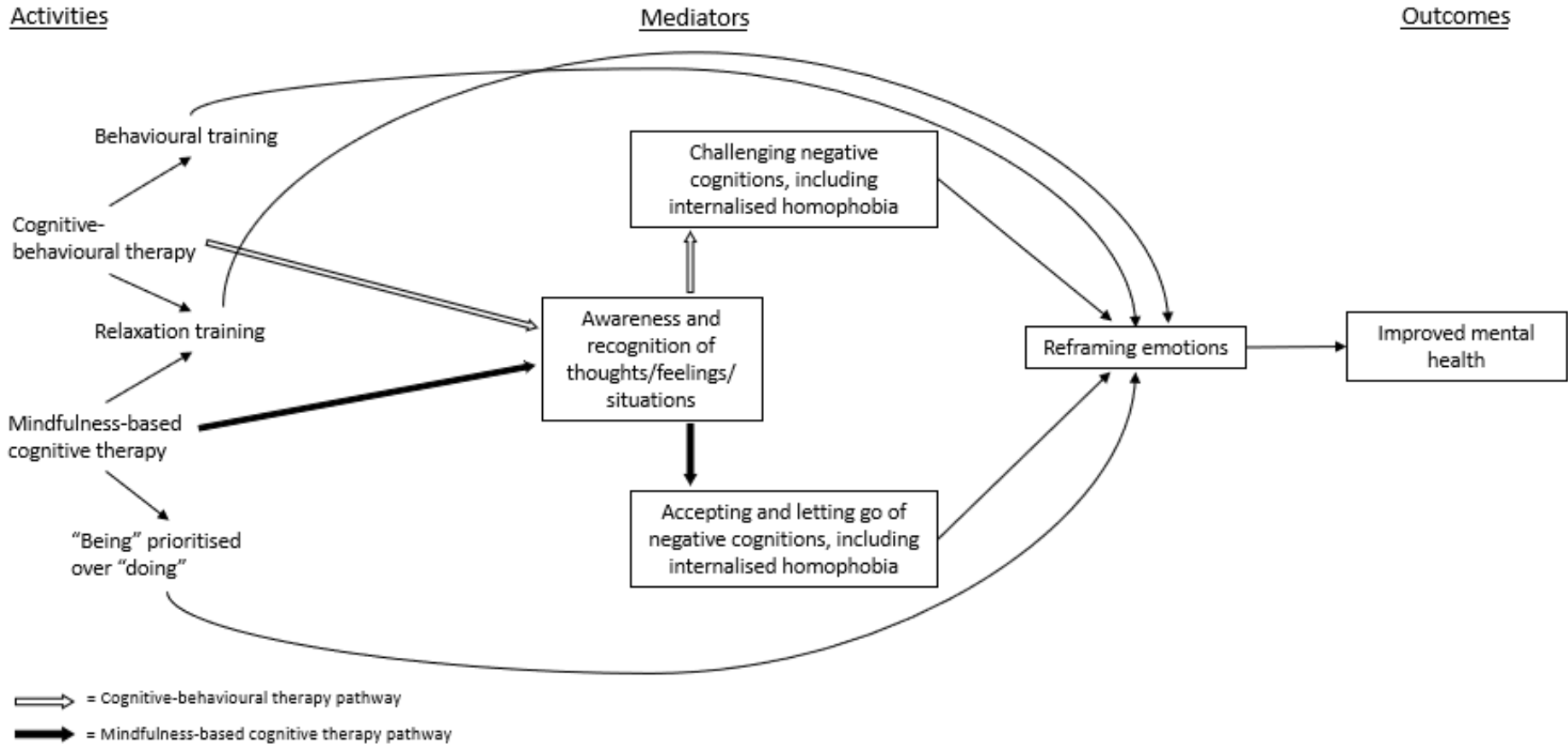
Internalised homophobia / minority stress

- Studies in all groups addressed this
- Theorised mechanism for reducing risk behaviour across the three areas of interest

Relationship between risk / emotions

- Theory that emotions and stress affect sexual risk behaviour

Modelling

- Using modelling / role modelling to address behaviours

Goal setting / reflection

- Encouraging users to reflect on / set life goals

Process evaluation review

- 10 reports included process evaluation data from 7 studies

Intervention engagement / completion

- 3 studies explored completion rates across participant groups
- Completion rates were similar across groups (e.g. ethnicity, age, education, risk profile)
- Some differences across geographical context
- One study found intervention too simple for some users

"I thought some things were a little easy…Like overall it wasn't difficult to figure out what you needed to do. Those little puzzles were quite easy to do. I guess it would be hard to make them more difficult though because you would have to be careful that everyone could actually get it."

Process evaluation

"This program was [way] too long. Like really long. My suggestion would be to either break it up into more sections or cut out some videos that only introduced a topic. It's just a lot to get through. The information was all very necessary, especially for queer kids, but keep attention spans in mind."

Usability / acceptability

- Technical issues not uncommon, negatively impacted acceptability

Content, language and tone

- Attractive, well designed content increased acceptability
- Video game format especially well received
- Frank, candid sex positive tone valued

Interaction and personalisation

- Very highly valued

Process evaluation

"I found the program extremely helpful because it encounters real situation[s] within the community such as hooking up online and or bars. I think it can be of great help to a young crowd that has not much experience into the gay scene."

Privacy / intrusiveness

- Some intervention components seen as overly intrusive, questions too detailed.

Pacing and ordering

- Interventions should be minimally demanding
- Content which appears last often seen as most interesting (in randomised studies)

Relevance to own life

- Important that content is grounded in lived experience of users.

Conclusions

- Range of studies identified, minority addressed all 3 areas of interest.

- Highly divergent theoretical underpinnings.
    - IMB and social cognitive theory most commonly used
    - Issues with description of interventions and approached.

- Good user experience critical.

- Balance between needs of programme and of users.