

that more evidence is needed to establish the effects on biological outcomes, to understand mechanisms of action and to establish cost-effectiveness.

Johnson and Warren argue that the type of comparator used to test the efficacy of computer-based interventions would have little bearing on the degree of efficacy of the intervention, and that combining trial results regardless of type of comparator would increase the statistical power of the meta-analyses, also allowing greater scope for evaluating heterogeneity and testing moderators.

We conducted the analyses by type of comparator because Group 1 studies (with 'minimal' comparators) yield evidence on the efficacy of interventions and Group 2 studies (with face-to-face comparators) yield evidence on efficacy in comparison with examples of standard practice. Whilst 'minimal' interventions may have some effect on sexual health just by virtue of participation in a trial (1), we judged that the effects of minimal interventions (e.g. receiving a leaflet or being on a waiting list) were not likely to have a significant impact on sexual health outcomes. By contrast, although face-to-face interventions show mixed success (2–5) we felt that receiving a lecture or other face-to-face intervention would be more likely to have an impact on sexual health outcomes.

We therefore analysed trials in these separate groups according to the type of comparator because the results have distinct implications for public health initiatives: if computer-based interventions prove to be equal in effects to minimal interventions, it is not worth developing and disseminating these interventions. However, if computer-based interventions are equal in effects to face-to-face interventions, it may be highly cost-effective to develop and disseminate computer-based interventions to replace or supplement face-to-face sexual health interventions.

Equivalence trials (to address ICBI effects in comparison with face-to-face interventions) are expensive to run because they need to be sufficiently large to be confident of 'evidence of no difference' rather than 'no evidence of difference' between interventions. However, face-to-face interventions are very expensive to deliver, and it is therefore very important to know the effects, effectiveness and cost-effectiveness of ICBI by comparison.

We found that results were positive for both groups of comparators, and were surprised to discover that ICBI seem more effective than face-to-face interventions for knowledge acquisition. We also separately analysed trials or trial arms which were testing the mechanism of action of an intervention, for example two different designs of ICBI (Group 3), because these trials were addressing specific questions about optimum intervention design. We agree that more evidence is needed to be confident of the size of the effects: this is a rapidly-developing field, and the next update of the Cochrane review will include substantially more trials.

Response by authors

The 'lumping or splitting' debate - making systematic review results useful for policy-makers

We agree with Johnson and Warren that the results of our Cochrane systematic review indicate that interactive computer-based interventions (ICBI) are promising as a means of promoting sexual health, but also

Good retention of participants is of course crucial in minimizing attrition bias: in seven out of 15 included studies retention was poor (less than 80%) or there was differential drop-out (with reporting unclear in two further studies). Clearer reporting of trial conduct (including detailing incentives offered) would add to the evidence base about which methods of maximizing retention are the most successful. There is a need to improve standards of trial conduct and reporting by adhering to the Consolidated Standards of Reporting Trials recommendations (6). It is important that study authors clearly describe intervention design (including theoretical rationale and behaviour change techniques), study design and delivery, and describe exactly what trial participants received (7,8). This would allow more accurate judging of trial quality, and also a more sophisticated analysis of what works, for whom and why.

Julia V. Bailey** , Richard W. Morris, Elizabeth Murray, Greta Rait, Catherine H. Mercer, Richard Peacock, Jackie Cassell and Irwin Nazareth
e-Health Unit, University College London, Royal Free Hospital, London, UK

Correspondence to: Julia V. Bailey, e-Health Unit, University College London, Upper Third Floor, Royal Free Hospital, Rowland Hill Street, London NW3 2PF, UK.
E-mail: julia.bailey@ucl.ac.uk

Keywords: computer-based intervention, meta-analysis, randomized controlled trials, sexual health, systematic review

References

1. French DP, Sutton S. Does measuring people change them? *Psychologist* 2011; **24**: 272–274.
2. Kirby D. Emerging answers: research findings on programs to reduce teen pregnancy and sexually transmitted diseases. 2007; Available at: http://www.thenationalcampaign.org/EA2007/EA2007_full.pdf [accessed on 16 September 11].
3. Speizer IS, Magnani RJ, Colvin CE. The effectiveness of adolescent reproductive health interventions in developing countries: a review of the evidence. *J Adolesc Health* 2003; **33**: 324–348.
4. Swann C, Bowe K, McCormick G, Kosmin M (Health Development Agency). *Teenage Pregnancy and Parenthood: a Review of Reviews. Evidence Briefing*. London: Health Development Agency; 2003; Available at: <http://www.nice.org.uk/page.aspx?o=502529> [accessed on 16 September 2011].
5. Johnson BT, Scott-Sheldon LAJ, Carey MP. Meta-synthesis of health behavior change meta-analyses. *Am J Public Health* 2010; **100**: 2193–2198.
6. Moher D, Schultz KF, Altman DG. The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomised trials. *Lancet* 2001; **357**: 1191–1194.
7. Abraham C, Michie S. A taxonomy of behavior change techniques used in interventions. *Health Psychol* 2008; **27**: 379–387.
8. Michie S, Fixsen D, Grimshaw JM, Eccles MP. Specifying and reporting complex behaviour change interventions: the need for a scientific method. *Implement Sci* 2009; **4**: 40.