



Title	Assessing Participation and Effectiveness of the Peer-Led Approach in Youth Sexual Health Education: Systematic Review and Meta-Analysis in More Developed Countries
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Abstract

Sexual health education for young people is crucial not only for development of norms but also for protection against vulnerabilities during this stage in life. Although several systematic reviews have examined the effectiveness of peer-led sex education, none have focused on the extent of peer participation. The purpose of this review was to evaluate peer-led sexual health education interventions in More Developed Countries (MDC).

Electronic and hand searches across five social science, education, and medical databases were conducted. Fifteen articles were selected in total. Most (10/15) studies gave low or no responsibility to peers. The majority of articles found improvements in sexual health knowledge (13/14) and attitudes (11/15) at post-intervention stages. Two studies showed improved self-efficacy and three showed behavioural changes. A preliminary synthesis of effectiveness and level of participation was done. Meta-analysis revealed a large effect on knowledge change (Hedges' $g=0.84$, 95% CI: 0.43-1.25) and a medium effect on attitude change (Hedges' $g=0.49$, 95% CI: 0.19-0.80).

Peer-led interventions could be a powerful tool. This review shows that this approach is effective in changing knowledge and attitude but not behaviours. Further research and action are needed to understand the optimal implementation.

Introduction

Improving young people's sexual health by reducing sexually transmitted infections (STI), unwanted pregnancies, and prejudice towards sexual minorities remains one of the biggest public health challenges in the world (Bailey et al., 2010). Although young people enjoy better general health overall, they face heightened sexual health risks. In some developed cities, young people (< 30years) has the highest HIV rate out of all population groups, with STIs mostly reported amongst 15–24-year-olds (Centers for Disease Control and Prevention, 2013; Sit & Yim, 2015). While an estimated 41% of all pregnancies worldwide were unintended (Singh, Sedgh, & Hussain, 2010), a significant proportion (15%) of mortality in young females was related to pregnancy and childbirth (Patton et al., 2009). Moreover, discrimination faced by sexual minorities potentiates serious negative mental health consequences, particularly depressive and social anxiety symptoms (Feinstein, Goldfried, & Davila, 2012).

Sexual health education is an important means of improving sexual health outcomes (Becasen, Ford, & Hogben, 2015), and addressing the needs of sexual minorities (Pingel, Thomas, Harmell, & Bauermeister, 2013). The *International Technical Guidance on Sexuality Education* (UNESCO, 2009) defines *sexual health education* as “age-appropriate and culturally relevant education about sex and relationships which is scientifically accurate, realistic, and non-judgmental” (p. 2). A review that included 83 sex education programmes in developing and developed countries found that the majority (65%) of them had significant positive impacts on one or more sexual behaviours (Kirby, Laris, & Roller, 2005). Sex education fosters positive attitudes towards cognitive, social, interpersonal, and physical aspects of an individual (Yankah, 2015).

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The peer-led approach is one of the most popular strategies for sexual health education, with “peers” being defined as “members of similar age or status groups” (Milburn, 1995). It is generally believed that the peer-led approach is particularly appropriate for adolescents, as they have a greater tendency to learn from and be influenced by their own peers (Bandura & McClelland, 1977). Well-trained peer educators are often seen as role models, providing the trust, comfort, and familiarity that facilitates health education on sensitive and personal topics such as sex. Peer-led education often starts with recruitment of peers, followed by training to increase their knowledge as well as their teaching skills, which, in turn, implement behavioural changes through further “teaching and sharing” (Milburn, 1995).

Previous Reviews

Although five systematic reviews on peer-led sexual health education have been published since 2001 (Harden, Oakley, & Oliver, 2001; Kim & Free, 2008; Maticka-Tyndale & Barnett, 2010; Medley, Kennedy, O’Reilly, & Sweat, 2009; Tolli, 2012), there has been no consensus on its effectiveness. The first review by Harden et al. (2001) on peer-led health promotion identified 49 outcome evaluations and 15 process evaluations, half of the evaluations were on sexual health. Although some evidence existed supporting the effectiveness of peer-led education for promoting healthy behaviour, they found the overall methodological quality was poor. Kim and Free (2008) later conducted a meta-analysis of 13 peer-led education programmes on sexual health in low, middle, and high-income countries. Despite the research quality being poor, most interventions showed some improvements in knowledge, attitudes, and intention. Yet they concluded that there was a lack of convincing evidence for effectiveness. With a focus on developing countries, Medley et al. (2009) performed a systematic review and meta-analysis concerning the effectiveness of peer education for HIV prevention, involving 28

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interventions, while Maticka-Tyndale and Barnett (2010) conducted a review of peer-led education for adolescent HIV in low and middle-income countries involving 24 programme evaluations. Maticka-Tyndale and Barnett (2010) and Medley et al. (2009) identified only one piece of overlapping literature by Kim and Free (2008), and both concurred that a peer-led approach was effective. The latest review, by Tolli (2012), with a focus on Europe, identified five studies, three of which were also included in Kim and Free (2008) review. The conclusion was that there was insufficient evidence to support the effectiveness of a peer-led approach. At best, the evidence for the effectiveness of peer-led sexual health intervention is inconclusive, sometimes even conflicting.

Thus far, no attempt has been made to investigate the diverse roles of the peer-led approach. The lack of consensus on such an approach constitutes a barrier to a constructive discussion, especially when the spectrum of peer-led approaches is exceptionally broad and diverse. Tolli (2012) highlighted that the factors largely related to peer participation, such as peer educators' self-determination, empowerment, recruitment, training, and supervision, could contribute to the programme's success. Although previous reviews emphasised the importance of peer participation, the failure to define it could create confusion. Moreover, peer participation is closely tied to youth rights. According to the UN's Fact Sheet of Youth Participation, "through active participation, young people are empowered to take control of their personal growth, take active participation in the community through education of vital life-skills, and knowledge on human rights and citizenship" (UNICEF, 2011). Therefore, the present review will focus on the effectiveness of peer-led sexual health education in MDCs and on analysing the role of various peer participations.

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Arguably, less developed countries (LDCs) and more developed countries (MDCs), as defined by the Human Development Index (HDI), face different types of challenges on sexual health. Hence, the form of peer-led sexual health education would vary significantly due to the contextual differences (Story & Gorski, 2013). In LDCs, the primary concern is making sexuality education accessible to the young population, while the major concern in MDCs lies in advancing sexuality education when many already have experienced formal sexual health education (Ponzetti, 2015). Here, professionals advocate for the perspective of rights and empowerment in sex education, including different ways to engage young people (Haberland & Rogow, 2015). Therefore, this review will synthesise the results of peer-led sexual health education in MDCs through meta-analysis, as well as narrative synthesis, and describe the extent of youth involvement. An analysis of effectiveness and levels of peer participation is also conducted.

Methods

Literature Search

This review aims to identify English-language peer-reviewed literature from 2005 to 2015 providing evaluations of peer-led sexual health education in MDCs. This search was undertaken in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). The timeframe was selected due to the last large-scale review on peer-led sexual health education being based on literature published until 2005 (Kim & Free, 2008). Our search strategies were similar to those of Kim and Free (2008), except for a particular focus on MDCs. Title and abstract reviewing was applied to five databases (PubMed, ERIC, PsycINFO, Sociological Abstracts, and Cochrane) according to the pre-determined inclusion and exclusion criteria. Each database was searched by

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combining terms from two conceptual categories: “sex education” and “peer-led” (see search terms in Appendix I). To further capture relevant articles, reference lists and related journals were examined. The journal, *Sex Education: Sexuality, Society and Learning* was hand searched. This initial search resulted in a total of 2,196 articles (see Figure 1). Two reviewers independently reviewed the 86 full-text articles eligible after the initial screening. Discrepancies were first resolved through discussion, and then by an independent third person if consensus was not reached. Finally, 15 articles were included in this review.

Inclusion and exclusion criteria

Studies were included if they 1) examined interventions that promoted adolescents’ sexual health using peer educators, 2) conducted pre-intervention and post-intervention tests with quantitative outcome evaluations, and 3) reported details of peer participation. For the purpose of this review, *youth* is defined as those aged under 24 years (UNDESA). Although a Randomised controlled trial (RCT) is the gold standard for study design, this review also included non-randomised controlled trials (non-RCTs) as they could be more aligned with the flexibility and adaptability that are often seen in many peer-led programmes (Guse et al., 2012). Studies on sex education that specifically focused on a functional group, such as people with a disability or special learning needs, sex workers, sex offenders, or people living with HIV or AIDs (PLWHA), rather than adolescents as a whole, were excluded.

Narrative Synthesis

A narrative synthesis was necessary to encompass the considerable heterogeneity of the included studies (Light & Pillemer, 1982; Popay et al., 2006). Amongst the selected studies, there were large variations in the methodologies, data structures, and evaluation methods. There were also varying degrees of peer participation. The extraction items for the narrative analysis

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were divided into 1) basic information, 2) research quality, 3) peer participation, and 4) evaluation. Both reviewers discussed and agreed upon the components of the narrative analysis before individually working to extract key information from all literature accordingly. The coding tool was standardised to enhance reliability and Constant Comparative Method was adopted. Constant Comparative Method involves analysing the data into discrete incidents and coding them into categories (Glaser, 1965). Coders constantly compare incidents within the same categories. Reviewers met regularly to discuss any discrepancies in the coding until an agreement was reached.

Research quality. The Quality Assessment Tool for Quantitative Studies, developed by the Effective Public Health Practice Project (Canada), was used to assess the research quality. This tool was judged suitable for use in systematic reviews of effectiveness (Deeks et al., 2003), and recommended by Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings (2012) when compared with the Cochrane Collaboration Risk of Bias Tool, with its content and construct validity well-established (Thomas, Ciliska, Dobbins, & Micucci, 2004). The tool assessed the research quality through the following components: selection bias, study design, confounders, blinding, data collection methods, and withdrawals and drop-outs. Each aspect would be rated with an individual score. The combined scores were then accordingly grouped under a global research quality rating of “Weak”, “Moderate”, or “Strong”. For this review, the quality was assessed individually by the two coders when each study was read by both reviewer. Any discrepancies were discussed with an independent third person.

Peer participation. The extent of peer participation was examined based on needs assessment, design, recruitment and selection, training, supervision and monitoring, and follow-up and debriefing. The level of peer participation was evaluated by the Flower Model (see Figure

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2), developed from the Hart's Ladder of Participation (Hart, 1992). Each programme was first ranked from one to eight according to Hart's Ladder of Participation, based on the peers' level of responsibility, as described in the study. In the Flower Model, the first three levels were grouped as "no responsibility", the fourth and fifth levels as "low", the sixth as "medium", and the top two levels were considered "high" (See Figure 2). No responsibility was regarded as tokenism, whereby peers were only used as "decoration" without reinforcing active participation; the involvement of peers is only a gesture. When peers are passively assigned a particular role designed by adults, it is categorised as low responsibility. Equal responsibility among adults and the peer is regarded as medium responsibility. For high responsibility, arrangements are designed for peer-empowerment and adult-youth partnership.

Evaluation. The effectiveness of the programme was evaluated through six aspects: knowledge, attitudes, skills, behaviour, self-efficacy, and social norms. A narrative synthesis of the outcomes was also done according to the different levels of peer participation. This evaluation was in accordance with the framework of European Guidelines for Youth AIDS Peer Education (Svenson & Bertinato, 1998) and Quality Assurance Guidelines on Prevention of HIV/AIDS through Peer Education Programme in Community Settings (HK Advisory Council on AIDS, 2010).

Meta-analysis

Meta-analysis was performed on a subset of selected studies. Three outcomes, knowledge, attitudes towards people living with HIV/AIDS (PLWHA), and condom use, were selected for meta-analysis due to their popularity and importance for evaluating the effectiveness of sexual health promotion. For knowledge and attitude change, the variables were measured in scales. Therefore, only studies that reported means and standard deviations for both intervention

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and control arms were selected. The effect size was expressed as a standardised mean difference using Hedges' g with 95% confidence interval. Interpretation of effect size followed the general recommendation from Cohen — 0.2 for small, 0.5 for medium, and 0.8 for large (Cohen, 1992). Only condom use was reported as a dichotomous outcome. Their sample size and proportion of condom use pre- and post-intervention were extracted to derive odds ratios.

Heterogeneity across studies was quantified using the I^2 statistic computed by the Cochran Q-test and Q-test degree of freedom whilst evidence of publication bias across studies was assessed using Kendall's Tau. Both fixed-effect and random-effect models were applied. All statistical analyses were performed using the software package, Comprehensive Meta-Analysis Version 2 (Biostat, Englewood, NJ, US).

Results

Characteristics

There were, in total, 15 studies that fulfilled the inclusion and exclusion criteria (see Table 1 for more details). Of these, seven programmes were focused on sexual health, including decision-making in sexual behaviour and condom use, six on HIV/STI prevention, and two on sexual violence. The duration of the interventions ranged from 50 minutes to eight weeks (due to prolonged exposure in an online, social media intervention). Six of the studies used lectures; seven utilised participatory methods such as brainstorming, experimental exercises, empathy exercises, and skill-building activities. Two studies included school activities, such as artwork displays. The social media intervention included online quizzes and use of multimedia. The overall research quality was judged to be “moderate”. Two studies were rated “strong” in research quality, eight “moderate”, and five “weak”. The study designs and participants' characteristics are listed in Table 1. As in previous reviews, one study (Borgia, Marinacci,

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Schifano, & Perucci, 2005) overlapped with the reviews conducted by Kim and Free (2008) and Tolli (2012).

Peer participation

According to the Flower Model, two studies were categorised, in terms of peer responsibility, as “high responsibility”, three as “medium”, seven as “low”, and three as “no responsibility” (See Table 2 for more details). Most peer educators were slightly older than the participants. During the planning stage, only four studies conducted need assessments to identify the needs of either the peer educators or the participants. In the design stage, ten programmes involved peers in the programme design and development to varying degrees (See Table 2 for more details).

Implementation included recruitment, training, retention, supervision, debriefing of peer educators, and execution of the programme. Recruitment criteria were based on age, communication skills, leadership ability, interest, school performance, and cultural background. Most of the training for peer educators was over 10 hours, whilst one study organised a five-day residential camp (Borgia et al., 2005). The training took on various forms, ranging from small consultations with boys and girls separately and participatory learning activities to educational protocol design and anchoring classroom sessions. Regarding the content, other than sexual health knowledge and classroom management, three training programmes also included leadership and teambuilding skills (Connolly et al., 2014; Fongkaew, Fongkaew, & Suchaxaya, 2007; Paul, Bell, Fitzpatrick, & Smith, 2010).

Although supervision was common, retention and debriefing were not often reported. In addition to outcome evaluation, five studies found higher participant satisfaction in peer-led sex education (Connolly et al., 2014; Huang et al., 2008; Li et al., 2010; Shen, Hong, Cai, Jin, & Shi,

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2008; Stephenson et al., 2008). Participants generally focused more during peer-led sex education and found it more interesting, possibly due to more interactive methods used in peer-led sessions. Two studies reported benefits to peer educators, such as improvement in sexual health knowledge and personal growth (Fongkaew et al., 2007; Paul et al., 2010).

Intervention Effect

Knowledge. Thirteen studies measured changes in sexual health knowledge, with twelve reported improvements. Seven found significant increases when compared with the control. Ten studies measured HIV or STI knowledge, two contraceptive methods, two sexual and reproductive health, and one sexual violence. The percentage of mean knowledge score increased by 19–82% in the four reported studies intervention groups. The between-group increase of knowledge ranged from 8% to 26% across three reported studies. Significant knowledge changes were reported across studies with different levels of peer participation and the only insignificant result was from a study classified as having a low level of peer participation (Stephenson et al., 2008).

Seven trials were selected for meta-analysis, with a total sample size of 3,584 in the intervention arm and 4,839 in the control arm (see Figure 3). Others were not selected due to the lack of a comparison group or insufficiently reported data. Five studies measured HIV-related knowledge, one measured dating aggression, and one measured sexual risk behaviour surveillance. Estimates of measures of heterogeneity (Cochran Q-test = 403.097; Q-test degree of freedom = 6; $I^2 = 98.512\%$) suggested the use of a random-effect model. There was no publication bias on the basis of the non-significant Kendall's Tau statistic (Kendall's Tau = -0.190; $P=0.548$). Hedges' g of the knowledge change is 0.84 (95% CI: 0.43–1.25) as shown in Figure 3. The effect was large (above 0.8).

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Attitudes. Thirteen studies measured changes in attitude, with eight studies showing significant improvements compared to control groups. Five measured attitudes towards PLWHA, two towards sexual relationships, two towards sexual violence, two towards reproductive health, and one towards HIV Behavioural Surveillance. Amongst them, five studies examined attitudes towards PLWHA, with a percentage increase ranging between 4% to 15% (Barss et al., 2009; Huang et al., 2008; Jahanfar, Lye, & Rampal, 2009; Kernsmith & Hernandez-Jozefowicz, 2011; Li et al., 2010). One study showed a 9% increase in HIV Behavioural Surveillance (Ibrahim, Rampal, Jamil, & Zain, 2012). Another study found a less accepting attitude towards dating aggression (Connolly et al., 2014) and one study reported a 15% improvement in attitudes towards reproductive health (Fongkaew et al., 2007).

All studies classified as having a high level of peer participation showed improvement in attitude. One of the two studies classified at medium level showed no attitude change while another showed an improvement in positive attitude. Insignificant attitude change was identified in three of six studies with low levels of peer participation and the other three reported significant positive results. Of the three studies classified as having no participation, one study reported an indifferent result and two reported significant positive results.

Four out of six trials were selected for meta-analysis, with a total sample size of 3,179 in the intervention arm and 4,356 in the control arm (See Figure 4). Estimates of measures of heterogeneity (Cochran Q-test = 114.801; Q-test degree of freedom = 3; $I^2 = 97.387\%$) indicated the use of a random-effect model. There was no publication bias regarding the non-significant Kendall's Tau statistic (Kendall's Tau = 0; P=1.000). Hedges' g of the attitude change towards PLWHA was 0.49 (95% CI: 0.19–0.80) as shown in Figure 4 with a medium effect size (0.5).

Behaviour. Ten studies measured changes in behaviour or behaviour proxy variables.

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Eight studies measured sexual behaviours, such as safe sex rate and the number of sex partners. Three studies measured substance use, two relationship building, and two tracked participants' abortion rate and live births. One study measured sexual violence victimisation.

Most studies concluded that longer exposure was required to create behavioural changes. Three studies found improvements, six found no difference, one showed mixed results, and two did not report the results. Two studies reported that the intent to engage in condom use had increased by 5% (Huang et al., 2008; Mahat, Scoloveno, De Leon, & Frenkel, 2008), one of which was classed as having medium-level peer participation and the other as having no participation. The social media promotion study, classified as having a low level of peer participation, reported a significant increase (3%) in condom use at a two-month follow-up, with no effect at six-month follow-up (Bull, Levine, Black, Schmiede, & Santelli, 2012). Another study with a low level of participation found a significant decrease (5%) in condom use (Borgia et al., 2005).

Four studies were selected for meta-analysis, with a total sample size of 2,747 (see Figure 5). Three were RCTs and one was a before-after study. Quantifying the heterogeneity (Cochran Q-test = 3.464; Q-test degree of freedom = 3) with I^2 Test = 13.383% indicated that the studies were to be regarded as homogeneous. There was no evidence of publication bias based on non-significant Kendall's Tau statistic (Kendall's Tau = 0; P=1.000). Using a random effect model, the odds ratio of the change in condom use was 1.007 (95% CI: 0.88–1.15), as shown in Figure 5, indicating statistical insignificance (p=0.919).

Skill, self-efficacy and social norm. One study, classed as having low-level peer participation, measured skills at identifying local sexual health services, with the results concluded to be inconclusive (Stephenson et al., 2008). Four studies measured self-efficacy at

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safe sex behaviour, self-protection, or both; two of these showed improvements and they were both classified as having high-level peer participation. One study found that the intervention group had higher self-efficacy (Odds ratio = 1.4) on refusal and felt able to obtain a condom if wanted (Odds ratio = 1.2) when compared to the control group (Denison et al., 2012). Three studies measured social norms around risk perception concerning sexual violence, or peer norms around condom use, or using knowledge to benefit the family. One showed improvements at risk perception while another reported benefits to the families. These were classified as having high level and no peer participation respectively.

Discussion

With the fifteen selected peer-led sexual health interventions that provided quantitative outcome evaluations and details on peer participation, the evidence showed strong and moderate effects on knowledge and attitudes respectively, while data on behavioural changes was insignificant in both qualitative summary and meta-analysis. Whilst two out of the four studies measuring self-efficacy showed improvements, only one of three evaluating social norms demonstrated significant results yet the only study measuring skills was inconclusive. Of the studies included, two were rated at a high level of peer participation, three at medium, six at low, and three at no participation. Our study improved on previous reviews by including both narrative synthesis and meta-analyses on major outcomes.

Although peer-led approaches show promising results in changing knowledge, attitude, and even self-efficacy, evidence of its effectiveness in changing behaviours is lacking, which constitutes a major limitation of this approach. Some selected studies mentioned that a longer exposure time was required for behavioural change. The peer-led approach is still one of the most popular approaches in sex education despite its limitations at changing behaviour.

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Nonetheless, the effects of peer-led sexual health education include not only improved outcomes but also the overall learning environment and benefits to the peer educators. Five studies found higher participant satisfaction towards peer-led sex education and two revealed benefits to peer educators such as improved knowledge, self-efficacy, and leadership skills. Another reason could be the emphasis of youth right and youth involvement in a peer-led approach. It enables customer involvement and co-creation, which is a trend in health services recently.

In contrast to previous reviews, this review is focused on the effectiveness of the peer-led approach in MDCs and the overall results parallel closely the last large-scale meta-analysis, by Kim and Free (2008). However, Kim and Free (2008) focused solely on condom use, pregnancy, and the number of partners in the meta-analysis (OR: 1.04; 95% CI: 0.85–1.28), while this review also included improved knowledge and attitude changes from these peer-led sex education programmes in the meta-analysis. Both reviews concluded with insignificant behavioural change. Another meta-analysis, focusing on developing countries found significant changes in condom use (OR: 1.92; 95% CI: 1.59, 2.33) (Medley et al., 2009). Five of the six identified studies disseminated HIV information through lectures or seminars. Thus, the difference in effectiveness may be due to the varying levels of peer participation and countries' developmental levels.

We provided a definition of peer participation and offered a classification of different levels of participation which was previously overlooked. Peer participation level, using no-to-high responsibility, assigned according to Hart's Ladder of Participation (Hart, 1992), was systematically investigated in this review. A wide range of peer involvement was observed. One study had peers only responsible for specific aspects of the implementation, such as comedy pantomimes, with very restricted and passive peer input (Jahanfar et al., 2009). It was classified

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as no peer participation in our case. In contrast, another study allowed peers to design the intervention (a training camp), involved them in planning for the evaluation, and encouraged interactive methods via the peer educators' training (Fongkaew et al., 2007), which was classed as a high level of peer participation. Preliminary analyses of outcomes and levels of participation were made. Despite the pattern not being straightforward, studies classified as having high levels of peer participation consistently showed significant results in terms of improved knowledge, attitude, self-efficacy, and social norms. For behavioural outcomes, significant results have been found in studies of medium, low level, and no participation, but not in studies with high-level participation.

Seven studies compared the peer-led approach with an adult-led approach. It allowed us to summarise the benefit and cost of both approaches. All studies found that the peer-led approach had a larger effect on outcomes such as knowledge. Two studies found that there were gender and racial differences in the effect of a peer-led approach (Connolly et al., 2014; Huang et al., 2008). Three studies reported more popularity and satisfaction from students of the peer-led intervention, reporting that the sessions were more fun and enabled communication through familiar language (Huang et al., 2008; Mahat et al., 2008; Stephenson et al., 2008). Borgia et al. (2005) mentioned that a peer-led approach was generally much more expensive than an adult-led one.

This review has several limitations. Two-thirds of the selected studies were categorised as having either low level or no peer participation, which may risk selection bias in our analyses, especially relating to effectiveness with different levels of participation. Therefore, it should be treated with caution in the narrative analysis. It is of note that some peer-led sex education research was excluded in this review due to the insufficient reporting of details of the peer

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participation process. This prevented the inclusion of more studies and, hence, a more complete synthesis of data. Consistent with previous reviews, the general research quality was moderate, particularly on the aspect of blinding and reliance on self-reported data. Another limitation is that this review is only based on published articles in electronic databases. Nonetheless, publication bias was checked, with Kendall's Tau test revealing minimal bias. Regarding the meta-analysis on knowledge change, we compared different dimensions of sexual health knowledge, measured using a range of scales. Although the heterogeneity test was positive, studies adopting the same scale would yield stronger results. Conversely, this would be difficult because researchers often chose scales according to the focus of their programmes and participants' characteristics.

With the preliminary analyses of effectiveness and levels of peer participation, no attempt was made to define the most effective level of peer participation. Instead, flexibility in the peer-led approach is the key. On the ladder of participation, Hart (2008) added additional comments, following more experience from practice, and stressed that programme planners should be able to adopt an appropriate level of peer participation relevant to their stage and strategic needs. Simovska and Jensen (2009) built upon the ladder model and gave further advice on how to empower peers with different share of power according to customers' needs. Consistently, both studies agreed that the lowest level of responsibility, that is, tokenism and decoration, would not adequately make use of the advantages of a peer-led approach.

Implication and Recommendations

In MDCs, peer-led educations of various forms and delivery modes have become increasingly popular. Programme designers for a peer-led programme should involve peers meaningfully, avoiding tokenism or decoration (Hart, 1992), and take into consideration the degree of participation of peer-led programmes when designing new programmes. The model

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used in this review can help rate the level of peer participation and divide them into different components (Hart, 1992; HK Advisory Council on AIDS, 2010; Svenson & Bertinato, 1998), such as needs assessment, recruitment, and evaluation. Programme designers should choose an appropriate level of peer participation, matching it to their context strategically. Reporting the level of peer participation could facilitate robust and more inclusive research into peer participation effects. To further evaluate the effectiveness of different levels of peer participation, controlled trials comparing different levels of peer participation through comprehensive outcome measures (e.g., knowledge and behavioural change) and process evaluation (e.g., students' and peer educators' satisfaction) are recommended.

Although most programme settings in the selected studies were within schools, other innovative delivery methods, such as residential camps or social media interventions, have shown promising results and therefore their potential should also be considered. With the increasing penetration of the internet and mobile devices, sexual health promotion through new media holds much potential for youth work (Guse et al., 2012). Last but not least, programme designers and researchers should be aware of the lack of behavioural change associated with this approach. If a longer intervention were developed, evaluation could examine peer-led interventions' effect on behaviours with longer exposure.

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Appendix I

Search terms used:

Sex education (sex education/methods*, sexuality education, sex and relationship education, sexual health education, HIV/AIDS prevention promotion, pregnancy in adolescence/prevention & control*, HIV Infections/prevention & control*, sexual health promotion, sex education/organization & administration*)

Peer-led (peer-led, “youth engaged”, youth-designed, youth participant*, crowdsource*, peer education, peer-tutoring, peer deliver*, student* led, peer educator*, peer-to-peer, peer-based).