

How to Achieve Evidence-Based Behavioural Change

Practitioners are increasingly aware of the fact that providing for example drinking water disinfection technologies, improved toilets or handwashing facilities will fail to lead to the desired health effects if used inadequately or not at all. Evidence-based behavioural change must therefore be a major component of any mitigation effort. Hans-Joachim Mosler¹, Alexandra Huber¹, Jennifer Inauen¹, Robert Tobias¹

Introduction

Practitioners throughout the world report of unused or misused toilets (e.g. used as storage rooms), abandoned newly constructed wells or inadequate hygiene practices. Providing target populations in developing countries with hygiene, sanitation and water “hardware” must be accompanied by so-called “software” programmes to achieve behavioural change. As behaviour is the product of psychological processes, public awareness campaigns must be conducted to change the factors influencing the outcome of these processes. It is thus necessary to determine the key factors responsible for changing a behaviour, and to implement behavioural change techniques that most effectively change these factors.

A general protocol for behavioural change is outlined containing the following steps:

- Defining the behaviour to be changed of the target population.
- Determining the factors steering the target behaviour.
- Selecting and designing behavioural change techniques (BCTs) to alter crucial behavioural factors.
- Evaluating short-term and long-term effects and the effectiveness of behavioural change techniques.

Defining the behaviour to be changed of the target population

For optimal resource allocation and to attain the objective of a campaign, the specific behaviour of the target population requiring a change must be determined. To characterise critical behaviours, a closer look at everyday behaviour patterns is necessary. At this stage, discussions with experts and in-depth interviews with a small number of people from the target population should be conducted to identify the existing barriers and to facilitate conditions leading to the desired behaviour.

Determining the factors steering the target behaviour

A theoretical framework of potential behaviour-influencing factors should be used to identify the factors determining a specific target behaviour. The factors can then be measured in the target population, and key determinants steering the behaviour identified by statistical analyses. The RANAS Model [1], as a theoretical framework of factors, is herewith shortly introduced (Fig. 1).

Factors of behavioural change: The RANAS Model

The RANAS Model (R(isk), A(ttitudes), N(orms), A(bilities), and S(elf-Regulation) includes several theories from social and health psychology [1]. The model comprises three distinctive components: (1) the factor blocks grouping the behavioural factors, (2) the target behaviours and (3) interventions or BCTs corresponding to the factor blocks.

The psychological factors comprise all possible drivers of health behavioural

change. *Risk factors* are divided into perceived vulnerability (a person’s subjective perception of his or her risk of contracting a disease), and perceived severity (a person’s perception of the seriousness of the consequences of contracting a disease). Additionally, a person should have an understanding (factual knowledge) of how he or she could be affected by a disease through environmental conditions. *Attitudinal factors* include cost/benefit (e.g. how time-consuming is the behaviour) and affective evaluations (e.g. taste and temperature of the treated drinking water). *Normative factors* comprise the descriptive norm (perceptions of those behaviours that are typically performed by others) and the injunctive norm (perceptions of those behaviours that are typically approved or disapproved by important others). *Ability factors* characterise self-efficacy, i.e. the belief in one’s capabilities to organise and take the appropriate actions, and the action knowledge, i.e. knowing how to perform the behaviour. Finally, *self-regulation factors* refer to aspects of putting a be-

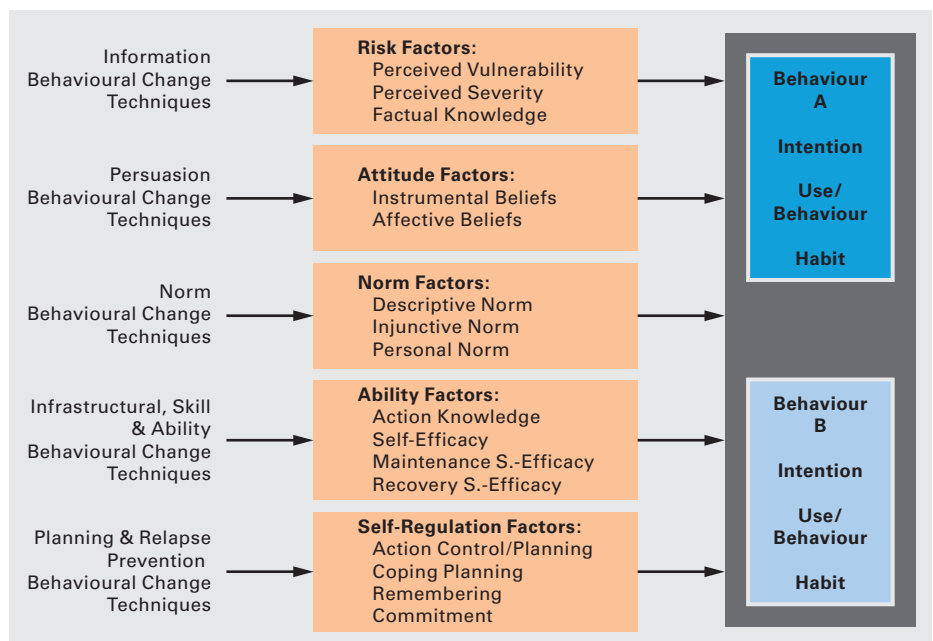


Figure 1: The RANAS model (R(isk), A(ttitudes), N(orms), A(bilities), and S(elf-Regulation) of behavioural change.

Risk Factors	Informational BCTs
Factual knowledge Vulnerability Severity	Presentation of facts/knowledge transfer Personal risk information Showing scenarios Fear arousal
Attitudinal Factors	Persuasion BCTs
Instrumental beliefs	Persuasive arguments Persuasive means Talking to others
Affective beliefs	Affective persuasion
Normative Factors	Normative BCTs
Descriptive norm Injunctive norm Personal Norm	Highlighting norms Informing about others' approval/disapproval Public commitment Anticipated regret
Ability Factors	Infrastructural, Skill & Ability BCTs
Action knowledge (skills)	Provide instruction
Self-efficacy	Guided practice Facilitating resources (financing) Social help Modelling Reattribution of past successes and failures
Maintenance (Coping) self-efficacy	Coping with barriers
Recovery self-efficacy	Coping with relapse
Self-Regulation Factors	Planning & Relapse Prevention BCTs
Action control Coping planning Remembering Commitment	Daily routine planning Outcome feedback Stimulus control Forming implementation intentions Prompts

Table 1: Factor blocks, behavioural factors and corresponding behavioural change techniques (BCTs).

behaviour into practice and maintaining it. Coping with planning includes arrangements plans to cope with barriers. Also to consistently practice a behaviour, the person has to be committed to doing so, and the behaviour has to be remembered at critical moments. A more detailed description of the behavioural factors is given in Mosler [1].

Not only the target behaviour, but also the alternative behaviour has to be taken into account. For example, not only drinking safe water (Behaviour A), but also drinking contaminated water (Behaviour B) has to be tackled. Furthermore, intentions and habits of both behaviours have to be considered.

To measure the incidence of each behavioural factor amongst the population, a questionnaire will have to be developed with questions used as indicators for the corresponding factors. Intensive training of the interviewer team is crucial, as the interviewers have to understand the questionnaire and the interview situation has to be trained.

A large enough number of households should be interviewed and selected according to a predefined scheme. This selection is usually conducted randomly to avoid a biased representation of the population (e.g. questioning only easily reached households).

A comparison of the mean results is the simplest way to determine the most

promising factors to be targeted by BCTs. Any factor whose mean result greatly differs from the optimal result (e.g. any evaluation of the desired behaviour whose result is far from optimal) is a candidate to be targeted. Particularly promising are factors with significant differences in the mean results obtained from persons already practising the desired behaviour and from those not practising it sufficiently enough. For more in-depth analyses (e.g. regression analyses), experts should be consulted (cf. [1] for a short description).

Selecting and designing BCTs to alter crucial behavioural factors

This step allocates the BCTs to the factor blocks of the RANAS Model. BCTs and factor blocks do not necessarily correspond on a one-to-one basis, as many of the BCTs tackle more than one factor. Table 1 contains the BCTs corresponding to each factor block.

A detailed description of the BCTs is given in Mosler [1]. The BCTs are spread via communication channels, comprising mass media and interpersonal channels. Numerous investigations have revealed that interpersonal dissemination is more effective than use of mass media, yet more people can be reached by mass media. The channel chosen for a behavioural change campaign will also depend on availability, resources and on the type of channel people are used to.

Evaluating short-term and long-term effects and the effectiveness

This evaluation will reveal how effective BCTs bring about behavioural change, and also how the BCTs affect the psychological factors. A campaign should comprise at least three surveys: (1) A baseline survey to be conducted before the BCTs are implemented; (2) intermediate surveys to be conducted 1–2 months after implementation of BCTs; (3) the final survey to be conducted 6–12 months after the last BCT is implemented. These surveys are panel surveys, i.e. the same persons are interviewed in all the surveys to identify the changes occurring within the persons.

The baseline survey should be used to define the BCTs (e.g. the BCTs can be tailored to specific subgroups of the population). In intermediate surveys, it is important to also ask about the BCTs, i.e. whether the persons were in contact with promotion material and its impact. It is also good practice to enquire about special events that may have influenced behaviour (e.g. special climatic events or competing campaigns conducted by other organisations). A final survey is vital to evaluate the long-term effects of BCTs. This questionnaire should specifically focus on assessing whether and why people have stopped practising the new behaviour.

For a simple analysis, a comparison can be conducted of the changes in the mean results obtained from groups who received different BCTs. The mean results of the desired behaviour show the effectiveness of the different measures or of the campaign as a whole. The mean results of the psychological factors inform on the reasons for the effect or lack of effect and can be used to improve future campaigns.

- [1] Mosler, H.-J. (2012): A systematic approach to behavior change interventions for the water and sanitation sector in developing countries: a conceptual model, a review, and a guideline. International Journal of Environmental Health Research, 1–19.

¹ Eawag/Sandec, Switzerland

A more detailed behavioural change protocol can be found on www.eawag.ch/forschung/siam/schwerpunkte/soziale_systeme/index_EN

Organisations interested in conducting evidence-based behavioural change should contact Prof. Dr Hans-Joachim Mosler.

Contact: mosler@eawag.ch