



Can Virtual Reality be Used for the Prevention of Peer Sexual Harassment in Adolescence? First Evaluation of the Virtual-PRO Program

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ABSTRACT

Objective: The present study analyzed the Virtual-PRO program's efficacy in preventing peer sexual harassment by promoting the bystanders' active intervention and incorporating a virtual reality (VR) component. The impact of the program on sexist attitudes, moral disengagement, the intention to intervene as bystanders, and the involvement in sexual aggression and victimization was tested. **Method:** Virtual-PRO is a VR-enhanced sexual harassment curricular prevention program of six one-hour sessions. The evaluation comprised a pre-test, a post-test after the intervention, and a follow-up measure at three months. In the study, 579 Spanish adolescent students aged between 12 and 17 years ($M = 14.76$, $SD = 0.88$; 47.1% boys) were randomly grouped into experimental ($n = 286$) and control ($n = 293$) conditions. **Results:** The Virtual-PRO program effectively controlled participants' levels of sexism and reduced moral disengagement in the experimental group compared to the control group three months after the intervention. The program also showed positive results in changing bystander behavior, increasing the intention to intervene when the victim was not a friend. Finally, visual/verbal and online victimization decreased in the experimental group and increased in the control group. No differences were found for physical sexual victimization and sexual aggression. **Conclusions:** The first trial of the Virtual-PRO program is promising and highlights the use of VR as a sexual harassment prevention tool. Follow-up measures are essential to determine the impact of interventions accurately.

¿Puede utilizarse la realidad virtual para prevenir el acoso sexual entre iguales en la adolescencia? Primera evaluación del programa Virtual-PRO

RESUMEN

Objetivo: El presente estudio analiza la eficacia del programa Virtual-PRO en la prevención del acoso sexual entre iguales promoviendo la intervención activa de los espectadores mediante el uso de la realidad virtual (RV). Se comprobó el impacto del programa en las actitudes sexistas, la desconexión moral, la intención de intervenir como espectadores y la implicación en agresión y victimización sexual. **Método:** Virtual-PRO es un programa curricular compuesto por seis unidades que incorpora la RV para mejorar la prevención del acoso sexual. La evaluación incluyó una medida pre-test, un post-test después de la intervención y una medida de seguimiento a los tres meses. En el estudio participaron 579 estudiantes españoles de entre 12 y 17 años ($M = 14.76$, $DT = 0.88$, 47.1% chicos), agrupados aleatoriamente en grupo experimental ($n = 286$) y control ($n = 293$). **Resultados:** El programa Virtual-PRO controló eficazmente los niveles de sexismo y redujo la desconexión moral en el grupo experimental en comparación con el grupo de control tres meses después de la intervención. También mostró resultados positivos en el cambio del comportamiento de los espectadores, mejorando la intención de intervenir cuando la víctima no era amigo o amiga. Por último, la victimización visual/verbal y online disminuyó en el grupo experimental y aumentó en el grupo control. No se encontraron diferencias en victimización sexual física y agresión sexual. **Conclusiones:** El primer ensayo del programa Virtual-PRO es prometedor y pone de relieve el uso de la RV como herramienta eficaz para la prevención del acoso sexual. Las medidas de seguimiento son esenciales para determinar con precisión el efecto de las intervenciones.

Palabras clave:

Acoso sexual
Programa de prevención basado en los espectadores
Realidad virtual
Adolescentes
Virtual-PRO

Peer sexual harassment during adolescence is defined as any undesired aggressive behavior of a sexual nature that generates

distress and stress in the victim and interferes with the personal and social life of all those involved (Espelage & Holt, 2007; Hill & Kearl,

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2011). Previous studies have confirmed this, finding that experiences of sexual victimization have serious consequences for young people's physical and mental health, including an increase in substance abuse, depressive symptoms and suicidal tendencies, particularly among girls and sexual minorities (Gruber & Fineran, 2008; Marx et al., 2021).

Sexual harassment is a complex phenomenon that includes a wide variety of behaviors that differ in their severity and prevalence rates. Prevalence rates found in international and national studies oscillate between 30% and 80%, depending on the behavior under study or the specific measures used (American Association of University Women [AAUW, 2001]; Charamaman et al., 2013; Vega-Gea et al., 2016). One of the most salient forms, with prevalence rates of between 25% and 50% (Ngo et al., 2018; Vega-Gea et al., 2016) is verbal and visual harassment, which includes behaviors such as obscene comments, sexually-charged staring, spreading sexual rumors about someone, exhibitionism (AAUW, 2001; Smith et al., 2022), continuous pestering for dates or romantic-sexual encounters, and even homophobic sexual insults (Rinehart & Espelage, 2016). Physical sexual harassment is also present during adolescence, with prevalence rates of between 25% and 30% for the less serious forms (Vega-Gea et al., 2016), such as embracing someone with sexual intentions or unwanted touching, and of 2% for more serious forms (Ortega-Ruiz et al., 2010), such as maintaining sexual intercourse without the other person's consent (AAUW, 2001; Smith et al., 2022). Over recent years, research has also begun to explore online sexual harassment. Although the dimensions of online sexual harassment have not yet been fully identified, studies indicate that verbal and visual sexual harassment continues to manifest itself through this pathway with prevalence rates of between 16% and 26% (Sánchez-Jiménez et al., 2017). Moreover, social media facilitate new types of sexual violence, such as, for example, the coercive and non-consensual exchange and dissemination of sexual material (Walker et al., 2017), which has been found to have prevalence rates of between 10% and 20% (Reed et al., 2020).

Prevention of Sexual Harassment

Despite high prevalence rates, the prevention of sexual harassment in adolescence continues to pose a challenge for the scientific community. Both meta-analyses and systematic reviews have concluded that current intervention and prevention programs are insufficient. This is firstly because, although sexual violence prevention programs demonstrate promising reductions in sexual violence perpetration and victimization (Coker et al., 2017; DeGue et al., 2021), as well as changes in knowledge, beliefs, and attitudes towards sexual harassment, aggregate results in meta-analytic reviews are less conclusive (De la Rue et al., 2014; Piolanti & Foran, 2022). Secondly, most programs that have been found to be effective have focused on university students and young adults (Jouriles et al., 2018; Kettrey et al., 2023), not on adolescent samples. Adolescence is a developmental period in which teenagers face specific and unique developmental tasks, such as the construction of their sexual identity. Boys and girls must learn to handle and modulate their sexual attraction and impulses towards others in accordance with social and cultural values (Collins & Steinberg, 2007), so a lack of skills when it comes to expressing the drive to establish sexual relationships can put adolescents at risk of perpetrating and suffering sexual harassment (Vega-Gea et al., 2016). For this reason, it is necessary to develop tailored interventions that are developmentally appropriate to the needs of and the challenges faced by adolescents. Of the theoretical models in which these programs are grounded, those based on peer-led (Connolly et al., 2015) and bystander models are the ones that have been found to generate the most promising results (Coker et al.,

2017; Jouriles et al., 2019; Miller et al., 2016). These programs view sexual harassment as a social phenomenon that is maintained and reinforced by the peer group. They therefore encourage bystanders to act proactively, then they witness sexual harassment in order to put a stop to it, either by minimizing the risk situations that may result in sexual aggression or by supporting and defending the victim (Banyard et al., 2007). Programs based on these models seek to foster moral responsibility and feelings of personal competence (Miller et al., 2016), helping participants acquire the skills and strategies required for active, responsible, and safe intervention in the event of witnessing peer sexual harassment (DeGue et al., 2014). If, as Kettrey and Marx (2019) suggest, victims are more likely to turn to their peer group than to the police to report an incident of sexual harassment, raising awareness and changing the beliefs, attitudes, and behaviors of this group emerges as a key strategy for preventing this type of aggression.

To date, prevention programs based on bystander models have been implemented more frequently among young adults and university students than among adolescents (Park & Kim, 2023), and have been found to generate positive results in terms of changing how young people perceive their own response to harassment (Coker et al., 2017). Specifically, studies have reported an increase in intention to act, actions taken, and perceptions of self-efficacy (Kettrey & Marx, 2019). Moreover, the impact of these programs on intention to intervene is greater during the initial years of university education, when the importance and influence of the peer group is greater (Kettrey & Marx, 2019). Specific examples of bystander model-based programs for the prevention of sexual harassment include Bringing in the Bystander (Moynihan et al., 2015), TakeCARE (Jouriles et al., 2016) and the Men's Program (Langhinrichsen-Rohling et al., 2011).

However, despite their promising results, recent studies have highlighted the need to incorporate other variables when assessing the efficacy of these bystander programs, such as their capacity to modify sexist attitudes, their direct impact on sexual aggression and victimization, and socio-emotional variables (e.g., Jouriles et al., 2018; Mujal et al., 2021). One of the few bystander programs that has analyzed its impact on some of these variables is the Green Dot (Coker et al., 2017), which is targeted at adolescents. In this program, adolescent boys and girls identified as leaders received intensive bystander training designed to teach them to identify and intervene in situations of sexual harassment. As a result of this selective training strategy, the Green Dot program managed to reduce involvement in sexual harassment as both aggressors and victims during the three years following implementation. The program also reported an attitudinal change that was sustained over time, reducing sexual and intimate partner violence justification beliefs at both individual and school-wide level (Coker et al., 2019). Interestingly, the program was more effective during early than during late adolescence (Coker et al., 2022).

To the best of our knowledge, no programs to date have assessed their impact on social-moral variables (Park & Kim, 2023). However, the extant literature reports consistent results regarding the influence of social-moral variables on bystanders' intention to intervene. For example, Jouriles et al. (2016) found that adolescents who feel more responsible are more likely to intervene. Studies on bullying have shown that bystanders' intention to actively intervene and defend the victim is associated with their moral evaluation of the situation (Thornberg et al., 2012), moral sensitivity (Thornberg & Jungert, 2013), and moral distress (Gini et al., 2022). In contrast, moral disengagement has been identified as one of the mechanisms underlying passive bystander behavior or the intention not to defend the victim (Killer et al., 2019; Obermann, 2011). Bandura (1996) defined moral disengagement as social-cognitive processes that disengage people from moral acts. By activating these mechanisms, people can justify immoral and inhumane acts and minimize feelings of remorse, guilt, and shame (Bandura, 1996). The direct and indirect

influence of moral disengagement on aggressive behavior (Killer et al., 2019) and bystander behavior (Gini et al., 2022; Thornberg et al., 2017) has been widely proven, with the results confirming how important it is to include the social-moral domain in violence prevention programs. In this respect, it is necessary to increase bystanders' awareness of the activation of moral disengagement mechanisms in response to interpersonal violence (Gini et al., 2022). In other words, if bystander models aim to increase the help provided by bystanders by enhancing their sense of personal responsibility and fostering their awareness of sexual harassment, then it follows that they would have an impact also on moral disengagement. To date, few intervention programs include strategies for reducing moral disengagement as a means of enhancing bystander behavior (Barkoukis et al., 2016; Wang & Goldberg, 2017) and, to the best of our knowledge, no sexual harassment prevention programs have yet introduced this focus.

Overall, the extant literature suggests that sexual harassment prevention programs based on bystander models may be effective for activating bystander behavior, but their impact on social-moral variables is still unknown. Furthermore, most prevention programs have been implemented with young adults in North America, and the evidence available in other social-cultural contexts, such as Spain, and with adolescents, is scarce. Thanks to efforts made in the political, social, economic, and educational fields, Spain has made major headway over recent decades in the field of gender equality (European Institute for Gender Equality [EIGE, 2020]; López-Zafra & García-Retamero, 2012). Nevertheless, prevalence rates for sexual harassment during adolescence remain high and are similar to those reported by studies from other countries (Vega-Gea et al., 2016). The same can be said of sexism levels (Cava et al., 2020; Sánchez-Jiménez & Muñoz-Fernández, 2021), which tend to remain stable throughout adolescence, at least concerning the more hostile forms (Ferragut et al., 2017). Moreover, and although the number of interventions developed to prevent interpersonal violence in adolescence has increased in recent years (Del Rey et al., 2016; Muñoz-Fernández et al., 2019), there is still a paucity of sexual harassment prevention programs (Martínez et al., 2012). The present study aims to advance this avenue of research by assessing the impact of a sexual violence prevention program based on the bystander model and targeted at adolescents.

Use of Virtual Reality for Violence Prevention

Virtual Reality (VR) can be defined as the creation of a simulated digital environment (Strate et al., 1996) that provides an immersive experience in which individuals can interact directly with the environment or objects, thereby reducing the distance between the actor and the viewer of the simulated experience. Over recent years, VR has been used in a wide range of different areas of Psychology, as well as in universal, selective, and indicated interventions. Some studies argue that VR may be a very useful tool for increasing cognitive empathy and self-awareness (Ventura et al., 2021), as well as an excellent platform for developing social skills among people diagnosed with schizophrenia (Park et al., 2009). VR has also been identified as a useful instrument in indicated interventions with victims or perpetrators of violence, helping to identify alert and risk signals (Vogel et al., 2004) and posttraumatic stress among victims of criminal violence (De la Rosa-Gómez & Cárdenas-López, 2012), proving useful in work with child abusers (Fromberger et al., 2018), and enabling professionals to intervene directly with aggressive children (Alsem, et al., 2021).

The use of VR in the prevention of peer violence is also generating promising results (see Xue et al., 2021 for a review). In the field of bullying, for example, Barreda-Ángeles et al. (2021) found that the use of 360° videos that enabled children to view events from the

perspective of the victim resulted in a greater increase in realistic emotional responses than viewing traditional videos. Similarly, McEvoy et al. (2016) demonstrated that 360° videos that used real actors were more effective in terms of eliciting empathic responses to victims of bullying than customized ones that used avatars. For their part, Ingram et al. (2019) developed the first antibullying program to include VR scenes using a Google headset. The program reported positive results not only in terms of reducing victimization, but also in terms of increasing bystanders' empathy and enhancing the likelihood of them intervening in situations of bullying.

In the field of sexual harassment, most studies have been carried out with adult population. One example that has reported positive results is the use of VR in indicated interventions with adult perpetrators of gender-based violence, with the aim of enhancing their perspective-taking and emotional recognition (Seinfeld et al., 2018). Jouriles et al. (2011) found that the use of VR role-play experiences enhanced the ecological validity of traditional role-play. The authors compared two different trainings (VR role-play experiences versus traditional role-play) designed to help women respond more effectively to sexual threats, finding that VR led to a greater increase in negative affect and realism than traditional role-play, as well as increased their active resistance of women with a previous experience of sexual harassment. We were able to find only one study that used VR in the field of sexual harassment prevention during adolescence. Rowe et al. (2015) developed a pilot study for the "My voice, My choice" program, designed to reduce sexual victimization among adolescent girls through training in assertive resistance skills using VR. The program was found to be effective, reducing sexual victimization three months after the intervention.

According to these studies, it could be expected that incorporating VR into interpersonal violence prevention programs would improve perspective-taking and awareness, since VR provides a safe and immersive environment that reduces the distance between the viewer and the protagonists. Moreover, the likelihood of bystanders actively intervening would also increase, since VR allows participants to develop strategies and skills to act against sexual harassment in a safe environment, minimizing the effect of other factors, such as peer influence. Finally, the incorporation of new technologies, such as VR, would increase participants' motivation to complete the program, thereby fostering adherence.

The Present Study

In Spain, psychoeducational interventions designed to prevent sexual harassment during adolescence are still scarce (Carrera et al., 2007) and have focused mainly on promoting young people's affective-sexual development. To the best of our knowledge, no interventions to date have attempted to assess their impact in terms of reducing involvement in sexual harassment or adopted an approach based on bystander behavior. We were also unable to find any studies that have used VR to help prevent sexual harassment during adolescence. The present study aims to fill this gap in the literature by developing and assessing the impact of Virtual-PRO, a psychoeducational program for preventing sexual harassment in adolescence that is based on the bystander model and incorporates the use of VR. Unlike previous short programs incorporating VR that were targeted at teenage girls or female college students (Rowe, 2015; Jouriles, et al., 2011), Virtual-PRO is designed to be universal in nature and combines VR simulations with other non-VR activities to sensitize and train students in how to cope with and respond to sexual harassment. Moreover, the program extends the previous bystander models by explicitly addressing social-moral content related to bystander behavior. The aim of the program is to make bystanders aware of the cognitive processes and social

determinants surrounding their non-intervention (Gini et al., 2022) and the consequences of this passive or non-active behavior for victims, aggressors, and bystanders themselves. Moreover, following the recommendations of authors such as Kettrey and Marx (2019) and Mujal et al. (2021), we tested the efficacy of the program not only in terms of its impact on bystander behavior, but also in terms of its ability to reduce aggressive behavior and victimization, as well as to modify sexist attitudes and other social-moral variables, such as moral disengagement, which have largely been overlooked to date. The specific aim of our research project was to assess the impact of the Virtual-PRO program on participants' gender-based (ambivalent and benevolent sexist attitudes) and social-moral beliefs and attitudes, as well as on their intention to intervene (as bystanders) and their involvement in sexual harassment as both aggressors and victims.

Method

Procedure and Study Design

Once the study was been approved by the Andalusian Ethical Coordination Committee for Biomedical Research (code: 1757-N-20), we contacted the Regional Education Authority to request a list of schools that complied with the following criteria: a) public schools, b) secondary schools teaching compulsory secondary education, and c) located in Seville and Huelva (Western Andalucía, South of Spain). We then randomly selected 22 schools from the list provided. In September-October 2021 the selected schools were sent a letter letting them know of the aims of the study and inviting them to participate. Five schools expressed an interest. After putting the issue to their corresponding School Boards for approval (by means of a vote), four schools agreed to participate in the study. A cluster-randomized control trial design was used to assign two schools to the control group and two to the VR experimental group.

In October-November 2021, the management teams of the schools sent students' families a letter informing them of the study and asking them to sign an informed consent form authorizing their children's participation in the research project. After receiving and taking note of the families' responses, the schools ensured that, at the time of the study, the only children in the classroom were those whose parents or legal guardians had given their authorization. The pre-test evaluation was carried out in December 2021. The Virtual-PRO program was implemented between January and February 2022, and the post-test evaluation was conducted in February-March 2022. Finally, the follow-up evaluation was carried out in June 2022 (three months following the end of the program). No intervention was carried out in the schools assigned to the control group, although they were offered the opportunity of participating in the program after the end of the follow-up evaluation.

The Virtual-PRO Program

Virtual-PRO is a universal, curriculum-based psychoeducational intervention program. It was designed in accordance with the bystander model with the aim of preventing sexual harassment among adolescents and activating bystander behavior. The program comprises six hour-long curricular sessions, focusing on content related to sexual harassment that is directly linked to the processes that guide bystander behavior: awareness of sexual harassment, the social-moral reasoning and gender-based beliefs and attitudes that help sustain sexual harassment, empathy towards victims and personal responsibility when faced with a situation of harassment, knowledge and practice of how

to intervene as a bystander and the consequences of bystanders' actions for others, and coping strategies for victims. The program tackles sexual harassment from a gender-based perspective, taking into account the differences between boys and girls in terms of involvement, consequences, and other associated factors.

Virtual-PRO adopts a constructivist approach, encouraging participants to play an active role and to be protagonists in the process, as well as to become aware of their own learning process. To this end, it combines VR simulations with other intervention strategies such as debates, decision-making games, and role-play. VR activities are used to improve participants' awareness of sexual harassment, enhance their sense of responsibility in terms of preventing it, and enable them to directly experience the consequences of their actions by viewing the reactions of victims, bystanders, and perpetrators. Debates, decision-making games, and role-play are then used to consolidate knowledge and provide participants with the skills they need to deal effectively and safely with sexual harassment, as either bystanders or victims.

VR simulations were three 360° VR scenarios (see Appendix for a description of the developing and piloting process). Participants in the experimental group were exposed to these VR scenarios using Oculus Quest 2 headsets, as either bystanders or victims of sexual harassment. VR simulations were included in three out of the six lessons of the program. These immersive experiences took place in the classroom and were individually experienced by all participants at the same time. Research staff helped participants put on the headsets and resolved any doubts they had about how to use them.



Figure 1. Starting Screen to Access the Virtual-PRO Application.

Before accessing the VR scenario, participants engaged in a short training session designed to teach them how to use the VR headset controller and the Virtual-PRO application developed for the visualization of the VR scenarios. Figure 1 shows the starting screen of the Virtual-PRO application. Each box corresponds to one of the three scenarios. The first scene was created to help raise participants' awareness of the existence of different forms of sexual harassment, exposing them to scenes from the perspective of both bystander and victim (see Figure 2). Scenarios 2 and 3 (see Figures 3 and 4) focus in more detail on bystander behavior

and coping strategies for victims (respectively). Scenarios 2 and 3 were interactive in nature in order to enable a deeper exploration of the moral determinants that influence bystanders' decisions and victims' coping strategies. After viewing an initial situation, participants decided what to do from a series of available options. The story developed differently depending on their choice. The aim was to show participants the consequences of their decisions. Once the option had been selected and the consequences experienced, participants were allowed to re-watch the consequences of their decision, but not to choose a second option. Afterwards, in the class group, participants watched the consequences of each decision on a computer screen. This activity triggered a discussion about the consequences of each choice.



Figure 2. Frame Showed in Scenario 1.



Figure 3. Frame Showed in Scenario 2.



Figure 4. Frame Showed in Scenario 3.
Note. A girl is receiving a massive amount of messages because someone shared a sexual picture of her on the internet.

Participants

Sample Size

We estimated the sample size necessary to analyze the efficacy of the intervention, assuming a confidence level of 95% and a statistical power of 90% and adjusting the sample size to losses of 10%. We also knew that the effect size (Cohen's d) of previous interventions on sexual harassment (Anderson & Whiston, 2005) was between 0.10 (change in incidence of the phenomenon) and 0.57 (change in knowledge), and that the observed variance was 0.12 (Connolly et al., 2015). Based on this information, and assuming the most conservative effect size ($d = 0.10$), we calculated that at least 228 adolescents needed to participate in each experimental condition, giving a total sample size of at least 456 participants.

Participants

The sample comprised 30 class groups (12 in the experimental group and 18 in the control group) and a total of 579 students from compulsory secondary education participating in the study (286 in the experimental group and 293 in the control group). Of these, 579 participated at time 1, 512 participated at time 2, and 461 participated at time 3 (see Figure 5).

Variables and Instruments

Sexism

Sexism was measured using the Inventory of Ambivalent Sexism in Adolescents (ISA), validated in Spain by De Lemus et al. (2010). This instrument comprises a set of 20 items rated on a 6-point Likert-type scale (1 = *I strongly disagree*, 6 = *I strongly agree*). It is divided into two subscales that measure hostile sexism (aggressive and hostile beliefs about women, who are considered directly and pejoratively as inferior beings), with items such as "Boys are physically stronger than girls", and benevolent sexism (beliefs about the difference between men and women, seeing women as weak and in need of protection and provision by men), with items such as "At night, boys should accompany girls home to make sure that nothing bad happens to them." The internal consistency values were adequate for both hostile sexism ($\alpha = .87$ at T1, $\alpha = .89$ at T2, and $\alpha = .89$ at T3) and benevolent sexism ($\alpha = .79$ at T1, $\alpha = .82$ at T2, and $\alpha = .81$ at T3). Higher scores on the scale indicate higher levels of sexism.

Moral Disengagement

Moral disengagement was measured using the Spanish adaptation for adolescents (Sánchez-Jiménez & Muñoz-Fernández, 2021) of the Moral Disengagement scale proposed by Bandura (Bandura et al., 1996). This instrument comprises 14 items and evaluates mechanisms for justifying violence among adolescents, with items such as "Picking on someone does not really hurt them." Items are rated on a five-point Likert-type scale (1 = *I strongly disagree*, 5 = *I strongly agree*). Internal consistency values were good ($\alpha = .77$ at T1, $\alpha = .81$ at T2, and $\alpha = .83$ at T3). Higher scores on the scale indicate higher levels of moral disengagement.

Bystander Intention to Intervene in Sexual Harassment

Intention to intervene in situations of sexual harassment was measured using an adaptation of the stories created by Taylor et al. (2011). Three written situations of sexual harassment were described to measure bystander intention to intervene. The first

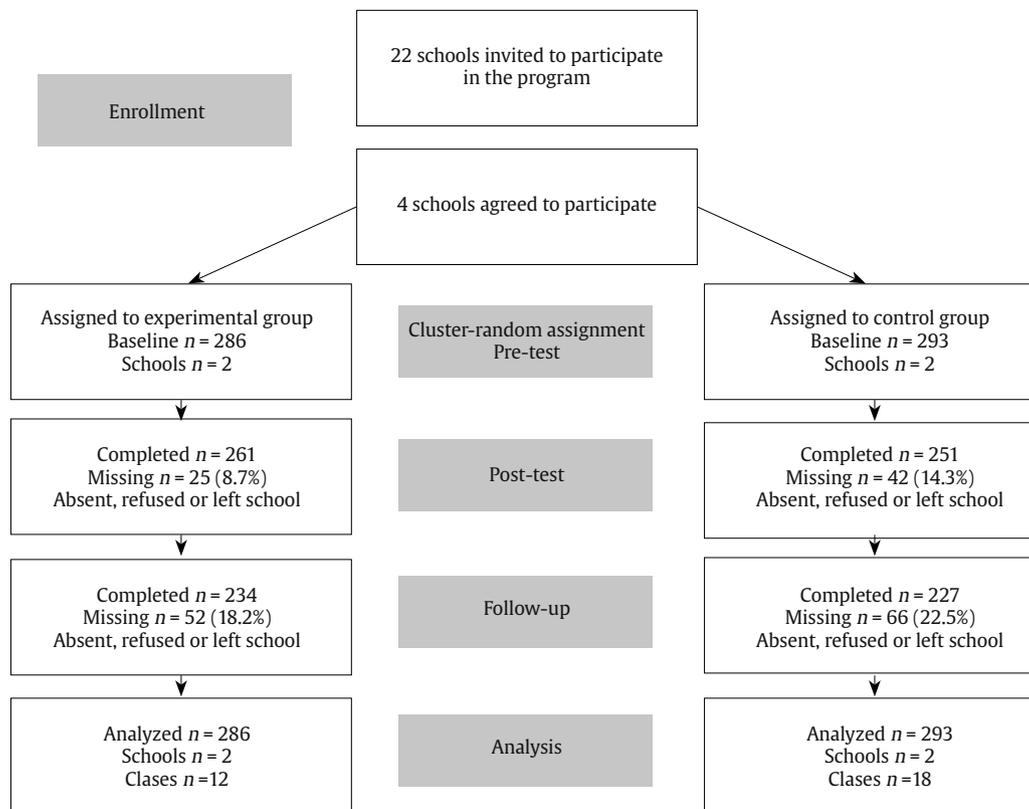


Figure 5. Flowchart of Participant Recruitment and Retention in the Study.

presented an episode of physical aggression, the second described an episode of online aggression, and the third referred to a situation involving verbal aggression. After each situation, participants were asked what they would do as a bystander, choosing from several options (nothing, walk away, join in, tell the aggressor to stop, get help from others), with two conditions: when the victim is a friend and when the victim is not a friend. Participants could only select one option. In accordance with our research aims, the present study focused only on the get-help- from-others response. The internal consistency values for bystander intention to intervene when the victim is a friend (KR-20 = .80 at T1, KR-20 = .86 at T2, and KR-20 = .87 at T3) and when the victim is not a friend (KR-20 = .79 at T1, KR-20 = .83 at T2, and KR-20 = .86 at T3) were good.

Face-to-face Sexual Harassment

Face-to-face sexual harassment was measured using the Spanish adaptation of the Sexual Harassment Survey (AAUW, 1993), validated in Spain by Ortega-Ruiz et al. (2010) and Vega-Gea et al. (2016). This instrument comprises a set of 20 items rated on a 5-point Likert-type scale (1 = never, 5 = every day). It is divided into victimization (10 items) and aggression (10 items), with each dimension comprising two subscales: visual/verbal sexual harassment (insults, jokes and/or showing visual materials of a sexual nature), with items such as "Made sexual comments, jokes, movements, or looks at you in a sexual manner", and physical sexual harassment (physical contact of a sexual nature), with items such as "Brushed up against you in a sexual way on purpose." The internal consistency values were adequate for visual/verbal victimization ($\alpha = .70$ at T1, $\alpha = .70$ at T2, and $\alpha = .75$ at T3), physical victimization ($\alpha = .79$ at T1, $\alpha = .78$ at T2, and $\alpha = .72$ at T3), visual/verbal aggression ($\alpha = .69$ at T1, $\alpha = .70$ at T2, and $\alpha = .78$ at T3), and physical aggression ($\alpha = .68$ at T1, $\alpha = .73$ at T2, and $\alpha = .83$ at T3). Higher scores on the scale indicate higher levels of sexual harassment.

Online Sexual Harassment

Online sexual harassment was measured using the Peer Sexual Cybervictimization Scale (Sánchez-Jiménez et al., 2017), validated for Spanish adolescents. The instrument consists of 24 items rated on a 5-point Likert-type scale (1 = never, 5 = every day), and is divided into victimization (12 items) and aggression (12 items), with items such as "Making obscene comments, jokes or gestures on my social media profile." The internal consistency values were adequate for both online sexual victimization ($\alpha = .85$ at T1, $\alpha = .89$ at T2, and $\alpha = .89$ at T3) and online sexual aggression ($\alpha = .72$ at T1, $\alpha = .88$ at T2, and $\alpha = .89$ at T3) scales. Higher scores on the scale indicate higher levels of online sexual harassment.

Experience during VR Scenarios

The realism, emotional impact, and embodiment of the VR scenarios were evaluated. Realism was measured by asking "Did you find what you saw real or realistic?". Emotional impact was assessed by asking "Were you emotionally affected by what was happening?". Embodiment was measured by asking "Did you put yourself in the shoes of the person they were bothering, and did you experience it as if you were that person?". Responses to the three questions were given on a 5-point Likert-type scale (1 = not at all, 2 = a bit, 3 = more or less, 4 = quite a lot, 5 = totally). Realism and emotional impact were measured after participants had viewed all three VR scenarios. Embodiment was only measured after they had viewed the third scenario, which was designed from the victim's perspective. The questions were asked as soon as participants had finished viewing the scenarios, while they were still wearing the headsets, with answers being recorded by the application itself.

Program Adherence and Satisfaction

The trainer coded participants' attendance at each session (0 = not present; 1 = present). Participants' satisfaction was measured at the end of each session by means of a confidential questionnaire that asked them how satisfied they felt with the session content (1 = *I would not say I liked this session*, 5 = *I liked it very much*). Participant satisfaction was calculated on the basis of the average score obtained from the total number of sessions attended.

Data Analysis

To assess the efficacy of the program, a linear mixed-effect model (MIXED) procedure was performed with full-information maximum likelihood (ML) estimation. Outcomes were entered individually as dependent variables. Time, experimental condition (Virtual-PRO and control), and time interacting with experimental condition were entered as fixed effects of the model. The random effects of the model considered within-individual and within-classroom measurement occasions. Effect sizes were estimated as standardized effect sizes in a mixed model. Standard deviations were calculated using the standard errors of the estimated marginal means (Hedges, 2007). All analyses were performed using the SPSS program.

Results

Preliminary Analyses

Attrition Analysis

We analyzed whether attrition (students who only participated at T1, students who only participated at two time points – T1T2 or T1T3 – and students who participated at all three time points – T1T2T3 – differed across the control and VR experimental groups, or in accordance with either the sociodemographic variables or the study variables measured at T1. No attrition differences were found in accordance with experimental condition, $\chi^2(2) = 4.16; p = .125$, gender, $\chi^2(6) = 3.71, p = .716$, or academic year, $\chi^2(2) = 0.69, p = .709$.

In terms of the variables used to assess the efficacy of the program, Table 1 shows the means comparisons in accordance with attrition. No significant differences were found between attrition groups, with the exception of benevolent sexism, moral disengagement, and physical victimization, although the effect size was small in all cases. We therefore decided to run the analyses with all available information, including all participants regardless of their attrition.

Program Adherence and Participants' Satisfaction with the Program

Students were screened at pre-test to control for organic diseases for which exposure to VR is contraindicated. Moreover, a pre-test analysis of sexual harassment involvement was carried out to identify any student with severe experiences of sexual harassment or related problems (such as bullying). We corroborated the results of these analyses during teacher interviews to control for any student who may have been distressed by the intervention. No such cases were detected. During the intervention, only two participants had trouble viewing the first VR scenario and reported feeling a bit nauseous when the scene involved a sensation of movement. This situation was addressed by the researchers adjusting the placement of the VR headset on these participants' heads.

Around 80% of participants attended five or more sessions. Specifically, 29.3% attended five sessions and 52.5% attended all six sessions (i.e., the entire training course). Participants reported high levels of satisfaction with the Virtual-PRO program ($M = 4.36, SD = 0.60$).

Realism, Emotional Impact, and Embodiment of VR Scenarios

The realism and emotional impact of all three VR scenarios were assessed. Overall, participants perceived all scenarios as being very realistic. The first VR scenario was the most realistic ($M = 3.79, SD = 1.30$) and the third VR scenario was the least realistic ($M = 3.69, SD = 1.31$). Girls perceived the first VR scenario as more realistic than boys, $M_{girls} = 3.93 (SD = 1.32)$ vs. $M_{boys} = 3.29 (SD = 1.33)$, $t(210) = -1.97, p = .050$. No gender differences were observed in terms of the realism of the second and the third VR scenarios ($p > .05$). The mode for the scenarios was the highest value (5 = *totally*) for the first scenario (37.8%) and the fourth value (4 = *quite a lot*) for the second (34.9%) and third scenarios (33.3%).

The emotional impact of all three VR scenarios was moderate. The emotional impact of the first VR scenario ($M = 2.77, SD = 1.19, Mo = 3, 31.1%$) was lower than that of the second ($M = 3.05, SD = 1.28, Mo = 4, 26.1%$) and third scenarios ($M = 3.15, SD = 1.26, Mo = 3, 31.5%$). Girls reported higher levels of emotional impact than boys for the second, $M_{girls} = 3.37 (SD = 1.22)$ vs. $M_{boys} = 2.78 (SD = 1.24)$, $t(220) = -3.57, p < .001$, and third VR scenarios, $M_{girls} = 3.52 (SD = 1.17)$ vs. $M_{boys} = 2.73 (SD = 1.19)$, $t(224) = -4.98, p < .001$.

In the third VR scenario (which showed events from the victim's point of view), embodiment was also assessed. Participants reported moderate-high levels of embodiment ($M = 3.64, SD = 1.15, Mo = 4; 31.5%$), with girls reported higher levels than boys, $M_{girls} = 3.93 (SD = 0.97)$ vs. $M_{boys} = 3.29 (SD = 1.20)$, $t(224) = -4.35, p < .001$.

Table 1. Attrition Analysis in Relation to the Study Variables

	T1	T1T2 or T1T3	T1T2T3	F	p-value	Eta ²
	M(SD)	M(SD)	M(SD)			
Hostile sexism	2.16 (1.28)	2.21 (1.14)	1.99 (0.93)	2.31	.100	.01
Benevolent sexism	2.57 (1.03)	2.48 (1.16)	2.18 (0.83)	7.07	< .001	.02
Moral disengagement	1.83 (0.50)	1.92 (0.61)	1.73 (0.51)	5.33	.005	.02
Bystander intention to intervene (victim is a friend)	1.03 (1.16)	0.81 (1.13)	0.78 (1.10)	0.81	.447	.00
Bystander intention to intervene (victim is not a friend)	0.89 (1.19)	0.78 (1.14)	0.72 (1.05)	0.55	.578	.00
Physical sexual victimization	1.15 (0.28)	1.36 (0.75)	1.23 (0.45)	3.52	.030	.01
Online sexual victimization	1.18 (0.38)	1.30 (0.54)	1.27 (0.41)	1.08	.340	.00
Visual/verbal sexual aggression	1.24 (0.33)	1.26 (0.43)	1.27 (0.43)	0.12	.888	.00
Physical sexual aggression	1.08 (0.22)	1.15 (0.39)	1.12 (0.35)	0.55	.575	.00
Online sexual aggression	1.11 (0.20)	1.15 (0.32)	1.13 (0.23)	0.55	.576	.00

Table 2. Descriptive Statistics for the Total Sample

	T1		T2		T3	
	Control group <i>M(SD)</i>	Experimental group <i>M(SD)</i>	Control group <i>M(SD)</i>	Experimental group <i>M(SD)</i>	Control group <i>M(SD)</i>	Experimental group <i>M(SD)</i>
Hostile sexism	<i>N</i> = 293 2.10 (1.05)	<i>N</i> = 285 1.98 (0.94)	<i>N</i> = 250 2.19 (1.10)	<i>N</i> = 261 2.04 (0.98)	<i>N</i> = 227 2.23 (1.08)	<i>N</i> = 234 1.98 (0.97)
Benevolent sexism	<i>N</i> = 293 2.30 (0.95)	<i>N</i> = 285 2.22 (0.89)	<i>N</i> = 250 2.29 (0.95)	<i>N</i> = 261 2.20 (0.94)	<i>N</i> = 227 2.32 (0.91)	<i>N</i> = 234 2.16 (0.88)
Moral disengagement	<i>N</i> = 293 1.78 (0.57)	<i>N</i> = 285 1.76 (0.50)	<i>N</i> = 251 1.73 (0.61)	<i>N</i> = 261 1.77 (0.52)	<i>N</i> = 227 1.77 (0.58)	<i>N</i> = 234 1.70 (0.55)
Bystander intention to intervene (victim is a friend)	<i>N</i> = 278 0.90 (1.14)	<i>N</i> = 262 0.70 (1.10)	<i>N</i> = 247 0.64 (1.08)	<i>N</i> = 257 0.41 (0.91)	<i>N</i> = 226 0.62 (1.05)	<i>N</i> = 232 0.41 (0.93)
Bystander intention to intervene (victim is not a friend)	<i>N</i> = 283 0.87 (1.14)	<i>N</i> = 265 0.62 (1.00)	<i>N</i> = 249 0.69 (1.09)	<i>N</i> = 257 0.63 (1.05)	<i>N</i> = 226 0.64 (1.05)	<i>N</i> = 232 0.72 (1.16)
Visual/verbal sexual victimization	<i>N</i> = 293 1.48 (0.56)	<i>N</i> = 286 1.43 (0.55)	<i>N</i> = 251 1.46 (0.51)	<i>N</i> = 261 1.45 (0.53)	<i>N</i> = 227 1.52 (0.61)	<i>N</i> = 234 1.39 (0.50)
Physical sexual victimization	<i>N</i> = 293 1.24 (0.45)	<i>N</i> = 286 1.24 (0.56)	<i>N</i> = 251 1.32 (0.52)	<i>N</i> = 261 1.32 (0.60)	<i>N</i> = 227 1.30 (0.53)	<i>N</i> = 234 1.23 (0.40)
Online sexual victimization	<i>N</i> = 292 1.28 (0.43)	<i>N</i> = 285 1.25 (0.43)	<i>N</i> = 251 1.25 (0.39)	<i>N</i> = 260 1.29 (0.46)	<i>N</i> = 227 1.29 (0.53)	<i>N</i> = 234 1.21 (0.41)
Visual/verbal sexual aggression	<i>N</i> = 290 1.27 (0.42)	<i>N</i> = 285 1.26 (0.43)	<i>N</i> = 251 1.27 (0.46)	<i>N</i> = 261 1.28 (0.44)	<i>N</i> = 227 1.26 (0.50)	<i>N</i> = 234 1.24 (0.42)
Physical sexual aggression	<i>N</i> = 289 1.12 (0.34)	<i>N</i> = 285 1.11 (0.34)	<i>N</i> = 251 1.12 (0.35)	<i>N</i> = 261 1.14 (0.39)	<i>N</i> = 227 1.11 (0.44)	<i>N</i> = 234 1.11 (0.31)
Online sexual aggression	<i>N</i> = 288 1.13 (0.23)	<i>N</i> = 285 1.14 (0.26)	<i>N</i> = 251 1.15 (0.40)	<i>N</i> = 260 1.17 (0.30)	<i>N</i> = 227 1.14 (0.37)	<i>N</i> = 234 1.13 (0.27)

Baseline Equivalence

At T1, participants were aged between 12 and 17 years (*M* = 14.76, *SD* = 0.88). No age differences were observed between participants in the control and experimental groups, *t*(577) = -0.96, *p* = .33. In terms of gender, 272 participants (47.1%) identified as boys, 298 (51.6%) identified as girls, 4 (0.70%) said they identified with both genders, and 4 (0.70%) said they did not identify with any gender. One participant preferred not to provide this information. No gender differences were observed between participants in the control and experimental groups, $\chi^2(3) = 2.95, p = .399$. In terms of education level, 325 participants (56.1%) were in the third year of compulsory secondary education and 254 (43.9%) were in the fourth year. No differences were found between the experimental and control groups in terms of education level, $\chi^2(1) = 0.86, p = .354$.

As regards the comparison between the control and experimental groups in terms of outcomes, the control group had higher levels at T1 than the experimental group (Table 2) and a significant effect was only observed in hostile and benevolent sexism (Table 3). No significant effects of condition (control or experimental group) were found for any of the other variables analyzed (Table 4 and 5).

Main Analyses

Effects of the Intervention on Sexism

Table 3 shows a significant effect of the interaction between time and group for hostile sexism, specifically in the comparison between the baseline and follow-up levels. Similarly, a marginally significant effect was observed of the interaction between time and group for benevolent sexism, again in the comparison between the baseline and follow-up levels.

In the case of hostile sexism and the changes observed in the mean baseline and follow-up values of both groups (Table 2), the levels of the experimental group remained stable, whereas those of the control group rose over time (*d* = 0.14). Regarding benevolent sexism, and again comparing the means at T1 and T3 in both groups (Table 2), the mean levels of this type of sexism dropped in the experimental group, whereas in the control group a slight upward trend was observed over time (*d* = 0.04).

Effects of the Intervention on Moral Disengagement

In relation to moral disengagement, a significant effect was observed of the interaction between time and group (Table 3),

Table 3. Mixed Model Predicting Outcomes Linked to Sexism and Moral Disengagement

	Hostile sexism			Benevolent sexism			Moral disengagement		
	<i>df</i>	<i>B(SE)</i>	<i>p</i> -value	<i>df</i>	<i>B(SE)</i>	<i>p</i> -value	<i>df</i>	<i>B(SE)</i>	<i>p</i> -value
Intercept	25.61	2.00 (0.08)	< .001	28.31	2.18 (0.08)	< .001	31.30	1.73 (0.04)	< .001
T1	980.31	-0.04 (0.05)	.424	983.05	0.04 (0.05)	.449	995.09	0.03 (0.03)	.309
T2	975.31	0.02 (0.05)	.687	977.08	0.02 (0.05)	.710	988.19	0.05 (0.03)	.114
Group (control group)	31.44	0.29 (0.11)	.018	34.92	0.22 (0.11)	.049	40.98	0.07 (0.06)	.235
T1 by group (control group)	985.31	-0.14 (0.06)	.032	989.75	-0.12 (0.07)	.075	1001.59	-0.04 (0.04)	.324
T2 by group (control group)	977.14	-0.10 (0.07)	.143	979.72	-0.08 (0.07)	.261	990.90	-0.10 (0.04)	.018
Residual variance		0.25 (0.01)	< .001		0.28 (0.01)	< .001			
Subject: random intercept		0.75 (0.05)	< .001		0.56 (0.04)	< .001			
Classroom: random intercept		0.04 (0.03)	.085		0.03 (0.02)	.098			

Table 4. Mixed Model Predicting Outcomes Linked to Bystander Intention to Intervene

	Victim is a Friend			Victim is not a Friend		
	df	B (SE)	p-value	df	B (SE)	p-value
Intercept	50.09	0.43(0.07)	< .001	61.94	0.72 (0.07)	< .001
T1	977.80	0.28 (0.07)	.000	981.62	-0.10 (0.08)	.199
T2	979.87	-0.02 (0.08)	.837	986.85	-0.08 (0.08)	.288
Group (control group)	70.02	0.18 (0.09)	.066	86.81	-0.08 (0.10)	.457
T1 by group (control group)	994.77	0.02 (0.11)	.882	998.57	0.33 (0.11)	.003
T2 by group (control group)	983.30	0.05 (0.11)	.666	989.08	0.13 (0.11)	.246
Residual variance		0.67 (0.03)	< .001		0.73 (0.03)	< .001
Subject: random intercept		0.40 (0.04)	< .001		0.43 (0.05)	< .001
Classroom: random intercept		0.01 (0.01)	.676		0.00 (0.01)	.708

Table 5. Mixed Model Predicting Outcomes Linked to Sexual Victimization and Sexual Aggression

	Visual/verbal sexual victimization			Physical sexual victimization			Online sexual victimization			Visual/verbal sexual aggression			Physical sexual aggression			Online sexual aggression		
	df	B (SE)	p-value	df	B (SE)	p-value	df	B (SE)	p-value	df	B (SE)	p-value	df	B (SE)	p-value	df	B (SE)	p-value
Intercept	43.19	1.41 (0.04)	< .001	37.13	1.28 (0.04)	<.001	1096.81	1.22 (0.03)	<.001	35.05	1.25 (0.03)	<.001	49.38	1.12 (0.03)	<.001	1181.69	1.14 (0.02)	<.001
T1	998.09	0.02 (0.03)	.490	998.87	-0.03 (0.03)	.385	1000.89	0.03 (0.03)	.213	1018.12	0.02 (0.03)	.436	1030.35	0.00 (0.02)	.943	1020.06	0.00 (0.02)	.950
T2	991.33	0.04 (0.03)	.255	992.65	0.05 (0.03)	.152	992.00	0.07 (0.03)	.011	1010.90	0.03 (0.03)	.212	1022.71	0.03 (0.03)	.310	1010.86	0.03 (0.02)	.142
Group (CG)	55.95	0.09 (0.06)	.111	46.60	0.01 (0.06)	.902	1116.43	0.07 (0.04)	.070	45.79	0.01 (0.05)	.866	66.49	-0.01 (0.04)	.716	1196.89	0.00 (0.03)	.949
T1 by group (CG)	1006.82	-0.05 (0.05)	.286	1007.71	-0.02 (0.04)	.713	1007.26	-0.04 (0.04)	.306	1025.39	0.00 (0.04)	.990	1038.72	0.02 (0.04)	.657	1025.98	-0.01 (0.03)	.644
T2 by group (CG)	995.22	-0.10 (0.05)	.041	996.71	-0.02 (0.05)	.632	994.09	-0.12 (0.04)	.002	1014.42	-0.03 (0.04)	.479	1027.28	-0.01 (0.04)	.820	1013.27	-0.02 (0.03)	.438
Residual variance		0.14 (0.01)	<.001		0.12 (0.01)	<.001		0.08 (0.00)	<.001		0.08 (0.00)	<.001		0.07 (0.00)	<.001		0.04 (0.00)	<.001
Subject: random intercept		0.16 (0.01)	<.001		0.15 (0.01)	<.001		0.12 (0.01)	<.001		0.11 (0.01)	<.001		0.05 (0.01)	<.001		0.05 (0.00)	<.001
Classroom: random intercept		0.01 (0.00)	.163		0.01 (0.01)	.085		0.00 (0.00)	a		0.00 (0.00)	.241		0.01 (0.00)	.331		0.00 (0.00)	a

Note. CG = control group.

^aThis covariance parameter is redundant. Statistics and confidence interval cannot be calculated.

although in this case it was the change between T2 and T3 that was significant. When the mean values at these two time points (T2 vs. T3) were compared, a drop in moral disengagement was observed in the experimental group ($d = 0.08$), whereas in the control group mean values were found to increase (Table 2).

Effects of the Intervention on Bystander Intention to Intervene

As shown in Table 4, a significant effect was observed of the interaction between time and group for bystander intention to intervene when the victim is not a friend, specifically in the comparison between T1 and T3. In contrast, no significant effect of the interaction between time and group was observed for bystander intention to intervene when the victim is a friend. Table 2 shows the drop in mean scores between T1 and T3 in the control group, along with an increase in mean scores in the experimental group ($d = 0.09$).

Effects of the Intervention on Face-to-Face and Online Sexual Victimization and Aggression

In relation to victimization, a significant effect was observed of the interaction between time and group in relation to visual/verbal and online victimization, particularly in the comparison between T2 and T3 (Table 5). In contrast, no significant effect of the interaction between time and group was observed for physical victimization. When the mean values at T2 and T3 were compared (Table 2), a drop in visual/verbal victimization ($d = 0.06$) and online victimization scores ($d = 0.15$) was observed in the experimental group, whereas in the control group scores for both variables were found to increase from T2 to T3.

In relation to aggression, no significant effects of the interaction between time and group were observed for any of the forms of aggression analyzed (Table 5). Table 2 presents the means for both groups (experimental and control) at the different time points analyzed.

Discussion

The aim of the present study was to assess the impact of a new program to prevent sexual harassment during adolescence using Virtual Reality, based on the bystander model. To date, most prevention programs have been developed in the USA and have been targeted at young university students (DeGue et al., 2014; Jouriles et al., 2018; Katz & Moore, 2013; Kettrey & Marx, 2019; Mujal et al., 2021), with few programs having been developed with adolescents in European countries, such as Spain, for example.

This is why we designed the Virtual-PRO program, which comprises six hour-long sessions that focus on different steps of the bystander model. The traditional intervention was enhanced by the development of three VR scenarios that were used to raise students' awareness of sexual harassment, encourage them to reflect on the consequences of active and passive bystander behavior, and to understand the consequences of sexual harassment for victims. The program was implemented as a RCT with a follow-up measure.

The present study analyzes the impact of the program on attitudinal, social-moral, and behavioral variables, specifically sexist attitudes (hostile and benevolent sexism), moral disengagement, sexual aggression and victimization, and intention to intervene as a bystander. The results revealed significant effects on hostile sexism and marginally significant effects on benevolent sexism. In the case of hostile sexism, although the program did not decrease

the levels of the experimental group, unlike in the control group, no increase was observed. In the case of benevolent sexism, a slight decrease was observed immediately following the intervention, and was maintained also at follow up. These results therefore seem to indicate that the program buffered or delayed the increases in sexism observed in the control group. However, consistently with that found in previous studies (Anderson & Whiston, 2005; Jouriles et al., 2018), the effect sizes were small.

Clearer results were found in relation to the effect of the program on moral disengagement, for which a reduction was observed in the experimental group in comparison with the control, with these changes being particularly notable during follow-up. A large body of scientific literature links moral disengagement to aggressive behavior in a range of different contexts (Lo Cricchio et al., 2021; Rodríguez-deArriba et al., 2022), including sexual harassment (Page & Pina, 2015). Despite this, few intervention programs have included this moral variable in either their components or their outcomes (Barkoukis et al., 2016; Wang & Goldberg, 2017) and, to the best of our knowledge, no programs seeking to prevent sexual harassment have done so to date. The findings of the present study are novel and promising in this sense, pointing to a significant reduction in moral disengagement following the intervention. This result confirms the appropriateness of explicitly including content linked to the mechanisms that bystanders use for not intervening, as well as content related to the consequences of actions for others. This content was incorporated during the curricular lessons, but particularly during the VR simulations. By viewing interactive scenarios from different points of view (bystander and victim), adolescents were able to experiment with decision making and become more aware of the consequences of their actions as both bystanders and victims. The reduction of moral disengagement among participants would result in adolescents being more aware of sexual harassment, less prone to justifying violence and, consequently, more disposed to intervene in these situations. Ultimately, if sexual harassment is viewed as a social phenomenon in which bystanders play a key role, then moral disengagement becomes a core component to incorporate into the bystanders' prevention programs (Gini et al., 2022; Thornberg & Jungert, 2013).

Indeed, this is exactly what the effects of the program on intention to intervene suggest. Following the intervention, participants in the experimental group reported a stronger intention to intervene by defending and helping the victim in comparison with their counterparts in the control group. A similar effect has been found previously in interventions designed to prevent sexual harassment (Coker et al., 2017; Jouriles et al., 2019; Miller et al., 2020), as well as in programs designed to prevent face-to-face and online bullying (Menesini et al., 2018; Polanin et al., 2012). This would seem to support the suitability of bystander models for preventing aggressive behavior. Moreover, the fact that this effect was observed when the victim was not a friend bestows even greater value on the result. Previous studies have shown that bystanders are more willing to intervene in situations of violence when the victim is a friend or someone they know than when they are not (Bennett et al., 2017; Seo et al., 2022). Helping a stranger requires greater moral sensitivity to violence, free from contextual influences. The effects found are therefore very relevant and may be explained by the decrease in participants' moral disengagement. Although in the present study we did not analyze the mechanisms underlying the change in intention to intervene, one hypothesis may be that changes in moral disengagement mediate changes in defense and helping behaviors.

Although the program focuses on bystanders, consistently with that reported by previous studies, the results also revealed significant reductions in visual/verbal and online sexual victimization (Coker et al., 2017), indicating that the intervention gave participants the strategies they needed to cope more effectively with harassment. No reduction was found, however, in aggressive behavior. Although a

decrease in aggression may perhaps have been expected, an analysis of the components of the Virtual-PRO program may provide insight into the reason why this was not observed, since they mainly emphasize bystander behavior and coping strategies for victims. Furthermore, and although to date few sexual harassment prevention programs have sought to assess their impact on reducing aggressive behavior (Coker et al., 2017), the absence of any reduction observed here is consistent with that reported by previous interventions that aimed to reduce involvement in violence, leading to the conclusion that programs seem to be more effective in reducing victimization than in reducing aggression (DeGue et al., 2014). The present study also adds to our knowledge regarding the use of VR in reducing aggressive behavior. Whereas previous attempts failed to find any reduction in face-to-face and online aggression among peers (Ingram et al., 2019), the Virtual-PRO was found to be effective in reducing victimization three months after its implementation, which indicates that VR is a useful tool for training adolescents in effective coping strategies (Fromberger et al., 2018). Future studies may wish to confirm whether VR is more or less effective than traditional programs for developing skills and strategies among victims.

The present study is the first RCT to be carried out with the Virtual-PRO program for preventing sexual harassment among adolescents, using VR. Although they should be interpreted with caution, the results are promising and indicate the efficacy of the program in terms of modifying attitudes and reducing sexual victimization. The incorporation of virtual reality is an innovative development in relation to programs of this kind. The scenarios developed for the program were compiled and piloted with adolescents, who rated them as being realistic and emotionally moving, as indeed did the participants in the present study, a finding which enhances their validity. Having implemented the scenarios with large groups and in universal interventions (similarly to Ingram et al., 2019 and McEvoy et al., 2016), rather than in small samples (Jouriles et al., 2019) or selective interventions (Alsem et al., 2021), enabled us to test the usefulness of VR as an intervention and training tool at a "larger scale". Participant adherence and satisfaction were also positive, indicating that the inclusion of VR encouraged adolescents to continue attending the program.

Despite the above, the study has a number of limitations which should be taken into consideration. The first is linked to the sustainability of the program, which in turn is associated with the difficulties inherent in its implementation. Although it enriched the immersive experience, the use of VR made the program costly to implement, in both monetary terms and in relation to the human resources required. Future studies may wish to compare the efficacy of the Virtual-PRO program with VR with other versions that use more traditional (narratives) or audiovisual (videos) resources, in order to determine whether the use of VR significantly increases its effectiveness. In this sense, previous studies have reported controversial results. For example, McEvoy et al. (2016) found that viewing videos generated more empathic responses and a greater perception of bullying than VR situations. However, the program employed in this study used augmented reality based on artificial scenarios and 3D avatars, rather than real scenarios and actors as in the Virtual-PRO program. Similarly, future research may wish to test whether the changes observed following the program are sustained when cheaper VR devices are used. One such device may be the Google headset, for which very encouraging results have been reported in the field of bullying prevention (Ingram et al., 2019). This would enable cost reductions and would improve the sustainability of the program. The use of VR also impacted the duration of the sessions, which had to be longer in order to allow participants time for reflection and analysis after viewing the 360° scenes. The percentage of students experiencing difficulties viewing the VR scenarios was very low, indicating that the Virtual-PRO program is accessible for the target population. The scenarios did not depict situations of physical sexual

harassment in order not to provoke high levels of distress among participants, since this may have led to a rejection of the program and reluctance to continue attending sessions.

Overall, the results of the present study are promising and, although this was only an initial trial, they nevertheless indicate that the program was effective in enhancing victim defense behaviors and reducing moral disengagement and sexual victimization. In our view, this program has two key elements: first, the inclusion of decision making and the moral dimension as fundamental components of the bystander model and second, the use of VR scenarios portraying situations that reflect adolescents' real-life experiences. This, along with other psycho-educational strategies, help strengthen the model. Future trials may wish to try and confirm these results, and to explore whether the changes generated in moral disengagement are responsible for those observed also in relation to intention to intervene as a bystander.

Conflict of Interest

The authors of this article declare no conflict of interest.

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Appendix

Developing and Piloting the VR Scenarios

To develop the scenarios, a previous study was conducted to determine the most prototypical sexual harassment situations among adolescents. The study was carried out in phases. In the first phase, all the sexual harassment measures published in the literature up to December 2019 were reviewed. The review of these measures resulted in a pool of 34 items representing sexual aggression of differing severity levels among adolescents. Next, 64 adolescents (46.9% girls, 14-18 years old, $M = 15.95$, $SD = .86$) and 37 teachers (67.6% women, 27-58 years old, $M = 42.49$, $SD = 7.93$) were asked about the frequency with which such situations occurred at their school. The results were compared with sexual harassment prevalence data reported by previous national studies, in relation to both face-to-face (Vega-Gea et al., 2016) and online harassment (Sánchez-Jiménez et al., 2017). The most frequent types of sexual harassment were sexist comments ($M_{\text{teachers}} = 7.17$, $SD_{\text{teachers}} = 2.98$; $M_{\text{students}} = 5.19$, $SD_{\text{students}} = 3.33$), homophobic insults ($M_{\text{teachers}} = 6.37$, $SD_{\text{teachers}} = 3.10$; $M_{\text{students}} = 5.50$, $SD_{\text{students}} = 3.42$), insults and obscene comments and gestures ($M_{\text{teachers}} = 6.87$, $SD_{\text{teachers}} = 3.14$; $M_{\text{students}} = 4.59$, $SD_{\text{students}} = 2.57$), the spreading of rumors about sexual behavior, both face-to-face ($M_{\text{teachers}} = 6.33$, $SD_{\text{teachers}} = 2.66$; $M_{\text{students}} = 2.87$, $SD_{\text{students}} = 2.77$) and online ($M_{\text{teachers}} = 5.31$, $SD_{\text{teachers}} = 3.18$; $M_{\text{students}} = 2.78$, $SD_{\text{students}} = 3.17$), and unwanted physical contact or attempts at making physical contact ($M_{\text{teachers}} = 1.45$, $SD_{\text{teachers}} = 0.83$; $M_{\text{students}} = .21$, $SD_{\text{students}} = 0.65$).

Based on these results, we selected the most salient situations according to both teachers and students and used them to create the narratives for the different scenarios. In order to make the scenarios as ecologically valid as possible, gender differences were taken into account, with boys and girls being aggressors and/or victims in accordance with the prevalence data reported. We did not, therefore, develop different versions for boys and girls. Nor did we include instances of serious physical sexual aggression that may have had an excessive impact on students' sensibilities. The scenarios were played by young professional actors who bestowed a high degree of realism on the different scenes represented.

The three videos were piloted prior to the intervention with small groups (Sánchez-Jiménez et al., 2022). A total of 78 adolescents ($M = 14.76$, $SD = 0.84$, 39.8% girls) and 10 teachers (70% women) participated in the pilot project. After watching the scenarios, participants were asked how realistic they thought they were ("Do you think the scenario represents a real situation?"), as well as about their emotional impact ("Has the scenario touched/moved you?"). Response options to the two questions were measured on a 5-point Likert-type scale (1 = *not at all*, 5 = *totally*). The results revealed mean scores of $M = 3.70$ ($SD = 1.30$) for realism, and mean scores of $M = 2.93$ ($SD = 1.03$) for emotional impact. Gender differences were found in both cases, with girls awarding scoring higher than boys for both realism and emotional impact.