



# A Multilevel Model to Assess the Effectiveness of an Affective-Sexual Education Program for People with Intellectual Disabilities: the Influence of Participants' Characteristics

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Accepted: 12 December 2022  
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## Abstract

**Introduction** Personal characteristics have been shown to influence the psychosexual development of people with intellectual disabilities. This study aims to evaluate the effectiveness of the SALUDIVERSEX program about affective-sexual education depending on gender, age, relationship status, and degree of autonomy.

**Methods** Two hundred fifty-four participants, clustered within 28 daytime support services, completed a battery of instruments before and after the intervention. The data was collected between January 2021 and April 2022.

**Results** Multilevel analyses, controlling for participant's dependence within the same center, confirm that the program is equally effective regardless of gender. Likewise, younger participants, who have greater autonomy and who have a partner, seem to benefit more from the intervention.

**Conclusions** This suggests that the SALUDIVERSEX program is a useful tool for educating adults with intellectual disabilities on sexuality, when they possess a high degree of autonomy.

**Policy Implications** The present study contributes to the successful replication of the intervention being tested, providing information on the aspects that may be more difficult to learn depending on the personal characteristics of the individuals.

**Keywords** Affective-sexual education program · Intellectual disabilities · Gender · Age · Autonomy · Partner

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## Introduction

The sexuality of people with intellectual functional diversity (PIFD) has always been a controversial topic, partly due to the conservative attitudes of family members and professionals. Their immediate sociocultural context highlights their immaturity in sexual development and their limitations in assuming responsible sexual behavior, which positions them against this group receiving training on sexuality (Santinelé Martino, 2021). However, for some time now, a significant number of studies have provided valuable knowledge on the sexual development of this group, which has led to an increase in the demand for affective-sexual education initiatives aimed at PIFD (Yildiz & Cavkaytar, 2017).

The DSM-5 establishes criteria that define intellectual disability (ID) as a type of neurodevelopmental disorder, a very different conceptualization compared to the previous one based mainly on intelligence quotient (IQ) (APA, 2013). The current conceptualization has shifted the focus from the degree of discrepancy with respect to the IQ of

normotypical individuals, to the degree of support needed in various domains, i.e., conceptual, practical, and adaptive (Tassé et al., 2016). The DSM-5 establishes 4 diagnostic categories characterized by the different levels of support required in each of these domains. However, the specific configuration of each individual is also influenced by the context in which they have developed and lived (Krahn & Fox, 2014).

People who have shown a progressive and greater degree of autonomy throughout their lives have achieved higher levels of permissiveness from their caregivers, which has allowed them to enjoy more experiences and learn more, and vice versa (Emond Pelletier & Joussemet, 2017). According to Deci (2004), PIFD should learn in an environment that supports their degree of autonomy so that they can learn new activities more efficiently and experience greater levels of well-being.

Thus, degree of autonomy has been identified as one of the main variables influencing psychosexual development in PIFD (Löfgren-Mårtenson & Ouis, 2019). The individual's degree of autonomy, closely linked to the need for support required to make decisions regarding the different areas of his or her life, also reflects their level of disability. Mild PIFD not only experience their sexuality in a way that is quite close to that of neurotypical adolescents (Luque-Martínez et al., 2021), but they also appear to have good levels of literacy (Lundberg & Reichenberg, 2013). In affective-sexual education programs that have activities that require the ability to read and write, it is expected that their performance will be higher than moderate PIFD.

The degree of autonomy and permissiveness are unfortunately closely related to gender (McCarthy, 2014; Vehmas, 2019). The fear of an unwanted pregnancy or simply of a scandal caused by engaging in an intimate sexual practice in a public context has caused many women to be watched more closely and has resulted in them to having a lower degree of autonomy compared to men with identical characteristics (Bernert & Ogletree, 2013; Fitzgerald & Withers, 2013). This phenomenon does not surprise us insofar as replicates, to a certain extent, what is still happening in many areas of society (UNFPA, 2021).

As reported by González et al. (2018) in their meta-analysis, gender seems to negatively affect the effectiveness of the program, while IQ level has not been shown to be a moderating variable, as many of the programs included were adapted to the cognitive development of the sample. Differences between genders are also visible in relation to having or not having a partner and the activities and skills practiced with a partner.

In general, PIFD who have had a partner have had the opportunity to experience, more or less, healthy relationships, what it feels like to be loved, and improvement in their communication skills. They have practiced respect and

assertiveness, as they may have had to respond to requests for unwanted sexual practices and may even have been treated inappropriately by tolerating unhealthy and unacceptable dynamics (Brkić-Jovanović et al., 2021; Rushbrooke et al., 2014). People who participate in affective-sexual education programs while in a relationship have the opportunity to practice many of the skills and attitudes that are taught in the course. Therefore, having or having had a partner could be a relevant factor influencing the effectiveness of an affective-sexual education program.

Another essential aspect in the study of the psychosexual development of PIFD is age, not so much in itself, but in relation to the social changes that have occurred at an accelerated rate in recent decades. Permissiveness, liberation of sexuality from strict norms emanating from ecclesiastical authorities in many countries, women's liberation movements, as well as an increased tolerance and awareness of people with minority sexual orientations, have brought about a real revolution in considering sexuality as something that is intrinsic to human nature, as a right that is associated with quality of life and emotional well-being, and as something for which we need to receive an adequate education in respect and dignity (Gil-Llario et al., 2021b). The parents of older PIFD lived a very different reality and think of sexuality as something intrinsically dangerous, resulting in them only seeing potential scandals and unwanted pregnancies (Cuskelly & Bryde, 2004; Morell-Mengual et al., 2017). However, the parents of younger PIFD, who have already grown up with this healthy vision of sexuality, are not only more tolerant of the affective-sexual education activities that take place in the occupational centers, but they are also often the ones who demand them themselves (Stein et al., 2018; Walker-Hirsch, 2010). The same goes for professionals. Not too many decades ago, they were reluctant to take such initiatives, but today they are the main plaintiffs in such initiatives (Parchomiuk, 2012). For these reasons, the sexual history and attitudes of older and younger PIFD are very different at this time, given that they have been raised in very different contexts.

Even within the same age range, given the enormous individual differences found among PIFD, the affective-sexual education of those with a greater degree of autonomy should be qualitatively different from those who are deprived of the possibility of having a partner and/or enjoying a certain margin of freedom to experience their sexuality as they see fit (Schaafsma et al., 2015; Vrijmoeth et al., 2012), either due to their limitations in the practical sphere or to the excessive degree of overprotection by their guardians and relatives (Schalock & Verdugo, 2012). Galea et al. (2004) concluded that sexuality education programs should be specifically tailored to the individual characteristics of the participants, as this will ensure that the program is effective (Schaafsma et al., 2015).

Based on what has been mentioned thus far, it is evident that the effectiveness of a group affective-sexual education program may vary depending on the personal characteristics of the people in the group (Schaafsma et al., 2017). It is important to analyze the implications of these aspects (gender, age, degree of autonomy, and relationship status) in order to tailor the programs to the specific needs of different PIFD. Specifically, according to the information extracted from the literature consulted, we hypothesized the existence of a differential effectiveness of the affective-sexual education program analyzed according to (1) the gender of the participants, (2) their age, (3) their degree of autonomy, and (4) their sentimental situation depending on whether or not they have a partner at the time of receiving the training.

## Methods

### Participants

The total sample in the present study includes 254 participants who attend to daytime support services. A total of 28 daytime support services were recruited to participate in the current research. To ensure sample representativeness, we utilized a stratified random sampling procedure based on population density to select these centers (Lohr, 2010). We prioritized the selection of centers located in urban areas with a medium population density, and then we included centers located in areas with high and low population densities. Thus, in the final sample, around 22.1% of the participants were from cities with a population density > 500,000, around 65.3% were from cities with a population density between 10,000 and 500,000, and around 13.1% were from cities with < 10,000 inhabitants (considered rural areas). This recruitment procedure allowed us to obtain a representative sample of individuals with ID from both urban and rural areas.

To determine eligibility for participation, we established the following inclusion criteria: (1) aged 18 years old or older; (2) have an ID as outlined by the DSM-5 criteria; and (3) have sufficient communication and reading abilities to complete the items in the study. Participants were excluded from the research (1) if they did not have high enough comprehension and communication skills to carry out the assessment procedure with the researcher's assistance, and (2) if their guardians did not sign the informed consent.

According to the characteristics of the participants, 53% ( $n=135$ ) were women and 47% ( $n=119$ ) were men, with ages ranging from 19 to 67 years old ( $M=37.25$ ,  $SD=10.59$ ). The majority presented a low autonomy ( $n=157$ , 61.9%), while 38.1% ( $n=97$ ) presented a high autonomy. All of them presented mild ID according to the DSM-5 classification. The majority of participants lived in their parents or guardians' homes ( $n=200$ , 78.9%), followed by 9.3% ( $n=24$ ) living in

nursing home/hospital settings for PIFD, 8.4% ( $n=21$ ) living in community facilities with different degrees of supervision, and only 3.4% ( $n=9$ ) of participants living alone. In addition, although the majority did not have a partner during their participation in the program ( $n=166$ , 65.3%), 34.7% ( $n=88$ ) did have a partner.

The accuracy of the results obtained regarding the effectiveness of the program was evaluated by obtaining a sexual behavior and knowledge assessment of the participants from two psychologists/teachers at each center, a total of 56 professionals.

## Measures

### Demographics

Gender and age were self-reported by the participants, whereas the professionals responsible for their care at the support services were asked about the participant level of autonomy (information available in the participants' clinical records), residence type, and whether they had a partner at the time of the intervention.

### Self-Report Instrument for the Assessment of Sexual Behavior and Concerns of People with Mild Intellectual Disabilities (SEBECOMID-S; Gil-Llario et al., 2021c)

The SEBECOMID-S is a self-administered instrument to assess sexual behavior and concerns of people with mild ID that includes 14 questions. The questions have different response formats depending on the content: a frequency scale ranging from never to always (e.g., "How often do you use a condom when you have oral sex with your partner?") and dichotomous questions with yes/no answers (e.g., "Have you ever masturbated?"). This instrument includes three main aspects: *sexual response*, or reaction to excitation (e.g., "When you see pictures of people you like or someone you are attracted to is near you, do you feel like touching yourself?"), *worry*, or concerns of PIFD about issues related to sex or interpersonal relationships (e.g., "Do you worry that people you like will look at you funny or misunderstand you when you show that you like them?"); *sex practices*, or sexual activities that PIFD might engage in (e.g., "Have you ever had anal intercourse?"); and *condom use*, or safe sex practices (e.g., "How often do you use a condom when you have vaginal intercourse with your partner?"). The reliability of the factors ranged from 0.50 to 0.72.

### Inventory of Sexual Knowledge of People with Intellectual Disability (ISK-ID; Gil-Llario et al., 2021a)

The ISK-ID is a scale designed to be applied as a self-report measure and provides a measure of sexual

knowledge across six different sexuality domains: (a) knowledge about what kind of sexual activities may be considered sexual or not depending on the context (“concept of sexuality,” e.g., “A part of the body such as the ear is sexual or not depending on the person who touches it and the situation”); (b) knowledge about how to have a positive body image and communicate sexually (“body image and sexual communication,” e.g., “If I have a beautiful body, I will have a positive body image”); (c) knowledge about the nature of different sexual practices, such as masturbation, oral sex, or vaginal and anal intercourse (“sexual practices,” e.g., “When the penis is inside the vagina or the anus, it is called intercourse”); (d) knowledge about sexual diversity (“homosexuality,” e.g., “It is wrong for two men or two women to kiss on the mouth”); (e) knowledge about how to interact with a romantic/sexual partner in the context of an intimate relationship (“dating, intimacy, and sexual assertiveness,” e.g., “Boyfriends/girlfriends are forever. Therefore, I do not break up with my boyfriend/girlfriend even if he/she wants to”); and (f) knowledge about how to prevent STIs and unwanted pregnancy (“sexual health,” e.g., “Contraceptive methods are useful to prevent unwanted pregnancies”). It is comprised of 34 items that are written in an easy-to-read format and rated on a dichotomous scale (yes/no), thus helping individuals with ID to understand the item content and provide reliable responses. It takes about 20 min to complete. With respect to its psychometric properties, reliability analysis of the ISK-ID found good internal reliability for the total scale ( $\alpha=0.79$ ) and acceptable for the six factors ( $\alpha$  ranging between 0.51 and 0.70).

### Assessment of Sexual Behavior and Knowledge of People with Intellectual Disability (ABSKID; Gil-Llario et al., 2020)

The ABSKID is a 24-item other-reported instrument to be completed by professionals working with PIFD in occupational settings. The main components are as follows: concern about the client’s inappropriate or uninhibited sexual behavior (“BEH-UNINHIB,” e.g., “do you know if s/he has ever masturbated in public?”), perception of client’s knowledge about privacy and social norms (“PRIV-NOR,” e.g., “do you think s/he is aware of social norms about not letting others touch one’s private body parts?”), perception of client’s knowledge about sexuality (“KNOW-SEX,” e.g., “do you think s/he understands the human reproduction process?”), and concerns about the client’s sexuality (“CONCERN,” e.g., “are you worried that s/he won’t find a partner?”). The items have a dichotomous “Yes” or “No” response format. The reliability of the factors ranged from 0.59 to 0.74.

### Procedure

Two support service networks for PIFD contacted the head of the research project (Gil-Llario, M. D.) due to their interest in providing an appropriate affective-sexual education adapted to their patients’ characteristics. Our research team became involved in studying the needs of this group in this area of development. This project allowed us to lay the foundations for an intervention program. The principal investigator held several meetings with the heads of the main support service networks in order to present the objectives of the project and explain how the intervention would be tested.

The clients of the 28 selected occupational centers were assessed twice: before the implementation of the intervention (pre-test) and 2 weeks after finishing the program (post-test). As for the assessment procedure, two members of the research team with extensive experience in the assessment and treatment of PIFD carried out the data collection. Each participant was assessed individually in a private and quiet room of the support service. Only the participant and one of the evaluators were present while completing the assessment and evaluators kept their distance from participants in order to respect their privacy and create a comfortable environment. Participants were given a brief explanation about how to complete the assessments and, if needed, support was provided to them while they completed them (e.g., explaining the meaning of a word). The two professionals from each center also received copies of the questionnaire that were to be filled in about each participant, and they were given a couple of weeks to complete them (adjusting to their workload), during which they could contact the principal investigator if they had any concerns.

We received all of the participants’ clinical records from the support services, which included information on their level of autonomy. Professionals in these centers determine the levels of autonomy through standardized tests, and the level of functional impairment in conceptual, social, and practical domains based on the criteria proposed by the DSM-5. We also consulted participants’ educational supervisors in order to assess their reading skills.

Between administration of the pre-test and post-test, the 254 participants received the SALUDIVERSEX program about affective-sexual education (Gil-Llario et al., 2019), in groups of no more than 10 people. The affective-sexual education program consists of 16, 2-h sessions (once a week) and focuses on analyzing sexuality as something much broader than genitality; the importance of communication in all its components (verbal, nonverbal, and paraverbal) to initiate, maintain, and terminate relationships; the importance of hygiene and other self-care measures; self-awareness and tolerance towards sexual orientations

that are different from one's own; self-regulation and affective-sexual manifestations according to the degree of trust with the person, the occasion, and the appropriateness of the place for sexual relations, as they are intimate practices that cannot be performed in public places; self-protection measures against sexual abuse, i.e., the ability to identify risk indicators and defense mechanisms.

The intervention was implemented by caretakers from the support services. Before the program was carried out, these caretakers received extensive instruction on how to run the program and were provided all required materials. The sessions were held in large spaces, set up with tables and chairs in order to provide a workspace for participants, as well as another open area where role-playing could take place. Privacy was ensured so that participants could express themselves freely without the fear of being overheard by people outside the group. Prior to the start of the program, all participants agreed to maintain confidentiality of what was said by their peers during the sessions. Each session began with a set of "pre-questions" which focused on participants' previous knowledge. These "pre-questions" were followed by the development section, which included activities and explanations. These were adapted to the autonomy and abilities of each participant, as well as to the content. For example, in the session on learning the rules of hygiene, one of the activities consist of a story with mistakes that the participants have to locate, while in the session on how to initiate relationships, the main activity is role-playing. Finally, at the end of each session, a summary sheet was presented with the main takeaways from the session. This summary sheet was presented again at the beginning of the next session and periodically throughout the program in order to help participants consolidate what they had learned. Readers can find a more detailed description of the SALUDIVERSEX program at Gil-Llario et al. (2019).

All participants filled out an informed consent form and were informed about the confidentiality of their answers and the purpose for which the data were to be used. The study complied with the ethical principles of the Declaration of Helsinki and was approved by the Experimental Research Ethics Committee of the University of Valencia. We report how we determined our sample size, all manipulations, and all measures in the study.

## Statistical Analyses

### Descriptive Analysis

We presented a description of the sample at pretest with means and SDs for numerical variables, and percentages for categorical variables.

### Efficacy of the Intervention as a Function of Participants' Personal Characteristics

Several multilevel models were run to assess the efficacy of the intervention as a function of different characteristics of the participants. The significance of the efficacy was examined by controlling for participants who belonged to the same center by using multilevel models controlling for pretest differences and cluster dependence. The goodness of fit of the models were investigated using a number of goodness-of-fit indices, i.e., Akaike's information criterion (AIC), Schwarz's Bayesian criterion (BIC), and  $-2$  restricted log likelihood. Data were analyzed using the SPSS version 25.0 statistical package.

Materials and analysis code for this study are available by emailing the corresponding author.

## Results

The effectiveness of the SALUDIVERSEX program, taking into account the different personal characteristics of the participants, was evaluated by analyzing the amount of knowledge about sexuality that they reported, and the sexual behaviors and concerns reported both by the participants themselves and by the caretakers after the implementation of the program (always controlling for the pretest).

### Effectiveness of the SALUDIVERSEX Program as a Function of Participants' Gender

Regarding the participants' knowledge about sexuality after participating in the program, the analyses of the multilevel model (see Table 1) show that there do not seem to be statistically significant differences according to the gender of the participants in any of the dimensions evaluated, with the exception of knowledge about sexual practices. In this dimension, men seem to have a greater range of increase in their knowledge ( $\beta_{10} = 0.65 \pm 0.22$ ,  $p = 0.004$ ). In other areas of sexuality, although the differences are not statistically significant between each gender, women show a slightly greater range of improvement in their knowledge about body image and sexual communication than men (*Body image and sexual communication*:  $\beta_{10} = -0.11 \pm 0.16$ ,  $p = 0.49$ ). On the other hand, men show a slightly greater increase in their knowledge of the concept of sexuality, sexual health, and sexuality in general after the intervention compared to women (*Concept of sexuality*:  $\beta_{10} = 0.2 \pm 0.15$ ,  $p = 0.183$ ; *Sexual health*:  $\beta_{10} = 0.04 \pm 0.17$ ,  $p = 0.83$ ; *Total scale*:  $\beta_{10} = 1.29 \pm 0.68$ ,  $p = 0.06$ ). Regarding knowledge about homosexuality and affective interactions, the differences are almost nonexistent (*Homosexuality*:  $\beta_{10} = -0.01 \pm 0.1$ ,  $p = 0.94$ ; *Dating, intimacy, and assertiveness*:  $\beta_{10} = -0.005 \pm 0.23$ ,  $p = 0.98$ ).

**Table 1** Gender differences in clients' acquired knowledge of sexuality

Model	Concept of sexuality		Body image and sexual communication		Sexual practices		Homosexuality		Dating, intimacy, and sexual assertiveness		Sexual health		Total scale_Sexual knowledge	
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p
<i>Fixed-effects</i>														
$\beta_{00}$ (intercept)	2.47 (0.21)	0.000	3.38 (0.23)	0.000	3.65 (0.34)	0.000	1.95 (0.16)	0.000	4.51 (0.36)	0.000	2.85 (0.25)	0.000	12.88 (1.71)	0.000
$\beta_{10}$ (gender) <sup>b</sup>	0.20 (0.15)	0.183	-0.11 (0.16)	0.489	0.65 (0.22)	0.004	-0.01 (0.10)	0.941	-0.005 (0.23)	0.984	0.04 (0.17)	0.828	1.29 (0.68)	0.058
$\beta_{20}$ (pretest) <sup>a</sup>	0.12 (0.06)	0.038	0.18 (0.06)	0.004	0.30 (0.06)	0.000	0.25 (0.06)	0.000	0.33 (0.06)	0.000	0.37 (0.05)	0.000	0.55 (0.07)	0.000
<i>Random-effects</i>														
$\tau_{00}$ (intercept)	0.45 (0.17)	0.009	0.19 (0.10)	0.054	0.32 (0.18)	0.083	0.04 (0.03)	0.197	0.32 (0.19)	0.094	0.05 (0.08)	0.512	5.32 (2.48)	0.032
$\rho_{\text{logit}}$	0.93 (0.11)	0.000	1.25 (0.13)	0.000	2.39 (0.25)	0.000	0.43 (0.05)	0.000	2.60 (0.27)	0.000	1.32 (0.15)	0.000	16.22 (2.02)	0.000
<i>Fit indexes</i>														
AIC	542.73		654.19		790.06		417.43		829.89		626.85		906.50	
BIC	549.08		660.80		796.69		423.97		836.57		633.38		912.56	
LogLik	538.73		650.19		786.06		413.43		825.89		622.85		902.50	

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of knowledge of sexuality

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the male subgroup. Gender (male = 1, female = 2)

In terms of their sexual behaviors, the multilevel model analyses (see Table 2) report that men appear to have decreased their sexual responsiveness over a wider range after the intervention compared to women, with this difference being statistically significant (*Sexual response*:  $\beta_{10} = 0.34 \pm 0.15$ ,  $p = 0.027$ ). Regarding the other self-reported aspects, although these differences are not significant, women show a slightly greater increase in sexual practices and condom use than men (*Sex practices*:  $\beta_{10} = -0.05 \pm 0.17$ ,  $p = 0.78$ ; *Condom use*:  $\beta_{10} = -0.19 \pm 0.5$ ,  $p = 0.7$ ), and also their concerns (*Worry*:  $\beta_{10} = -0.23 \pm 0.15$ ,  $p = 0.12$ ).

When this information is compared to that provided by the professionals, we find that both genders seem to have a similar increase in sexual knowledge after the intervention, as the multilevel model does not report statistically significant differences (see Table 2). However, the professionals find that men show a slight increase in their knowledge about sexuality after the intervention (*KNOW-SEX*:  $\beta_{10} = 0.16 \pm 0.16$ ,  $p = 0.302$ ) while women show an increase in knowledge about social norms and intimacy (*PRIV-NOR*:  $\beta_{10} = -0.04 \pm 0.05$ ,  $p = 0.434$ ), these differences being non-significant. Similarly, in regard to the participants' concerns about their sexuality, male participants show a greater reduction in their concerns after the intervention compared to women, with these differences being non-significant (*BEH-UNINHIB*:  $\beta_{10} = 0.01 \pm 0.05$ ,  $p = 0.78$ ; *CONCERN*:  $\beta_{10} = 0.02 \pm 0.12$ ,  $p = 0.88$ ).

### Effectiveness of the SALUDIVERSEX Program According to the Age of Participants

The results of the multilevel model show that there are no statistically significant differences in the effectiveness of the program according to the age of the participants (see Table 3), with the exception of knowledge about homosexuality. In this area, younger participants have shown a larger increase in their knowledge after the intervention compared to older participants, these differences being statistically significant (*Homosexuality*:  $\beta_{10} = -0.01 \pm 0.005$ ,  $p = 0.015$ ). In the rest of the dimensions, although the differences are not significant, younger participants show a slightly greater increase in their knowledge about sexual practices than older participants (*Sexual practices*:  $\beta_{10} = -0.01 \pm 0.01$ ,  $p = 0.383$ ). However, the latter improve slightly more than younger participants in their knowledge about the concept of sexuality, sexual health, and sexuality in general, these differences being non-significant (*Concept of sexuality*:  $\beta_{10} = 0.01 \pm 0.01$ ,  $p = 0.122$ ; *Sexual health*:  $\beta_{10} = 0.005 \pm 0.01$ ,  $p = 0.561$ ; *Total scale*:  $\beta_{10} = 0.33 \pm 0.04$ ,  $p = 0.36$ ). With respect to knowledge about body image, sexual communication, and affective interactions, the differences are almost nonexistent (*Body image and sexual*

*communication*:  $\beta_{10} = 0.0003 \pm 0.01$ ,  $p = 0.974$ ; *Dating, intimacy, and sexual assertiveness*:  $\beta_{10} = 0.001 \pm 0.11$ ,  $p = 0.926$ ).

Regarding the information reported by participants on changes in their sexual behaviors and concerns after participating in the program, the results of the multilevel model do not show statistically significant differences according to age (see Table 4). However, older participants show a slightly greater range of improvement in their sexual response but increase in their concerns about their sexuality than younger participants (*Sexual response*:  $\beta_{10} = 0.01 \pm 0.01$ ,  $p = 0.111$ ; *Worry*:  $\beta_{10} = 0.01 \pm 0.01$ ,  $p = 0.144$ ), while their range of increase is slightly lower than that of the latter with respect to sexual practices experienced (*Sex practices*:  $\beta_{10} = -0.01 \pm 0.01$ ,  $p = 0.08$ ). Regarding condom use, the differences are almost nonexistent (*Condom use*:  $\beta_{10} = 0.0001 \pm 0.02$ ,  $p = 0.997$ ).

These results align with the information provided by the professionals (see Table 4), as the multilevel model only identifies statistically significant differences in the concerns about clients' inappropriate sexual behaviors, being in favor of older participants (*BEH-UNINHIB*:  $\beta_{10} = 0.01 \pm 0.002$ ,  $p = 0.044$ ). Regarding the other dimensions, although not statistically significant, the oldest show a slightly greater increase in their concerns about the risk of misconceptions or experiencing loneliness and/or sexual abuse, and their knowledge about social norms and intimacy (*PRIV-NOR*:  $\beta_{10} = 0.0003 \pm 0.002$ ,  $p = 0.883$ ; *CONCERN*:  $\beta_{10} = 0.001 \pm 0.01$ ,  $p = 0.9$ ), while the youngest appear to have a slight increase in their knowledge about sexuality in general (*KNOW-SEX*:  $\beta_{10} = -0.01 \pm 0.01$ ,  $p = 0.309$ ).

### Effectiveness of the SALUDIVERSEX Program According to the Participants' Level of Autonomy

The results of the multilevel model (see Table 5) reported that the more autonomous participants increased their knowledge about sexuality in general (total scale) and about the concept of sexuality to a greater extent after the intervention compared to less autonomous ones, with this difference being statistically significant (*Total scale*:  $\beta_{10} = 1.49 \pm 0.73$ ,  $p = 0.043$ ; *Concept of sexuality*:  $\beta_{10} = 0.47 \pm 0.16$ ,  $p = 0.003$ ). Also, marginally significantly, the more autonomous participants also showed a greater increase in their knowledge of homosexuality and sexual health after the intervention than less autonomous participants (*Homosexuality*:  $\beta_{10} = 0.18 \pm 0.98$ ,  $p = 0.064$ ; *Sexual health*:  $\beta_{10} = 0.31 \pm 0.17$ ,  $p = 0.067$ ). Regarding knowledge about body image and sexual communication, although not statistically significant, more autonomous participants showed a slightly greater increase in their knowledge than less autonomous participants (*Body image and sexual communication*:  $\beta_{10} = 0.91 \pm 0.17$ ,  $p = 0.592$ ). However, with respect to the

**Table 2** Client gender differences in self-reported information on sexual behaviors and concerns, and information on sexual knowledge and concerns reported by professionals

Dependent variables	Reported by clients (PIFD)						Reported by professionals									
	Sexual response		Worry		Sex practices		Condom use		BEH-UNINHIB		PRIV-NOR		KNOW-SEX		CONCERN	
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p
<i>Fixed-effects</i>																
$\beta_{00}$ (intercept)	0.58 (0.14)	0.000	1.19 (0.17)	0.000	0.81 (0.16)	0.000	4.43 (0.49)	0.000	0.001 (0.05)	0.977	3.16 (0.17)	0.000	3.95 (0.29)	0.000	-0.31 (0.21)	0.158
$\beta_{10}$ (gender) <sup>b</sup>	0.34 (0.15)	0.027	-0.23 (0.15)	0.121	-0.05 (0.17)	0.78	-0.19 (0.50)	0.7	0.01 (0.05)	0.789	-0.04 (0.05)	0.434	0.16 (0.16)	0.302	0.02 (0.12)	0.888
$\beta_{20}$ (pretest) <sup>a</sup>	0.36 (0.07)	0.000	0.26 (0.08)	0.001	0.66 (0.06)	0.000	0.46 (0.07)	0.000	0.71 (0.03)	0.000	0.38 (0.03)	0.000	0.58 (0.04)	0.000	0.58 (0.06)	0.000
<i>Random-effects</i>																
$\tau_{00}$ (intercept)	0.07 (0.06)	0.234	0.23 (0.11)	0.038	0.08 (0.07)	0.254	0.34 (0.57)	0.554	0.01 (0.01)	0.131	0.05 (0.02)	0.012	0.45 (0.19)	0.021	0.40 (0.15)	0.007
$\rho_{\text{logit}}$	0.93 (0.10)	0.000	0.93 (0.10)	0.000	1.11 (0.13)	0.000	10.20 (1.19)	0.000	0.12 (0.01)	0.000	0.09 (0.01)	0.000	1.04 (0.12)	0.000	0.59 (0.07)	0.000
<i>Fit indexes</i>																
AIC	520.11		538.6		504.18		902.71		158.92		124.59		570.89		471.30	
BIC	526.47		544.99		510.36		908.98		165.32		130.98		577.29		477.69	
LogLik	516.11		534.6		500.18		898.71		154.92		120.59		566.89		467.30	

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of sexual behaviors and concerns reported by clients, and factors of sexual knowledge and concerns reported by professionals

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the male subgroup. Gender (male = 1, female = 2)



**Table 3** Differences according to the age of the clients' acquired knowledge of sexuality

Model	Concept of sexuality		Body image and sexual communication		Sexual practices		Homosexuality		Dating, intimacy, and sexual assertiveness		Sexual health		Total scale_Sexual knowledge	
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p
<i>Fixed-effects</i>														
$\beta_{00}$ (intercept)	2.07 (0.36)	0.000	3.31 (0.37)	0.000	4.30 (0.54)	0.000	2.39 (0.25)	0.000	4.38 (0.55)	0.000	2.70 (0.38)	0.000	11.87 (2.2)	0.000
$\beta_{10}$ (age) <sup>b</sup>	0.01 (0.01)	0.122	-0.0003 (0.01)	0.974	-0.01 (0.01)	0.383	-0.01 (0.005)	0.015	0.001 (0.11)	0.926	0.005 (0.01)	0.561	0.33 (0.04)	0.36
$\beta_{20}$ (pretest) <sup>a</sup>	0.13 (0.06)	0.029	0.18 (0.06)	0.004	0.30 (0.07)	0.000	0.24 (0.06)	0.000	0.34 (0.06)	0.000	0.36 (0.05)	0.000	0.57 (0.07)	0.000
<i>Random-effects</i>														
$\tau_{00}$ (intercept)	0.38 (0.15)	0.015	1.28 (0.14)	0.057	0.22 (0.16)	0.169	0.03 (0.03)	0.272	0.26 (0.17)	0.128	0.00 (0.00)	0.000	3.30 (1.86)	0.075
$\rho_{\text{logit}}$	0.97 (0.11)	0.000	1.28 (0.14)	0.000	2.55 (0.27)	0.000	0.43 (0.05)	0.000	2.64 (0.28)	0.000	1.31 (0.14)	0.000	16.81 (2.11)	0.000
<i>Fit indexes</i>														
AIC	536.30		648.35		785.06		409.60		816.98		610.37		881.96	
BIC	542.59		654.91		791.64		416.09		823.61		616.84		887.96	
LogLik	532.30		644.35		781.06		405.60		812.98		606.37		877.96	

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of knowledge of sexuality

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the older participants. Numerical variable by years

**Table 4** Differences by client age in self-reported information on sexual behaviors and concerns, and information on sexual knowledge and concerns reported by professionals

Dependent variables	Reported by clients (PIFD)						Reported by professionals									
	Sexual response		Worry		Sex practices		Condom use		BEH-UNINHIB		PRIV-NOR		KNOW-SEX		CONCERN	
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p
<i>Fixed-effects</i>																
$\beta_{00}$ (intercept)	0.27 (0.29)	0.353	0.65 (0.32)	0.047	1.31 (0.33)	0.000	4.34 (0.96)	0.000	-0.18 (0.1)	0.077	3.12 (0.18)	0.000	4.28 (0.38)	0.000	-0.32 (0.31)	0.298
$\beta_{10}$ (age) <sup>b</sup>	0.01 (0.01)	0.111	0.01 (0.01)	0.144	-0.01 (0.01)	0.080	0.0001 (0.02)	0.997	0.01 (0.002)	0.044	0.0003 (0.002)	0.883	-0.01 (0.01)	0.309	0.001 (0.01)	0.900
$\beta_{20}$ (pretest) <sup>a</sup>	0.40 (0.07)	0.000	0.27 (0.08)	0.000	0.67 (0.06)	0.000	0.45 (0.06)	0.000	0.72 (0.03)	0.000	0.38 (0.03)	0.000	0.59 (0.04)	0.000	0.58 (0.6)	0.000
<i>Random-effects</i>																
$\tau_{00}$ (intercept)	0.07 (0.06)	0.260	0.24 (0.11)	0.037	0.09 (0.07)	0.22	0.33 (0.57)	0.563	0.02 (0.01)	0.126	0.05 (0.02)	0.013	0.47 (0.20)	0.019	0.40 (0.15)	0.007
$\rho_{\text{logit}}$	0.94 (0.11)	0.000	0.93 (0.10)	0.000	1.08 (0.13)	0.000	10.21 (1.191)	0.000	0.11 (0.01)	0.000	0.09 (0.01)	0.000	1.03 (0.12)	0.000	0.59 (0.07)	0.000
<i>Fit indexes</i>																
AIC	528.58		554.85		507.22		908.98		161		131.17		576.91		477.29	
BIC	534.94		551.23		513.40		915.25		167.40		137.56		583.31		483.68	
LogLik	524.58		540.85		503.22		904.98		157		127.17		572.91		473.29	

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of sexual behaviors and concerns reported by clients, and factors of sexual knowledge and concerns reported by professionals

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the older participants. Numerical variable by years

**Table 5** Differences according to the level of autonomy of clients with respect to knowledge acquired about sexuality

Model	Concept of sexuality		Body image and sexual communication		Sexual practices		Homosexuality		Dating, intimacy, and sexual assertiveness		Sexual health		Total scale_Sexual knowledge	
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p
<i>Fixed-effects</i>														
$\beta_{00}$ (intercept)	2.45 (0.20)	0.000	3.30 (0.22)	0.000	3.99 (0.34)	0.000	1.86 (0.16)	0.000	4.53 (0.35)	0.000	2.79 (0.23)	0.000	14.28 (1.62)	0.000
$\beta_{10}$ (level of autonomy) <sup>b</sup>	0.47 (0.16)	0.003	0.91 (0.17)	0.592	0.002 (0.23)	0.993	0.18 (0.98)	0.064	-0.03 (0.24)	0.913	0.31 (0.17)	0.067	1.49 (0.73)	0.043
$\beta_{20}$ (pretest) <sup>a</sup>	0.97 (0.58)	0.1	0.18 (0.62)	0.005	0.30 (0.07)	0.000	0.25 (0.06)	0.000	0.33 (0.06)	0.000	0.36 (0.05)	0.000	0.50 (0.07)	0.000
<i>Random-effects</i>														
$\tau_{00}$ (intercept)	0.46 (0.10)	0.000	0.20 (0.10)	0.050	0.26 (0.17)	0.131	0.05 (0.03)	0.150	0.30 (0.28)	0.000	0.05 (0.07)	0.519	4.59 (2.25)	0.041
$\rho_{\logit}$	0.90 (0.17)	0.008	1.25 (0.13)	0.000	2.52 (0.27)	0.000	0.42 (0.05)	0.000	2.65 (0.19)	0.105	1.30 (0.14)	0.000	16.55 (2.05)	0.000
<i>Fit indexes</i>														
AIC	542.30		657.59		805.43		421.00		840.79		629.75		912.81	
BIC	548.68		664.20		812.08		427.55		847.50		636.30		918.88	
LogLik	538.30		653.59		801.43		417.00		836.79		625.75		908.81	

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of knowledge of sexuality

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the most autonomous subgroup. Level of autonomy (high = 1, low = 2)

remaining dimensions (sexual practices and affective interactions), the differences are almost nonexistent (*Sexual practices*:  $\beta_{10} = 0.002 \pm 0.23$ ,  $p = 0.993$ ; *Dating, intimacy, and sexual assertiveness*:  $\beta_{10} = -0.03 \pm 0.24$ ,  $p = 0.913$ ).

There does not appear to be statistically significant differences between participants with greater and those with less autonomy with respect to changes in their sexual behavior and self-reported concerns after the intervention (see Table 6). However, the more autonomous participants improved slightly more than the less autonomous participants in all the dimensions evaluated (*Sex practices*:  $\beta_{10} = 0.06 \pm 0.18$ ,  $p = 0.716$ ; *Condom use*:  $\beta_{10} = 0.36 \pm 0.51$ ,  $p = 0.483$ ), and their concerns also increased after the intervention (*Worry*:  $\beta_{10} = 0.08 \pm 0.16$ ,  $p = 0.616$ ), with the exception of their sexual responses (*Sexual response*:  $\beta_{10} = -0.03 \pm 0.16$ ,  $p = 0.85$ ).

Similarly, the information reported by the professionals regarding the increase in knowledge and decrease in worries confirms the absence of statistically significant differences based on the participants' level of autonomy (see Table 6). However, although the differences are not statistically significant, according to the professionals, in all the areas evaluated the clients with greater autonomy showed greater improvement (*BEH-UNINHIB*:  $\beta_{10} = 0.01 \pm 0.05$ ,  $p = 0.894$ ; *KNOW-SEX*:  $\beta_{10} = 0.03 \pm 0.17$ ,  $p = 0.88$ ; *CONCERN*:  $\beta_{10} = 0.02 \pm 0.13$ ,  $p = 0.891$ ), with the exception of knowledge of social norms and privacy, a factor in which clients with low autonomy improved more (*PRIV-NOR*:  $\beta_{10} = -0.05 \pm 0.05$ ,  $p = 0.286$ ).

### Effectiveness of the SALUDIVERSEX Program as a Function of Whether Participants Have a Partner

The results of the multilevel model found no statistically significant differences between those with and without partners with respect to their increase in knowledge about sexuality after the intervention (see Table 7). Despite this, participants who had a partner during the implementation of the program seem to present a slightly greater increase in their knowledge of sexuality in general and in all the dimensions evaluated (*Concept of sexuality*:  $\beta_{10} = 0.45 \pm 0.26$ ,  $p = 0.09$ ; *Body image and sexual communication*:  $\beta_{10} = 0.28 \pm 0.24$ ,  $p = 0.258$ ; *Sexual practices*:  $\beta_{10} = 0.16 \pm 0.41$ ,  $p = 0.697$ ; *Homosexuality*:  $\beta_{10} = 0.25 \pm 0.13$ ,  $p = 0.055$ ; *Dating, intimacy, and sexual assertiveness*:  $\beta_{10} = 0.10 \pm 0.42$ ,  $p = 0.807$ ; *Sexual health*:  $\beta_{10} = 0.13 \pm 0.27$ ,  $p = 0.628$ ; *Total scale*:  $\beta_{10} = 0.71 \pm 1.16$ ,  $p = 0.546$ ).

Similar to this, in regard to changes in sexual behaviors and concerns after experiencing the intervention, no statistically significant differences were found between those who did and did not have a partner (see Table 8). However, those who had a partner throughout the course of the program increased their sexual practices and condom use more after

the intervention compared to those who did not have a partner, although these differences were not statistically significant (*Sex practices*:  $\beta_{10} = 0.59 \pm 0.41$ ,  $p = 0.16$ ; *Condom use*:  $\beta_{10} = 0.23 \pm 1.08$ ,  $p = 0.829$ ). Regarding sexual responses and concerns, the differences between those with and without a partner are almost nonexistent (*Sexual response*:  $\beta_{10} = -0.01 \pm 0.3$ ,  $p = 0.981$ ; *Worry*:  $\beta_{10} = -0.02 \pm 0.4$ ,  $p = 0.967$ ).

The information reported by the professionals coincides with the self-reported data, as the multilevel analysis evaluating the knowledge and concerns reported by the professionals does not reflect statistically significant differences between those with and without a partner (see Table 8). However, it seems that they believe that those who had a partner during the implementation of the program showed greater improvement in their knowledge and a decreased in their concerns about their sexuality (*BEH-UNINHIB*:  $\beta_{10} = 0.002 \pm 0.1$ ,  $p = 0.98$ ; *PRIV-NOR*:  $\beta_{10} = 0.03 \pm 0.04$ ,  $p = 0.487$ ; *KNOW-SEX*:  $\beta_{10} = 0.06 \pm 0.29$ ,  $p = 0.843$ ; *CONCERN*:  $\beta_{10} = -0.08 \pm 0.13$ ,  $p = 0.522$ ).

## Discussion

The objective of this study was to analyze which personal variables of the participants might explain differences in the effectiveness of a affective-sexual education program for PIFD.

This information is particularly important, as it provides insight into which personal qualities the program is best suited for. The first variable analyzed was gender. Although there were some differences between genders, contrary to our hypothesis, they did not appear to be statistically significant, which confirms that this program is equally effective for both genders. However, men seemed to have learned comparatively more in aspects related to knowledge of sexual practices and women seemed to learn more about sexual communication and body image. In the opinion of the professionals, although the differences are not statistically significant either, men showed a greater increase in general knowledge and women in social norms and intimacy. These results mirror, to some extent, those found in normative adolescent populations where females are typically more concerned with establishing romantic relationships (Hefner & Wilson, 2013). As a result, they have a stronger appreciation for the program modules that allow them to initiate, maintain, and end relationships in which social norms and the concept of intimacy are relevant. This could explain why they were more engaged in learning the contents and/or skills of these modules. On the other hand, men paid more attention to information relating to sexuality in general, especially in relation to sexual practices. Baines et al. (2018), in their study with youth with ID, also found that males had a better understanding of sexual issues in

**Table 6** Differences according to the level of autonomy of clients in self-reported information on sexual behaviors and concerns and information on sexual knowledge and concerns reported by professionals

Dependent variables	Reported by professionals																				
	Reported by clients (PIFD)			Sex practices			Condom use			BEH-UNINHIB			PRIV-NOR			KNOW-SEX			CONCERN		
	Estimate (SE)	p	Worry	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p		
<i>Fixed-effects</i>																					
$\beta_{00}$ (intercept)	0.71 (0.14)	0.000	1.03 (0.17)	0.000	0.76 (0.15)	0.000	4.21 (0.48)	0.000	0.01 (0.04)	0.897	3.14 (0.17)	0.000	4.01 (0.28)	0.000	-0.30 (0.21)	0.151					
$\beta_{10}$ (level of autonomy) <sup>b</sup>	-0.03 (0.16)	0.850	0.08 (0.16)	0.616	0.06 (0.18)	0.716	0.36 (0.51)	0.483	0.01 (0.05)	0.894	-0.05 (0.05)	0.286	0.03 (0.17)	0.880	0.02 (0.13)	0.891					
$\beta_{20}$ (pretest) <sup>a</sup>	0.41 (0.07)	0.000	0.27 (0.08)	0.001	0.66 (0.06)	0.000	0.45 (0.06)	0.000	0.71 (0.03)	0.000	0.38 (0.03)	0.000	0.59 (0.04)	0.000	0.58 (0.06)	0.000					
<i>Random-effects</i>																					
$\tau_{00}$ (intercept)	0.08 (0.07)	0.211	0.23 (0.11)	0.040	0.09 (0.07)	0.247	0.23 (0.56)	0.676	0.01 (0.01)	0.132	0.05 (0.02)	0.011	0.46 (0.20)	0.021	0.41 (0.15)	0.007					
$\rho_{\text{logit}}$	0.95 (0.11)	0.000	0.94 (0.11)	0.000	1.11 (0.13)	0.000	10.26 (1.20)	0.000	0.12 (0.01)	0.000	0.09 (0.01)	0.000	1.04 (0.12)	0.000	0.59 (0.07)	0.000					
<i>Fit indexes</i>																					
AIC	524.93		540.64		504.02		902.36		158.90		123.96		571.82		471.19						
BIC	531.30		547.02		510.20		908.63		163.30		130.35		578.22		477.58						
LogLik	520.93		536.64		500.02		898.36		154.90		119.96		567.82		467.19						

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of sexual behaviors and concerns reported by clients, and factors of sexual knowledge and concerns reported by professionals

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the most autonomous subgroup. Level of autonomy (high = 1, low = 2)

**Table 7** Differences according to whether or not clients had a partner with respect to their knowledge of sexuality

Dependent variables	Concept of sexuality		Body image and sexual communication		Sexual practices		Homosexuality		Dating, intimacy, and sexual assertiveness		Sexual health		Total scale_Sexual knowledge	
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p
<i>Fixed-effects</i>														
$\beta_{00}$ (intercept)	2.59 (0.34)	0.000	2.82 (0.39)	0.000	4.43 (0.66)	0.000	2.09 (0.21)	0.000	4.86 (0.59)	0.000	4.30 (0.45)	0.000	15.76 (2.7)	0.000
$\beta_{10}$ (relationship status) <sup>b</sup>	0.45 (0.26)	0.090	0.28 (0.24)	0.258	0.16 (0.41)	0.697	0.25 (0.13)	0.055	0.10 (0.42)	0.807	0.13 (0.27)	0.628	0.71 (1.16)	0.546
$\beta_{20}$ (pretest) <sup>a</sup>	0.06 (0.1)	0.542	0.30 (0.1)	0.003	0.24 (0.13)	0.058	0.21 (0.08)	0.007	0.30 (0.1)	0.003	0.14 (0.07)	0.068	0.47 (0.11)	0.000
<i>Random-effects</i>														
$\tau_{00}$ (intercept)	0.46 (0.31)	0.128	0.25 (0.99)	0.158	0.53 (0.45)	0.239	0.04 (0.04)	0.268	0.69 (0.53)	0.192	0.39 (0.29)	0.184	9.38 (6.03)	0.120
$\rho_{\text{logit}}$	1.02 (0.18)	0.000	0.99 (0.17)	0.000	2.64 (0.46)	0.000	0.27 (0.05)	0.000	2.55 (0.44)	0.000	1.19 (0.21)	0.000	18.81 (3.47)	0.000
<i>Fit indexes</i>														
AIC	236.84		237.36		306.05		133.46		309.34		246.66		417.65	
BIC	241.42		242.00		310.66		138.04		313.98		251.24		422.06	
LogLik	232.84		233.36		302.05		129.46		305.34		242.66		413.65	

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of knowledge of sexuality

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the subgroup that had a partner. Relationship status (had a partner = 1, did not have a partner = 2)

**Table 8** Differences according to whether clients had a partner or not in self-reported information on sexual behaviors and concerns and in information on sexual knowledge and concerns reported by professionals

Dependent variables	Reported by clients (PIFD)																							
	Sexual response			Worry			Sex practices			Condom use			BEH-UNINHIB			PRIV-NOR			KNOW-SEX			CONCERN		
	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p	Estimate (SE)	p		
<i>Fixed-effects</i>																								
$\beta_{00}$ (intercept)	0.88 (0.29)	0.007	1.55 (0.45)	0.005	1.13 (0.37)	0.009	4.40 (1.12)	0.000	0.16 (0.06)	0.782	4.99 (0.08)	0.000	2.66 (0.51)	0.000	0.07 (0.15)	0.655								
$\beta_{10}$ (relationship status) <sup>b</sup>	-0.01 (0.30)	0.981	-0.02 (0.40)	0.967	0.59 (0.41)	0.160	0.23 (1.08)	0.829	0.002 (0.10)	0.980	0.03 (0.04)	0.487	0.06 (0.29)	0.843	-0.08 (0.13)	0.522								
$\beta_{20}$ (pretest) <sup>a</sup>	0.51 (0.13)	0.000	0.24 (0.2)	0.243	0.59 (0.11)	0.000	0.58 (0.13)	0.000	0.29 (0.06)	0.000	-0.005 (0.02)	0.81	0.70 (0.06)	0.000	1.06 (0.05)	0.000								
<i>Random-effects</i>																								
$\tau_{00}$ (intercept)	0.08 (0.12)	0.52	0.37 (0.39)	0.342	0.14 (0.22)	0.540	0.00 (0.00)	0.000	0.00 (0.00)	0.000	0.02 (0.004)	0.901	0.001 (0.08)	0.986	0.06 (0.05)	0.284								
$\rho_{\text{logit}}$	0.86 (0.20)	0.000	1.44 (0.34)	0.000	1.51 (0.35)	0.000	10.54 (2.39)	0.000	0.1 (0.02)	0.000	0.0002 (0.001)	0.000	0.96 (0.2)	0.000	0.18 (0.04)	0.000								
<i>Fit indexes</i>																								
AIC	123.83		146.32		147.09		218.86		40.95		-40.89		155.62		73.92									
BIC	127.21		149.69		150.47		222.18		44.77		-37.07		159.44		77.71									
LogLik	119.83		142.32		143.09		214.86		36.95		-44.89		151.62		69.92									

Note: Multilevel models, individual participants clustered within their center. Dependent variables: Factors of sexual behaviors and concerns reported by clients, and factors of sexual knowledge and concerns reported by professionals

<sup>a</sup>All models are adjusted for pretest

<sup>b</sup>Positive scores greater than 0 means the favoring the subgroup that had a partner. Relationship status (had a partner = 1, did not have a partner = 2)

general than females. This may reflect the greater limitations that women with ID have had in accessing this type of information, because due to their greater vulnerability, they have only been taught the rules of privacy (Pownall et al., 2012).

The second variable analyzed was age. Regarding this characteristic, along the lines of what was hypothesized, there is a bit of bias in terms of previous education, involvement in learning, etc. similar to what find in society between older people whose parents received a more conservative sexual education and younger people who have grown up in a more liberal context (Othman et al., 2020). Thus, we find greater knowledge about homosexuality among young people and also a greater increase in their sexual practices, knowledge of the body, affective interactions, and communication. The older participants show greater knowledge about their sexual response and concerns, but the younger ones show a greater amount of sexual activity. In any case, they do not differ in condom use, which is quite low, as reported in a recent study (Gil-Llario et al., 2022). The systematic use of condoms is not only an unresolved issue for this type of population, but levels of systematic use are also low in the general population (Ballester-Arnal et al., 2022) and in specific populations (i.e., men who have sex with men, Morell-Mengual et al., 2021; or male sex workers, Ruiz-Palomino et al., 2010).

The professionals who work with older clients show higher levels of concern relating to the misconceptions they may have and the inappropriate sexual behaviors they may exhibit. This indicates that professionals may believe it is more difficult for this subgroup to achieve such significant changes, such as improving their ability to establish relationships or learning socially accepted patterns of sexual expression, because of their long-established pattern of behavior. Similarly, in their study with older people from the general population, Fileborn et al. (2017) found that many of the participants had limited sex education and had received negative messages on this topic, which led them to internalize the stigma around sex and feel uncomfortable with certain issues. These experiences could also apply to the PIFD. In contrast, younger people who have greater plasticity can benefit more in this sense, since in addition to having more learning opportunities, their motivation towards romantic and sexual behaviors is also greater (Suleiman et al., 2017).

The third variable analyzed was the degree of autonomy. The results indicate a clear pattern consistent with the hypothesized, with the most autonomous participants showing a significantly greater improvement in their knowledge of sexuality in general (total score) and in the concept of sexuality than the least autonomous participants. They also show greater improvement in their knowledge of homosexuality, sexual health, social communication, and body image, although in these cases the differences are not statistically significant and thus remain at a marginal point. These results

suggest that degree of autonomy is a key feature influencing the effectiveness of the program (Löfgren-Mårtenson & Ouis, 2019). There appear to be no differences in terms of concerns, but those with a higher degree of autonomy show greater improvement in all other dimensions. It seems that the concern of not fitting in and not having a partner with whom to share emotions and experiences is not diminished by being more or less independent. In fact, the course can provide tools that, for various reasons, some may be able to use more than others. However, only with the opportunity to apply these skills and knowledge will these fears be reduced (Emond Pelletier & Joussemet, 2017).

Professionals corroborate this relationship between higher learning and greater autonomy, with the exception of knowledge about social norms and privacy, where those with less autonomy appear to improve more. It seems that the most obvious interpretation of this last result is that they probably started from a lower level (hence their low autonomy), and, therefore, the most autonomous individuals, who were already at high levels, did not experience substantial changes. Also, according to some research (Björnsdóttir et al., 2017; Gil-Llario et al., 2018; Verdugo et al., 2002), PIFD who have less autonomy are more vulnerable to sexual abuse, and their parents and professionals who work with them are not only more concerned about this, but also about their possible inappropriate sexual manifestations, which may have led them to place more emphasis on these concepts.

Finally, we analyzed the extent to which having a partner during the course may have influenced the effectiveness of the program. Those who have a partner improved more in all the dimensions evaluated, as we hypothesized, although this improvement was not statistically significant in all items assessed. However, the increase in knowledge about sexual practices and condom use in this subgroup is noteworthy, and these results were replicated by the professionals as well.

It is evident that we learn the most effectively when we are able to observe what we are being taught in our own reality and when we can practice hands-on what we have learned (Brkić-Jovanović et al., 2021; Rushbrooke et al., 2014). Since the current program provides PIFD the opportunity to learn in this way, we anticipate that it will be very effective in educating them on sexuality.

Thus, in this particularly large group of PIFD from almost 30 occupational centers, who have received training about affectivity and sexuality specifically designed for them and implemented by professionals, we have verified that the only differences in terms of gender (greater interest in learning how to communicate and defend their privacy for women versus greater interest in learning more about sexuality in general for men) are probably due to the social influence that they have experienced throughout their lives, as they show a similar pattern similar to that



found in society in general. In terms of age, degree of autonomy, and relationship status, regardless of whether we evaluate the improvement indicators of the participants themselves or those provided by the professionals, it appears that those who are younger, more autonomous, and have a partner benefit most from the SALUDIVERSEX affective-sexual education program, although the results in many cases are not statistically significant. Therefore, this program is presented as a powerful tool for the affective-sexual education of young adults with ID, who have high levels of autonomy and attend occupational centers either from their residence or family units.

Finally, this study focused on the analysis of the influence of some participant variables on the effectiveness of the intervention. However, we have not addressed those characteristics related to the professionals who teach it and to the program's implementation methodology, which is a limitation of our study. Therefore, future research is encouraged to also take these important variables into account and explore their influence on the program effectiveness.

## Policy Implications

The novelty of this study lies in the importance it gives to the personal characteristics of the participants when concluding whether an affective-sex education program is effective. It is rarely tested whether the effectiveness of interventions aimed at improving the sexual health of individuals varies according to their personal characteristics, much less when we are talking about such a neglected group as the one we are dealing with here. This can be really important because the needs required to experience a healthy sexual development can be very different depending on the individual's age, gender, level of autonomy, etc., and if we do not take this into account, we may be making interventions that do not provide the expected results. Thus, the present study makes an important contribution to science, as it helps to ensure that successful replicability of the intervention being tested can be achieved, while also providing information on the aspects that may be more difficult to learn depending on the different characteristics of the sample. Likewise, this study also echoes the heterogeneity that characterizes this group and the importance of attending to it.

On the other hand, we cannot underestimate the contribution made by this study in highlighting not only the need for effective educational proposals on affectivity and sexuality aimed at this group, but also the importance and effectiveness of including them as an essential part of public policy plans and that the professionals who work with them receive the necessary training to ensure the success of such programs.

**Acknowledgements** The authors would like to thank the Agencia Estatal de Investigación (AEI), Ministerio de Ciencia e Innovación (MCIN) and Fondos de la Unión Europea (ERDF) for the financial support granted to this research activity, as well as all study participants and the support service networks for people with intellectual disability that collaborated, for their strong involvement in this project. Also to Mikaela Puzzo for her invaluable collaboration.

**Author Contribution** María Dolores Gil-Llario: conceptualization, funding acquisition, investigation, methodology, project administration, resources, supervision, writing—original draft, writing—review and editing. Rafael Ballester-Arnal: conceptualization, funding acquisition, supervision, project administration, writing—original draft. Olga Fernández-García: formal analysis, investigation, data curation, visualization, writing—original draft, writing—review and editing. Tania B. Huedo-Medina: formal analysis, investigation, visualization. Juan Enrique Nebot-García: data curation, investigation, validation.

**Funding** Open Access funding provided thanks to the CRUE-CSIC agreement with Springer Nature. This work is part of the R + D + i project RTI2018-095538-B-I00, funded by MCIN/AEI/10.13039/501100011033 and by “ERDF A way of making Europe.”

**Data, Materials, and Code Availability** Materials and analysis code for this study are available by emailing the corresponding author.

## Declarations

**Ethics Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Human Research Ethics Committee of the Experimental Research Ethics Committee of the University of Valencia.

**Consent to Participate** Informed consent was obtained from all individual participants included in the study and their legal guardians.

**Consent for Publication** Participants signed informed consent regarding publishing their data.

**Competing Interests** The authors declare no competing interests.

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