UNIVERSITY OF EXETER | MEDICAL SCHOOL

Identifying effective elements of behaviour change interventions

OR

Identifying Effective Intervention Development Processes

Charles Abraham

NICE, London Sept 6th 2012

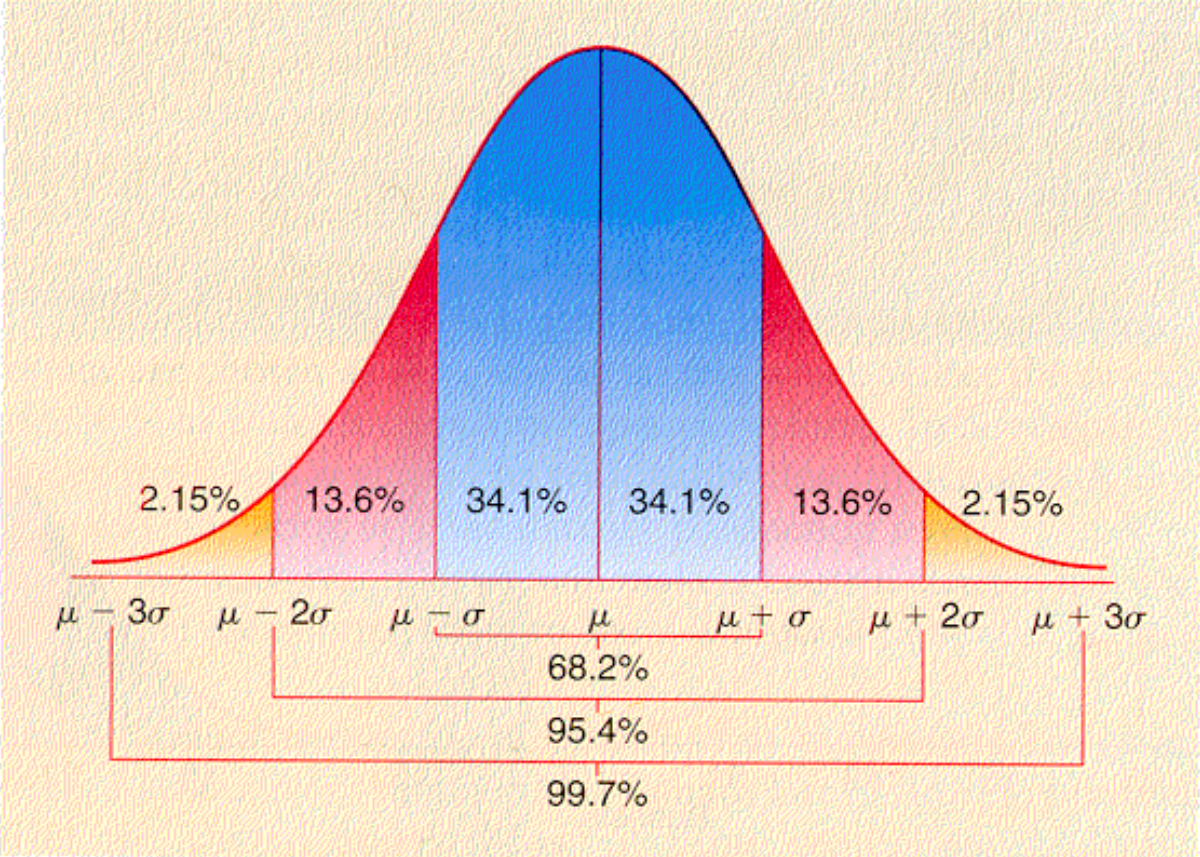
UNIVERSITY OF EXETER

Overview

1. Are behaviour change interventions effective?
2. The problem for reviewers
3. Identifying Behaviors Change Techniques
4. The SHARP Taxonomy: Illustration of Method
5. Active control content and effectiveness
6. Questions for Reviewers.
7. Project HeLP –illustrative intervention developed using Intervention Mapping, IMB and BCT identification.
8. Pointers to effective intervention development.
9. Issues for guidance development.

Measuring Behaviour Change Intervention – Cohen's *d*

d = difference between intervention and control means/ overall variation
1 .0= changed by a standard deviation
0.5 = changed by half a standard deviation
0.25 = changed by a quarter of a standard deviation
0 = no change



Behaviour Change Interventions *Can* Work

Johnson et al. (2010, *Am J Pub Hlth*)

- Synthesis of 62 meta analyses, 1,011 primary evaluations
- Interventions targeting-
  eating, physical activity, sexual behaviour,
  addictive behaviours, stress management,
  screening for women and use of health services.
- Targeting women & older people - more effective.
- Shorter interventions - more effective.
- Heterogeneity of small/ medium effect sizes

ds* = .08 - .45. *Why – what works?

The Problem for Reviewers I

Davidson et al. (2003, *Annals of Behavioural Medicine*)

"Often.. reports fail to describe the actual behavioural intervention techniques used; instead they provide details regarding treatment format… this omission.. is an obstacle not only to replication but also to the credibility and understanding of core, science-based behavioural medicine intervention technology" (p.165)

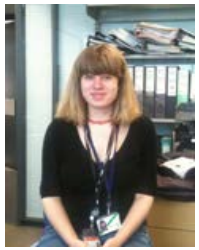
Defining Behaviour Change Techniques

Abraham & Michie (2008, *Health Psychology*)

1. General information
2. Information on consequences
3. Information about approval
4. Prompt intention formation
5. Specific goal setting
6. Graded tasks
7. Barrier identification
8. Behavioral contract
9. Review goals
10. Provide instruction
11. Model/ demonstrate
12. Prompt practice
13. Prompt self monitoring
14. Provide feedback
15. General encouragement
16. Contingent rewards
17. Teach to use cues
18. Follow up prompts
19. Social comparison
20. Social support/ change
21. Role model
22. Prompt self talk
23. Relapse prevention
24. Stress management
25. Motivational interviewing
26. Time management

Person is asked to keep a record of specified behaviour/s. e.g. using diary/ questionnaire.

Behaviour Change Techniques Taxonomy Project

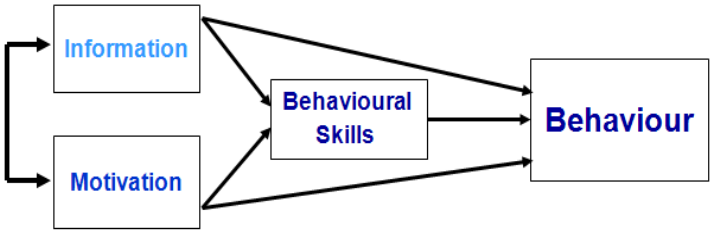


What is a “Behaviour Change Technique”?

- Observable technique
- Smallest active ingredient. Cannot be sub-divided.
- Which has a basis in hypothesised change processes, i.e., we can describe *how* it promotes behaviour change,
- Can be faithfully replicated using additional information about materials (i.e., in a protocol or manual),
- Can be empirically related to intervention effectiveness through meta regression.

SHARP Techniques to Change – What?

Intervention Mapping Question:
What are the modifiable determinants of the target behaviour?



Fisher & Fisher (1992)

What are the determinants of condom use?
Sheeran, Abraham and Orbell (1999)
Albarracín et al (2001)

Which change processes count in condom use promotion?
Albarracín et al (2005)

.... the most effective interventions contained educational information, attitudinal arguments, behavioral skills arguments, and behavioral skills training.... the least effective attempted to induce fear of HIV.

(all refs from *Psychological Bulletin)*

SHARP Change Techniques and Targets I

Knowledge (9 techniques)

e.g., Modes of Transmission (information on)

Awareness (2 techniques)

(i) Self-Monitoring of Behaviour & (ii) Feedback on Behaviour

Attitudes (6 techniques)

e.g., (i) Provide Information on Affective Consequences

Social influence (4 techniques)

e.g., Approval by Others (Injunctive Norm)

Self-efficacy (13 techniques)

e.g., Planning Strategies to Overcome Identified Barriers

Intention (4 techniques)

e.g., Prompt goal formation.

SHARP Change Techniques and Targets II

Action control (4 techniques)

e.g., Implementation Intention Formation(If-then plans)

Maintenance (2 techniques)

e.g., Use of follow-up prompts.

Facilitators (3 techniques)

e.g., Creating social support.

47 change techniques (9 broad change targets) defined in (22 pp) SHARP Taxonomy Coding Manual

SHARP Intervention Content Classification System I

SYNTHESES OF HIV/AIDS RISK REDUCTION CODING FORM

Study ID: _____

Coder: _____

		Information Provided	USED
☑	GK.1	Epidemiological Info	
☑	GK.2	Modes of Transmission	
☑	GK.3	Prevention Strategies	
☑	GK.4	Structure of HIV	
☑	GK.5	Reproductive Anatomy	
☑	GK.6	General (Unspecified Sex-RR)	
☑	GK.7	Active Information Encoding	
		vant)	
		e Access	

Control / Experimental Condition: _____

Intervention Focus (circle): HIV / STIs / Both / Irrelevant

Generic: BCT delivered to participant(s) is identical, or virtually identical for all.

the individual level, (i.e. special characteristics of the participant, NOT
s; e.g., race, gender, age, etc. [See IF.42]). Must be clear to code; **do not**

d in more than one session

TYPE OF BEHAVIOUR TARGETED?

TAILORED?

		Behavior Change Techniques	Generic SexRR	rgeted Sexual Behavior				PAGE NUMBERS & NOTES
				ABS IN	USE	TALK	OTHER	
T	AW.10	Self-Monitoring of Behavior		X				
T	AW.11	Feedback on Behavior			X+			

IN MORE THAN ONE SESSION?

SHARP Intervention Content Classification System II

	Other Intervention Features		
IF.1	Macro-Tailoring?	Gender / Race / Sexuality / Occupation / HI	
IF.2	Is model theoretically based? (If SOC/TTM-based only, code AW.10a, SE.20a, and SE.20b [Tailored] at a minimum)	☐ TRA/TPB [Fishbein/Ajzen] ☐ Social Cognitive Model [Bandura] ☐ AIDS Risk Reduction Model [Catania] ☐ IMB Model [Fisher & Fisher] ☐ Health Belief Model [Rosenstock] ☐ Transtheoretical Model/Stages of Change [Prochaska & Diclemente]	☐ rotectio ☐ Self-Perc [Aronson, Bem, Festinger] ☐ ocial A ☐ Other: _
IF.3	List Intervention Objectives other than safe sex. Write 'unclear' if the behavioral objective is very vague.		
IF.4	Delivery Mode Used	One-on-One / Couple / Group Verbal / Print Materials (during) / Print Ma nals (atte	
IF.5	Number of Sessions		
IF.6	Average Session Length (mins)		
IF.7	Quality Control		
IF.11	Identity of Intervention Provider		
IF.12	Intervention Provider Training	Intensive Interactive / Brief Interactive / Inten Mate	
IF.13a	Provide Testing?	STD/STI	
IF.13b	Pre and post-test counseling?		
IF.14	Provide Condoms?	Free, Provided / Free, Availabl Reques	

Tailored to target group

Theory based

Delivery format

Intervention provider

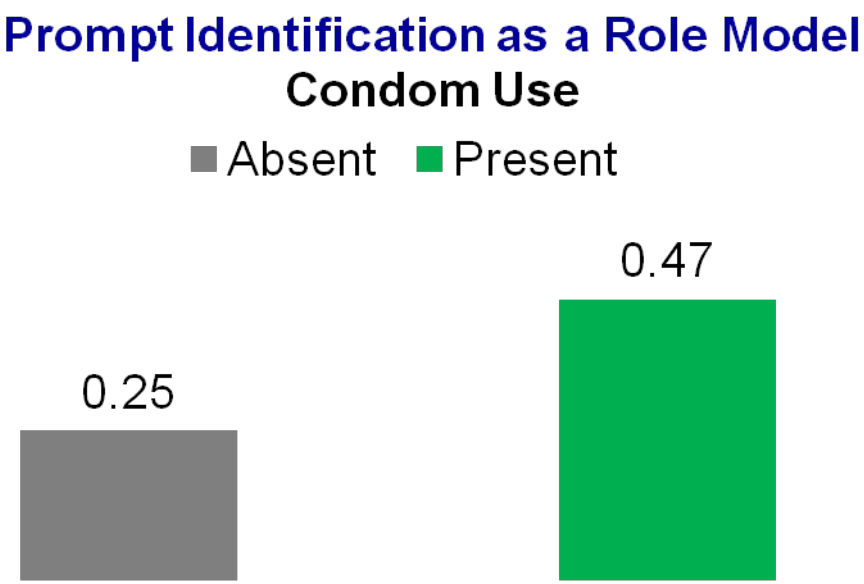
HIV counselling & testing

Which SHARP Change Techniques are Associated with Effectiveness? Illustrative Early Analysis

Overall average ***d* = 0.265**

Inclusion of *some* techniques alters average *d*

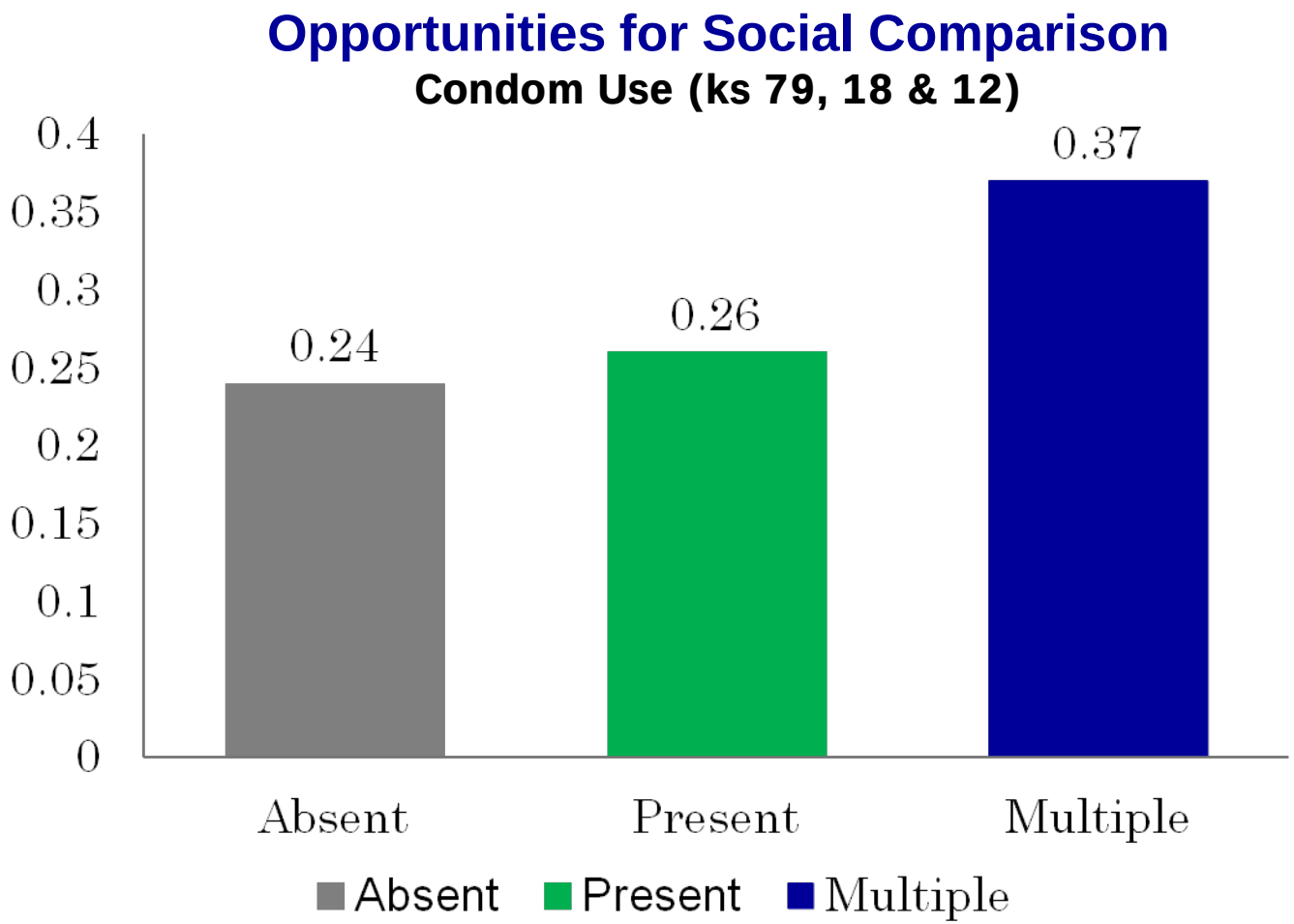
Despite a large data set techniques are often not included frequently enough to assess impact of effectiveness.



BUT

Absent k=105
Present k=4…?

Multiple versus Single Use MAY be Important for Some Techniques



Conclusions

Sharp Taxonomy…

a comprehensive, easy-to-use, reliable tool for identifying change techniques in intervention descriptions,

can be used to assess the effectiveness of including techniques and using them once versus repeatedly for specific behavioural targets,

can guide the selection of change techniques and the construction of evidence-based (as opposed to theory-based) change techniques.

Facilitating Replication through Accurate Reporting of Methods

Abraham & Michie (2008) Taxonomy

13 article- manual pairs (describing the same intervention)
Correspondence of included change techniques = 74%.
73% of mismatches - technique in manual only.
Techniques in manuals M=9.07
Techniques in articles M=6.07 $t(25) = 2.4$ $p<0.033$ (2 tailed)

SHARP Taxonomy

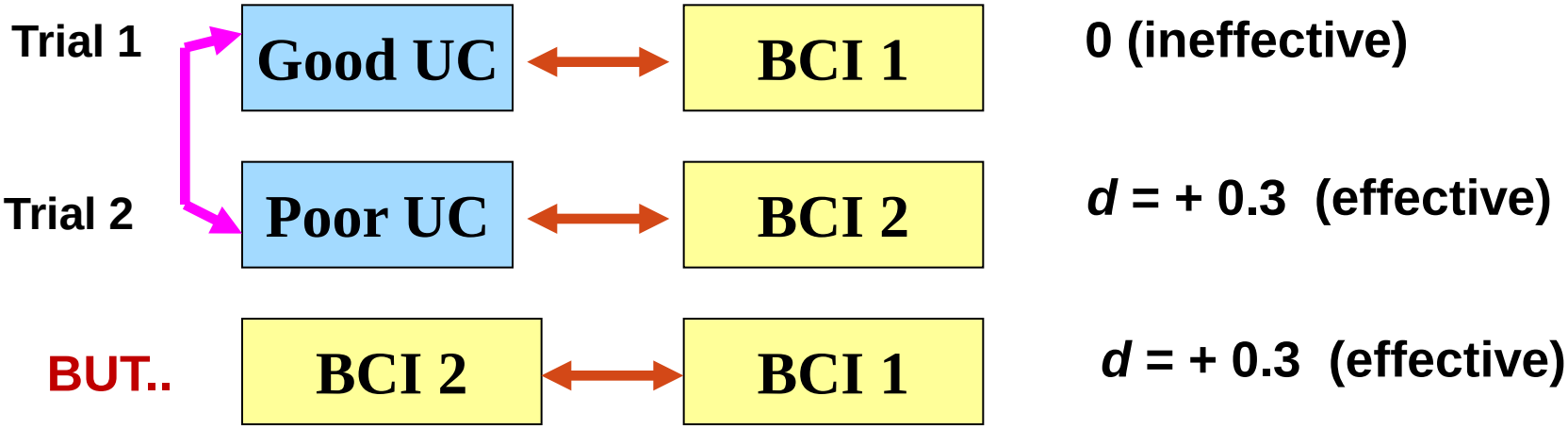
27 article- manual pairs (describing the same intervention)
Correspondence of included change techniques = 78%.
84% of mismatches - technique in manual only.
Techniques in manuals M=44.63 (multiple behaviours)
Techniques in articles M=18.56 $t(26) = 7.15$ $p<0.000$ (1 tailed)

Under-reporting of intervention change techniques in articles compared to manuals means replication requires manuals…

Unspecified Active Controls
e.g. “Usual Care

Davidson et al (2003)

“efforts should be to specify the therapeutic elements that constituted usual care so that…the reader can compare the intensity of usual care with the treatment intervention (p.165)



de Bruin, M., Viechtbauer, W., Schaalma, H. P., Kok, H., Abraham, C., & Hospers, H., J. (2010). Standard care impact on effects of Highly Active Antiretroviral Therapy Adherence Interventions: A Meta-Analysis of randomized controlled trials. *Annals of Internal Medicine*, *170*, 240-250.

Questions for Reviewers

1. How should we define BCTs – mechanism?
2. What level of specificity...?
3. How reliable?
4. Is it worth coding papers – i.e., not manuals?
5. How can we code active controls (e.g., usual care)?

Helping Motivated, Overweight and Obese Woman to Lose Weight

Research Question

Does action and if-then planning help motivated people lose weight?

Sample

Randomised Controlled Trial of 45 women attending Weight Watchers classes.

Intervention

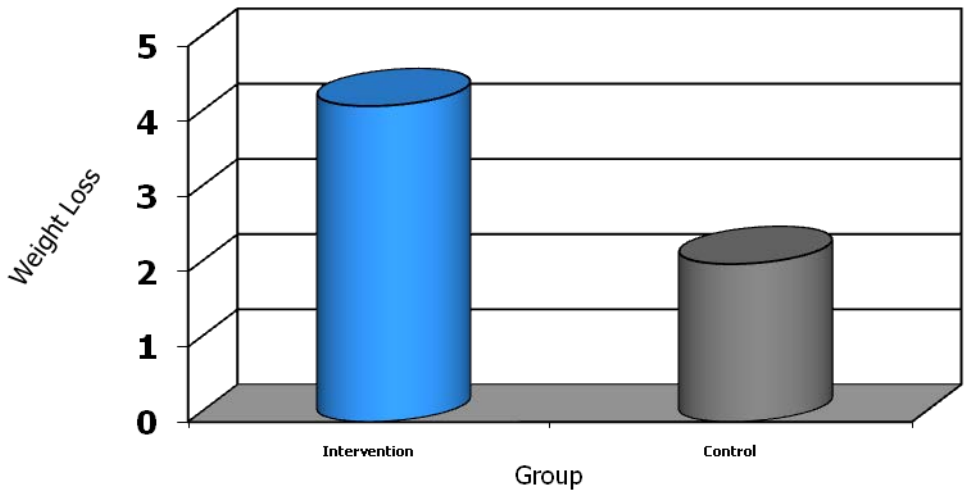
Single session add-on “planning” (including if-then plans) intervention.

Outcome.

Weight loss two months later.

Luszczynska, A., Sobczyk, A, & Abraham, C (2007) Planning to lose weight: RCT of an implementation intention prompt to enhance weight reduction among overweight and obese women. *Health Psychology, 26,* 507-512.

Intervention Development/ Improvement is Continuous
Results – 2 Months Later



Control	**2.1kg Lost**
Intervention	**4.2 Kg Lost**

Clinically significant reduction of weight (5%):

54.2% of Intervention participants
8.3% of Control participants

A Guide to Mapping Change Techniques Onto Change Processes

From.... **Abraham & Michie (2008) 22 techniques + 4 groups mapped to theories**

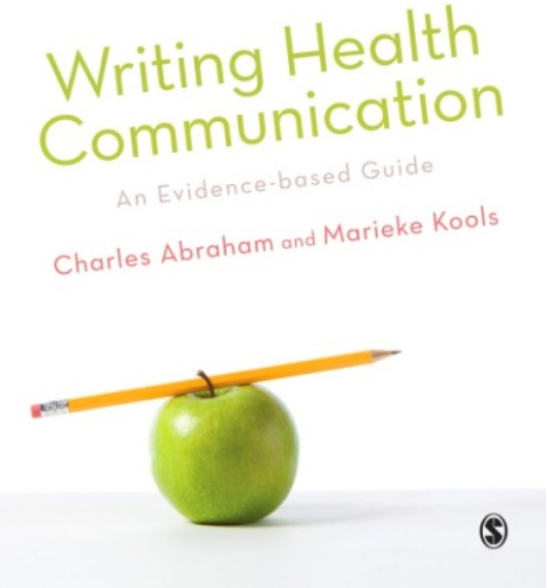
To..... **Abraham (2012) - 40 Change Techniques defined in detail and mapped onto 11 broad change processes/ (i.e., targets)… *in***

Abraham, C. & M. Kools (Eds 2012)

Writing Health Communication:

An Evidence-Based Guide.

London, SAGE Publications Ltd.



Pointers for Intervention Development I

1. Begin with a problem-solving approach to empirically-verified health needs,
2. Identify underlying regulatory and change processes.
3. Develop interventions in the context in which they will be used.
4. Develop products and interventions that can readily be used in everyday work/ leisure environments and are sustainable over time within available resources,
5. … with the active creative participation of those who will use, deliver and adopt the intervention.
6. Understand the reasons why adopters would select and employ products, including interventions, and “design-in” such usability features.
7. Develop a multi-skilled team including users and those who will deliver the intervention.

Pointers for Intervention Development II

8. Use intervention mapping procedures to map change techniques to be used in the intervention onto underlying change processes.

9. Pilot the intervention and seek to improve it in-context.

10. Conduct feasibility evaluations and re-design time.

11. Include process evaluations that track adherence, how the intervention is “used” and the change processes it affects – ideally qualitative and quantitative data.

12. Design effectiveness trials to scale…

13. ….using objective measures (linking outcomes to behaviours) with long-term follow up.

14. Develop detailed implementation manuals to ensure fidelity of replication.

Issues for Guidance Development

1. Editorial policy on manaul preparation and availability.
2. Intervention development is crucial – most interventions are adapted to context... i.e.
3. Development/ improvement is continuous.
4. Delivery modes are important.
5. In-context co-creation may be crucial.
6. Make expertise available to commissioners and practitioners through (1) guidance, (2) training and (3) collaboration.

THANK YOU!