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Identifying Effective Methods for Teaching Sex Education to Individuals With Intellectual Disabilities: A Systematic Review

Dilana Schaafsma, Gerjo Kok, and Joke M. T. Stoffelen

Work and Social Psychology, Maastricht University; Gouverneur Kremers Centrum, Maastricht

Leopold M. G. Curfs

Clinical Genetics, Maastricht University; Gouverneur Kremers Centrum, Maastricht

Sex education for individuals with intellectual disabilities is important. However, our knowledge about effective methods for teaching sex education to this population is limited. We report the results of a systematic review identifying methods for sex education programs aimed at individuals with intellectual disabilities. In all, 20 articles were included that met the criteria set in terms of topic—the effectiveness of sex education programs—and population of interest—individuals with intellectual disabilities. In these articles, methods for increasing knowledge and for improving skills and attitudes were reported. However, the studies revealed that generalization of skills to real-life situations was often not achieved. There are indications that the maintenance of knowledge and skills still needs extra attention. Moreover, detailed descriptions of the program materials, program goals, and methods used in the programs were often lacking in the reports. Although there is some evidence for methods that may improve knowledge, attitudes, and skills with regard to sex education aimed at individuals with intellectual disabilities, due to the lack of detailed descriptions provided it is unclear under which conditions these methods work. We therefore suggest that authors provide additional detail about methods in future publications or in online supplements.

Sexual health is defined by the World Health Organization (2006) not only as the absence of disease or negative experiences regarding sexuality, although this is an important aspect of the definition, but also as “the possibility of having pleasurable and safe sexual experiences” (p. 4). Furthermore, the definition states that “the sexual rights of all persons must be respected, protected and fulfilled” (p. 4). In short, everyone has the right to experience sexuality in a positive and pleasurable way. Individuals with intellectual disabilities are no different in this respect, and express the need and desire to form relationships, engage in sexual contact, and acquire sexual knowledge (Kelly, Crowley, & Hamilton, 2009; Konstantareas & Lunskey, 1997; McCabe, 1999; Siebelink, de Jong, Taal, & Roelvink, 2006).

Sexual Health of Individuals With Intellectual Disabilities

Despite the widespread acknowledgment of the rights and needs of individuals with intellectual disabilities to experience sexual health in a positive way, the situation is currently far from ideal. Individuals with moderate intellectual disabilities regularly report incidents of sexual abuse (Eastgate, van Driel, Lennox, & Scheermeyer, 2011; McCarthy, 1996; Stoffelen, Kok, Hospers, & Curfs, 2013; Yacoub & Hall, 2009) and have been shown to run a greater risk of being sexually abused than their nondisabled peers; the incidence of abuse can be up to three times as high (Commissie Samson, 2012; Reiter, Bryen, & Schachar, 2007; van Berlo et al., 2011). The perpetrators are usually people in their environment: peers, staff members, or family (Lesseliers, 1999; van Berlo et al., 2011). In cases where a peer is involved, the perpetrator is usually a male (Cambridge & Mellan, 2000). Among individuals with intellectual

© Dilana Schaafsma, Gerjo Kok, Joke M. T. Stoffelen, and Leopold M. G. Curfs

Correspondence should be addressed to Dilana Schaafsma, P.O. Box 616, 6200 MD Maastricht, The Netherlands. E-mail: dilana.schaafsma@maastrichtuniversity.nl

disabilities, experience of sexual abuse is associated with mental health problems such as depression and anxiety symptoms (Sequeira, Howlin, & Hollins, 2003).

In addition, opportunities for positive sexual experiences seem to be limited for individuals with intellectual disabilities, as compared to their nondisabled peers (Leutar & Mihokovic, 2007; McCabe, 1999; Siebelink et al., 2006). Experiences with friendship, kissing, cuddling, and holding hands are reported (Leutar & Mihokovic, 2007; Siebelink et al., 2006); this may be in part due to the fact that other sexual expressions are not allowed by parents (Lesseliers, 1999) or are discouraged by relatives or staff members (Löfgren-Mårtenson, 2004).

In relation to gender, many women with intellectual disabilities do not seem to associate sex with pleasure (Bernert & Ogletree, 2013; Fitzgerald & Withers, 2011; McCarthy, 1999; Shandra & Chowdhury, 2012), and they tend to play a rather passive role in sex (Fitzgerald & Withers, 2011; McCarthy, 1999). Most of the sexual acts they report tend to be directed toward “pleasuring the penis of their sex partner” (McCarthy, 1999, p. 141). These women are also most likely to experience feelings of guilt and depression after sexual activity (Shandra & Chowdhury, 2012). This might explain why women with intellectual disabilities often do not see themselves as sexual beings, despite having sexual experiences (Fitzgerald & Withers, 2011), and tend to think sex is for procreation only (Bernert & Ogletree, 2013). For men, on the other hand, issues with masturbation seem to be one of the most frequently reported problems. Problems can include not knowing how to masturbate; not masturbating properly; or masturbating in inappropriate places (Cambridge, Carnaby, & McCarthy, 2003).

It is not only in the area of sexual experiences that problems arise; individuals with intellectual disabilities also experience difficulties in finding, forming, and maintaining relationships—both friendships and sexual relationships (Abbott & Burns, 2007; Abbott & Howarth, 2007). The inability to form healthy and enjoyable relationships may also negatively influence sexual health.

A number of factors have been identified that contribute to these problems. First of all, having an intellectual disability is associated with limitations in both intellectual functioning and in adaptive behavior, including conceptual, social, and practical adaptive skills (Schalock et al., 2012; Schalock et al., 2010). This negatively influences attainability of knowledge and skills that are beneficial for good sexual health. It is therefore not surprising that individuals with intellectual disabilities show low levels of knowledge regarding sexuality-related topics such as masturbation, pregnancy, safe sex, reproduction, and same-sex relationships (Healy, McGuire, Evans, & Carley, 2009; Kelly et al., 2009; Lesseliers, 1999; Leutar & Mihokovic, 2007; McCabe, 1999; McCarthy, 2009; Murphy & O’Callaghan, 2004) as compared to nondisabled individuals (McCabe, Cummins, & Deeks, 1999). Individuals with intellectual disabilities

may also show impaired social, behavioral, and decision-making skills (Egemo-Helm et al., 2007; Hayashi, Arakida, & Ohashi, 2011; Khemka, Hickson, & Reynolds, 2005; Miltenberger et al., 1999). Low levels of knowledge can impede, for example, the recognition of sexual abuse situations, safe sex practices, or the development of positive attitudes toward sexuality. However, skills are important as well. A review by Bruder and Kroese (2005) showed that knowledge alone does not change behavior and that the necessary skills to perform the appropriate behavior are also important. Regarding homosexuality, it seems that the knowledge of individuals with intellectual disabilities on the topic is limited, and their attitudes tend to be negative (Konstantareas & Lunsy, 1997; Leutar & Mihokovic, 2007; Murphy & O’Callaghan, 2004; Siebelink et al., 2006; Stoffelen et al., 2013). These negative attitudes might explain why homosexual individuals with intellectual disabilities experience loneliness, isolation, and negative reactions regarding their sexual orientation (Abbott & Burns, 2007; Stoffelen et al., 2013).

Intellectual disability alone does not explain the low levels of knowledge and skills. Many of the problems that directly influence the sexual health of individuals with intellectual disabilities are situated in their environment. One of these factors might be the absence or low frequency of sex education. Research shows that individuals with intellectual disabilities receive less sex education (Levy & Packman, 2004; McCabe et al., 1999; Murphy & O’Callaghan, 2004) and that they find it difficult to remember whether they have received sex education (Löfgren-Mårtenson, 2011).

Why are individuals with intellectual disabilities offered less sex education, when it is known that they have problems understanding and attaining knowledge and possess low levels of conceptual, social, and practical adaptive skills? Research has shown that even though attitudes toward the sexuality of individuals with intellectual disabilities are becoming more positive (Christian, Stinson, & Dotson, 2001; Cuskelly & Bryde, 2004; Cuskelly & Gilmore, 2007; Lafferty, McConkey, & Simpson, 2012; Rohleder & Swartz, 2009), sexuality is still treated as a taboo (Bernert & Ogletree, 2013; Löfgren-Mårtenson, 2004; McCabe et al., 1999; Rohleder, 2010). This may be the reason why family and staff members do not initiate conversations about the subject (Abbott & Howarth, 2007; Kok, Maassen, Maaskant, & Curfs, 2009) or are unprepared to deal with sexual issues (Howard-Barr, Rienzo, Pigg, & James, 2005). Some do not feel comfortable talking about sexuality, because they do not know how to start the conversation. This could be due to a lack of training (Lafferty et al., 2012). Also, it has been shown that staff and family primarily encourage friendships instead of sexual relationships (Healy et al., 2009; Kelly et al., 2009; Löfgren-Mårtenson, 2004), and staff members may feel under pressure to limit the sexual expression

of their clients (Lafferty et al., 2012). Moreover, parents or staff members may be reluctant to teach sex education because they want to protect vulnerable individuals (Lafferty et al., 2012) and believe that teaching sex education might actually cause harm or lead to unwanted sexual behavior (Rohleder, 2010). Therefore, when sex education is taught, it is usually taught reactively in response to problems, rather than as a tool to prevent problems and proactively support individuals with intellectual disabilities (Abbott & Burns, 2007; Abbott & Howarth, 2007).

The sexual experiences of individuals with intellectual disabilities are also limited due to lack of privacy given by staff or family (Evans, McGuire, Healy, & Carley, 2009; Healy et al., 2009; Löfgren-Mårtenson, 2004). For example, in a study by Lesseliers (1999), it was shown that couples were never left alone and were therefore unable to experiment with sexual behavior. Caregivers also tend to judge the quality of sexual expressions in relationships involving individuals with an intellectual disability (Löfgren-Mårtenson, 2004). In addition, most staff members are female and they tend to enforce more restrictive rules regarding sexual expression compared to male caregivers (Lesseliers, 1999; Löfgren-Mårtenson, 2004).

Systematic Review of Sex Education Programs for Individuals With Intellectual Disabilities

This overview of sexuality-related issues clearly illustrates the urgency of these problems. This urgency necessitates the development of evidence-based interventions to reduce the reported problems and promote sexual health. Several protocols have been developed to facilitate the development of theory- and evidence-based interventions. One such protocol, intervention mapping (Bartholomew, Parcel, Kok, Gottlieb, & Fernández, 2011), also provides a comprehensive vocabulary to describe the dynamics of behavior change. In the current review, we use this vocabulary to describe the results of studies that have investigated the effectiveness of sex education programs or sex education-related materials for individuals with intellectual disabilities. The results will help determine which

methods can be used effectively in sex education programs for this target population.

Method

Literature Search and Selection

The literature search consisted of three steps. The first step was a search of bibliographic databases. The second step involved asking experts in the field of sexuality and intellectual disabilities whether they were aware of any relevant studies for this review. Finally, Web of Science was used to determine in which later publications our final selection of articles was cited. The search string contained three concepts: “intellectual disability,” “sexuality,” and “education.” Synonyms and related terms were identified for the three concepts (Table 1). The databases that were used to find articles were Pubmed, PsycARTICLES, CINAHL, PsycINFO, and Psychology and Behavioral Sciences Collection. Articles that appeared in the past 30 years were included (for an overview of the search strategy, see Figure 1). The search was run in October 2011. Combining the articles found in the databases resulted in a list of 838 articles. Two reviewers checked the articles between 1981 and 1998, and two other reviewers checked the articles between 1999 and 2012. In the first selection, articles were included based on the following criteria: the article included the topic sexuality; the target population comprised individuals with intellectual disabilities; and the article discussed aspects of sex education. Only journal articles that were written in English were included. Disagreements between the two reviewers were resolved by a third reviewer who had the final vote. This resulted in a selection of 284 articles. One person then checked the abstracts of the articles, excluding articles on a number of criteria (see Figure 1). This resulted in a list of 59 articles. The complete content of these articles was checked. It was important that the article reported research investigating the effectiveness of sex education materials, a sex education program, or materials related to sex education, such as teaching self-protection skills. This reduced the list to 23 articles. Subsequently, Web of Science was used to check in which papers these 23 articles were cited. This resulted in four new additions to the list. Finally, to

Table 1. *Keywords That Were Used for Building the Search String*

Concept	Synonyms or Related Terms	Search Field
Sexuality	Sex or sexual* or condom use or safe sex or birth control or contraception or family planning or homosexual* or gay or lesbian or bisexual*	Abstract, title, keywords
Education	Educate* or promotion or intervention or curriculum or teaching or training or campaign or course or leaflet or folder or movie or film or video or media or quiz or exercise or instruction or learning or class or seminary or counseling or therapy	Abstract, title, keywords
Intellectual disability	Mental* retard* or intellectual disability* or learning disability* or developmental disability* or cognitive disability* or intellectual impairment or mental deficiency or mentally defective or psychosocial retard*	Abstract, title, keywords

Figure 1. The review process.

ensure the most recent publications were included, the query was run again in January 2013. This did not result in any new additions. This list of 27 articles was checked again by two reviewers. The procedure for dealing with disagreements was the same as in the first screening round. This resulted in the final list of 20 articles that were included in this article (see Appendix). Experts in the field of intellectual disabilities were asked whether they were aware of any papers that should be included in this review. However, this did not result in any new additions.

Assessment and Reporting of the Research Articles

To enable coherent discussion of the methods and the results, the vocabulary provided by the intervention mapping protocol is used (Bartholomew et al., 2011). The intervention mapping protocol refers to subbehaviors of the main health outcome as “performance objectives,” which are predicted by both generic psychological variables, named “determinants,” and environmental conditions. Programs for sex education consist of program materials, which in intervention mapping vocabulary would be called “practical applications” of methods for behavior change that are derived from theory. These theoretical methods can change behavior by targeting the determinants of the behavior. Being derived from theory, the methods are defined in a generic, abstract

fashion. This enables (but also necessitates) translation into a variety of different practical applications. Because of this wide range of potential incarnations of the same theoretical method, a number of parameters have been identified that determine method effectiveness (i.e., necessary conditions that must be met in the translation from theoretical method to practical application; Peters, de Bruin, & Crutzen, 2013).

For example, a program developed to promote sexual health might target several performance objectives, one of which might be to “verbally communicate refusal in the case of unwanted sexual requests.” One of the identified determinants of this performance objective might be the skills of target population individuals, and the behavior change method selected to target this determinant might be “modeling.” Modeling has four parameters for effectiveness, one of which is that targeted individuals must be able to identify with the model (Bartholomew et al., 2011). These parameters, in combination with the characteristics of the target population and the program context, might cause the intervention developers to choose to translate the method of modeling to the practical application of a video with a story, which then becomes one of the program materials.

In reading the articles, special attention was paid to the materials of the program, the specification of the program goals, the description of the methods used to achieve those goals, the evaluation design and measurements, and the outcomes, guided by checklists from the Critical Appraisal Skills Programme (CASP; Public Health Resource Unit, 2006).

Results

Compilation of the included articles resulted in five themes. The first theme concerned the materials used to teach knowledge, improve attitude, or increase skills (i.e., practical applications). The second theme concerned the change methods used in these materials (i.e., theoretical methods). These themes are important, because effectiveness of the materials is directly related to the quality and content of these materials. In the third and fourth themes, the quality of the design and the measurements used in the articles were examined, as these factors can greatly influence the generalizability and credibility of the results. Finally, we summarized the results of the included studies to see whether there were any indications that certain methods are particularly effective in teaching sex education to individuals with intellectual disabilities.

Sex Education Materials and Programs

The studies in this review were all geared toward improving knowledge, skills, and/or attitudes toward sexuality-related topics. Fifteen articles (in the Appendix, items #1, 3, 5, 7–11, 13, 15–20) explicitly stated the program topics. Furthermore, 15 articles (#1, 3–6,

8–12, 14, 16, 17, 19, 20) mentioned which methods were used to teach knowledge, skills, or attitudes. However, both the descriptions of the topics and the descriptions of the methods were generally very broad and generic. None of the included articles provided justification for the choice of topics or the methods used in the program. In addition, the goals of the program or materials were in most cases not reported in the articles. Furthermore, no support could be found showing that the sex education programs had been developed systematically or on the basis of theory and evidence.

Reported Methods

The following methods were reported to target participants' skills and/or improve their knowledge: (corrective) feedback (#1, 3, 7–9, 11, 16, 17, 20), role-play, practice skills, or guided practice (#3–7, 9, 11, 13, 15–17, 19, 20), modeling (#3, 5, 8, 9, 13, 16, 17, 20), rehearsal (#1, 3, 5, 7–9, 11, 16), reinforcement (#1, 8–11, 16, 17), imagery or images (#5, 10, 15, 18–20), and discussion (#5, 7, 10, 13, 15, 19). However, in most articles no details were given as to exactly how these methods were used, nor were any parameters for correct use reported; so it is unknown whether the methods were implemented correctly.

Study Designs

Two types of quasi-experimental study designs were commonly reported in the papers: the multiple baseline design (#1, 3, 5, 9, 11, 16–18) and a pretest-posttest design with (#4, 6–8, 15) or without (#2, 10, 12–14, 19, 20) a follow-up measurement. The interval between the posttest and the follow-up assessment was between one week and six months. Of the 12 studies that used a pretest-posttest design, four did not include a control group (#10, 12, 14, 20). Some of the pretest-posttest design studies had a small number of participants (#2, 12, 13, 14, 19), while all of the multiple baseline studies had small samples.

Measurements

Of the 13 papers (#3, 5, 7–9, 11–13, 15–17, 19, 20) that focused on skill acquisition, three (#2, 6, 14) focused on both attitude change and knowledge improvement, and two (#4, 18) focused on knowledge improvement alone. Of the 13 papers that focused on skill acquisition, six (#3, 5, 7, 9, 11, 16) used some form of an ecologically valid assessment, such as an in situ assessment or naturalistic observation. In the other papers, measurements such as role-play (#17), demonstration of skills (#20), and a questionnaire or interview/self-report (#8, 13, 15, 19) were used to measure skill level. The three articles that focused on improving knowledge and changing attitudes used questionnaires as measurements.

Reported Findings

Knowledge

Most articles included in the review stated that the general goal was to increase knowledge in the area of sexuality. An increase in knowledge was reported in 13 studies (#1, 2, 4–6, 8–10, 14, 15, 17, 18, 20), indicating that it is possible to improve the sexual knowledge of individuals with intellectual disabilities.

Attitudes

Three articles (#2, 4, 14) reported changes in attitudes. All three articles reported an improvement in the attitudes of their participants toward sexuality-related topics. Participants showed more liberal attitudes after the intervention than before the intervention.

Skills

Of the 13 articles that included skills training, five (#3, 5, 9, 11, 16) focused on self-protection skills. In general, the training consisted of the following steps: (1) verbally refuse request, (2) remove yourself from the situation, and (3) report the incident. The results of these studies show that these skills can be taught, but generalization of the skills to real-life situations was seldom achieved. The other eight articles (#7, 8, 12, 13, 15, 17, 19, 20) focused on improving a range of skills: social skills, protective skills, decision-making skills, behavioral skills, and dating skills. One major limitation is that five of these articles (#8, 12, 13, 15, 19) assessed skill levels via a questionnaire or verbal report. The other three used role-play (#17), demonstration of skills (#20), or observation (#7) to assess skill level.

Discussion

This review was conducted to identify effective methods for teaching sex education to individuals with intellectual disabilities. The various studies that were included in the review were compared on a number of topics: the sex education materials that were used, the methods that were described, the design of the study, the measurements used to assess the effectiveness of the sex education materials, and the results of the studies.

There are some indications that skills and knowledge can be increased, and attitudes can indeed be improved. It also became apparent that some studies used similar methods. Furthermore, it became clear that there is room for improvement. What exactly was taught to individuals with intellectual disabilities and how it was taught was rarely reported in sufficient detail. It seems as if the underlying assumption is that the sex education materials and programs used in the studies are effective in

positively changing the determinants (e.g., knowledge, skills, and attitudes) they focus on, yet most studies do not provide any evidence of the quality of the program that was used or information on how these programs or training sessions were developed (see Appendix). It has been shown that sex education programs for individuals with intellectual disabilities often have an insufficient theory or evidence base and have not been properly evaluated (Blanchett & Wolfe, 2002; McCabe, 1993; Schaafsma, Stoffelen, Kok, & Curfs, 2013; Whitehouse & McCabe, 1997). It is likely that any references to theory and evidence in terms of the development of such programs are omitted because the research lacks this theory and evidence base. One article even indicated that the programs were practice based (Garwood & McCabe, 2000). This is an important issue, because programs have been shown to be more effective when they are based on theory and evidence (Albarracín et al., 2005; Bos, Schaalma, & Pryor, 2008; de Bruin et al., 2010; Mullen, Green, & Persinger, 1985; L. Peters, Kok, Ten Dam, Buijs, & Paulussen, 2009; van Achterberg et al., 2010; van Empelen et al., 2003).

Of further interest is that most of the goals described by the articles were broad and nonspecific. For example, a goal reported in some of the studies was to increase the sexual knowledge of the participants (Caspar & Glidden, 2001; Dukes & McGuire, 2009; Garwood & McCabe, 2000; Lindsay, Bellshaw, Culross, & Staines, 1992; Lumley, Miltenberger, Long, Rapp, & Roberts, 1998; McDermott, Martin, Weinrich, & Kelly, 1999; Robinson, 1984; Valenti-Hein, Yarnold, & Mueser, 1994; Wells, Clark, & Sarno, 2012; Zylla & Demetral, 1981). Formulating more specific goals requires defining exactly which kinds of sexual knowledge individuals with intellectual disabilities need to have to increase their positive sexual experiences. Asking such questions is precisely what protocols for intervention development, such as intervention mapping (Bartholomew et al., 2011), do. Specific goals are defined and methods are chosen that match these goals. Producing specific goals for sex education programs, and then describing them in detail in research articles, is essential for measuring the true effectiveness of sex education materials or programs. The only articles that described specific goals were ones investigating self-protection skills training. They proposed a specific number of steps a participant needed to perform in order for the program to be successful (i.e., refuse request, leave the situation, and report the incident).

Like the goals that were stated in the studies, the reported methods used in the sex education materials and programs were not always clearly described. This is a serious omission, because theoretical methods work only under certain circumstances (Bartholomew et al., 2011). To make it possible for other program developers to successfully replicate effective interventions and use the methods described by these interventions, it would

make sense to describe the methods in detail (Abraham & Michie, 2008) and to include the “parameters for use” (Schaalma & Kok, 2009). Parameters for use are important because they describe under which conditions the method will most likely be effective.

What can be said about the methods that have been identified? It seems that methods such as modeling, role-play, rehearsal, and practice skills can be quite useful for improving the skills of individuals with intellectual disabilities. This is in line with Bruder and Kroese (2005), who concluded that three elements are essential when teaching protective behaviors: (1) information and instruction; (2) modeling and rehearsal of skills in role-play; and (3) testing and rehearsing skills during in situ assessment, for example, in real-life situations. These elements are important because knowing how to perform the appropriate behavior does not necessarily lead to implementing the correct behavior, and correct behavior performed during role-play does not necessarily generalize to correct behavior in real-life situations (Egemo-Helm et al., 2007; Lumley et al., 1998; Miltenberger et al., 1999; Watson, Bain, & Houghton, 1992). While modeling is an existing theoretical method, role-play, rehearsal, and practice skills are in fact a small part of a method called guided practice. *Guided practice* is defined by Bartholomew and colleagues (2011) as “[p]rompting individuals to rehearse and repeat the behavior various times, discuss the experience, and provide feedback” (p. 342). The definition is accompanied by clear parameters for use: “subskill demonstration, instruction, and enactment with individual feedback; requires supervision by an experienced person; some environmental changes cannot be rehearsed” (p. 342). Furthermore, reinforcement and corrective feedback seem to have been commonly used methods in the selected studies. Nonetheless, there is no evidence suggesting that parameters for use have always been taken into account by developers of the program materials, as detailed descriptions were lacking in most cases.

In summary, it is difficult to draw conclusions about the effectiveness of the methods used in a program when there is no detailed description of these methods and when these methods were not related to specific goals about improving sexual health. For future program development, it is essential that methods are clearly defined and linked to specific determinants and specific goals and that the conditions under which the method is effective are taken into account when methods are translated into practical applications. Using protocols such as intervention mapping can facilitate this process considerably.

The studies in this review used two different types of quasi-experimental study designs: either a pretest-posttest design or a multiple baseline design. Both designs have advantages and disadvantages. The advantage of a multiple baseline design is that it measures the effect of an intervention using a small sample of participants.

However, intervention effectiveness might be more sensitive to the influence of individual characteristics. It is therefore difficult to assess the generalizability of an intervention with a multiple baseline design. To do this, a design with a larger sample is needed. Multiple baseline designs are also very time-consuming and therefore expensive due to the multiple measurement points. In terms of assessing how generalizable an intervention is, a pretest-posttest design with a control group seems to be more appropriate. A control group is important, since it is not possible to attribute changes between pretest and posttest to the intervention when there is no control group (e.g., change could be due to the passing of time). This kind of design requires a larger sample, which reduces the influence of individual characteristics on the results. However, a large sample is not always available, especially in minority populations, which would make a multiple baseline design a good second choice. In this review it was noticeable that some of the pretest-posttest design studies had a small sample; this makes it difficult to generalize from the results.

Regarding measurements, testing and rehearsing skills in situ was shown to be important (Bruder & Kroese, 2005), because generalization from a practice environment to a real-life environment was not always successful (Egemo-Helm et al., 2007; Lumley et al., 1998; Miltenberger et al., 1999; Watson et al., 1992), as mentioned. Measuring skills with a verbal report, such as an interview or questionnaire, also seems possible; for example, the participant could be asked a question about condom use to see whether the frequency of condom use increased after the intervention. However, in addition to the possibility of receiving socially desirable answers from the participants, these kinds of measurements are very inaccurate and unrealistic when they are used for behaviors that do not occur frequently, such as sexual abuse. For example, the researcher could ask the participants what they think they would do in sexually abusive situations, but the answer will not necessarily reflect the true behavior in such a situation. Therefore, in situ assessment would be more suitable than a verbal report for assessing outcomes such as social skills (Garwood & McCabe, 2000; Hayashi et al., 2011), decision-making skills (Khemka et al., 2005), and self-protection skills (Lee & Tang, 1998) related to sexual abuse.

Limitations

The articles that were included in this review were journal articles that were available online. An attempt was made to retrieve articles by sending the authors a request by e-mail. However, this was seldom successful. Moreover, no other literature or books were included. In addition, the sex education materials that were used in the studies were not further investigated. This review

analyzed only the information that was provided in the article itself.

The articles that were included contained methods that might be useful when considering sex education for individuals with intellectual disabilities. Of course, publications from other fields of research may also contain information about which methods might be useful for teaching sex education to individuals with intellectual disabilities, for example, publications about sex education for students with a low level of education.

Finally, differences between participants' demographics, such as age, living conditions, and country of origin, were not taken into account in this study due to the heterogeneity of these variables across the assessed articles. As most of the participants were between the age of 25 and 45, young adolescents were underrepresented. The needs and capabilities with regard to the sexuality of individuals with intellectual disabilities might be different for those under the age of 25, compared to those above the age of 25. Also, most studies included participants living in a residential setting under the care of professionals or family. There might be differences in the needs and capabilities of individuals who live independently in the community as compared to those who are under the constant supervision of caregivers. Last, almost all studies were conducted in Western countries; of these, more than half were done in the United States, one in Japan, and one in China. The care for individuals with intellectual disabilities may differ cross-culturally, and culture may also play a role in the way sex education is developed.

Recommendations

In summary, there is a need for more detailed descriptions of program materials, the goals of the program, and the methods used in the program to achieve a better understanding of what is effective for this target population. Schaalma and Kok (2009) went even further by saying that intervention descriptions should not only describe *what* is included in the intervention but also *why* it is included in the intervention. Program developers have to find a balance between what would be effective in the ideal world and what is feasible, efficient, and ethical in the current context. Reporting when and how the intervention was affected by practical or political decisions will contribute to the quality of future programs. Abraham and Michie (2008) made a plea for a more standardized taxonomy of methods, as this will make it easier for other program developers to replicate effective interventions.

An intervention development framework, such as intervention mapping (Bartholomew et al., 2011), can assist in formulating proper and specific program goals and selecting suitable methods for achieving these goals. Future program developers could look at information

Table 2. Overview of the Methods Mentioned Most Frequently in the Papers, and Definitions and Parameters for Use (Bartholomew, Parcel, Kok, Gottlieb, & Fernández, 2011)

Method	Definition	Parameters for Use
Modeling	Providing an appropriate model being reinforced for the desired action.	Attention, remembrance, self-efficacy and skills, reinforcement of model, identification with model, coping model instead of mastery model.
Guided practice	Prompting individuals to rehearse and repeat the behavior various times, discuss the experience, and provide feedback.	Subskill demonstration, instruction, and enactment with individual feedback; requires supervision by an experienced person; some environmental changes cannot be rehearsed.
Reinforcement	Linking a behavior to any consequence that increases the behavior's rate, frequency, or probability.	Needs to be tailored to the individual, group, or organization to follow the behavior in time and to be seen as a consequence of the behavior.
(Corrective) feedback	Giving information to individuals and environmental agents regarding the extent to which they are accomplishing learning or performance, or the extent to which performance is having an impact.	Feedback needs to be individual, follow the behavior in time, and be specific.

regarding existing theoretical methods for improving determinants, such as knowledge, attitudes, and skills (Abraham & Michie, 2008; Bartholomew et al., 2011). However, these methods have rarely been tested with individuals with intellectual disabilities, so additional research is needed to find out which methods would be suitable for this target population. In addition, it would be useful to further investigate the applicability of the methods used in the studies included in this review, taking their respective parameters for use into account (see Table 2). Such investigations should also formulate more specific goals for the sex education programs, as current program goals are broad and nonspecific, making them more difficult to achieve.

Of course, one problem is that journals have restrictions regarding word count; however, it is becoming increasingly common to publish supplements online. This gives researchers the opportunity to publish intervention manuals, containing detailed descriptions of the methods that were used in the intervention. In addition, this prevents details from getting lost or misplaced over time, which increases reproducibility of the intervention and makes it possible for other researchers to critically scrutinize the content of the research article (Peters, Abraham, & Crutzen, 2012). This will, in time, improve the quality of research.

It is important that sex education programs not only address knowledge regarding how to do something but also teach the relevant skills involved. Moreover, generalization of skills to real-life situations should be considered, because knowledge about the correct behavior does not necessarily lead to a change in behavior, and demonstration of behavior during role-play does not automatically lead to the implementation of the appropriate behavior in real-life situations (Bruder & Kroese, 2005; Caspar & Glidden, 2001; Dukes & McGuire, 2009; Garwood & McCabe, 2000; Lindsay et al., 1992; Lumley et al., 1998; McDermott et al., 1999; Robinson, 1984; Valenti-Hein et al., 1994; Wells et al., 2012; Zylla & Demetral, 1981). It makes sense,

then, that when evaluating a sex education program one must also consider assessing skills in situ. This will provide a more accurate representation of skills than a role-play assessment. Of course, in the context of sex education, in situ assessment will not always be appropriate or possible. For example, as it is not possible to assess condom use directly, self-report measurement may be more appropriate.

Finally, it is important to consider the type of research design used for testing the effectiveness of the sex education program or materials. This depends partly on sample size, with multiple baseline designs being more suitable for smaller samples, and pretest-posttest designs being more suitable for larger samples. Also, follow-up measurements are necessary to see whether the effects of the sex education program are maintained.

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Appendix: All Studies Included in This Review and Their Content

Table A1. *Study Demographics and Goals*

#	Year	Author(s)	Country	ID ^a or IQ Level	Age Range	Location	n	Female	Goal of the Study
1	1981	Zylla & Demetral	United States	IQ: 58, 50, and 63	Age: 24, 30, and 18	State residential facility	3	3	Investigate effects of modified PSI sex education program on sexual behavior and knowledge.
2	1984	Robinson	Australia	IQ: 50–80	16, 5–52	39 residential, 44 nonresidential	83	45	1. Investigate relationship between the sex of the person with ID and sexual knowledge/attitude. 2. Investigate how sociosexual knowledge/attitudes are influenced by residence. 3. Investigate relationships between exposure to a sex education program, the sex of a person, type of residence, and knowledge of and attitudes toward sociosexual matters.
3	1990	Haseltine & Miltenberger	United States	Mild	22–45	Group home	8	3	Examine effectiveness of a curriculum for teaching self-protection skills.
4	1992	Lindsay et al.	Great Britain	Mild/moderate	17–49 exp./18–43 control	1. 32 home/14 hospital 2. 8 home/6 hospital	46 exp./14 control	20 exp./7 control	Evaluation of acquisition of sexual knowledge.
5	1992	Watson et al.	Australia	Moderate/severe	6–8	Home (with parents or guardians)	7	5	Determine the effects of self-protection skills training on behavior of children with moderate/severe ID.
6	1994	Lindsay, Michie, Staines, & Bellshaw	Great Britain	Mild/moderate	17–49 exp./18–43 control	1. 32 home/14 hospital 2. 8 home/6 hospital	46 exp./14 control	20 exp./7 control	Measure changes in the attitudes of clients toward sexual behavior.
7	1994	Valenti-Hein et al.	United States	Moderate/borderline	18–50	1. 3 family/7 group home/3 independent home/4 independent home/4 independent	13 exp./12 waitlist	6 exp./6 waitlist	Increase social skills and social/sexual knowledge.
8	1998	Lee & Tang	China	Mild	$M_{exp} = 13.38/$ $M_{control} = 13.51$ (no range)	Unknown	38 exp./34 control	72	Evaluate effectiveness of a sexual abuse prevention program/investigate negative effects/examine feasibility.
9	1998	Lumley et al.	United States	Mild/moderate	30–42	Group home	6	6	Extend methods to evaluate sexual abuse prevention programs.
10	1999	McDermott et al.	United States	$M_{IQ} = 59.9$	$M = 31.9$	73.8% private residence, 26.2% supervised	252	252	Is knowledge increased? How are social skills, hygiene practices, and prior sexual experiences related to sexual knowledge? Does the number of family planning instructional sessions increase knowledge related to sexuality, hygiene, and social skills? Evaluate strategies to enhance generalization.
11	1999	Miltenberger et al.	United States	Mild/moderate	33–57	Group home	5	5	Assess sexual knowledge, experience, and feelings of participants attending two different sex education programs (Co-Care and Family Planning Victoria).
12	2000	Garwood & McCabe	Great Britain	Mild	28–32	Home (with parents)	6	0	

(Continued)

Table A1. *Continued*

#	Year	Author(s)	Country	ID ^a or IQ Level	Age Range	Location	n	Female	Goal of the Study
13	2000	Khemka	United States	Mild/moderate	M = 35.75 (no range)	Large nonprofit agency	36 (3 groups)	36	Examine significance of cognitive and motivational factors in interpersonal decision making/enhance quality of decision-making responses.
14	2001	Caspar & Glidden	United States	Mild/moderate	28–62	Unknown	12	9	Increase level of positive sexual expression and experience.
15	2005	Khemka et al.	United States	Mild/moderate	M = 34.31 (no range)	Family or independent	18 exp./18 control	36	Measure effectiveness of a curriculum on decision making.
16	2007	Egemo-Helm et al.	United States	Mild/moderate	28–47	6 group home/1 alone	5	5	Evaluate behavioral skills training combined with in situ training.
17	2009	Bollman & Davis	United States	Mild	49–51	State-operated residential facility	2	2	Extend research in the area of sexual abuse prevention.
18	2009	Dukes & McGuire	Ireland	Moderate	22–23	Community group home	4	2	Find out whether education improves capacity to make sexuality-related decisions (skill?).
19	2011	Hayashi et al.	Japan	Mild/moderate/severe	19–45 exp./19–56 control	Transition dormitory	17 exp./17 control	4 exp./6 control	Improvement of social skills and effects of participation by volunteers and training outside the facility.
20	2012	Wells et al.	United States	Mild/moderate	24–59	14 independent 11 semi-independent	25	25	Teach women with ID about HIV prevention.

^aIntellectual disability (ID) level: borderline = IQ between 70/75–80/85; mild = IQ between 50/55–70; moderate = IQ between 35/40–50/55; severe = IQ between 20/25–35/40 (*DSM-IV-TR* [American Psychiatric Association, 2000]).

Table A2. *Study Design, Goals, and Program Details*

Author	Subgoals/Implicit Goals	Design	Control Group	Training/Material/Program
Zylla & Demetral, 1981		Multiple baseline/two-week follow-up	No	Sex Education Family Planning Course for People: Gender identification, biological identification, sexual intercourse, pregnancy, hygiene, contraception, and venereal disease. Ten week course: anatomy of sexual organs, typical sexual development, varieties of sexual behavior, conception, gestation and birth, contraception and venereal disease, interpersonal relationships, sexual values and decision making, relationships between self-concept and sexuality.
Robinson, 1984		2 (exp. versus control) $\times$ 2 (institutional residence versus noninstitutional residence) $\times$ 2 (male versus female) experimental design (pretest-posttest)	Yes	Curriculum: private body parts, discrimination of good and bad touch, three safety skills (say no, get away, and tell). Course: basic areas of body, male/female puberty, social interaction, sexuality and childbirth, birth control, venereal disease, parenting and marriage. Film on sexual intercourse and development of a fetus. Social skills training.
Haseltine & Miltenberger, 1990		Multiple baseline/one- and six-month follow-up	No	No! Go! Tell! Program: Teach what a stranger is and who is and who is not; learn rules about strangers (No! Go! Tell!); use rules in different settings.
Lindsay et al., 1992		Pretest/posttest/three-month follow-up	Yes	Course: basic areas of body, male/female puberty, social interaction, sexuality and childbirth, birth control, venereal disease, parenting and marriage. Film on sexual intercourse and development of a fetus. Social skills training.
Watson et al., 1992		Modification of multiple probe design/follow-up (unknown when)	No	Dating skills program: Videotaped role-playing tape. Behavioral skills program: knowledge on abuse and self-protection skills (say no, get away from situation, and tell someone). Attention control program: general safety skills.
Lindsay et al., 1994		Pretest/posttest/three-month follow-up	Yes	Behavioral training: (1) verbally refuse request, (2) leave situation, (3) report incident.
Valenti-Hein et al., 1994		Pretest/posttest/eight-week follow-up	Yes	Family Planning Program: Content is selected based on what the participant wants. No topics were required.
Lee & Tang, 1998		Pretest/posttest/two-month follow-up	Yes	Ten-week behavioral skills training: (1) does not comply with requested behavior, (2) verbally refuses, (3) leaves the situation or tells staff to leave, (4) reports incident.
Lumley et al., 1998	Increase sexual abuse prevention knowledge and skills	Multiple baseline/one-month follow-up	No	Cocare topics: feelings, body language, social skills, human life cycle, puberty, body awareness, private and public behavior, sexual relationships, conception, contraception (including safe sex, STDs), menstruation, and protective behaviors. Family Planning Victoria topics: self-awareness, feelings, body parts and behavior, relationships and friendship, protective behavior, sexual relationships, contraception, and AIDS. Both programs were based on practical experience.
McDermott et al., 1999		Pretest/posttest (one-year assessment)	No	
Miltenberger et al., 1999		Multiple baseline/one-month follow-up	No	
Garwood & McCabe, 2000		Pretest/posttest	No	

(Continued)

Table A2. *Continued*

Author	Subgoals/Implicit Goals	Design	Control Group	Training/Material/Program
Khemka, 2000		Pretest/posttest	Yes	Three groups: (1) decision-making training, (2) self-directed decision-making training, (3) control (regular education).
Caspar & Glidden, 2001	Enhance sexual awareness, knowledge, and attitudes	Pretest/posttest	No	Multisession program containing topics on STDs, birth control, reproductive systems, menstrual cycle, circle concept for relationships.
Khemka et al., 2005		Pretest/posttest/one- to three-week follow-up	Yes	ESCAPE curriculum (decision-making strategies).
Egemo-Helm et al., 2007	Improve sexual abuse prevention skills (implicit)	Multiple baseline/one- and three-month follow-ups	No	Behavioral skills program (correct safety responses): say no, leave the situation, tell the confederate to leave, report incident.
Bollman & Davis, 2009	Increase skills to identify inappropriate situations (implicit)	Multiple baseline design/two- and four-week follow-ups	No	Uses scenarios depicting appropriate and inappropriate (physical, physical-sexual, verbal, sexual-verbal abuse) staff-client interactions.
Dukes & McGuire, 2009	Measure change in knowledge → indirectly measuring capacity to make sexuality-related decisions	Multiple baseline/week 46 follow-up	No	Sex education drawn from: Living your life (anatomically detailed dolls, drawings, worksheets).
Hayashi et al., 2011		Pretest/posttest	Yes	Sex education program of eight sessions including social skills sessions: body grooming and cleanliness, first impression and thinking toward your partner, communication training, self-assertiveness training, manners in public spaces, sexual harassment, male-female relationships, differences between male and female bodies.
Wells et al., 2012		Within subjects quasi experimental design/ pretest/posttest	No	Program containing a knowledge-based/social behavioral skills model. Computer-based interactive multimedia HIV prevention program. Content: Transmission of HIV through sexual contact, HIV avoidance strategies, getting tested for HIV, taking responsibility for condom use.

Table A3. *Study Methods and Outcome Measures*

Author	Reported Methods	Determinants	Outcome Measure	Measure Type
Zylla & Demetral, 1981	Social reinforcement, feedback/active learning, repetition/overlap, chunking	Knowledge	Correct responses to questions (questions unknown).	Interview (questions)
Robinson, 1984	No description	Knowledge, attitudes	Pretest/posttest scores on the Socio-Sexual Knowledge and Attitude test.	Questionnaire
Haseltine	Modeling, rehearsal, feedback, role-play	Knowledge, skills	Response of participant to probe (research assistant acting as abductor).	Role-play (in situ assessment), questionnaire
Lindsay et al., 1992	Film, role-play (in film)	Knowledge	Questions related to the subjects of the program.	Questionnaire (verbal)
Watson et al., 1992	Small groups, discussion, information, role-play, imagery, modeling, rehearsal	Knowledge, skills	In situ assessment. Tested on five occasions (in nine weeks).	In situ assessment
Lindsay et al., 1994	Role-playing (not clear)	Knowledge, attitudes	Questionnaire to assess sexual knowledge and attitudes toward sexual relationship (Fischer, Krajicek, & Borthick, 1973).	Questionnaire (verbal)
Valenti-Hein et al., 1994	Discussion, rehearsal, role-playing, feedback	Knowledge, skills	Behavioral observations, Social Avoidance and Distress scale (SAD), Stacking the Deck Baseline procedure (STD), Role-Play test (RPT).	Questionnaire (Likert-type scales), observation
Lee & Tang, 1998	Self-protection skills: instruction, modeling, behavioral rehearsal, shaping, social reinforcement, feedback; Safety skills: instruction, modeling, rehearsal, social reinforcement, feedback	Skills, knowledge	“What if” situation test (participants’ response to abusive situations). Personal safety questionnaire (assess knowledge about sexual abuse). Fear assessment thermometer scale (side effects measure).	Questionnaire, verbal report
Lumley et al., 1998	Instructions, modeling, rehearsal, reinforcement, corrective feedback, role-play	Knowledge, skills	Closed-end questions to assess knowledge, verbal response to a given scenario, role-play assessment.	Questionnaire, verbal report, observation
McDermott et al., 1999	Tailoring, directed conversation, prompting, coaching, identification of natural supports, discussion, images, reinforcement	Knowledge	Social Sexual Assessment: sexuality and family planning knowledge and behavior (hygiene, social interaction, and sexual knowledge).	Questionnaire
Miltenberger et al., 1999	Information, instructions, rehearsal/role-play, reinforcement/ corrective feedback, variety in people/scenarios/locations	Knowledge, skills	Response to several abusive scenarios was assessed (0: incorrect response; 4–100%: correct response). Skills were assessed through role-play. Generalization assessed through in situ assessments.	Verbal report (knowledge)/correct responses to scenarios/role-play (skills), observation/in situ assessment
Garwood & McCabe, 2000	Both: experiential learning, for the rest unclear	Knowledge, skills	SexKen ID (sexual knowledge).	Questionnaire
Khemka, 2000	Decision-making training: visual mapping, alternative thinking, consequence perception, probing, discussion, practice skills; Self-directed decision-making training: added is enhanced motivational framework (generating personal goals, guided practice)	Skills	Social interpersonal decision-making video scale, self-social interpersonal decision making scale, locus of control scale.	Interview, questionnaire

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Table A3. *Continued*

Author	Reported Methods	Determinants	Outcome Measure	Measure Type
Caspar & Glidden, 2001	Tailoring, the rest unclear	Knowledge, attitudes	Knowledge on sexuality related topics, attitude.	Questionnaire
Khemka et al., 2005	Modeling, guided practice, images, discussion, support, chunking	Knowledge, skills	Decision-making video scale, knowledge of abuse concepts scale, empowerment scale, stress management survey, self-decision-making scale.	Questionnaire
Egemo-Helm et al., 2007	Information, modeling, rehearsal, role-play, feedback, reinforcement, generalization	Knowledge, skills	A score was given to the behavior (0: not performing target behavior; 4–100%: performance of target behavior).	Self-report (knowledge), role-play, in situ assessment
Bollman & Davis, 2009	Modeling, reinforcement, corrective feedback, role-play	Knowledge, skills	Skills: Correct number of steps taken by the participant one to three days after successful completion of the program (follow-up, two and four weeks).	Role-play (acting out the response after seeing a video with scenario)
Dukes & McGuire, 2009	Imagery, tailoring, one on one	Knowledge	Knowledge on topics like safety practices, physical self, sexual functioning, choices and consequences in sexual matters.	Questionnaires: SCEA S and SCEA K-scales
Hayashi et al., 2011	Discussion, practice skills, role-play, imagery (actual human body models)	Skills	KISS-18 (measures three skills: communication, management, and problem-solving) + process evaluation (enjoyment, difficulty, and usefulness).	Questionnaire
Wells et al., 2012	Modeling (social learning theory), practice, feedback, images	Knowledge, skills	Items from several existing questionnaires.	Interview (questions), demonstration of condom use skills, audio computer assisted interview (A-CASI)

Table A4. *Study Strengths and Limitations*

Author	Number of Sessions	Reported Findings	Ecological Validity	Strengths/Limitations
Zylla & Demetral, 1981	Three months, two sessions per week, one hour	Increase in knowledge, even when trainer was inexperienced.	None.	<ul style="list-style-type: none"> -No info on quality of the program -No specific goals ±Methods are mentioned, but no details +Follow-up +Increase in knowledge -Small <i>N</i>, difficult to generalize results -Effect on overall sexual health unknown -No info on quality of the program -No specific goals -No methods are reported +Control group -No follow-up +Increase in knowledge -Small <i>N</i>, difficult to generalize results -Effect on overall sexual health unknown -No info on quality of the program +Clear goals for safety skills ±Methods are mentioned, but with a brief description +Follow-up +In situ assessment -Small <i>N</i>, difficult to generalize results -No info on quality of the program -No specific goals -No description of methods +Follow-up -Size control and intervention group differ -No info on number of sessions +Knowledge improved -Effect on overall sexual health unknown +Clear description of sessions +Specific target behaviors +Description of methods and their applications -Unknown when follow-up takes place +In situ assessment +Skills improved in most participants -Small <i>N</i>, difficult to generalize results -No info on quality of the program -No specific goals -No description of methods +Follow-up -Size control and intervention group differ +Attitudes become less conservative ±Effect on overall sexual health unknown
Robinson, 1984	Ten weeks, unknown how many sessions	No significant difference in knowledge between sexes. Greater sexual knowledge among community based participants (IQ of residential participants was significantly lower [three points]). Significant increase in sociosexual knowledge after sex education program. Evidence for positive change in attitudes.	None.	
Haseltine & Miltenberger, 1990	Nine sessions, 25 to 30 minutes	Self-protection skills improved for 7 out of 8 participants; 5/6 skill maintenance at one-month follow-up and 5/6 at six-month follow-up.	In situ assessment; however, focused on abduction, not sexual abuse.	
Lindsay et al., 1992	Period of nine months, no info on how many sessions	Knowledge improved significantly on all subjects. Knowledge was maintained after a three-month follow-up.	None.	
Watson et al., 1992	15 sessions, 25 minutes	Training was effective in modifying self-protective skills. Gains for two participants were marginal. Skills can be generalized to other environments.	In situ assessment.	
Lindsay et al., 1994	Period of nine months, no info on how many sessions	Sexual knowledge increased in posttest and follow-up. Attitudes became less conservative after the sex education program.	None. Only change in knowledge and attitudes was measured.	

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Table A4. *Continued*

Author	Number of Sessions	Reported Findings	Ecological Validity	Strengths/Limitations
Valenti-Hein et al., 1994	Six weeks, two sessions per week	Improvement in social skills and social knowledge. Social anxiety did not change over time. Maintenance of skills and knowledge at follow-up.	Naturalistic observation during midsession breaks.	<ul style="list-style-type: none"> +Info on quality of the program +Info on content of the program -No specific goals +Description of methods -No parameters for use +Follow-up +Naturalistic observation +Skills and knowledge improved -Social anxiety did not decrease +Info on quality of the program +Description of the program ±Methods are mentioned, but no details -No specific goals +Follow-up +Control group -No in situ assessment +Knowledge increased -Knowledge not always maintained -No info on quality of the program +Detailed description of sessions +Specific target behaviors +Description of methods -No parameters for use +Follow-up +In situ assessment -Small <i>N</i>, difficult to generalize results -Failed generalization of skills to target situation -No info on quality of the program -No specific goals ±Methods are mentioned, but no details -No control condition -One question on sexual behavior +Large <i>N</i> +Increase after 1 year in hygiene and sexual knowledge was related to number of sessions
Lee & Tang, 1998	Two sessions, 45 minutes	Recognition of appropriate touch requests increased but was not maintained. Increase in knowledge about sexual abuse and was maintained. Self-protection skills increased and were maintained; clinical significance, however, less promising. Participants showed less fear after two months.	None.	<ul style="list-style-type: none"> +Info on quality of the program +Info on content of the program +Description of methods -No parameters for use +Follow-up +Control group -No in situ assessment +Knowledge increased -Knowledge not always maintained -No info on quality of the program +Detailed description of sessions +Specific target behaviors +Description of methods -No parameters for use +Follow-up +In situ assessment -Small <i>N</i>, difficult to generalize results -Failed generalization of skills to target situation -No info on quality of the program -No specific goals ±Methods are mentioned, but no details -No control condition -One question on sexual behavior +Large <i>N</i> +Increase after 1 year in hygiene and sexual knowledge was related to number of sessions
Lumley et al., 1998	Five sessions	Criterion performance for both verbal report and role-play measures. No criterion performance for naturalistic assessment, therefore complete generalization was not achieved. Increase in knowledge. 5/6 skill maintenance at one-month follow-up (role-play assessment).	In situ assessment.	<ul style="list-style-type: none"> +Info on quality of the program +Info on content of the program +Description of methods -No parameters for use +Follow-up +Control group -No in situ assessment +Knowledge increased -Knowledge not always maintained -No info on quality of the program +Detailed description of sessions +Specific target behaviors +Description of methods -No parameters for use +Follow-up +In situ assessment -Small <i>N</i>, difficult to generalize results -Failed generalization of skills to target situation -No info on quality of the program -No specific goals ±Methods are mentioned, but no details -No control condition -One question on sexual behavior +Large <i>N</i> +Increase after 1 year in hygiene and sexual knowledge was related to number of sessions
McDermott et al., 1999	No exact numbers; more retention for those who had more sessions	Knowledge and hygiene increased for those with intense training (however, no control). Unknown how knowledge related to future (sexual) behavior.	None.	<ul style="list-style-type: none"> +Info on quality of the program +Info on content of the program +Description of methods -No parameters for use +Follow-up +Control group -No in situ assessment +Knowledge increased -Knowledge not always maintained -No info on quality of the program +Detailed description of sessions +Specific target behaviors +Description of methods -No parameters for use +Follow-up +In situ assessment -Small <i>N</i>, difficult to generalize results -Failed generalization of skills to target situation -No info on quality of the program -No specific goals ±Methods are mentioned, but no details -No control condition -One question on sexual behavior +Large <i>N</i> +Increase after 1 year in hygiene and sexual knowledge was related to number of sessions
Miltenberger et al., 1999	Ten weeks, one hour per week	After four to eight sessions, all subjects achieved the maximum score in the role-play assessment. In situ training was needed for generalization of skills. 1/4 had maximum score of 4 after one month; the others scored 3.	In situ assessment.	<ul style="list-style-type: none"> +Info on quality of the program +Info on content of the program +Description of methods -No parameters for use +Follow-up +Control group -No in situ assessment +Knowledge increased -Knowledge not always maintained -No info on quality of the program +Detailed description of sessions +Specific target behaviors +Description of methods -No parameters for use +Follow-up +In situ assessment -Small <i>N</i>, difficult to generalize results -Failed generalization of skills to target situation -No info on quality of the program -No specific goals ±Methods are mentioned, but no details -No control condition -One question on sexual behavior +Large <i>N</i> +Increase after 1 year in hygiene and sexual knowledge was related to number of sessions

Garwood & McCabe, 2000	Co-Care: Ten sessions (two hours) Family Planning Victoria: Six sessions (one hour)	Quantitative data analysis not possible. Low levels of sexual knowledge were maintained (only minimal increase).	None.	<ul style="list-style-type: none"> -Skills did not fully generalize to target situation -Small <i>N</i>, difficult to generalize results -Programs only based on practical experience -No specific goals -No description of methods -No follow-up -No control group -Small <i>N</i> -Increase in knowledge minimal +Theoretical background on training construction +Detailed description of program -No specific goals +Explanation of methods -No follow-up +Control group -No in situ assessment +Improvement greater for self-directed decision making -Small <i>N</i>, difficult to generalize results ±References regarding effectiveness of program, but details are lacking +More detailed goals in appendix -Many goals geared toward obtaining knowledge ±Description of what program did, but unclear what the theoretical basis was -No follow-up -No control group -Behavior not measured +Increase in knowledge -Decrease in decision making abilities -Small <i>N</i>, difficult to generalize results +Theoretical background on training construction +Detailed description of program -No specific goals ±Methods were described, but no details of some methods +Follow-up +Control group -No in situ assessment -High dropout in control in follow-up +Increase in knowledge on abuse concepts +Theoretical background on training +Appendix contains detailed info of training
Khemka, 2000	Ten sessions	Decision-making scores increased in both experimental groups but was greater for self-directed decision making; self-directed decision making also led to more internal locus of control.	None. No realistic assessment used.	
Caspar & Glidden, 2001	Six sessions	Increase in knowledge, alteration in subjective perception (more liberal attitude, small change), anecdotal evidence of increased awareness, ability to make decisions about sexuality decreased.	None.	
Khemka et al., 2005	Six to 12 weeks, once or twice a week, 40 to 50 minutes (five sessions)	Scores on knowledge, empowerment, and self-decision making increased. Problems with attaining the right amount of knowledge in some areas. Postintervention performance did not approach mastery. May be due to low number of sessions.	None.	
Egemo-Helm et al., 2007	Seven to 13 sessions	For some generalization was obtained (3/5). One needed 12 in situ training sessions. For one	In situ assessment.	

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Table A4. *Continued*

Author	Number of Sessions	Reported Findings	Ecological Validity	Strengths/Limitations
Bollman & Davis, 2009	Training until 100% correct response Amy: Five sessions Cindy: Ten sessions	participant generalization failed. Declining scores on follow-ups show maintenance of skills is needed. 3/4 skill maintenance at one-month follow-up and 2/4 at three months. An increase in 100% correct responses during role-play in both participants.	None.	<ul style="list-style-type: none"> components +Specific target behaviors +Methods were described +Follow-up +In situ assessment +Response toward sexual solicitation was assessed +Generalization of skills for 3/5 participants -Small <i>N</i>, difficult to generalize results +Background info on training +Description of the training -Unclear which responses are analyzed; only few are mentioned +Follow-up -No in situ assessment of abusive situations +Reporting skills increased -Small <i>N</i>, difficult to generalize results -No info on quality of the program -No info on content of the program +Clear target behavior -Unclear how education leads to improved capacity to make sexuality-related decisions +Follow-up -No in situ assessment +Knowledge increased -Capacity to make sexuality-related decisions not directly measured -Small <i>N</i>, difficult to generalize results -Unknown how program was developed +Description of program content -No specific goals +Some methods were mentioned -No parameters for use -No follow-up +Control group -Pretest scores differ -Skills measured with questionnaire -Small <i>N</i>, difficult to generalize results +Info on theoretical background of program +Description of program components -No specific goals +Description of methods -No follow-up -No control group -Unknown how many sessions +Increase in knowledge and skills
Dukes & McGuire, 2009	Nine sessions? (not explicitly mentioned)	Knowledge was improved in all participants (higher scores on questionnaire were correlated with greater capacity to make sexuality-related decisions). Reduction in some aspects of knowledge at follow-up.	No information on effect of education on daily lives.	
Hayashi et al., 2011	Eight sessions	High scores for enjoyment and usefulness, low scores for difficulty. Scores on KISS increased for experimental group. Volunteers (students) positively influenced attendance and improvement of social skills.	None, experimental design.	
Wells et al., 2012	Unknown	Gain in HIV knowledge, condom application skills, risk perception, and condom use intent, medium to large effect sizes. Knowledge and skills can be taught using interactive technology.	None.	