

Additional file 10: Exploring potential adverse effects and “far transfer” of learning

Evaluating potential adverse effects

Researchers and others often overlook potential adverse effects of educational and public health interventions (Lorenc and Oliver 2014; Bonell et al. 2015; Zhao 2018; 2017). In developing the IHC secondary school intervention, we have taken steps to prevent potential adverse effects, informed by findings and experiences from the development and evaluation of the IHC primary school intervention (Nsangi, Semakula, Rosenbaum, et al. 2020; Nsangi et al. 2019), as well as findings from piloting and user-testing prototypes of the secondary school resources (Rosenbaum et al. 2019). For example, we explicitly address barriers to applying skills learned from the intervention, such as limited access to reliable health information.

Serious adverse effects of the secondary school intervention are unlikely based on the steps taken to prevent them, as well as the results of the evaluation of the primary school intervention (Nsangi, Semakula, Oxman, et al. 2020; Nsangi et al. 2019). Nonetheless, adverse effects of the secondary school intervention are possible. In a separate study, in parallel with the development of the protocols for the process evaluations, we are developing a framework of such effects, informed by expert and stakeholder feedback. The framework is in turn informing the data collection strategies and tools used in the process evaluations, as well as the trials. Table 1 presents the core content of the framework

Table 1. Potential adverse effects of the IHC secondary school intervention.

Category	Undesirable outcome¹	Short description
<i>Decision-making harms</i>	Incorrect or unnecessary application of learning	Incorrect application of a skill or knowledge learned from the intervention, or correct but unnecessary application
	Misunderstanding	Misunderstanding concepts or examples
	Overconfidence	Excessive confidence in a skill or knowledge
	Inappropriate distrust	Feeling that a person or organisation cannot be relied upon when the person or organisation is providing reliable information or advice
<i>Psychological harms</i>	Cynicism or pessimism	Inclination to believe that the application of a learned skill or knowledge is impossible or worthless, or tendency to focus on challenges to the application of a learned skill or knowledge
	Uncomfortable cognitive dissonance	Uncomfortable experience of inconsistent beliefs
	Work/schoolwork-related stress	Mental or emotional strain from work or schoolwork
<i>Equity harms</i>	Benefit-based inequity	Inequity due to the distribution or size of a benefit
	Harm-based inequity	Inequity due to the distribution or size of a harm
<i>Group and social harms</i>	Conflict	Unconstructive argument or disagreement between two or more parties
<i>Waste</i>	Wasted time or resources	Use of time or resources on the intervention that would be better used on something else
<i>Any</i>	Other	Unspecified or overlooked adverse outcome

¹The adverse effect would be an increase in the undesirable outcome.

²Distrust might also be a psychological harm.

³Cynicism or pessimism might also be a decision-making harm.

Evaluating “far transfer” of learning

If people are unable to “transfer” what they learn in school to other contexts, the value of a formal education is limited (Barnett and Ceci 2002). As follows, if students are unable to transfer skills that they learn from the IHC secondary school intervention to other contexts, the value of the intervention is limited. The more different the transfer context is from the learning context, the “further” the transfer. There is often uncertainty about how best to evaluate transfer of learning (transfer effects), in particular far transfer effects (Barnett and Ceci 2002).

The primary outcome measure for the trial—multiple-choice items from the Claim Evaluation Tools bank—is a measure of transfer, which we consider “near” or “intermediate”. In other words, applying IHC Key Concepts within the context of the intervention is similar overall to applying them to Claim Evaluation Tools items. Granted, there are some important differences. Centrally, in both contexts, students are intended to apply the concepts to hypothetical scenarios, as opposed to practical decisions. An important difference is that in the context of the intervention, students are intended to apply the concepts together, guided by their teachers, while in the context of the outcome measurement, they are intended to apply them independently.

In another separate study, also in parallel with the development of the process evaluation protocols, we are developing a model to identify potential transfer effects of the IHC secondary school intervention, including far transfer effects. Like the framework of potential adverse effects, the model is informing the data collection strategies and tools used in the process evaluations, as well as the trials.

References

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