An updated version of this systematic review has been published and can be found online at www.cochrane.org. We will soon update the below RHL summary to reflect the updated findings of the systematic review.

The theory-based interventions to improve contraceptive use that were used in the trials in this review were not uniformly effective in improving outcomes. They appear to be more effective in reducing unwanted pregnancy and improving contraceptive use when they are based on social cognitive theory rather than on other models of health behaviour change. They also appear to be more successful when applied to adolescents in school-based group sessions rather than individually to adults.

RHL Commentary by Warriner I

1. INTRODUCTION

There has been significant global progress in expanding the use of contraceptives by women. By 2009, an estimated 63% of women aged 15–49 who were married or in a union were using some form of contraception (1). However, despite considerable investment in family planning programmes, the pace of improvement in contraceptive use has slowed and regional disparities have grown (2). During the past decade, the annual rate of increase in contraceptive prevalence was lower than in the 1990s and unmet need for family planning remains moderate to high in many regions of the developing world (1).

A better theoretical understanding of the processes involved in changing contraceptive behaviour may help increase contraceptive prevalence. Yet, many health education interventions for contraceptive use are are not based on any explicit guiding theory or principles. The absence of a theoretically grounded basis for behavioural and educational interventions on contraceptive use may have an effect on the success of these programmes. This is of particular relevance for interventions targeting certain populations (i.e. poorer women) and regions such as Africa where contraceptive use is low or slowing down (3).

Behavioural theory has been used for more than 50 years to guide health interventions but use of the theory in contraceptive use interventions has never been comprehensively assessed. Published research often fails to provide sufficient information on the theoretical relevance of the intervention and whether it has been adequately implemented. The objective of this Cochrane review (4) was to examine the impact of theory-based interventions on contraceptive use by systematically reviewing randomized controlled trials (RCTs) that explicitly tested a theoretical approach to improving contraceptive use, choice, and/or continuation of use.
There are some 30 psychological theories of behaviour change (5). Those that are centered on health behaviour often draw on some form of social cognitive theory, the process through which people learn to adopt new behaviours. This entails acquiring knowledge of the risks and benefits of behaviour change, developing a belief in self-efficacy, i.e. the confidence that one has the power to change health behaviour, and determining outcome expectations based on a cost-benefit analysis of different behaviour choices (6).

The specific theories and models used in the studies in this review are: social cognitive theory, social learning theory (a pre-cursor to social cognitive theory), social influence theory, the transtheoretical model, theory of reasoned action, theory of planned behaviour, and motivation theory (including information-motivation-behaviour skills model, protection motivation theory, and motivational interviewing). Given that there is a need for a new generation of research on contraception interventions, it is important to review the success of these theories and models in improving contraceptive use.

2. METHODS OF THE REVIEW

The review was restricted to randomized controlled trials (RCTs) that tested a theoretical approach to improving contraceptive use. The comparison group was either a different theory-based intervention or an intervention that did not have a theoretical base. Trials were excluded if they focused solely on preventing sexually transmitted infections (STIs) or HIV, had study populations of HIV-positive women or other high-risk populations, or had studied abstinence or postponement of first sex for adolescents.

Primary outcome measures were pregnancy (test or self-reported), choice of contraceptive method, initiation or change in contraceptive use, adherence to a contraceptive regimen, and continuation of contraception. Secondary outcomes were knowledge of contraceptive effectiveness and attitudes about contraception.

The list of search terms was extensive and the search for trials was comprehensive with no language limitation. Review authors used leading computerized databases in medicine, psychology, reproductive health and clinical trial registration as well as reference lists and personal contact with investigators. The GRADE approach was used to assess the quality of the trials which ranged from high (three trials), moderate (four trials), low (six trials), and very low (one trial). Data are presented clearly. Tables of the theoretical bases for the included studies and implementation fidelity and additional tables of summary findings are helpful. The analysis methodology is appropriate. Because no two behavioural interventions were the same, no meta-analysis could be conducted.

3. RESULTS OF THE REVIEW

Fourteen studies met the inclusion criteria. Of these, eight were randomized at the individual level with sample sizes ranging from 36–830 and six were randomized by groups (cluster randomized trials) with sample sizes ranging from 817–9645 participants. One trial had been conducted in the United Republic of Tanzania, one in the United Kingdom (Scotland), and the remaining 12 had been conducted in the USA. Nine of the 14 studies had focused on adolescents. Five trials had focused on using contraception to delay second births, reduce the risk of an alcohol-exposed pregnancy, and prevent adolescent pregnancy. Eight trials had focused on pregnancy prevention in conjunction with STI or HIV prevention. The duration of the interventions ranged from two months to 36 months.
Overall, results for theory-based interventions are mixed and there is no clear pattern by type of theory. Theory-based interventions had positive results in about half of the trials and in no case were they worse than usual care. They were more effective in improving contraceptive use in four out of 10 trials and improving condom use in three out of eight trials, but they were effective for pregnancy prevention in only two out of 10 trials. Theory-based trials with positive results were more likely to be adolescent focused and hence school-based, to draw on some version of social cognitive theory, and to have provided group rather than individual sessions.

Key results on pregnancy and contraceptive or condom use at last intercourse are reported below by type of theory or model. Results may be affected by a limited ability to assess the quality of the study design, unclear information about allocation concealment, lack of blinding in nine trials, incomplete outcome data for four trials (loss to follow-up >30%), and selective reporting of results in one study.

### 3.1 Social Cognitive Theory

Three trials were based on social cognitive theory interventions and results were mixed. Social cognitive theory focuses on understanding the risks and benefits of changing one’s behavior, developing self-efficacy, and assessing outcome expectations of the change in behaviour. One study used a customized intervention programme to delay second births among adolescents and results showed that adolescents in the treatment group were less likely to have had a second birth within two years compared with usual care (the standard sex education class) \[\text{Odds Ratio (OR) 0.41, 95\% confidence interval (CI) 0.17–1.00}\]. However, two cluster randomized trials using enhanced school-based curricula versus usual sex education found no difference in (reported) pregnancy for both study arms. One of these studies found no significant differences in contraceptive use within gender. The other study reported that males in the intervention group were more likely to use a condom at last intercourse \[\text{relative risk (RR) 1.47, 95\% CI 1.12–1.93}\] but not females.

### 3.2 Social Cognitive Theory combined with additional theories

Two cluster randomized trials used school-based curricula interventions to address prevention of STIs, HIV and pregnancy using a combination of theoretical frameworks and again results were mixed. Compared with students who received standard sex education, students in the intervention group that incorporated social cognitive theory, social influence theory, and models of social change were more likely to use an effective contraceptive method of pregnancy prevention \(p <0.05\) or a condom \(p <0.05\) at last intercourse at both 7-month and 31-month assessments. However, in another study, students in the intervention group that was based on social cognitive theory, the theory of reasoned action, and the theory of planned behaviour (all of which focus on intention to change behavior), were more likely to have used a condom at last intercourse compared with students receiving standard sex education \(\text{OR 2.12, 95\% CI 1.24–3.56}\) at 6 months follow-up but the two arms were similar at the 18 month follow-up. There were no differences in reported pregnancy by study arm.

### 3.3 Other social cognition models

Two studies employed interventions that were based on variations of social cognition theory and results indicated that these approaches were effective. Results from a school-based study employing a pregnancy prevention intervention based on cognitive and behaviourial training were reported at 6 months follow-up. Compared with students who were not exposed to the programme, students in the intervention arm reported being more likely to use contraception routinely, as a “habit” \(p <0.05\) and greater use of contraception at last intercourse \(p <0.005\). Results from a trial that provided multiple intervention sessions that focused on the Health Belief Model as well as self-efficacy indicate that compounded interventions involving youth programmes, parent programmes, and booster sessions were more effective at reducing (reported) pregnancy than single interventions, although reported use of contraception was the same between the groups.
3.4 Motivation Theory

Four studies were designed to reduce the risk for alcohol-exposed pregnancy through motivational interviewing (a method of facilitating and engaging intrinsic motivation in clients in order to change behavior and eliminate any ambivalence) and results were inconclusive. In two studies comparing intervention sessions with a control group that received a pamphlet on women’s health, results indicate that the intervention was more effective than the control arm. In one study, the intervention group was less likely to report ineffective contraceptive use (OR 0.49, 95% CI 0.28–0.87) and in the other study the intervention group was more likely to have used contraception during the three months prior to the follow-up interviews (OR 2.12, 95% CI 1.53–2.92). However, motivational interviewing techniques in the other two studies were no more effective than the control (general counseling on women’s health in one study and usual clinic follow-up care in the other) in improving contraceptive use. Tested and self-reported pregnancies were similar for both groups in both studies.

One cluster randomized trial using the Information-Motivation-Behavioural Skills Model (IBM) reported no significant differences in (tested) pregnancy or condom use between female marine recruits in the intervention arm compared with the control arm, which had focused on group health promotion.

3.5 Transtheoretical model

This model posits that interventions should be tailored to assist individuals through the various stages of behaviour change by recognizing the steps of the process, which include thinking about a new health behaviour, implementing it, and adhering to it. Two studies incorporated the Transtheoretical model into a tailored intervention compared to usual care. Results show that there were not significant differences between arms in both studies for consistent condom use and (tested) pregnancy.

4. DISCUSSION

4.1 Applicability of the results

The theory-based interventions to improve contraceptive use that were used in the clinical trials in this review were not uniformly effective in improving outcomes. They appear to be more effective at reducing unwanted pregnancy and improving contraceptive use when they are based on social cognitive theory rather than on other models of health behaviour change. They also appear to be more successful when applied to adolescents in school-based group sessions rather than individually to adults.

The findings from this review provide evidence on some successful theoretical approaches which could be selectively applied to interventions to improve contraceptive use in developing countries. However, although health behaviour theories nominally have universal relevance, many questions remain about the applicability of health behaviour theories to contexts outside the ones in which they were developed (6).

The applicability of health behaviour theories developed in the West to non-Western settings with very different social, economic, and cultural contexts shaping sexual and reproductive health behaviour remains under-researched. In this review, all but one of the trials had been conducted in Western countries (12 in USA and one in Scotland), which potentially limits the generalizability of the findings. Results from the study that took place in Tanzania, a school-based cluster randomized trial that used social cognitive theory, were similar to the other studies in that the findings were mixed: condom use during last sex improved for males but not for females and there was no difference in pregnancy outcomes.

4.2 Implementation of the intervention

Given the small and ambiguous evidence base of successful theory-based interventions for improving
contraceptive use, investment in the implementation of such interventions should proceed cautiously in low-resource settings. The large numbers of available theories combined with the paucity of evidence are likely to make investigation and construction of an appropriate intervention labour intensive. The theory-based interventions in this review generally required a significantly greater amount of resources than usual care, which may have consisted of a pamphlet or standard school curricula, but produced similar outcomes in half of the studies. Based on the results from the review, however, provider training in the standard, authoritative transfer of information about contraception could be usefully supplemented with elements of social cognitive theory. In nearly half of the studies on this review, the theoretical approach was helpful in improving contraceptive use. A better understanding of the psychology of how people make changes to their health behaviours is practical and would be useful wherever contraceptive counseling is offered. Nonetheless, where such an approach requires significant additional intellectual and financial resources, it may not be cost-effective. Whether theory-based or not, interventions to improve contraceptive use implicitly assume a continuous supply of contraceptives. In low-resource settings, this may not always be the case.

**4.3 Implications for research.**

Given the plethora of health behaviour theories and models and the paucity of evidence, rigorous research is needed to understand better which theories, or combinations of integrated theories, work best for improving contraceptive use. Equally importantly, research is also needed to test existing theories in non-Western, low-resource settings and among different populations to better determine what works and what does not. Since contraceptive use is lowest among the world’s poorest women and women with no education, research is needed to assess whether and how health behaviour theories apply to those groups of women (2). Future research should include men as well as women since there were some gender differences in outcomes in the studies that included men in this review. Adolescents were the focus of nine out of 14 trials. Since these trials were most likely to report a successful intervention, further research is needed on incorporating theory into school-curricula and adolescent counseling programmes.

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**References**

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