

## The RANAS behavioral factors

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Behavioral factors are perceptions, thoughts, feelings, and beliefs which influence the practice of a behavior. Together, they characterize the mindset of a person with regard to that behavior. Different behavioral factors will most critically regulate different behaviors in different populations and contexts. To select the most effective behavior change techniques, we recommend surveying all

the potential behavioral factors and conducting a doer/non-doer analysis to specify which behavioral factors are most critical. These are the factors to be addressed through behavior change techniques. Here, we first define all potential behavioral factors and then present example questions for each factor for chlorinating drinking water.

**Table 1: Definitions of behavioral factors (continued on next page)**

Behavioral factor	Definition
<i>Risk factors: represent a person's understanding and awareness of the health risk.</i>	
Health knowledge	A person's knowledge about a disease's causes and (personal) consequences and its preventive measures.
Vulnerability	A person's estimate about the general probability to contract a disease and the subjective awareness of the personal risk of contraction.
Severity	A person's assessment of the seriousness of an infection and of the significance of the disease's consequences.
<i>Attitude factors: represent a person's positive or negative stance towards a behavior.</i>	
Beliefs about costs and benefits	A person's beliefs about monetary and non-monetary costs (time, effort etc.) and benefits (lower medical costs, improved health) of a behavior, including social benefits (higher status, appreciation by others).
Feelings	A person's emotions (joy, pride, disgust etc.) which arise when thinking of a behavior or its consequences or when practicing the behavior.
<i>Norm factors: represent the perceived social pressure towards a behavior.</i>	
Others' behavior	A person's observation and awareness of others' behavior, his or her perceptions as to which behaviors are typically practiced by others.
Others' (dis)approval	A person's perceptions as to which behaviors are typically approved or disapproved by relatives, friends, or neighbors. This includes the awareness of institutional norms, i.e. the dos and don'ts expressed by recognized authorities such as village, tribe, or religious leaders, and other institutions.
Personal importance	A person's beliefs about what she or he should do or should not do.
<i>Ability factors: represent a person's confidence in her or his ability to practice a behavior.</i>	
How-to-do knowledge	A person's knowledge of how to execute the behavior
Confidence in performance	A person's perceived ability to organize and execute the courses of action required to practice a behavior.
Confidence in continuation	A person's perceived ability to continue to practice a behavior which includes the person's confidence in being able to deal with barriers that arise.
Confidence in recovering	A person's perceived ability to recover from setbacks, to continue the behavior after disruptions.

**Table 1: Definitions of behavioral factors (continued)**

Behavioral factor	Definition
<i>Self-regulation factors: represent a person's attempts to plan and self-monitor a behavior and to manage conflicting goals and distracting cues.</i>	
Action planning	The extent of a person's attempts to plan a behavior's execution, including the when, where, and how of the behavior.
Action control	The extent of a person's attempts to self-monitor a behavior by continuously evaluating and correcting the ongoing behavior toward a behavioral goal.
Barrier planning	The extent of a person's attempts to plan to overcome barriers which would impede the behavior.
Remembering	A person's perceived ease of remembering to practice the new behavior in key situations.
Commitment	The obligation a person feels to practice a behavior.

**Table 2: Example questions to measure behavioral factors (continued on next page)**

Behavioral factor	Question example	Response scale
Health knowledge	I will present you some potential causes of diarrhea. Could you please tell me for each whether it is a cause or not? 1. Water contaminated by bacteria 2. Mosquito bite 3. Spicy food 4. Raw water	A = Yes; B = No. Each correct answer is awarded with one point.
Vulnerability	How high do you feel is the risk that you contract diarrhea?	0 = No risk; 1 = A little risk; 2 = A risk; 3 = Quite a risk; 4 = A high risk
Severity	Imagine you contracted diarrhea, how severe would be the impact on your daily life?	0 = Not severe; 1 = A little severe; 2 = Severe; 3 = Quite severe; 4 = Very severe
Beliefs about costs and benefits (effort)	How effortful do you think is it to chlorinate all your drinking water?	0 = Not effortful; 1 = A little effortful; 2 = Effortful; 3 = Quite effortful; 4 = Very effortful
Beliefs about costs and benefits (time)	How time-consuming do you think is it to chlorinate all your drinking water?	0 = Not time-consuming; 1 = A little time-consuming; 2 = Time-consuming; 3 = Quite time-consuming; 4 = Very time-consuming
Beliefs about costs and benefits (health)	How certain are you that chlorinating all your drinking water prevents you from getting diarrhea?	0 = Not certain; 1 = A little certain; 2 = Certain; 3 = Quite certain; 4 = Very certain
Feelings (behavior)	How much do you like to chlorinate all your drinking water?	0 = Don't like it; 1 = Like it a little; 2 = Like it; 3 = Quite like it; 4 = Like it a lot
Feelings (taste)	How much do you like the taste of chlorinated water?	0 = Don't like it; 1 = Like it a little; 2 = Like it; 3 = Quite like it; 4 = Like it a lot
Others' behavior	How many people in your community chlorinate all their drinking water?	0 = (Almost) nobody; 1 = Some of them; 2 = Half of them; 3 = Most of them; 4 = (Almost) all of them
Others' (dis)approval	People who are important to you, how much do they approve to chlorinate all drinking water?	0 = Disapprove a lot; 1 = Disapprove; 2 = Neither approve nor disapprove; 3 = Approve; 4 = Approve a lot
Personal importance	How strongly do you feel an obligation to yourself to chlorinate all your drinking water?	0 = Not obliged; 1 = A little obliged; 2 = Obligated; 3 = Quite obliged; 4 = Very obliged

**Table 2: Example questions to measure behavioral factors (continued)**

Behavioral factor	Question example	Response scale
How-to-do knowledge	How are 20 Liters of drinking water correctly chlorinated?	No answer options are provided. Each mentioned critical step of chlorination is awarded with one point: A = Filter turbid water; B = Add [2 caps] of chlorine to the water; C = Wait for [30] minutes; D = For turbid water, add [two caps] of chlorine to the water. Note: correct amount of chlorine and time depends on used product.
Confidence in performance	How confident are you that you can chlorinate your drinking water?	0 = Not confident; 1 = A little confident; 2 = Confident; 3 = Quite confident; 4 = Very confident
Confidence in continuation	How confident are you that you can continuously chlorinate all your drinking water even though you have to spend a substantial amount of money on chlorine?	0 = Not confident; 1 = A little confident; 2 = Confident; 3 = Quite confident; 4 = Very confident
Confidence in recovering	Imagine you have stopped chlorinating your drinking water for several days, for example because there was no chlorine available. How confident are you that you would start chlorinating all your drinking water again?	0 = Not confident; 1 = A little confident; 2 = Confident; 3 = Quite confident; 4 = Very confident
Action planning	Do you have a plan when during the course of your day to chlorinate your drinking water? <i>If yes: Could you please specify the point in time?</i>	No answer options are provided. Answers will be classified into "specific plans" (e.g. after breakfast; at 9am) and "unspecific/no plans" (e.g. in the morning).
Action control	How much do you pay attention to chlorinating all your drinking water?	0 = Pay no attention; 1 = Pay a little attention; 2 = Pay attention; 3 = Quite pay attention; 4 = Pay much attention
Barrier planning	Do you have a plan how you can treat all your drinking water even if there is no chlorine at home?	No answer options are provided. Answers will be classified into "correct plan" (e.g. I'll boil the water) and "incorrect/no plan" (e.g. I'll drink raw water).
Remembering/forgetting	How often does it happen that you forget to chlorinate your drinking water?	0 = (Almost) never (0%); 1 = Seldom (25%); 2 = Sometimes (50%); 3 = Often (75%); 4 = (Almost) always (100%)
Commitment	How important is it for you to chlorinate all your drinking water?	0 = Not important; 1 = A little important; 2 = Important; 3 = Quite important; 4 = Very important

**Further information**

<http://www.eawag.ch/en/department/ess/main-focus/environmental-and-health-psychology-ehpsy>

**Publications**

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*, 22, 431-449.

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