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ORIGINAL PAPER

Effectiveness of a Universal Web-based Parenting Program to Promote Positive Parenting: Patterns and Predictors on Program Satisfaction

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Abstract
There is a need for effective and accessible web-based intervention strategy to promote positive parenting at a population level. We tested the effectiveness of the "Educar en Positivo" ("The Positive Parent") program by the self-assignment of 148 Spanish-speaking parents to the modules (program group) and 164 parents to multimedia complementary material (visitor group). Both groups were automatically monitored for their daily parenting mood and online parental support via a standard questionnaire. Overall, the program spontaneously attracted mainly highly educated young mothers with young children. Results of a linear growth modeling showed a sustained progression in the daily mood measures of parental role satisfaction and confidence in parenting capacities in the program group. Pretest-posttest comparison in both groups showed significant improvements in the two types of measures only in the program group. Cluster analyses showed improvements in the daily mood but not in the standard measures of online support in 40% of participants (Clusters 1 and 2) as well as improvements involving a greater coherence across these measures in 60% of participants (Clusters 3 and 4). Participants in Clusters 3 and 4 reported greater satisfaction than participants in Clusters 1 and 2 with the program's usability, content, and parenting impact. These results were modulated by the parents' greater forum participation, use of a diary, and family-related commitments. The existence of asynchronies in the learning process and the relevance of implementation factors have research implications for the evaluation of universal online parenting programs.

Keywords: Internet parenting intervention · Patterns of individual change · Daily parenting mood · Online support · Program implementation · Program satisfaction

Introduction

There is an ongoing need for effective and accessible universal interventions for parents at the population level. A rise has been observed in the number of websites offering parents support to learn more about how to overcome difficulties in the family and better promote healthier child development and family wellbeing (see for reviews, Nielavilén et al. 2014; Nieuwboer et al. 2013a, b; Plantin and Daneback 2009). The use of the Internet for parenting purposes allows parents to obtain information and counseling from experts, but also to exchange experiences with other parents and create virtual communities around certain child-rearing topics, creating a sort of online intimacy (Lomanowska and Guitton 2016; McDaniel, Coyne, & Holmes, 2012).

According to professionals, web-based support compares favorably with face-to-face support, since it offers abundant means through which parents can increase their self-efficacy and autonomous decision making with regard to family issues, provides opportunities for parents to receive and give social support anonymously despite geographical distance or time constraints, and empowers a large group of parents using universal and indicated prevention programs with a low amount of professional involvement (Amichai-Hamburger et al. 2008; Ritterband et al. 2009; Sanders et al.

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2014). Web-based delivery methods are also feasible (a notion that involves accessibility, engagement and impact) and may increase the reach of and participation in parent training programs (Breitenstein and Gross 2013). In turn, parents–including the parents of highly problematic children–have been found to prefer media-based approaches to delivering parenting information (i.e., self-administered video formats) over more intensive home visits, therapists, and multi-week parenting group approaches (Metzler, Sanders, Rusby, & Crowley, 2012). Participants usually report high satisfaction with the online services, at equal or better rates than those reported in the face-to-face parent education literature (Russell et al. 2016).

Web-based support efforts include but are not limited to: (a) information websites where users decide when and how to interact with materials in an unstructured way; (b) structured learning experiences that have guided interactions to achieve learning goals; and (c) opportunities for interactions with experts, instructors, or peers; some combinations among the three categories are also possible (Ebata and Dennis 2011). In particular, web-based training (category b) can be used as a technology that can structure effective step-by-step learning programs tailored to promote individual progress (LaMendola and Krysik 2008). Notably, according to recent systematic reviews, few studies involve universal online parent training interventions that have been evaluated (Dworkin et al. 2013; Niela-Vilén et al. 2014; Nieuwboer et al. 2013a, b). Online programs reviewed in these studies are usually aimed at enhancing parental competencies and offering support and training by means of different online technologies and with a varying degree of professional and peer support. Program outcomes are promising, since parents participating in online support resources tend to experience increasing support, improve their knowledge of child development, and use more positive parenting practices (Nieuwboer et al. 2013a, b). For mothers, who constitute the vast majority of participants, Internet-based peer support has been found to provide emotional support, information, and membership in a social community. For fathers, it provides support for the transition to fatherhood, information, and humorous communication (Niela-Vilén et al. 2014). Participation in discussion boards has also been found to play a role in parents' recognition of their own expertise and knowledge concerning child-rearing issues (Brady and Guerin 2010), helped alleviate parents' feelings of isolation (Chan 2008; Erera and Baum 2009; Fletcher and StGeorge (2011); Valaitis and Sword 2005), and increased their responsibility in their role as a parent (Brady and Guerin 2010; Fletcher and StGeorge (2011); Madge and O'Connor (2006)).

Given the professional and parental acceptance of online resources and the paucity of sound evaluation research, it is important to contribute to a reliable evidence base of online parenting programs, similar to what already exists for face-to-face parent education programs (Ponzetti 2016). The present study tried to progress in this direction by evaluating the effectiveness of the "Educar en Positivo" ("The Positive Parent") program hosted on the website of the same name (http://educarenpositivo.es), together with its related social media profiles (Facebook facebook.com/educarpositivo; Twitter @EducarPositivo). It is a resource authored by experts in family psycho-educational support programs and sponsored by the Spanish Ministry of Economy and Competitiveness (Torres et al. 2015). The target audience is Spanish-speaking parents of children from all age groups. The website has been in place since 2013 and currently has 1590 regular followers from Spanish-speaking countries, but also receives visitors from 114 countries all over the world. The website provides news, parenting information, and play activities to the family, and also offers a structured parenting program with a set of training materials to help parents improve their performance of the parenting task and their relationships with their children.

The objectives of this study were twofold. Firstly, to examine the effectiveness of "The Positive Parent" structured program exploring changes in two types of outcomes: (a) a daily parenting mood called "Emotionometer" based on the ecological momentary assessment (Trull and Ebner-Priemer 2009); and (b) a standard self-assessment of perceived online support based on the Online Parental Support Scale. Secondly, to analyze which implementation factors modulate the impact of the patterns of change in the two outcomes on program satisfaction measured with regard to the program's usability, content, and parenting impact (Hughes et al. 2012; Myers-Walls and Dworkin 2015; Suárez et al. 2016). With respect to the first objective, our hypothesis is that the pattern of change of the daily mood measures and that of the traditional assessment measures would differ, being the first measure more sensitive to the intervention effects than the second one. We also hypothesized that, within the traditional assessment measure, positive changes in the use of online parenting resources would go together with changes in perceived parental self-efficacy, parenting skills, and emotional support. With respect to the second objective, the evaluation of the quality of implementation and its impact on program satisfaction, we hypothesized that parents with better outcomes after completing the program would be more satisfied with the program than parents with poorer outcomes. To analyze the extent to which some implementation factors modulate this impact, we examined a variety of components: the time of day the parent went online (connection time), the time spent online in each connection (connection duration), and the program duration; and the participants' use of the spaces provided in the program for peer interactions and personal reflections: participation in a forum, diary use, and making a

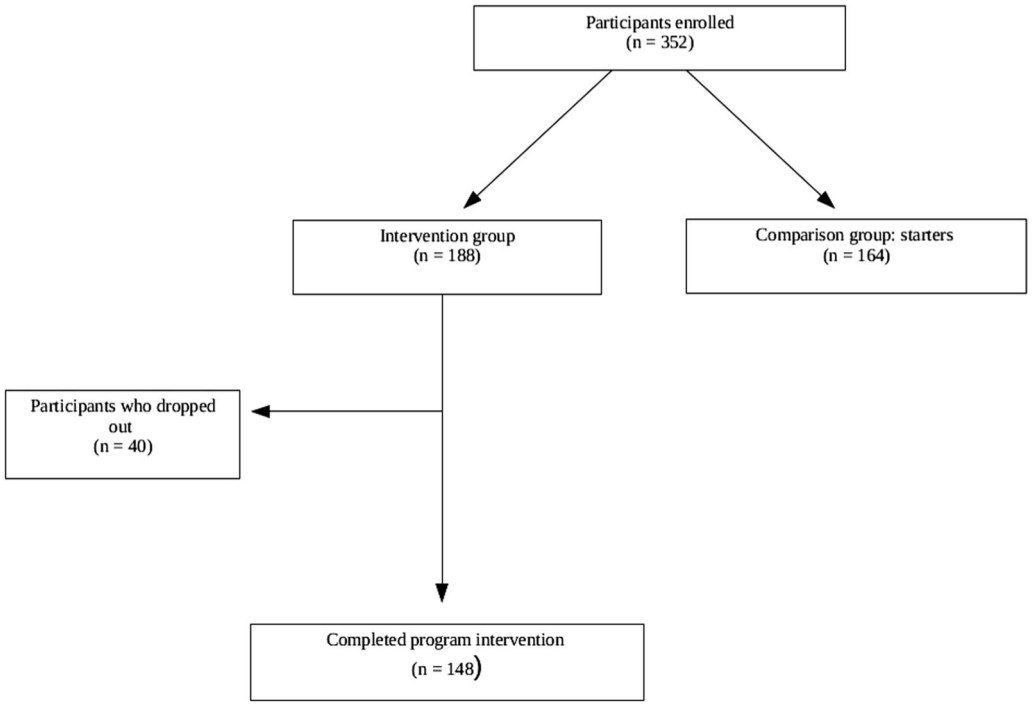

Fig. 1 Flow chart of participants

commitment to transfer the knowledge acquired to real-life situations. In addition to the implementation components, we measured participants' Internet experience and their educational use of web-based resources. Therefore, we hypothesized that the implementation components, as well as the degree of Internet experience and educational use of the Internet, would modulate the impact of the patterns of individual change on program satisfaction.

Method

Participants

The participants in this study were 148 parents (program group), who were self-assigned to the modules of "The Positive Parent" program, and 164 parents (visitor group), who were self-assigned to complementary multimedia material related to the program topics. Data collection took place from 2014 to 2015. The flow of participants through the stages of the study is depicted in Fig. 1. The average dropout rate in the program group was 21.3% and 10.9% in the visitor group Fig. 2.

In the program group, the majority of participants were young mothers with a high educational level and young children (Table 1). All lived in either Spain or a Latin American country (Chile, Colombia, Argentina, Venezuela, México, or Bolivia). The majority of participants had considerable Internet experience and showed an educational use

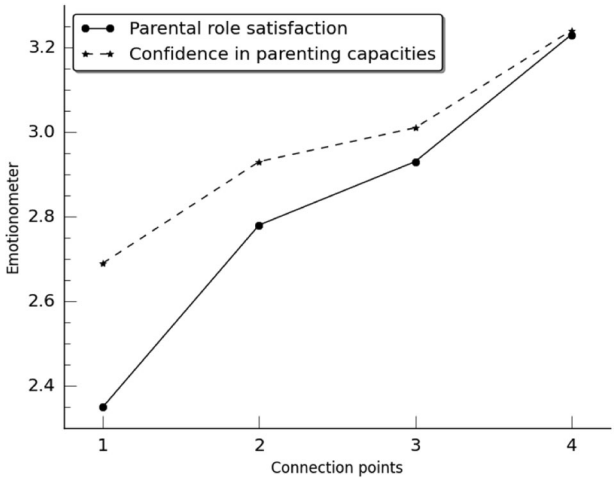

Fig. 2 Linear trajectories of the two emotionometer measures (scale 1–5) across the four connection points in the program group

of the Internet that was above the average. The profile of parents who completed the program did no differ significantly from those who abandon it on any of the measures in Table 1. The profile of the program group did not differ significantly for that of the visitor group who completed the evaluation (see Table 1).

Procedure

Participant recruitment was carried out through the website (http://educarenpositivo.es) where the program is hosted, as

Table 1 Participants' sociodemographic distribution, Internet experience and use by the program and visitor groups

Variables	*M* (SD)/%		χ^2/F
	Program group *n* = 148	Visitor group *n* = 164	
Parental gender—Mothers	85.14	78.10	2.36
Parental age	32.64 (7.9)	34.36 (9.1)	2.89
Educational level			1.20
Secondary/vocational training	13.5	13.1	
University degree	66.2	70.8	
Master/Ph.D.	20.2	15.3	
Employment status—Employed	75.6	71.5	.42
Country of residence			.95
Spain	67.5	62	
Latin America	32.4	37.9	
Age of children	5.22 (4.1)	4.99 (4.8)	.19
Internet experience and use			
Experience	4.19 (.63)	4.31 (.55)	1.99
Educational use	3.35 (1.1)	3.28 (1.2)	.20

well as via the program's social media accounts on Facebook and Twitter; recruitment efforts also drew on announcements and talks aimed at parents' associations at schools. Each of the participants in the program group had completed one self-selected module of the program: 32.43% in Module 1, 17.57% in Module 2, 22.30% in Module 3, 14.86% in Module 4 and 12.84% in Module 5. The visitor group had been presented with complementary material comprising educational videos, podcast of experts in psychology or education that were not part of the modules. However, both groups completed all evaluation instruments except the program Satisfaction Scale, insomuch as this scale show up after completing the last activity that makes up the module. Participant recruitment was carried out through the website (http://educarenpositivo.es) where the program is hosted, as well as via the program's social media accounts on Facebook and Twitter; recruitment efforts also drew on announcements and talks aimed at parents' associations at schools.

The "Educar en Positivo" Positive Parenting Program

To improve the offering of online parenting resources available in Spanish, a website has been created that also offers parents a training platform to promote parental competences in accordance with the Council of Europe's Recommendation 19 (2006) on positive parenting, which provides a modern view of the parenting role focusing on showing affection, supporting learning, sharing quality time, and offering positive reinforcement of tasks and behavior in family life, all known to be protective factors (Daly 2007; Rodrigo et al. 2016; Rodrigo et al. 2016). The program objectives are as follows: (a) to broaden parents' awareness of alternative ways to raise their children and react to everyday situations; (b) to create the need to share knowledge with experts and experiences with other parents using online resources; and (c) to motivate parents to feel more capable and satisfied about their performance of the parenting task.

The program is made up of five Modules, each with four types of activities: Introduction, Observation of other parents' views, Reflection on their own practices and consequences, and Remembering the main lessons learned. The Modules are the following: (1) *The Internet: a resource for the whole family* goes through the pros and cons of family Internet use and encourages parents to reflect on their role as mediators of their children's online activities; (2) *Helping our family get along better* offers parents the tools they need to create shared spaces for communication and foster positive interpretations of family conflicts between parents and their adolescent children; (3) *Understanding and guiding my young child's behavior* helps parents of children under the age of six learn to identify their child's needs and respond appropriately and positively to undesired behavior; (4) *Our child is different, let's help him/her grow* teaches parents of children with disabilities to recognize emotional reactions in the family and helps them move toward normalization and social inclusion for their children; and (5) *Healthy eating habits: a challenge for the whole family* helps instill appropriate eating habits and the development of a healthy diet for the whole family.

The website and the program hosted on it are run by a content manager, who is also available to assist visitors to the website and participants in the program, and a technical manager. Program activities and complementary activities are hosted separately on a Moodle platform that can be accessed freely via the website. The instructional design is based on the general guidelines for effective curriculum design, including the creation of clear objectives, refinement of content into units that learners can manage, and learning activities delivered in multimedia and interactive formats that help participants understand the content, observe other parents' views, and reflect on their own lives (Hughes et al. 2012; Mayer 2011; Myers-Walls and Dworkin 2015). A set of new learning materials was produced in a range of formats, including 120 web-based activities, 40 original videoclips, and over 200 illustrations and animated stories. Complementary materials involve 25 educational videos and podcast of experts. In previous studies, user satisfaction with the program activities was high, with the favorites

Table 2 Description of the evaluation design

Time	Variable	Measures	Source
Initial	Profile of participants	Sociodemographic data Internet experience Educational use	Parents Both groups
Initial/final	Daily parenting mood: emotionometer	Parental role satisfaction Confidence in parenting capacities	Parents Both groups
	Online parental support	Use of online educational resources Exchange of advice Parental self-efficancy Parenting skills Emotional support	Parents Both groups
Process	Implementation factors	Connection time Connection duration Program duration Forum participation Diary use Making a commitment	Web platform program group
Final	Program satisfaction	Usability Content Parenting impact	Parents Program group

being those that involved observing other parents' behavior, reflecting on their own views, and remembering the lessons learned, as well as the activities that combined original videos with interactive content (Torres et al. 2014; Torres et al. 2015). The program also offers parents the possibility of joining online discussion forums in each module moderated by the content manager to promote the exchange of experiences. It also includes a personal diary that parents can use throughout the learning process where they can make a commitment to transfer the knowledge acquired to real-life situations. In addition, participants are offered the incentive of receiving a certificate of participation upon completion, and encouraged to remain connected through associated profiles in social media.

Evaluation Design

The evaluation design comprised initial and final measures in both groups, and process measures as well as satisfaction in the program group (Table 2). The program could be freely accessed at any time it was required. Participants logged in to gain free access to the program, and made a choice either to engage in a program module (program group under the instruction of "follow the guidance") or to visit complementary multimedia material (visitor group under the instruction "explore by yourself"), and filled out the initial questionnaire. Participants in the program group chose the module in which they wanted to participate in, whereas participants in the visitor group selected videos or a podcasts from the multimedia complementary offer. Participants in both groups filled out the initial and final questionnaires at the initial and final sessions, respectively. They filled out the daily parenting mood measure every time they opened the module for a working session. A tracking database was built into the delivery system, which included an automatic register of the questionnaire measures, daily parenting mood measures for both groups. The system tracked the implementation measures while participants were completing the activities, and retrieved the full content of the forum and diaries only for the program group. In both groups we had the written permission of the participants according to the Ethic Committee from the University of La Laguna.

Measures

Internet experience and use (Suárez et al. 2016), consisting of 12 questions divided into three sections: a) *Sociodemographic data* (6 items): parental gender and age, educational level, employment status, country of residence, and age of children; b) *Internet experience* (3 items): How often do you go online? (scale of 1–5): (1) At least once a month; (2) Once or twice a month; (3) Three or four times a month; (4) Once or twice a week; (5) Three or four times a week or more; How long do you spend online each time? (scale of 1–5): (1) Less than 30 minutes; (2) 30–60 minutes; (3) From 1 to 2 h; (4) More than 2 h; (5) Most of the day; How many years ago did you start using the Internet? (scale of 1–5): (1) Less than 1 year ago; (2) 1–2 years ago; (3) 3–4 years ago; (4) 5 years ago; (5) 5–10 years ago; and c) *Educational use of the Internet* (1 item): Have you ever done any of the following activities related to child-rearing issues? (Scale 1 (never) to 5 (very often) for each category): Look for information to help with school homework; Contact a teacher via the Internet; Look for an online educational game; Seek information or guidance on child development; Look up family health-related information; Look for parenting-related topics. Overall mean ratings were calculated separately for the sections on Internet experience and Educational use (see Table 1).

Emotionometer, designed for this study to capture the daily parenting mood. Consisted of self-ratings of mood states with respect to parental role satisfaction and confidence in parenting capacities. The Emotionometer allows for observation of progression on a daily basis and in the parents' natural environment, since it is measured each time participants log into the program to perform the activities. A similar daily mood measure has been used to monitor fluctuations in mood disorders in clinical settings (e.g., Schwartz et al. 2016). The two questions are: To what

extent are you satisfied today with your role as a parent? (parental role satisfaction); To what extent do you feel confident today about your capacities/ability as a parent? (confidence in parenting capacities). A 5-point scale from 1 (not satisfied at all or I do not feel confident at all) to 5 (very satisfied or very confident) was used.

Online Parental Support Scale (Escala de Apoyo Parental Online, EAPO; Suárez et al. 2016). It is a self-administered questionnaire, which elicits non-contextualized, off-line ratings on the parent's engagement in online parental resources and their impact on parenting and support measures. Included 21 items presented on a 5-point Likert scale (scale from 1 (strongly disagree/never) to 5 (strongly agree/very often)). The Online Parental Support Scale provides five subscales: *Use of online educational resources* (3 items, $\alpha = .71$; e.g., Participates in a parenting-related blog, forum, or chat on the Internet), *Exchange of advice with peers and experts* (4 items, $\alpha = .86$; e.g., Shows support to other parents by reading and commenting on messages that they have written in forums or blogs), *Parental self-efficacy* (3 items, $\alpha = .84$; e.g., Strengthens my self-esteem as a father/mother), *Parenting skills* (7 items, $\alpha = .93$; e.g., Better management of my children's behavioral problems; Teaches me to spend quality time with family), and *Emotional support* (4 items, $\alpha = .82$; e.g., Increases sense of wellbeing).

Implementation measures: Six measures were recorded*: Connection time* (morning, afternoon, or evening), *Connection duration* (less than ten minutes, from ten to twenty minutes, more than twenty minutes), *Program duration* (less than 1 week, from one to 2 weeks, more than 2 weeks), *Forum participation* (none, at least once, two or three times, every time), *Diary use* (none, at least once, two or three times, every time), and *Making a commitment* in the diary (0 (absence), 1 (presence), accumulated across the diary use).

Program Satisfaction Scale, elaborated for this study, consisting of 14 items. To test for the factor structure, we used exploratory equation modeling (ESEM) with oblimin rotation, and for confirmatory purposes we used as the estimation method the Weighted Least Squares Mean and Variance Adjusted with moving measurement window (WLSMW). As a result, a final 3-factor model was selected, because it showed an appropriate fit (RMSEA = .042; CFI = .980; GFI = .968; SRMR = .024; χ^2 (75) = 127.108, $p > .001$), according to Tabachnick and Fidell (2007). The first factor: *Usability*, (4 items; $\alpha = .90$) defined as the user's perception of whether it was possible to access the program's web-based resources without an undue use of time (Nathan and Yeow 2011): Ease with which participants accessed the program, scale of 1 (very difficult) to 5 (very easy); Duration of activities, scale of 1 (very long) to 5 (appropriate); Comprehend the purpose, scale of 1 (Not at all) to 5 (Very much), and Clarity of language, scale of 1 (not at all) to 5 (very much). The second factor: *Content* (5 items; $\alpha = .91$), scale from 1 (strongly disagree) to 5 (strongly agree) for each item: The content was novel; It allowed me to change how I act; It dealt with interesting topics; The forum content was interesting; The use of diaries was interesting. Finally, the third factor: *Parenting impact* (5 items; $\alpha = .92$), scale from 1 (strongly disagree) to 5 (strongly agree) for each item: Improved my perception of the parenting role; Reflected on parenting difficulties; Improved my relationship with my children; Put into practice the lessons learned; Observed improvements when putting lessons into practice.

Data Analyses

In preliminary analyses, missing data at item level were extrapolated using the missing value analysis. When more than 10% of the items from a questionnaire were missing, the case was excluded from the corresponding analysis. When <10% then the SEM standard operating produce was performed to impute data, having checked that data were missing at random using Little's MCAR test. Less than 4% of missing data due to technical failures in the response were found.

For the first objective, to measure program changes in the two types of outcomes, we followed two analytic strategies. First, to capture the continuous progression in the Emotionometer, we used a two-factor Linear Growth Model (LGM) for a continuous outcome with four connection points (first, second, third, and fourth connection points), allowing for the estimation of inter-individual variability in intra-individual patterns of change over time (Muthén & Muthén, 2007). Four connection points in time were selected, as this corresponded to the pattern mainly observed in the participants of the program group (only two participants completed the program in two connection points and were excluded, whereas eight completed the program in more than four connection points but only the first four points were analyzed). For unconditional growth models, the evaluation of the goodness of fit was based on CFI values of at least .90 and RMSEA values lower than 0.07, we performed a chi-square differences test ($\Delta\chi^2$) to compare them. The parameterization of the growth model shows the intercepts of the outcome variables at the four time points fixed at zero as the default, and the means and variances of the growth factors fixed at zero as the default (Múthen & Múthen, 1998–2011). To analyze the LGM we used Mplus 6.11 (Muthén & Muthén, 1998–2011). We could not perform the same analyses with four connection points in the visitor group since all participants made two connections, except two participants that made three connection points.

Second, to examine comparable changes in the program and the visitor groups in parenting mood and perceived online support, we used repeated measures analyses of variance (ANOVA), with group as a between-subject factor, looking for Group × Time of measurement interactions informing of the differential effects in each group. For the program group we compared the first and the fourth (final) connection points in the Emotionometer, and the pretest/posttest measures in the Online Parental Support Scale. In the visitor group, we compared the first and second (final) connection in the Emotionometer and the pretest / posttest measures in the Online Parental Support Scale. The effect size (ES) was explored using the $\eta^{2\,(Partial)}$ statistics (Cohen 1988).

Finally, to further examine whether it was possible to distinguish different patterns of individual change in the two types of outcome measures, we followed a person-oriented approach (Bergman et al. (2003)). To capture the individual patterns of change in the program group we performed a hierarchical cluster analysis using Ward's (1963) method on the change scores corresponding to the first and fourth connection points in the Emotionometer and the pretest/posttest differences in the Online Parental Support Scale. One-way ANOVAs by cluster membership were performed with Scheffe post-hoc comparisons to examine whether the profiles differed significantly in the outcome variables. Next, we performed one-way ANCOVAs to determine a statistically significant difference between clusters in the three factors of the program satisfaction (usability, content, and parenting impact), controlling for implementation variables, Internet experience, and educational use as covariates. The implementation variables were connection time, connection duration, the program duration, participation in a forum, diary use, and making a commitment. All the variables were standardized to z scores to prevent the different scales from influencing the results of the analyses. One-way ANOVAs by cluster membership were performed with Scheffe post-hoc comparisons to examine whether the profiles differed significantly in the outcome variables. To analyze this statistically we used SPSS-19.

Results

Changes in Parental Outcomes in the Program and Visitor Groups

Results over the four connection points for the daily parenting mood showed that both parental role satisfaction and confidence in parenting capacities progressively increased over time, following a linear pattern with a minor discontinuity from 2.35 to 3.23 and from 2.69 to 3.24 on the scale of 1–5, respectively (Fig. 2). However, parental role satisfaction showed a larger increase from the first to the second connection point compared to confidence in parenting capacities. For parental role satisfaction the overall indexes indicated an adequate fit of the data with the LGM model (χ^2 (5) = 22.51, $p < .01$, RMSEA = .071, CFI = .974, TLI = .968). The intercept mean factor was 2.622, $p < 0.001$, and the slope mean factor was 0.190, $p < 0.001$, with a variance of 0.254 and 0.060, respectively, showing that both coefficients significantly differ across time. The residual variances of the four time points for the slope factor were the following: Y1 = 0.421; Y2 = 0.265; Y3 = 0.226; Y4 = 0.004. For confidence in parenting capacities the overall fit indexes indicated a close fit of the data with the LGM model (χ^2 (5) = 17.54, $p < .01$, RMSEA = .063, CFI = .984, TLI = .942). The intercept mean factor was 2.713, $p < 0.001$, and the slope mean factor was 0.181, $p < 0.001$, with a variance of 0.309 and 0.045, respectively, showing that both coefficients significantly differ across time. The residual variances of four time points for the slope factor were the following: Y1 = 0.273; Y2 = 0.171; Y3 = 0.121; Y4 = 0.032.

Results of the Group × Time of measurement interactions on the Emotionometer measures and the online parental support measures showed that parents in the program group exhibited significantly more improvement between pretest and posttest in the two measures of the Emocionometer: role satisfaction and confidence in parenting capacities, and three measures of the Online parental support scale: Use of Online resources, Exchange of advice and Parenting Skills with a large and medium effect size, in comparison to the visitor group (Table 3). Including duration of the intervention (2 weeks of average in the program group ($M = 1.9$, SD = .84) and 3 days of average in the visitor group) as covariate, did not significantly change the results.

Identifying Profiles of Program Outcomes in the Program Group

When applying a cluster analysis in the program group to the change scores of the Emotionometer and the Online Parental Support Scale, a four-cluster solution was chosen, because the clusters were theoretically meaningful, evident in the dendrogram, and represented the best possible balance between cluster size and differentiation. The hierarchical four-cluster solution was replicated using the iterative partitioning method, k-means ($n = 148$). Mean distances between the centroids of Cluster 1 and Clusters 2, 3, and 4 were 2.428, 3.423, and 1.984, respectively; the mean distance between Cluster 2 and Clusters 3 and 4 were 3.727 and 2.711, respectively; and the mean distance between Cluster 3 and Cluster 4 was 2.871. The mean score on the clustering variables are shown in Table 4. All the

Table 3 Pretest-posttest scores on the emotionometer (first and last connection points) and online parental support scale as well as the group by time of measurement interactions in the program and visitor groups

Variables	Program group		Visitor group		Group × time interactions
	Pretest *M* (SD)	Posttest *M* (SD)	Pretest *M* (SD)	Posttest *M* (SD)	*F(1,313)* ($\eta^2_{partial}$)
Emotionometer					
Parental role satisfaction	2.35 (.77)	3.23 (.53)	2.78(.85)	2.73(.83)	59.12***(.16)
Confidence in parenting capacities	2.69 (.73)	3.16(.61)	2.78(.85)	2.43(1.1)	36.36***(.10)
Online parental support scale					
Use of online resources	2.70 (.95)	3.73 (.80)	2.66(1.0)	2.5(.93)	56.38***(.15)
Exchange of advice	3.35 (.75)	4.14 (.63)	3.51(.72)	3.60(.77)	35.96***(.10)
Parental self-efficacy	3.86 (.81)	3.70 (1.0)	3.84(.79)	3.75(.79)	.28(.01)
Parenting skills	3.79 (.70)	4.16 (.64)	3.74(.74)	3.13(.91)	50.87***(.14)
Emotional support	3.47 (.81)	3.49 (1.00)	3.76(.76)	3.10(.91)	.90(.03)

Note: $^{*}p \le .05$, $^{**}p \le .01$, $^{***}p \le .001$

Table 4 Centre of the final clusters and univariate contrast of variance between the clusters according to the changing dimensions in the program group ($n = 148$)

Variables	Clusters					Comparison		
	1 ($n = 34$)	2 ($n = 25$)	3 ($n = 34$)	4 ($n = 55$)	*F(3,144)*	η^2	Post hoc	
Parental role satisfaction	1.04	2.10	1.34	.44	23.16***	.32	2–1*** 2–3** 3–4***	1–4* 2–4***
Confidence in parenting capacities	.29	1.68	.68	.11	40.88***	.46	2–1*** 2–4***	2–3*** 3–4***
Use of online resources	1.34	.29	2.18	.46	26.99***	.36	1–2*** 1–4*** 3–4***	3–1*** 3–2***
Exchange of advice	1.25	.73	2.00	.49	27.62***	.36	1–2** 1–4*** 3–4***	3–1*** 3–2***
Parental self-efficacy	−1.52	–.76	1.42	.04	57.37***	.53	1–2* 4–1*** 4–2*	3–1*** 3–2*** 3–4***
Parenting skills	–.12	–28	1.23	.37	22.11***	.31	3–1*** 3–2*** 3–4***	4–1** 4–2**
Emotional support	–1.28	–.68	1.40	.28	57.70***	.54	3–1*** 3–2*** 3–4***	4–1*** 4–2***

Note: $^{*}p \le .05$; $^{**}p \le .01$; $^{***}p \le .001$

clusters differed significantly in the parenting dimensions, with large ES.

To label each cluster, we followed two criteria. The first criterion was the amount of change (total or partial) shown in the two types of outcomes as measured by the Emotionometer and the Online Parental Support Scale. A total change involved significant changes in both types of outcomes (whereby changes should have occurred in at least two variables for each type), whereas a partial change involved significant changes in one type of outcome (in at least two variables) but not in the other. The second criterion was the positive, negative, or mixed (positive and negative) nature of the pre-post changes.

Accordingly, Cluster 1 was labeled *Partial Mixed Changes* ($n = 34$) and was characterized by moderate positive changes in the first Emotionometer measure (parental role satisfaction), use of online educational resources, and exchange of advice, and negative changes in parental self-efficacy, parenting skills, and emotional support. Cluster 2 was labeled *Total Mixed Changes* ($n = 25$) and was characterized by large positive changes in both Emotionometer measures (parental role satisfaction and confidence in parenting capacities), small positive changes in use of online educational resources and exchange of advice, a moderate negative change in parental self-efficacy, and small negative changes in parenting skills and emotional support. Cluster 3 was labeled *Total Positive Changes* ($n = 34$) and was characterized by moderate positive changes in both Emotionometer measures and large positive changes in the five measures of the Online Parental Support Scale.

Cluster 4 was labeled *Partial Positive Changes* ($n = 55$) and was characterized by a moderate positive change in parenting skills and emotional support and small positive changes in the remaining measures. Sociodemographic variables, Internet experience, and educational use of the Internet did not show significant differences between the clusters ($p > .1$).

Cluster Membership Related to Satisfaction

Implementation measures across modules indicated that participants usually connected in the afternoons ($M = 2.10$, SD = .71), spent about 10 to 20 minutes online each time ($M = 1.68$, SD = .74), had a program duration of one to 2 weeks ($M = 1.89$, SD = .85), participated in the forum two or three times ($M = 2.51$, SD = 1.2), used the diary two or three times ($M = 2.39$, SD = 1.2), and made a commitment two or three times ($M = 2.43$, SD = .50). As this pattern did not significantly change across modules, we used the average scores of each implementation measure as covariates.

There was a significant effect of cluster type on Program usability: controlling for connection duration, $F(4, 143) = 9.79$, $p \le .001$ with large ES; for forum participation, $F(4, 143) = 9.58$, $p \le .001$ with large ES; for diary use, $F(4, 143) = 9.42$, $p \le .001$ with large ES; and for making a commitment, $F(4, 143) = 9.10$, $p \le .001$ with large ES. These covariates contributed significantly to higher satisfaction with program usability. Planned contrasts revealed that participants belonging to Cluster 3 (contrast 3-1: 0.59, $p \le .05$; contrast 3-2: 0.97, $p \le .001$) and Cluster 4 (contrast 4-1: 0.64, $p \le .05$; contrast 4-2: 1.02, $p \le .001$) experienced significantly higher satisfaction with program usability than those belonging to Clusters 1 and 2 (see Table 5 for results controlling for forum participation, as an example).

There was a significant effect of cluster type on satisfaction with Program content: controlling for forum participation, $F(4, 143) = 7.93$, $p \le .001$ with medium ES; for diary use, $F(4, 143) = 7.74$, $p \le .001$ with medium ES; and for making a commitment, $F(4, 143) = 7.56$, $p \le .001$ with medium ES. All these covariates contributed significantly to higher satisfaction with program content. Planned contrasts revealed that participants belonging to Cluster 3 (contrast 3-2: .99, $p \le .001$) and Cluster 4 (contrast 4-2: .90, $p \le .001$) experienced significantly higher satisfaction with program content than those belonging to Cluster 2 (see Table 5 for results controlling for forum participation, as an example).

There was a significant effect of cluster type on satisfaction with Parenting impact: controlling for forum participation, $F(4, 143) = 14.52$, $p \le .001$ with large ES; controlling for diary use, $F(4, 143) = 19.84$, $p \le .001$ with large ES; controlling for making a commitment, $F(4, 143) = 13.17$, $p \le .001$ with large ES. All these covariates contributed significantly to higher satisfaction with parenting impact. Planned contrasts revealed that participants belonging to Cluster 3 (contrast 3-2: .91, $p \le .01$) and Cluster 4 (contrast 4-2: 0.78, $p \le .01$) experienced significantly higher satisfaction with program content than those belonging to Cluster 2 (see Table 5 for results controlling for forum participation). Internet experience and educational use were not significant as covariates in any measure of satisfaction.

Discussion

The present study was designed to provide evidence of the effectiveness of the universal web-based positive parenting program "Educar en Positivo" for Spanish-speaking parents. The program spontaneously attracted mainly highly educated young mothers with young children, in accordance with the typical user profile of parenting resources (Dworkin et al. 2013). One possible reason is the lack of Internet proficiency in other profiles, since a previous study has shown this gap in low-educated mothers (Suárez, Rodrigo & Muñetón, 2016). The dropout rate was remarkably low (21.3% in the program group and 10.9% in the visitor group), compared to face-to-face delivery formats, which often suffer from low engagement and retention (Breitenstein and Gross 2013). This is probably due to the intrinsic motivation leading to spontaneous enrollment and efficient customer support (Baumeister et al. 2014). In the program group, the interactive format, the quality of the learning materials, and the semi-guidance format since the forums were moderated by the content manager and participants may receive technical assistance at any point, may have also helped as compared to other parenting programs in which

Table 5 Adjusted means and standard deviations for cluster differences on satisfaction measures, controlling for forum participation in the program group

Satisfaction (scale 1–5)	Cluster 1: partial mixed changes *M* (SD)	Cluster 2: total mixed changes *M* (SD)	Cluster 3: total positive changes *M* (SD)	Cluster 4: partial positive changes *M* (SD)
Usability	2.85 (.77)	2.47 (.94)	3.44 (1.13)	3.49 (.90)
Content	2.79 (.75)	2.33 (.87)	3.32 (1.12)	3.24 (.87)
Parenting impact	2.99 (.77)	2.43 (1.03)	3.34 (1.15)	3.21 (.91)

frequent initial use is followed by a steep drop-off in participant activity (Neve et al. 2010).

As a novelty, in the first objective we examined the patterns of individual changes that may occur in response to the online training intervention, in addition to the pre-post group changes. We also introduced the use of daily mood measures in addition to the traditional off-line questionnaire measures to test program effectiveness in the two types of outcomes. Results showed an overall linear progression in the daily mood measures of parental role satisfaction and confidence in parenting capacities, characterized by a significant individual variability in the program group. Parental role satisfaction showed a higher increase from the first to the second connection point than confidence in parenting capacities. Immediate but not lasting daily mood changes in depression are reported to be very sensitive to micro interventions (Elefant et al. 2017). Confidence is usually less sensitive to immediate program changes and sometimes even decreases, probably because participants have learnt from the program that the parenting task is more difficult and demanding than expected (Byrnes et al. 2010; Jones and Prinz 2005). However, in the last connection point the two progression lines converged, indicating that by the end of the program, parents' satisfaction with their role went in parallel with actual increases in their perceived parenting capacities.

Pre-post comparisons in the program and visitor groups showed that participants in the program group were more satisfied and felt more competent on a daily basis, and reported positive changes in the standard measures: more use of online educational resources, more exchanges with parents and experts, and increased parenting skills (i.e., better management of behavioral problems and conflict situations, more awareness of how to regulate the child's Internet use, improved family healthy habits and awareness of how to share leisure activities with their children). These positive results, remarkably obtained in around 2 weeks on average, were specific to the program group, since the visitor group with a similar sociodemographic profile and being also exposed to multimedia educational contents did not show significant changes in any of the measures. It seems that presenting original videos with interactive content, that were the favorites in a previous study (Torres et al 2015) as well as the semi-guidance format, were critical factors in producing better results. As expected, in the program group the self-reported daily parenting mood (satisfaction and confidence in parenting capacities) was more sensitive to the program changes than the equivalent self-reported self-efficacy extracted from the off-line questionnaire, which did not show any significant change. It seems that the parents' confidence in their capacities was appraised differently in daily, situated measures than in traditional off-line, non-situated measures (Moore et al. 2016). A possible reason is that individuals are unlikely to recall their experiences accurately when required to give a response that averages them over a relatively long lapse of time (Trull and Ebner-Priemer 2009).

A more accurate picture of the program effectiveness emerged from the inspection of the patterns of individual change, showing that participants in the program group do not all progress in the same way. Participants in Cluster 1, labeled *Partial Mixed Changes* (23%), felt satisfied with the parental role on a daily basis and reported an increased use of online educational resources and exchanges of advice with peers and experts but showed decreases in parental self-efficacy, parenting skills, and emotional support. Participants in Cluster 2, labeled *Total Mixed Changes* (17%), felt highly satisfied and confident of their parenting capacities on a daily basis, whereas results on the questionnaire showed a moderate decrease in parental self-efficacy and small decreases in parenting skills and emotional support. Participants in Cluster 3, labeled *Total Positive Changes* (23%), exhibited moderate increases in daily satisfaction and confidence in their parenting capacities and large increases in the use of online educational resources and exchanges of advice with peers and experts, as well as in parental self-efficacy, parenting skills, and emotional support. Finally, participants in Cluster 4, labeled *Partial Positive Changes* (37%), showed a moderate positive change in parenting skills and emotional support and small positive changes in the remaining measures. The clusters did not significantly differ by sociodemographic variables or Internet use profiles. In sum, the program worked well for 60% of the parents (Clusters 3 and 4) and achieved mixed improvements for 40% of the parents (Clusters 1 and 2).

A closer inspection of the individual variability revealed that changes are related across outcomes, which is informative about the process of change, a neglected topic in the prevention field (Sandler et al., 2010). Participants in Clusters 3 and 4 showed total and partial positive changes across the board; these were more robust and generalized in Cluster 3. Therefore, as expected, the more participants used online educational resources and the more exchanges they had with peers and experts, the greater the achievements they exhibited in parenting abilities and the more emotional support they perceived (Brady and Guerin 2010; Chan 2008; Erera and Baum 2009; Madge and O'Connor (2006); Niela-Vilén et al. 2014; Nieuwboer et al. 2013a, b; Valaitis and Sword 2005). Likewise, increases in both confidence in parenting capacities and parental self-efficacy were related to positive parenting skills (Coleman and Karraker 2003; Fletcher and StGeorge (2011); Jones and Prinz 2005). Moreover, the pattern of co-occurrences obtained both with online and off-line measurements is what could be expected of a consolidated learning process.

In turn, the participants' knowledge in Clusters 1 and 2 may represent transitional states in the learning process. The existence of transitional states in the process of individual learning allow us to report more accurately on program effectiveness (Byrne et al. 2014). In Cluster 1 participants' satisfaction and increased use of online educational resources and exchanges of advice did not correspond to the poor achievements observed in parenting measures and emotional support. The divergence is even more remarkable in Cluster 2, where participants felt highly satisfied and confident in their capacities when reporting online but reported a decrease in their self-efficacy, parenting skills, and emotional support in the off-line measures. In view of these results, we suggest that two indicators of a transitional state in online parenting programs are: (a) the participants' difficulties in benefiting from the knowledge obtained through online activities to change their own models of parenting and (b) the measure-dependent nature of their appraisals of their parenting capacities.

As in previous studies, participant satisfaction with the online program was quite remarkable (Metzler et al., 2011; Russell et al. 2016). The second objective explored the extent to which the patterns of individual change, under the modulation of some implementation factors, may have an impact on program satisfaction. The study of the implementation is critical to understand which factors make a program work when applied in real-life conditions, as has been shown in face-to-face programs (Berkel et al. 2011; Durlak and DuPre 2008; Álvarez et al. 2016). The results confirmed our predictions by showing that participants in Clusters 3 and 4 reported greater satisfaction with the program's usability, content, and parenting impact than participants in Cluster 2 and to a lesser extent those in Cluster 1. This means that parents' satisfaction with our program was not based on trivial factors but on their perceived proficiency achieved throughout the learning process. Moreover, the impact of the typology of individual changes on satisfaction was significantly modulated by the parents' greater forum participation, use of a diary, and making of commitments and, to a lesser extent, by the time spent online, all conditions known to favor positive results (Brady and Guerin 2010; Fletcher and StGeorge (2011); Madge and O'Connor (2006); Niela-Vilén et al. 2014). These components are very important for engaging participants who are learning online (Hughes et al. 2012; Mayer 2011), since they provide opportunities for observation, interaction, participation, reflection, and transfer to daily life. These are also the conditions of the implementation process in face-to-face prevention programs that have been shown to promote parenting skills (Álvarez et al. 2016; Durlak and DuPre 2008) and high levels of parental satisfaction (Byrnes et al. 2010). Although these factors are, in principle, under participants' control, a good program design may help to potentiate their use. This is not the case for certain conditions of use (connection time, program duration) and the user profile (Internet experience and educational use of Internet), which are totally under the participants' control. Fortunately, none of these factors modulated the impact of the patterns of individual change on satisfaction in our study. In sum, having more consolidated states of knowledge building and active participation in the interactive, reflective, and knowledge transfer spaces are the main factors that contributed to satisfaction with the program. Further studies may explore in detail the content of the forum and diaries to go deeper into the process of change. To conclude, this study shows that a cost-efficient (brief and fully automated) structured program, as compared to the simple exposition to multimedia materials, was able to promote reliable changes in parenting competences that are shown to promote positive parenting at least in medium-high educated parents. Besides to increasing Internet proficiency in low-educated parents, it is also helpful to use face-to-face formats to extent the benefits of the program to more vulnerable populations, such as parents at psychosocial risks.

Limitations

The present design has several limitations that should be addressed in future studies. First, our convenience sample is mainly composed by young mothers, highly educated and quite experienced with the Internet, so the lack of impact of these variables on the results may be due to this sample bias, which is typical in Internet users for educational purposes. Second, given the spontaneous enrollment and the self-assignment of participants to the program and visitor conditions we cannot rule out the possibility that individual differences in unknown factors (i.e., motivation) may have affected the results on the program effectiveness. However, using a quasi-experimental design with pre-post measures and controlling for relevant factors such as socio-demographic differences and program duration is a good option in universal online programs were there is a lack of an indicated population. Third, we did not have enough participants in the program group to examine the accumulative impact of engaging successively in more than one module, which was the case for some parents. However, we only tested the impact of the program after the engagement in the first module. Finally, we did not search for long-term outcomes since it is difficult in online universal programs using free enrollment.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval This study was approved by the Ethical Committee of Universidad de La Laguna (Spain) that provided IRB approval.

Informed Consent Participants of the "Positive Parent" program were informed about the treatment of their personal data, according to the Ley de Protección de Datos de Carácter Personal, de 24 de mayo de 2018, ISBN: 978-84-340-2157-0.

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