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Implementation fidelity for promoting the effectiveness of an adolescent sexual health program

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ABSTRACT

The goal of the present study was to examine COMPAS program (*Competencies for adolescents with a healthy sexuality*) outcomes based on implementation fidelity: dose, adherence, and acceptance. Participants were 716 adolescents aged 14–16 years (46.5% boys). Two fidelity groups were established: high ($n = 83$) and low ($n = 312$), with the remaining sample serving as a non-program control group ($n = 321$). Knowledge about sexually transmitted infections (STIs), attitudes towards HIV, intention to use condoms, and sexual behavior were evaluated. Results indicated that adolescents receiving the intervention displayed improved STI knowledge ($p < 0.001$) and improved attitudes toward HIV ($p < 0.05$) as compared to the control group. Between the two intervention groups, a high-fidelity group intended to engage more in safe sex behaviors ($p = 0.05$) and displayed greater STI knowledge ($p = 0.05$) as compared to the low-fidelity group. The present study revealed improved efficiency when applying prevention programs with implementation fidelity.

1. Introduction

School-based sexual health promotion interventions play a significant role in reducing adolescents' risky sexual behaviors (e.g., inconsistent condom use and multiple partners), which decreases the probability of an unplanned pregnancy or contracting a sexually transmitted infection (STI), including HIV (UNESCO, 2010). Effective programs are based on strategies that provide preventive value but also require rigorous implementation for achieving desired effects. However, program results can be limited if the original protocol is not properly adhered (Oosthuizen & Louw, 2013).

According to Dusenbury, Brannigan, Falco, and Hansen (2003), implementation fidelity refers to the degree to which a program or intervention is applied in the same way as was originally intended. Implementation fidelity is a complex and multidimensional concept, and Dane and Schneider (1998) proposed a model that includes five fidelity dimensions: adherence (compliance program), dose (number of sessions), quality (facilitator competence; proper use of materials and good activity performance), differentiation (uniqueness of the program components), and acceptance (participants' satisfaction).

Recent research has provided several frameworks for guiding fidelity measurement and evaluating relationships between the different model components (Berkel, Mauritius, Schoenfelder, & Sandler, 2011; Carroll et al., 2007; Hasson, 2010; Wang et al., 2014). One recent model has pared down the components to three: adherence, dose, and some aspects of acceptance (e.g., a teacher's perception of student engagement). This model also includes moderating variables (i.e., a teacher's level of comfort, teaching experience and training, and perception regarding the importance of the program and modifying program activities) that can have positive or negative influences on implementation fidelity. Facilitative or hindering effects are determined by whether specific program content is/is not applied in real contexts according to the protocol (Carroll et al., 2007).

There are several reasons for conducting an exhaustive implementation assessment (Dusenbury et al., 2003). An intervention can be considered ineffective when poor fidelity is able to explain observed outcomes (Type III error) (Dobson & Cook, 1980). In addition, an exhaustive assessment provides evidence as to implementation viability, how program modifications can influence efficacy, and why effective programs fail or succeed, among

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others. Multiple studies have examined the relationship between implementation fidelity intervention effectiveness (Wang et al., 2014), as program internal and external validity needs to be ensured (Durlak & Dupre, 2008). However, thus far, few studies have comprehensively evaluated implementation fidelity with Spanish adolescents within a sexual health context (Ariza, Villalbí, Sánchez-Martínez, & Nebot, 2011; Escribano, Morales, Orgilés, & Espada, 2015).

Very few studies have included randomized controlled assessments of sexual health intervention effectiveness within Spanish samples (Espada, Morales, Orgilés, Piqueras, & Carballo, 2013). *Competencies for adolescents with a healthy sexuality* (COMPAS; Espada, 2012) is a school-based program aimed at developing skills that include promoting condom use and preventing the transmission of HIV/AIDS (and other STIs) among adolescents in Spain. The COMPAS program has been previously effective in promoting healthy sexual habits among adolescents from different geographic regions in Spain (Espada, Orgilés, Morales, Ballester, & Huedo-Medina, 2012; Morales, Espada, Orgilés, Secades-Villa, & Remor, 2014). A 12-month follow-up also supported COMPAS' effectiveness based on reports of delayed age for first vaginal sexual experience, increasing perceptions of peers' condom use, increasing STI knowledge, and changing attitudes toward condom use and people living with HIV/AIDS (Morales, Espada, & Orgilés, 2015). While COMPAS appears to be effective for reducing sexual risk among Spanish adolescents, there is yet no evidence as to how fidelity implementation influences program effectiveness.

The objectives of the present study are twofold: (1) evaluating the COMPAS program based on levels of adherence, dose, and acceptance and (2) assess program efficacy according to the degree of implementation fidelity. We hypothesized that program effectiveness would be greater with increased loyalty to the tracking protocol.

2. Methods

2.1. Study design and participants

We conducted a quasi-experimental intervention with a total of 716 adolescents aged 14–16 years. Participants were enrolled in the 9th and 10th grades of high school, or the equivalent, from 2012 to 2013; 53% of the sample was female, with a mean age = 14.65 years (*SE* = 0.03). Participants were from different geographical areas in Spain: Alicante (n = 252; 35.20%) and Murcia (n = 86; 12.01%) in the southeast, Oviedo (n = 126; 17.60%) in the north, Castellón (n = 102; 14.25%) in the east, and Granada (n = 150; 20.95%) in the south. Most participants lived with parents who were married or living together (n = 549; 76.68%); 20.81% (n = 149) had separated or divorced parents, and 2.51% (n = 18) were orphans from one or both parents. According to the Family Affluence Scale (FAS; Boyce, Torsheim, Currie, & Zambon, 2006), 30.87% (n = 221) had a low socioeconomic status, 59.77% (n = 428) were in the middle range, and 9.38% (n = 67) had a high socioeconomic status.

Twelve months after the programs' implementation, 716 participants (61.83% retention) completed the survey (Fig. 1). All participants who completed the baseline and 12-month follow-up assessments were included in the analyses; 55.17% (n = 395) were included in the intervention group, and 44.83% were in the control group (CG) (n = 321). Based on degree of implementation fidelity, two groups – high (HFG) and low (LFG) – were established. Within each fidelity dimension (attendance, adhesion, and acceptance), the 80th percentile was established as a cutoff. Before setting this criterion, other less restrictive options were tested; however, when using lower percentiles, no differences were observed on any outcome variable between the HFG and LFG. This could be explained by the high rate of fidelity for all dimensions; consequently, the groups were not equal. This is because when lower percentiles were used, more than 50% of the participants were classified into the HFG. Another possibility was to sum scores on the three dimensions, but this was not possible given that different measurement scales were used. Dose was evaluated with an ordinal measure, while a 10-point Likert scale was used for adherence and acceptance.

The HFG consisted of 83 adolescents who scored above 80% on all dimensions; that is, they attended 100% of the sessions and received scores equal to or greater than 18 (out of a maximum of 20) for acceptance and adherence. Participants classified in the LFG (n = 312) did not meet the 80% criterion for any dimension; that is, they attended from 1 to 4 sessions and/or received scores lower than 18 for adherence and/or acceptance

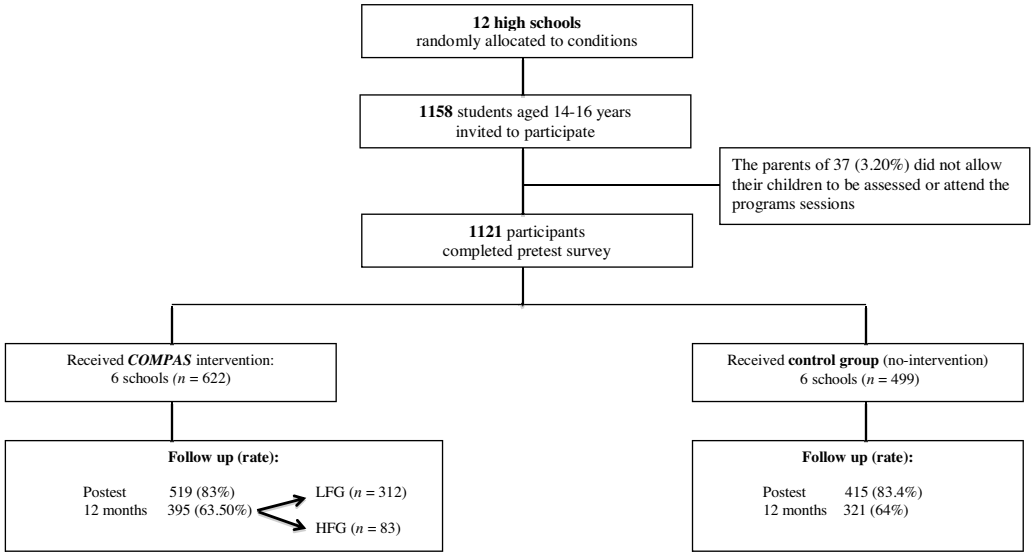

Fig. 1. Flowchart for group-randomized, controlled design. Participants who were not followed up were absent at the time of the follow-up session at school and did not answered the evaluation online for unknown reasons.