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ABSTRACT

This study focuses on the effectiveness of an app-based, monitored intervention using the Liad@s app in a residential youth-care setting. The aim of this intervention is to reduce maladaptive beliefs and attitudes linked to dating violence: distortions or myths about romantic love and hostile and benevolent dimensions of sexism. A quasi-experimental pre-post study with a control group was carried out. Participants were 71 adolescents from 9 group homes in Valencia (Spain). The outcomes measures were hostile and benevolent sexism (Ambivalent Sexism Inventory - ASI), ambivalence and prejudice towards men (Ambivalence toward Men Inventory - AMI), and myths about romantic love. The results of the intervention were assessed using multivariate analysis of variance (MANOVA). A post-intervention, statistically significant reduction with a medium-large effect size was observed in all dimensions for the treatment group, with eta-square of .25 for the sexism dimensions, .38 for myths, and .21 for ambivalence and prejudices. The experimental group demonstrated significantly more change than the control group on all measures. The benefits of the intervention did not vary by participants' sex. These results may be helpful to professionals involved in child and youth care, who can profit from adolescents' proclivity toward online communication.

La eficacia de una intervención con aplicación móvil sobre actitudes asociadas a la violencia de pareja en los adolescentes de centros de acogida

RESUMEN

Este estudio se centra en la de eficacia de una intervención monitorizada, basada en el uso de la app Liad@s en centros de acogida para jóvenes. El objetivo de esta intervención es reducir creencias desadaptativas y actitudes asociadas a violencia en las relaciones de pareja: mitos del amor romántico y sexismo tanto en su dimensión hostil como benévola. Se realizó un estudio pre-post cuasi experimental con grupo control. Participaron 71 adolescentes de 9 centros de acogida de Valencia (España). Se tomaron medidas del cambio en sexismo hostil y benévolo (Inventario de Sexismo Ambivalente - ASI), de ambivalencia y prejuicio hacia los hombres (Inventario Ambivalencia hacia Hombres - AMI) y medida de mitos del amor romántico. Los resultados de la intervención fueron evaluados usando MANOVA (análisis multivariado de varianza). Se obtuvo una reducción significativa con tamaño del efecto entre medio y grande en todas las dimensiones esperadas en el grupo que usó la app. Las etas cuadrado fueron de .25 para las dimensiones de sexismo, .38 para mitos y .21 para ambivalencia y prejuicios. El grupo experimental mostró significativamente más cambio que el control en todas las medidas. Las ventajas de la intervención no varían en función del sexo de los participantes. Estos resultados pueden ser útiles para profesionales implicados en atención y cuidado a jóvenes, quienes pueden beneficiarse a su vez de su facilidad para comunicarse online.

In the child welfare system, institutionalization is a public service designed to protect the vulnerable child or teenager from his/her family and the related social context. In Spain, about 14,000 at-risk children and youth who are deemed unable to live with their biological families reside in what are known as Residential Child Care centers (RCC). Spain leads the European Union in the number of institutionalized children and adolescents (Youth Observatory, 2017).

Children whose difficulties result in temporary or indefinite separation from their biological families have been the object of numerous studies (Ainsworth & Thoburn, 2014; Del Valle & Bravo,

2016). They have a high rate of psychosocial problems and make up one of the most vulnerable population groups. This may be due to emotional deprivation, abuse, and neglect, as well as vulnerability in their social and family conditions, ending up in processes of abandonment and residential foster care in institutions (Evans, Gardner, & Honig, 2014).

We undertook the current project with the objective of fighting some of the dysfunctional beliefs that may accompany teenage dating violence (TDV), which is considered a growing problem in many countries (Malhotra, González-Guarda, & Mitchell, 2015). Hopefully, this first step will eventually be found to be helpful in reducing TDV itself. In many places, sexual violence is endemic; however, children and adolescents often arrive at residential-care settings from a context of family violence, an additional factor that may influence their close relationships with others (Barter, Renold, Barridge, & Cawson, 2004; Lunn, 1990; Morris & Wheatley, 1994; O'Neill, 2004). Although not as frequent in these settings as physical violence, sexual violence in residential care is considered a very prominent and consequential aspect of their residential care by its victims, who are mostly female (Barter et al., 2004). In many cases, the victims, both male and female, had experienced sexual violence before their admission to residential care (Gibbs & Sinclair, 1998). Barter (2011) observed that sexual violence in residential-care institutions is frequently related to maladaptive beliefs about normal sex roles. Many female residents are known to regard sexual aggression as an integral aspect of male sexuality (Barter et al., 2004; Parkin & Green, 1997). Thus, our app intervention addresses an important problem in residential-care settings. It may be shown in subsequent research that correcting maladaptive beliefs about gender during residential care will eventually break the reported continuity of sexual violence across the settings in which the residents have lived, currently live, and will live in the future. It is our hope that the mobile-app technology that appeals to many adolescents will eventually lead to sustained reduction in actual TDV. Previous interventions using other modalities have reported improvement in attitudes and beliefs but highly inconsistent improvement in actual relationships and behavior (Ravi, Black, Mitschke, & Pearson, 2018).

Life experiences and Attitudes towards Love in Teen Dating Relationships: Sexism, Myths, and TDV

Children who have been removed from their biological families often present a patriarchal perception of their immediate surroundings; that is, they manifest gender stereotypes (Haines, Deaux, & Lofaro, 2016), hierarchical family structures, and inconsistent emotional bonds (Bower-Russa, 2005). Many of these children come from highly vulnerable backgrounds in which they are influenced by sexist roles that are somehow predetermined even before birth, especially for females (Delfabbro, Fernández, McCormick, & Kettler, 2013).

Miller et al. (2011) found that TDV was positively associated with a wide range of childhood adversities, including the institutionalization of minors. Sexism and maladaptive beliefs about love are closely related to TDV, especially at the youngest ages. Social forces may result in a maladaptive construction of gender, which may lead to sexist attitudes, beliefs about love that hinder the establishment of healthy relationships, and myths about TDV that blame women. Although there is evidence that adolescents in RCC are more likely to develop violent behavior in relationships (Jonson-Reid, Scott, McMillen, & Edmond, 2007), there is little scientific research on the connection between sexism and myths about gender in institutionalized adolescents.

The theory of ambivalent sexism (Glick & Fiske, 1996) simultaneously integrates positive (benevolent sexism) and negative (hostile sexism) attitudes towards the construction of gender. It combines stereotyped connotations that identify the male as a superior being (Hammond, Milojev, Huang, & Sibley, 2018) with other stereotypes focused on feminine fragility. This serves to protect traditional values that represent women as caregivers (Arnoso, Ibabe, Arnoso, & Elgorriaga, 2017). This problem is compounded by an extensive series of socially shared irrational beliefs about the supposed true nature of love that justify any type of behavior, thought, or attitude for the sake of the loving bond (Fromme, Corbin, & Kruse, 2008; Laghi et al., 2013), including maladaptive assumptions regarding belonging and control between romantic partners. Reyes, Foshee, Niolon, Reidy, and Hall (2016) suggest that myths and socially accepted but distorted beliefs and attitudes towards gender roles and stereotypes increase intimate partner violence. The authors emphasize that interventions are necessary to address these variables. More recent research (Fernández-González, Calvete, & Orue, 2017) additionally added interesting results from the perspective of hundreds of female victims of gender violence in shelter homes, most of them young girls.

ICT-based Intervention Tools in Residential Care Centers

Information and communication technologies (ICT) such as online applications or downloadable materials for training, learning, or developing competences provide a modality with the potential to reduce numerous risk behaviors (Zhao, Freeman, & Li, 2016). It has been suggested that ICT may be helpful in dealing with drug use (Mason, Ola, Zaharakis, & Zhang, 2015), with health promotion (Agarwal et al., 2016; Park, Beatty, Stafford, & Whooley, 2016), and in the prevention of suicide (Andreasson et al., 2017), peer violence and sexual risk behaviours (Brayboy et al., 2017; Devries et al., 2013; Timmons, Shakibnia, Gold, & Garbers, 2018).

Regarding adolescent sexism, some studies have been carried out on gender stereotypes subliminally projected through videogames (Chou & Tsai, 2007; Fox & Tang, 2014). Internationally, software for TDV prevention and intervention has been developed. Levesque, Johnson, Welch, Prochaska, and Paiva (2016) showed the effectiveness of an intervention system called Teen Choices, which uses the internet to integrate key content (warning signs, statistics on TDV) and activities (expectations about the balance of power in couple relationships) found in applied programs for the prevention of intimate partner violence. Alhusen, Bloom, Clough, and Glass (2015) developed the MyPlan app to help university women who are victims of TDV and offer support resources to friends and family to better understand the situation and aid in decision making. DetectAmor (Instituto Andaluz de la Mujer, 2014) is an informative app for the detection of male chauvinism and prevention and for increasing awareness of TDV.

Other mobile applications such as Aspire News (Lewis, Conley, & Breakey, 2015) offer resources to adolescent sufferers of TDV through messaging networks that are hidden in their phones and cannot be tracked. Within this framework, the Liad@s app (Navarro-Pérez, Oliver, Morillo, & Carbonell, 2018) was developed, which, unlike previous apps, is designed with a fun and interactive format and aims to reduce sexist thinking and increase awareness of TDV. It contains activities to foster critical and reflective thinking by promoting the development of prosocial skills and attitudes, questioning socially accepted mistaken beliefs, and identifying negative messages. This app has been found to be effective for secondary school students in reducing distortions about romantic love and sexist attitudes (Navarro-Pérez, Carbonell, & Oliver, 2019).

Braciszewski et al. (2018) recently developed an intervention involving a mobile application, iHeLP, which, in a pilot study with a small sample, proved effective in reducing marijuana use in adolescents residing in care facilities. However, no effective ICT-

based interventions for TDV appear to have been developed for this population group.

Current Study

Research suggests that living surrounded by peers who tolerate, promote, and practice sexism stunts the personality development of children and adolescents who live in RCC homes (Marinkovic & Backovic, 2007; Oriol-Granado, Sala-Roca, & Filella, 2015; Ryan, 2006). Therefore, there is a need to intervene in this population, providing counterbalancing competencies and non-sexist attitudes in game dynamics. Following the recommendations of Barter (2009) and Carrascosa, Cava, Buelga, and de Jesus, (2019), our current study pertains to the romantic beliefs and sexist attitudes of teen couples; our overarching aim is preventing future violence.

The specific purpose is to investigate the effectiveness of a social, psychological, and educational intervention using new technologies (Liad@s App) and addressing three variables linked to the prevention of dating violence in adolescents: sexism, myths of romantic love, and ambivalence, and prejudice towards men. We also aim to provide useful information about the role of sex and age for designing similar interventions in the area of child protection systems, specifically in cases where children have been separated from their biological families and taken into government- or court-mandated care.

Our main hypothesis is that the use of the app will achieve significant reductions in romantic love myths and sexist attitudes in youths in RCC compared to a control group. Secondary hypotheses were that reductions will vary depending on sex and age, with greater benefits for males and for younger participants.

Method

Design and Procedure

We used a quasi-experimental pre-post design with an equivalent control group and randomization by RCC homes. The sampling was probabilistic with clusters selected at random. Participation was voluntary and anonymous. The intervention received support from a funded competitive research program in R+D+i, (GV/2017/208). The study conforms to internationally accepted ethical guidelines and relevant professional ethical guidelines. Several review boards and committees of the autonomous government in the area of Equality and Inclusive Policies (which falls under the jurisdiction of Social Welfare, as RCC homes do) approved the research. Later, at each participating center, the parents or legal representatives of the participants (if younger than 16) gave written consent. The requirements of Spanish Law 15/1999 of 13 December on the Protection of Personal Data were met. The intervention consisted of the following stages:

a) Contact and visits to 25% of the existing RCC homes, selected by consensus with the administration as being more representative in size, location, and age group including 12 to 18. Processing of permits and collection of sociodemographic and pre-test data for the 71 adolescents participating in the intervention (November-December 2016).

b) Intervention involving half of the randomly selected participants. This intervention lasted two weeks and involved 1.5 hours of physical attendance in 4 of the 9 homes. The app was introduced or presented to participants prior to start gaming. This presentation was always made by the same researcher in each RCC, with the same protocol and power point support. The introduction was followed by individual practice using the Liad@s app in game mode for each participant. The Liad@s app is available and free to download for android and iOS. The entire contents and domains, the different tests and the scoring system used to develop targeted skills is fully described in Navarro-Pérez et al. (2019). In addition to attending the explanatory talk with instructions for using the app, the inclusion criterion for participants to remain in the intervention group was to individually obtain a minimum of 2,500 points in the game, as proof of commitment and evidence that they played with the app enough to become familiar with its contents and procedures. To earn that score, the participants had to use the app for 2 weeks, averaging 2 hours per week.

c) Post-test data collection for both groups (February 2017). The youths did not receive incentives for their participation.

d) Once the study ended, the intervention was delivered in 5 homes with the previous control groups.

Residential Child Care homes were randomly selected for participation in the study from the directory provided by the Child Welfare Administration. When contacted, 100% of the homes agreed to participate because participation was mandated by the local General Agency of Childhood and Adolescence. Half of the care homes were assigned randomly to the intervention condition, and half to the control condition, in order to balance their characteristics in size (measured as number of users or attendees in each RCC facility, that could be bigger or smaller centers), location (centers located in city and metropolitan area but also those in rural area), and ownership (entirely public or mixed public and religious funded ownership). The youths in the control group did not receive any intervention during the course of the study, but they were measured in the same two periods using the same protocol, with each session lasting about 25 minutes. The former control group participated in the intervention after the study was completed, following ethical principles.

After the homes were selected, an a priori sample size was established, corresponding to the statistical power associated with the average expected effect size (70 cases). This size is based on previous studies in the field (Navarro-Pérez & Puig, 2010), using G-Power with an alpha error of .05 and a power of .8 for ANOVA or mixed MANOVA analysis (a repeated-measures within-variable, as on the pretest-posttest for the sexism variable) and a between-variable (control group or intervention).

The intervention and control groups were formed by randomly choosing homes without differentiating between urban and rural. Once the groups were set up, with $n = 35$ participants in the intervention group and $n = 36$ in the control group, the equivalence between the two groups was checked for all variables: age, $t(66) = -.357$, $p = .723$; sex, $\chi^2(1) = .207$, $p = .649$; family household category (single parent, two-parent, other family structures), $\chi^2(2) = 3.82$, $p = .148$; and rural or urban setting, $\chi^2(1) = .07$, $p = .792$.

In homes chosen for the experimental (intervention) group, the app was implemented with the agreement of the educator in charge. In each case, the game's functioning was explained in a brief workshop led by two specialists (a social worker and a psychologist).

In homes assigned to the equivalent control group condition, the pre-test and post-test measures were also collected but the app was not implemented during the course of the study. The workshop on app awareness and instructions were deferred until after the intervention was completed for the experimental group.

Participants

The 71 participating adolescents were between 11-18 years old. The average age was 14.94 (mean 15) with a standard deviation of 1.39. Moreover, 57.4% were male and 42.6% female, 56.3% were from families with separated or divorced parents, 31.3% had parents who were living together, and 12.5% came from single-parent families.

Instruments

In addition to the sociodemographic variables described above, participants were also measured before and after the intervention on the following risk factors associated with dating violence:

Sexism was measured using Glick and Fiske's (1996) Ambivalent Sexism Inventory (ASI), adapted and validated by De Lemus, Castillo, Moya, and Ryan (2008). This tool consists of 20 items loading on two dimensions: hostile sexism and benevolent sexism. The response to each item is polytomic, with six options ranging from 0 = *strongly disagree* to 5 = *strongly agree*. The ASI provided measurements calculated from the mean scores obtained for each subscale and the general scale, with higher scores indicating higher levels of sexism. Internal consistency reliability was .895 in pre-test an .928 in post-test for the general scale, .859 for hostile sexism in pre-test and .928 in post-test, and .842 for benevolent sexism increasing to .890 in post-test.

Glick and Fiske (1999) also developed the Ambivalence toward Men Inventory (AMI), which we used to measure women's hostile and benevolent prejudices towards men. Hostile sexism comprises three components – paternalistic resentment, compensatory gender differentiation, and heterosexual hostility – whereas benevolent sexism comprises maternalism, complementary gender differentiation, and sexual intimacy. The reduced 12-item version validated for Spanish populations by Rodríguez, Lameiras, and Cabrera (2009) was used (half of the items measure hostile attitudes and half measure benevolent attitudes). Responses are given using a 6-point Likert scale (ranging from 0 = *strongly disagree* to 5 = *strongly agree*), with higher scores indicating higher levels of prejudice associated with sexual identity. The global alpha for the short version used here was .837 and .885 for post-test.

To measure distortions about romantic love in adolescents, we used the Myths, Fallacies and Erroneous Beliefs about the Ideal of Romantic Love Scale (De la Peña, Ramos, Luzón, & Recio, 2011). In the version for adolescents, this tool includes 18 situations in which respondents imagine themselves and then choose one of the two options proposed for each item, only one of which is associated with a myth of romantic love. The alpha for the internal consistency of the global scale with alpha was .843 in pre-test and .805 in post-test.

In the intervention group, information was also sought regarding the application's acceptability and their enjoyment experienced in using it. For this purpose, participants needed to choose one in three from these possible answers: a) "the app has not made me change my way of thinking or relating with peers"; b) "Liad@s have contributed to your appreciation of other points of view"; and c) "laying Liad@s helped me to mature in this area; I will try to improve my personal relations."

Finally, two extra questions were asked to ensure that participants understood the game's basic mechanics and to find out if they had participated sufficiently in the intervention. They were asked about the color associated with a particular section of the gaming and about how the scores change when players get a bonus. All participants answered correctly, thus fulfilling these inclusion criteria.

The intervention enables interactive synergies between the player and the game. This feature distinguishes it from other informative applications or workshops aimed at preventing gender-based violence.

Analyses

To study the effectiveness of the intervention, a multivariate analysis of variance (MANOVA) was carried out in which the independent variables were time (with two categories: pre and post) and group (intervention and control). The most robust Pillai criterion (Tabachnick & Fidell, 2007) was used to analyze the effectiveness of the treatment, which was revealed by a significant effect of the interaction between time and group variables.

The dependent variables in the first MANOVA were the dimensions of sexism (hostile and benevolent). In the second MANOVA the dependent variables were the four myth groupings (love conquers all, true love is predestined, love is important and needs total commitment, and love is possession and exclusivity). An examination of means after the intervention would be expected to show a reduction in each variable.

If the results are significant, the next step in MANOVA is to perform follow-up ANOVAs to discover which variables show statistically significant differences. Effect size was estimated using partial eta squared (η^2); according to Cohen (1992), partial eta squared near .02, .13, or .26 would indicate small, medium, or large effect sizes, respectively. The corresponding confidence interval of 90% is also included, as recommended in the literature (Lakens, 2013).

Results

Results for the Effectiveness of the Psychosocial Intervention

MANOVA with gain scores (pre-test minus post-test) on these two related dependent variables (hostile and benevolent sexism) yielded the following results: Pillai's trace .255, associated with $F(2, 68) = 11.653$, $p < .001$, $\eta^2 = .255$. After checking the joint significance using MANOVA, we followed standard analytic protocol and carried out follow-up ANOVAs for each of the two variables (Figure 1). The results in both cases showed statistical significance. The results for hostile sexism, $F(1, 69) = 7.24$, $p = .009$, $\eta^2 = .095$, IC 90% over η^2 .014 to .212, demonstrated an effect of almost 10% of the variability attributable to being in the intervention or the control group, i.e., a significant effect with a medium size. For benevolent sexism, the result was even larger, $F(1, 69) = 21.762$, $p < .001$, $\eta^2 = .24$, with IC 90% over η^2 .015 to .367), with an effect of 24% variability, almost a quarter of the variance attributable to being in the intervention or the control group, i.e., a significant effect with a large size. Table 1 shows the means and standard deviations of the gain scores (for change in attitude).
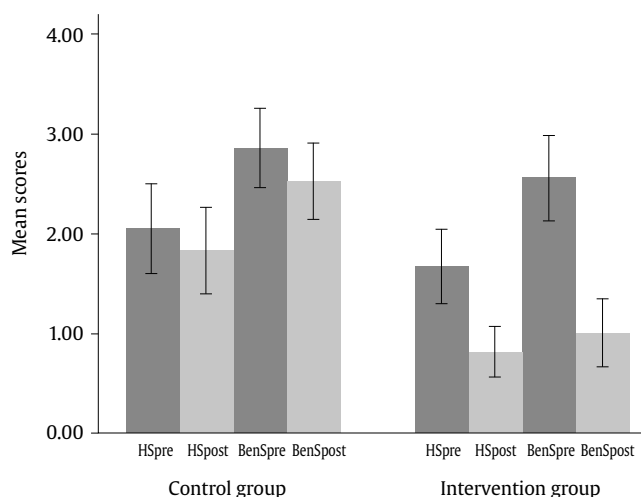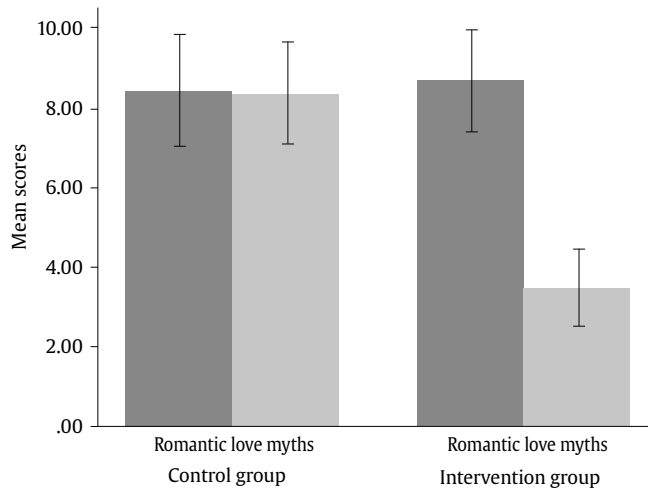

Figure 1. Pre (in dark) and Post (in light) Means for the Control and Intervention Groups for Hostile Sexism (HS) and Benevolent Sexism (BenS) with Confidence Intervals of 95%.

Table 1. Means and Standard Deviations of the Pre-post Differences in Sexism, Ambivalence towards Men and Romantic Love Myths for both Groups

	Control		Intervention	
Dependent variables	M	SD	M	SD
Hostile sexism	.223	0.887	0.855	1.087
Benevolent sexism	.336	0.885	1.548	1.275
Romantic love myths	.083	3.289	5.228	3.326
Paternal resentment HS	-.097	1.423	0.628	1.426
Compensatory gender dif. HS	-.431	1.631	1.071	1.596
Heterosexual hostility HS	.264	1.295	0.571	1.367
Maternalism BenS	.306	1.375	0.757	1.395
Complementary gender dif. BenS	.125	1.810	1.028	1.702
Hetero intimacy BenS	.597	1.319	1.129	1.682

Note. HS = hostile sexism; BenS = benevolent sexism; diff = differentiation.

In the area of myths or distortions of romantic love, the ANOVA computed with intervention gain scores indicates $F(1, 69) = 42.941$, $p < .001$, $\eta^2 = .384$ and IC 90% over η^2 between .233 and .499. Figure 2 shows the mean pre-test and post-test scores.

Figure 2. Pre (in dark) and Post (in light grey) Means for the Control and Intervention Groups in Romantic Love Myths (confidence intervals of 95%).

The effect on ambivalence, measured by the AMI, is similar. There is a significant effect in the expected direction following the intervention: Pillai's trace .211 for $F(6, 64) = 2.852$, $p = .016$, $\eta^2 = .21$. After testing joint significance, we carried out follow-up ANOVAs for each of the six variables. The results (Figure 3) indicate statistical significance with a large effect size in these dimensions: paternal resentment, $F(1, 69) = 4.605$, $p = .035$, $\eta^2 = .063$, IC 90% for $\eta^2 = .002$ to .170, and complementary gender differences, both hostile, $F(1, 69) = 15.377$, $p < .001$, $\eta^2 = .182$, IC 90% for $\eta^2 = .062$ to .309 and benevolent, $F(1, 69) = 4.69$, $p = .034$, $\eta^2 = .064$, IC 90% over $\eta^2 = .003$ to .171.

Results for Acceptability and Profile of Those Who Benefitted from the Intervention

With regard to the acceptability of the application, 68.6% of users chose the feedback option "It has shown me other points of view", followed by 22.9% who believed Liad@s had helped them to be more mature about the subject and made them try to improve. Only 8.6% (3 participants) said it had not made them change the way they thought or the way they related to other people.

After determining the effectiveness of the intervention on the three target aspects, complementary analyses were carried out, showing that the results for the three groups of variables were

not related to the sex variable. Using MANOVA (with sexism and ambivalence) or ANOVA (with the myths variable) and adding the sex variable showed that neither the effect of sex nor the effect of its interaction with treatment was significant ($p > .05$ for all tests). Regarding the association between the benefits of the intervention and age, only two aspects or targets are related: there is a significant negative relationship with hostile sexism (-.353, $p = .038$) and a negative and marginally significant relationship with paternal resentment (-.319, $p = .062$).
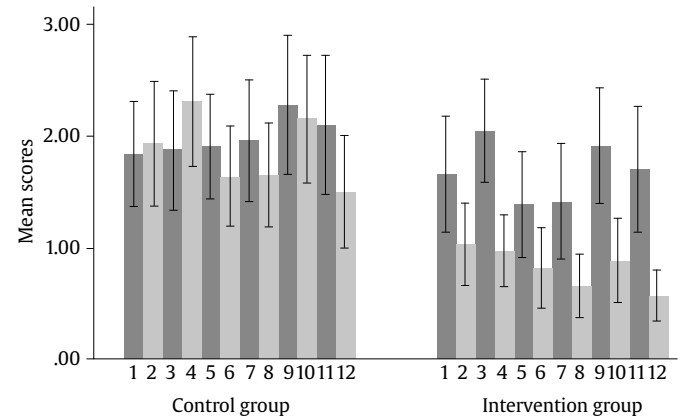
Figure 3. Pre (in grey) and Post (in white) Means for the Control and Intervention Groups for the Hostile and Benevolent Prejudices towards men Dimensions (confidence intervals of 95%).
Note. (1) Paternal resentment (hostile) pre and (2) post; (3) compensatory gender differences (hostile) pre and (4) post; (5) heterosexual hostility (hostile) pre and (6) post; (7) maternalism (benevolent) pre and (8) post; (9) complementary gender differences (benevolent) pre and (10) post; (11) hetero intimacy (benevolent) pre and (12) post.

Discussion

Although we could not conduct systematic statistical comparison with data obtained for adolescents in settings other than RCC, the scores of our participants revealed higher levels of sexism and misbeliefs about love in adolescents institutionalized in RCC than those found in other studies conducted in a non-institutionalized adolescent population of similar ages (De la Peña et al., 2011; Nava-Reyes, Rojas-Solís, Amador, & Quintero, 2018). Thus, the results suggest that children and adolescents separated from their families and sheltered in residential homes for their wellbeing and safety have difficulties in their affective and maturational development that diminish the ability to establish healthy future relationships, making them a vulnerable high-risk group (Anderson, 2014; Evans et al., 2014).

Despite the documented need for help in this area among high-risk groups, so far there is little replicable research specific to TDV interventions on the RCC population. In this regard, this study provides clear evidence about the effectiveness of a psychoeducational intervention based on the use of a mobile phone application to reduce attitudes and beliefs linked to TDV in adolescence: sexism, myths of romantic love, and ambivalence and prejudices towards men.

Hammond, Cooper, and Jordan (2018) found that the use of game applications generates prosocial beliefs and allows positive behavior patterns to be learned. We provide evidence in this study that, even in the RCC setting, dysfunctional beliefs about gender can be improved using app technology. Hopefully, this cognitive change will lead to improvement in behavioral patterns as well. It has been suggested that adolescents use new technologies in their relational and entertainment dynamics, so that in addition to having fun they can

"become native digital agents and promote benefits" (p. 1). Moreover, consistent with Tejeiro et al. (2009), they may develop critical thinking, which also leads to prosocial attitudes. Liad@s is a game that focuses on these characteristics and follows these recommendations.

Thus, this study implemented and evaluated the effectiveness of a psychoeducational intervention consisting of the monitored use of the mobile application in "Liad@s" game format with adolescents residing in RCC. The intervention was effective, making it possible to reduce adolescents' sexism and increase prosocial attitudes toward teenage dating in all the key variables. The score on romantic love myths was reduced with an effect size of .38, with findings that were not only significant but of an impressive moderate effect size. These myths are often a less visible threat than sexist language or behaviors manifestation, but they are equally offensive and dangerous distortions because they implicitly reproduce situations that recreate false ideals of love (Laghi et al., 2013). In relation to the second objective, the results obtained are consistent with previous research (Leaper & Brown, 2018), showing a higher level of hostile sexism among the youngest participants, decreasing as the age increases. Unlike the results of Thomas and Stevenson (2009), no significant gender differences were found in holding sexist attitudes and distortions of the ideals of love.

Limitations

This study has some strengths, such as support from the General Directorate of Universities of the *Generalitat Valenciana* with reference GV/2017/208 (permits from Education and from Equality and Inclusive Policies services from local govern) to carry out the study, or from the interdisciplinary teams of the centers to access a group of children and adolescents as the object of study. In addition, in the methodological field, strengths are the randomized sampling by centers and the estimation of the sample size based on an a priori effect size. First of all, although originally developed for men and women, in its current research the use of AMI may be weakened by gender bias. We used the same measure focused on attitudes against women for participants of both sexes. Another limitation is the lack of follow-up, which would allow us to know whether the effects are maintained over time. As a future line of research, it would be desirable to extend the measurement at least a third time to find out the stability or sustainability of the benefits of the intervention.

In addition, the public administration in charge of the protection centers participating in the study did not authorized a follow-up study, as they were concerned about how continued monitoring could affect the daily functioning of resident participants in these centers in order to analyze the results in a later period. Likewise, the normative and operational heterogeneity of the centers with regard to the use of mobile telephones produced differences in the amount of time the app was used.

Unfortunately, a variety of shortcomings, such as the ones mentioned, are common in applied interdisciplinary research in children and youth. Due to these difficulties, the gap in the specific literature on this topic in residential centers keeps us from comparing or relating the findings presented here to other research on sexist beliefs and attitudes, false myths of love, and TDV previously carried out in shelters for minors.

Implications for Practice

The results provide evidence about the effectiveness of an enjoyable digital tool that can prevent sexist attitudes and approach the ideals of romantic love from a perspective of equality between young men and women. The capacity of a tool based on new technologies to encourage, from a gaming perspective, non-sexist attitudes and build up competencies regarding the ideals of romantic love within a framework of equality is assessed and discussed. A key competence for all professionals in the field of child protection, and especially in RCC homes, is to develop skills of recognition, detection, and prevention of risk situations. Additional research is needed to replicate these findings and address their limitations.

The instrumentalization of interactive tools in a recreational format will hopefully make it possible to intervene successfully in this interdisciplinary area and in key variables in preventing gender-based violence: ambivalent sexism (Zawisza, Luyt, & Zawadzka, 2012), ambivalence towards men (Eagly & Wood, 1999), and myths of romantic love (Laghi et al., 2013). This research contributes with psychoeducational, preventive intervention strategies, and new technologies that reduce sexist beliefs and attitudes that condition TDV in a highly vulnerable environment (Uceda & Domínguez, 2017).

International treaties include agreements for the creation of instruments for education in equality that is non-sexist, non-discriminatory, healthy, and consistent with the objectives of human development. At the same time, participation, provision, and protection are guaranteed under the Convention on the Rights of the Child as fundamental rights for children who live in situations of great vulnerability. Interventions that favor prosocial learning through interactive educational tools, therefore, encourage the development of other dimensions of a child's positive personality. Hence, educating with novel tools that require direct participation is an interesting but necessary way to fulfill the commitments and responsibilities toward this collective.

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Conflict of Interest

The authors of this article declare no conflict of interest.

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