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ORIGINAL PAPER

Impact of the Happy Classrooms Programme on Psychological Well-being, School Aggression, and Classroom Climate

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Abstract

Objectives This study sought to evaluate the efficacy of a brief version of the Happy Classrooms Programme in psychological well-being, school aggression, and positive classroom climate. Likewise, this study also aimed to identify which intervention effects could be attributed to the development of mindfulness. Finally, the last target of this study was to evaluate the implementation fidelity and the acceptability of the programme.

Methods Multiple linear regression and longitudinal mediation analyses were performed with a sample of 524 students (49.8% boys and 50.2% girls) with a mean age of 13.6 years.

Results Results provided evidence of the efficacy of the intervention in the majority of variables. For Mindfulness, Depressive Symptomatology, Perceived Stress, Competence, Emotional Attention, Identified Regulation, External Regulation, and Amotivation, the intervention proved efficacious only when pre-treatment levels of mindfulness were high, and sometimes also medium. For Self-esteem, Satisfaction with Life, Relatedness, Emotional Repair, Physical Aggression, Relational Aggression, Affiliation, and Teacher Support, intervention effects were irrespective of pre-treatment levels of mindfulness. Mediation analyses found evidence of longitudinal mediation effect of mindfulness on the relation between the intervention and most outcome variables. Implementation data showed that total time implemented by the teachers varied among them and that the programme was not highly acceptable by most students.

Conclusions Our findings point out that Happy Classrooms Programme may promote psychological well-being and positive classroom climate, and reduce school aggression in students by increasing mindfulness levels.

Keywords Mindfulness · Character strengths · Well-being · School aggression · Classroom climate · Educative programme

Positive psychology is the study of the conditions and processes that contribute to the flourishing or optimal functioning of people, groups, and institutions (Gable and Haidt 2005). The core principles of positive psychology have been progressively assumed by applied researchers over the last two decades, to the point that in the educational context, for instance, there are now a number of programmes which incorporate such principles (International Positive Education Network 2017; Seligman and Adler 2018). Some of these programmes are the Penn Resiliency Programme (https://ppc.sas.upenn.edu/research/resilience-children); the Strath Haven Positive Psychology Curriculum (https://www.authentichappiness.sas.upenn.edu/es/learn/educatorresilience); the Geelong Grammar School Project (https://www.ggs.vic.edu.au/Positive-Education2/Model-for-Positive-Education); the Bounce Back! Programme (http://www.bounceback.com.au/); the Celebrating Strengths Programme (http://www.viacharacter.org/blog/celebrating-strengths-a-school-project-using-via-strengths/); the Strengths Gym Programme; and the SMART Strengths Programme (http://smartstrengths.com/), among many others. In these programmes, skills are introduced through a variety of activities such as skits, role plays, short

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stories, diaries, picture books, poetry, songs, and age-appropriate websites.

In Spain, one of the first programmes that has been developed is the Happy Classrooms Programme, which is the focus of our study (HCP; Arguís et al. 2012; freely available from http://www.aulasfelices.org). This programme was designed to be implemented with preschool, primary, and secondary education students (or middle school and high school students in the North American system). The goal of the programme is to enhance personal and social development and to promote happiness in students, teachers, and families in order to contribute to the student's development beyond academic learning. HCP is designed to fit into the usual areas of the school curriculum, as well as in Guidance and Counseling Programmes, and Values or Character Education and, following appropriate training, be taught by school teachers, which the literature suggests is necessary for long-term sustainability (Weare and Nind 2011). HCP incorporates two concepts that have been extensively investigated within positive psychology, namely, mindfulness and character strengths (Snyder and Lopez 2009). The concept of mindfulness has its roots in Buddhism, a spiritual tradition that is at least 2550 years old. One of the most commonly cited definitions of mindfulness is "the type of awareness that arises through paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn 1990, p. 4). Another definition describes mindfulness as "the non-judgmental observation of the ongoing stream of internal and external stimuli as they arise" (Baer 2003, p. 125). Considering the attentional aspects of mindfulness, it has also been described as "a quality of consciousness that is characterized by clarity and vividness of current experience and functioning, which stands in contrast to the mindless, less awake states of habitual or automatic functioning that may be chronic for many individuals" (Brown and Ryan 2003, p. 823). Although there is a discrepancy among authors on the number of components of mindfulness, most of them agree with Bishop et al. (2004), who include two components: self-regulation of attention (directed towards the present) and acceptance of the experience.

There are a number of psychotherapies that have incorporated the training and practice of mindfulness abilities within their protocols, such as Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn 1990) programme, Mindfulness-Based Cognitive Therapy (MBCT; Segal et al. 2002), Acceptance and Commitment Therapy (ACT; Hayes et al. 1999), Dialectic Behavior Therapy (DBT; Linehan 1993), and Brief Relational Therapy (BRT; Safran and Muran 2000). There is a growing body of evidence that supports the benefits of these therapies on psychological health (Keng et al. 2011). For example, several randomized controlled trials of MBSR, conducted among clinical and non-clinical populations, have found that MBSR reduces depression (e.g., Grossman et al. 2010) and perceived stress (e.g., Bränström et al. 2010), whereas it increases empathy (Shapiro et al. 1998) and satisfaction with life (Grossman et al. 2010). Likewise, research has shown that MBCT (Segal et al. 2002), specifically designed to address major depression, prevents relapses in patients with three or more previous episodes of depression (Teasdale et al. 2000), and reduces residual symptoms of depression (Kingston et al. 2007). In addition to treating depression, mindfulness-based interventions have also been developed to treat aggression. A recent review of these treatments (Fix and Fix 2013) has confirmed the efficacy of these interventions to reduce aggressive behavior.

Evidence of the benefits of mindfulness-based interventions (MBI) is growing, but this is only true for adults. For children and adolescents in educational and clinical settings, research is scarce (Harnett and Dawe 2012) and, although it is commonly assumed that the nascent evidence of MBIs is encouraging, it is still in the very early stages of development (Roeser and Peck 2009). In part, because of the relatively weak designs, measures, and the absence of follow-up data (Greenberg and Harris 2011; Harnett and Dawe 2012). Even more, the majority of the MBIs in schools' settings remains non-evaluated. At present, the current research provides support for the feasibility of MBIs with children and adolescents; however, most of the proposals concerning the creation and validation of secular adaptations of contemplative practices for educational settings are speculative and there is little evidence of their efficacy and the specific mechanisms of change that facilitate the cascading benefits for personal, academic and social success (Burke 2010; Davidson et al. 2012; Lawlor 2014).

Research of the effects of MBI among youth and adolescents have reported improvements in attention skills (Napoli et al. 2005; Zylowska et al. 2008), social skills (Beauchemin et al. 2008), sleep quality (Bootzin and Stevens 2005; Britton et al. 2010), well-being in adolescent boys (Huppert and Johnson 2010), and reductions in anxiety, depression, somatic, and externalizing symptoms in clinic-referred adolescents (Biegel et al. 2009; Bogels et al. 2008; Semple et al. 2010). Recently, a systematic review (Erbe and Lohrmann 2015) of MBIs for adolescents, including both clinical and school interventions, has informed that MBIs seem to reduce depression and stress, and increase overall well-being, self-esteem, and emotion regulation.

From a Self-Determination Theory (SDT) perspective, mindfulness may promote well-being through self-regulated activity and fulfillment of the basic psychological needs (Ryan and Deci 2000). That is, mindfulness may facilitate attention to prompts arising from basic needs, making one more likely to regulate behavior in a way that fulfills such needs (Brown and Ryan 2003). In agreement with this statement, trait mindfulness has been related to the fulfillment of the basic psychological needs

(Lawlor et al. 2014; Brown and Ryan 2003) and self-regulatory processes. Concrete types of self-regulatory processes are emotional regulation, behavioral regulation, and interpersonal regulation. With regard to emotional regulation processes, evidence supports the link between mindfulness and stronger affect regulation, including more awareness, understanding, and acceptance of one's emotions, and a greater ability to repair unpleasant mood states (Brown and Ryan 2003; Meiklejohn et al. 2012; Metz et al. 2013). With respect to behavioral and interpersonal regulatory processes, some studies have reported benefits of MBIs on externalizing behavior (Bogels et al. 2008), aggression, prosocial behavior and peer acceptance (Schonert-Reichl et al. 2015), classroom social competent behaviors (Flook et al. 2015; Schonert-Reichl and Lawlor 2010), and school climate (Wisner 2014).

SDT (Ryan and Deci 2000) also proposes that mindfulness should have positive effects on motivation. Importantly, SDT distinguishes between different forms of motivation that can be ordered in gradation along a self-determination continuum, where intrinsic motivation is the most self-determined motivation and amotivation is the least one. According to SDT (Deci and Ryan 1985), self-determined motivated activities are characterized by engagement with attention to what is occurring. Given that mindfulness is attention directed to the present moment, SDT expects that mindfulness should facilitate intrinsic motivation. In line with this idea, Levesque and Brown (2007) found that a more mindful disposition led to more autonomous (intrinsic) motivation for day-to-day behavior.

The second concept that HCP incorporates is character strengths. Character strengths are viewed as capacities of cognition, conation, affect, and behavior that, as a whole, show human goodness (Niemiec et al. 2012) and high functioning and performance (Peterson and Seligman 2004). In their seminal work, Peterson and Seligman (2004) established a model of the good character with 24 strengths organized in six virtues: Wisdom and Knowledge (i.e., curiosity, love of learning, judgment, creativity, and perspective), Courage (i.e., bravery, industry, integrity, and zest), Humanity (i.e., love, kindness, and social intelligence), Justice (i.e., citizenship, fairness, and leadership), Temperance (i.e., forgiveness, modesty, prudence, and self-control), and Transcendence (i.e., appreciation of beauty, gratitude, hope, humor, and spirituality). This classification of character strengths has received empirical support in numerous countries (Park et al. 2004), and there is evidence that character strengths play an important role in positive youth development, both as protective factors, by preventing psychopathology, and also as conditions that promote flourishing (Park and Peterson 2009).

Specifically, research has shown that "strengths of the heart" (e.g., temperance and transcendence-related strengths) are more robustly associated with young people's life satisfaction and well-being than "cerebral strengths" (e.g., curiosity) (Gillham et al. 2011; Leontopoulou and Triliva 2012; Park 2004; Shoshani and Slone 2013; Toner et al. 2012). Other studies have shown that intellectual and temperance strengths predicted school performance and achievement (Shoshani and Slone 2013; Weber et al. 2016); and interpersonal strengths (e.g., forgiveness, kindness, teamwork) predicted fewer depression symptoms (Gillham et al. 2011) and positive social functioning at school (Shoshani and Slone 2013).

Though character strengths are viewed as stable over the lifespan, they are a result of developmental opportunities (Park 2004; Steen et al. 2003), and they can be impacted by deliberate interventions. Research in educational settings with adolescents has shown that character strengths-based interventions increase students' life satisfaction and happiness, class cohesion, psychological need satisfaction, positive emotion, and classroom engagement; and can facilitate the progression towards self-concordant goals as intrinsic motivation (Grinhauz and Castro-Solano 2014; Linley et al. 2010; Oppenheimer et al. 2014; Proctor et al. 2011; Quinlan et al. 2015). However, although a growing body of research on character education offers the opportunity to derive lessons on effective practice, there is little research focused on the efficacy of specific practices on particular outcomes (Berkowitz et al. 2016).

In addition to evaluating the efficacy of interventions, studies should also examine mediation models to understand mechanisms of change and to better characterize which forms and frequencies of practices are most effective for adolescents from a developmental perspective (Davidson et al. 2012; Roeser and Pinela 2014; Zelazo and Lyons 2012). This is especially important when working with adolescents since in this developmental period there may be "windows of opportunity" when contemplative practices are particularly likely to produce habits conducive to learning, health, and well-being (Roeser and Zelazo 2012; Roeser and Pinela 2014).

In the matter of HPC, we note that although HCP has been widely disseminated, both at educational and scientific level (e.g., Arguís 2017), and it is being applied in numerous schools, both in Spain and in other Spanish speaking countries (México, Venezuela, Chile, Bolivia, Colombia, Argentina, Guatemala, and Uruguay), the programme has never been evaluated before. With this purpose in mind, the first aim of the present study was to examine the efficacy of a brief version of HCP to improve psychological well-being and positive classroom climate and to reduce school aggression. The second aim was to determine which effects of HCP on the studied variables were produced by an improvement in the ability to be mindful. Finally, the third aim was to evaluate the implementation fidelity and the acceptability of HCP.

Method

Participants

The sample included 524 Spanish students with a mean age of 13.6 years ($SD = 1.5$), of which 49.8% were boys, and 50.2% were girls. The students attended five different public schools and were distributed in first, second, third, and fourth grade of the compulsory secondary education and first grade of *bachillerato* (grades 7 and 8 of middle school and 9, 10, and 11 of high school in the North American system) according to the following percentages: 33.2%, 24.0%, 23.1%, 17.2%, and 2.5%, respectively.

Procedure

The research was conducted in compliance with APA ethical standards. First, we obtained the approval from the Provincial Board of Education and Science to perform the study. Second, we contacted the principal of each school to review the aims of the research and request their permission to conduct the study at their school. Next, passive consent was obtained from parents or guardians; they received written notice from the school that their children would be participating and were invited to contact the school if they did not want their child to take part in the study. No parent did so. Before obtaining answers of the students, informed consent was obtained from them, maintaining the confidentiality of the data. With the purpose of reducing the possible effect of social desirability, they were told that there were no right or wrong answers because researchers were interested in what they thought and felt about themselves. Students filled out the questionnaires in the classroom. At least one qualified researcher (researcher with a Ph.D.) was present during the administration of the instruments to provide students with the necessary help to complete the questionnaires if necessary. We collected the same measures two times, separated by a 6-month interval, during the same academic year. Measures were collected in all classrooms within a 2-week period. The first measure was collected before the intervention was implemented (pretest) and the second measure after its implementation (posttest). In addition to the postest questionnaires, some students (21 students from the same classroom) that received the programme also completed a questionnaire about the acceptability of the programme. All teachers, belonging to schools participating in the study, were offered a training course about HCP, via the Teachers Training Regional Centre (see "Intervention" section). The training course was recognized as an official training course. Those teachers that completed the training implemented the HCP in their classes. After its implementation, some of them (6 teachers out of 11) also responded to a questionnaire about the acceptability and implementation fidelity of the programme (see Tables 4 and 5). Students from teachers that implemented the intervention became experimental subjects (156 students), whereas students from the rest of the classes were selected to become control subjects (368 students). The selection of the control subjects sought to match them with experimental ones based on gender and age. With the result that 50.0% and 49.7% were boys, for experimental and control group, respectively. Moreover, the percentage difference of students with the same age between experimental and control groups ranged from 0.1 to 3.4, except for age 13 that was 9.4. The control group did not receive any type of intervention; neither HCP nor an alternative intervention. Given that the assignment of students to experimental or control group depended on the willingness of their teacher to receive the training, the assignment was not random. Therefore, the design of the study is a quasi-experimental design with pretest and posttest measures.

Intervention

HCP contains more than 300 hands-on mindfulness and character strengths activities designed for students. In this work, we employed a brief version of the programme, which included the activities that were core, according to their authors and previous empirical evidence (see Supplementary Material for a detailed list of activities included). Further description of these activities can be found in the HCP manual freely available on the website www.aulasfelices.org. The mindfulness practices included adapted meditation practices of focused and open monitoring attention, and mindful movement as breathing exercises, mindful walking, body scan, and mindful eating, among others. As for the character strengths practices, we included those pertaining to the transcendence virtue, since previous evidence suggests it is strongly correlated with well-being (Park and Peterson 2009; Park et al. 2004). Specifically, we included activities designed for the development of appreciation of beauty, gratitude, hope, humor, and spirituality.

Teachers were trained by the authors of the programme during four sessions for a total of 16 h. The training included: (1) theoretical foundations of mindfulness and character strengths, and empirical evidence of their benefits on well-being and (2) experiential practice in the activities of mindfulness and character strengths designed for the students. With the purpose of assuring the fidelity of the implementation, the programme authors supervised its implementation. The supervision consisted of two 2-h sessions where the authors of the programme addressed all the difficulties encountered by the teachers during the implementation of the activities. Additionally, a permanent online supervision through email contact with the programme authors was available where teachers could get help about their implementation problems as they were emerging. Moreover, all teachers received a booklet containing the theoretical foundation of the

programme, a complete guide with clear instructions for the development of all activities, and bibliographic resources related to the programme. Finally, teachers were provided with a follow-up document where they registered the time dedicated to the implementation for each activity (see Table 5 for the total time implemented for the activities of the programme for each classroom). Teachers were asked to implement the programme throughout 18 weeks, practicing the activities during approximately 5 min with a minimum periodicity of twice per week (with an estimated total time of 18 week × 2 session × 5 min = 180 min).

Measures

To assess the different variables of the study, the Spanish adaptation of validated scales were used**.** All these adapted scales are applicable for secondary school students. An exception was the teacher and student acceptability questionnaires, which were developed specifically for this study.

Teacher Acceptability and Implementation Fidelity Questionnaire Some of the teachers who implemented the programme (6 out of 11) responded to this questionnaire, which contains five items (see Table 4); four items assessing the acceptability of the programme and one item evaluating self-perceived efficacy to implement the programme with fidelity. Except for the last question whose answers were dichotomous (*yes* or *no*), the rest of the questions were rated on an 11-point scale ranging from 0 to 10, with higher scores corresponding to a higher agreement with the item.

Student Acceptability Questionnaire Some of the students that received the programme (21 students from the same classroom) also completed a questionnaire about the acceptability and the utility of the programme. The questionnaire contains five items (see Table 4) assessing the acceptability of the programme. Except for the last question whose answers were dichotomous (*yes* or *no*), the rest of the questions were rated on an 11-point scale ranging from 0 to 10, with higher scores corresponding to a higher agreement with the item.

Mindfulness We employed the Mindfulness Attention Awareness Scale (MAAS; Brown and Ryan 2003), adapted to Spanish by León et al. (2013). The scale contains 15 items assessing the frequency of conscious states (e.g., "I cannot stay focused on what is happening at the moment") on a 7-point Likert scale ranging from 1 (*never*) to 7 (*always*), with higher scores corresponding to a higher level of automatic attention. However, in the statistical analyses, participants' responses were reversed to facilitate interpretation, so that higher scores corresponded to higher levels of mindfulness. In previous studies, the reliability of the scale has been good with internal consistency scores that ranged from .88 to .90 and a test-retest correlation of .76 (León et al. 2013; Soler et al. 2012). In young people, scores in this scale correlated highly and positively with life satisfaction, vitality and self-esteem (León et al. 2013), and negatively with depressive symptomatology, antisocial behavior and anger (Calvete et al. 2014).

Self-esteem Self-esteem was measured with Echeburúa's (1995) Spanish version of the Rosenberg Self-esteem Scale (Rosenberg 1965). It contains 10 items assessing the sense of worthiness and personal value (e.g., "On the whole, I am satisfied with myself"). Responses are rated on a 7-point scale ranging from 1 (*I totally disagree*) to 7 (*I totally agree*). The Cronbach alpha obtained in previous studies ranged between .76 and .87 (Baños and Guillén 2000; Estévez et al. 2018; Vázquez-Morejon et al. 2004). This scale has been widely used with Spanish adolescent's samples. It has shown significant correlations with positive variables such as family cohesion and life satisfaction, and negative ones such as loneliness and depressive symptomatology (Cava et al. 2010; Estévez et al. 2008b; Vázquez-Morejon et al. 2004).

Satisfaction with Life We administered the Spanish version of the Satisfaction with Life Scale (SWLS) by Diener et al. (1985), as validated by Núñez et al. (2010a). This scale consists of five items that give a general measure of subjective well-being and life satisfaction (e.g., "In most ways my life is close to my ideal"). The answers are expressed on a 7-point Likert scale ranging from 1 (*I totally disagree*) to 7 (*I totally agree*). The internal consistency of this scale in previous studies with adolescent samples was good with values higher than .77 (Lombas and Esteban 2018; Núñez et al. 2010a). In these studies, scores in this scale correlated highly and positively with basic needs satisfaction, self-esteem, physical self-concept, and intrinsic motivation, and negatively with depressive symptomatology, stress, and loneliness.

Depressive Symptomatology We used the reduced version of the Scale of Depressive Symptomatology (Radloff 1977), adapted to Spanish by Herrero and Meneses (2006). This version includes 7 items, which evaluate depressive symptomatology over the last month (e.g., "I thought my life had been a failure"). Responses are rated on a 7-point scale ranging from 1 (*never*) to 7 (*many times*). The Cronbach alpha of the global scale obtained in previous studies with adolescent samples reached values above .80 (Crockett et al. 2005; Estévez et al. 2018; Herrero and Meneses 2006). This scale has been widely used with Spanish adolescent's samples. It has shown significant and positive correlations with perceived stress, loneliness and behavioral problems, and negative ones with self-esteem, satisfaction with life, basic needs satisfaction, and family support and communication (Cava et al. 2010; Lombas and Esteban 2018; Herrero et al. 2006; Jiménez et al. 2007).

Perceived Stress We used the Spanish version of the Perceived Stress Scale (PSS4; Cohen et al. 1983), adapted by Herrero and Meneses (2006). It is a 4-item scale that measures the degree to which respondents have appraised situations as stressful within the last month (e.g., "In the last month, how often have you felt that you were unable to control the important things in your life?"). Items are rated on a 7-point scale ranging from 1 (*never*) to 7 (*always*). The Cronbach alpha obtained in previous studies, with samples of Spanish adolescents, ranged between .64 and .80 (Estévez et al. 2018; Lombas et al. 2014; Remor 2006). Scores in this scale correlated highly and positively with depressive symptomatology, emotional attention, aggression, loneliness and family communication problems, and negatively with basic need satisfaction, emotional clarity and repair, self-esteem, intrinsic motivation and satisfaction with life (Lombas et al. 2014; Lombas and Esteban 2018; Herrero and Meneses 2006).

Basic Psychological Needs We employed the Psychological Needs Satisfaction Scale in Education (ESNPE; León et al. 2011), which is based on the *Échelle de Satisfaction des Besoins Psychologiques* of Gillet et al. (2008). ESNPE consists of 15 items that measure three dimensions, namely Autonomy (e.g., "I generally feel free to express my ideas and opinions"), Competence (e.g., "Often, I do feel very competent"), and Relatedness (e.g., "I feel appreciated and valued by my colleagues") in educational settings. Responses were evaluated with a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In previous studies, internal consistency for the three dimensions was above .80, and scores in this scale correlated positively with satisfaction with life, self-esteem, and intrinsic motivation, and negatively with perceived stress, depressive symptomatology, and loneliness (León et al. 2011; Lombas and Esteban 2018; Martín-Albo et al. 2015).

Emotional Intelligence We used the Trait Meta Mood Scale (TMMS) developed by Salovey et al. (1995), and adapted to Spanish by Fernández-Berrocal et al. (2004). This emotional intelligence scale measures attention to feelings (Emotional Attention; e.g., "I often think about my feelings"), the clarity of the experience of these emotions (Emotional Clarity; e.g., "I almost always know exactly how I feeling") and beliefs about prolonging pleasant mood states and ending unpleasant states (Emotional Repair; e.g., "I try to think good thoughts no matter how badly I feel"). Our version was modified in line with Martin-Albo et al. (2010), which resulted in the removal of item 23 (e.g., "I have lots of energy when I am happy"). Response options ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). The Cronbach alpha for the three dimensions obtained in previous studies conducted with Spanish adolescent samples was above .80 (Lombas et al. 2014; Salguero et al. 2010). Scores in the three dimensions correlated with other variables in the expected direction. Thus, on the one hand, emotional attention correlated positively with depressive symptomatology, perceived stress, anxiety, and rumination, and negatively with self-esteem. On the other hand, emotional clarity and repair correlated positively with satisfaction with life and self-esteem, and negatively with depressive symptomatology, perceived stress, anxiety and rumination (Fernández-Berrocal et al. 2004; Lombas et al. 2014; Martin-Albo et al. 2010).

School Aggression We employed the School Aggression Scale (Little et al. 2003), adapted to Spanish by Cava et al. (2006). It contains 25 items assessing Physical Aggressive Behavior (13 items; e.g., "I'm the type of person who hits, kicks, or punches others") and Relational Aggressive Behavior (12 items; e.g., "If others hurt me, I often try to keep them from being in my group of friends"). Respondents rate how often they have engaged in deviant and aggressive behavior at school over the last 12 months, on a 7-point scale ranging from 1 (*never*) to 7 (*many times*). The Cronbach alpha values obtained in previous studies with Spanish adolescent samples ranged between .72 and .87 (Estévez et al. 2008a; Estévez et al. 2018; Jiménez and Estévez 2017). Scores in school aggression correlated positively with perceived stress, depressive symptomatology, and family conflict, and negatively with self-esteem, empathy, positive classroom environment, and family cohesion and expressiveness (Cava et al. 2010; Jiménez and Estévez 2017; Estévez et al. 2008a, b).

Classroom Environment We used the Classroom Environment Scale (Moos et al. 1989) adapted by Fernández-Ballesteros and Sierra (1989). This scale consists of 30 items, forming three subscales: (1) involvement, or the degree of student attentiveness, interest and participation in class activities (10 items, e.g., "Students put a lot of energy into what they do here"); (2) affiliation, or the students' perceptions of care and friendship for one another (10 items, e.g., "Students in this class get to know each other really well"); (3) teacher support, or students' perceptions of the amount of help, trust and friendship the teacher offers to the students (10 items, e.g., "The teacher takes a personal interest in the students"). The level of agreement with the statement is indicated on a rating scale ranging from 1 (*never*) to 7 (*always*). The Cronbach alpha for the three dimensions obtained in previous studies conducted with Spanish adolescents took values between .77 y .90, and scores in this scale correlated positively with self-esteem, satisfaction with life, empathy and positive family environment, and negatively with aggression, victimization, perceived stress and family conflict (Estévez et al. 2008a, b; Jiménez and Estévez 2017; Martínez et al. 2012).

Academic Motivation A scale for measuring academic motivation according to Self-Determination Theory principles was

developed by Vallerand et al. (1989). This scale consists of 28 items distributed in seven subscales that measure Intrinsic Motivation, three types of extrinsic motivation (Identified Regulation, Introjected Regulation and External Regulation) and Amotivation. In this study, we used the Spanish version of this scale, developed by Núñez et al. (2005). The answers are expressed on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). In previous studies, this scale has shown suitable internal consistency with alpha values exceeding .80 on all subscales (Núñez et al. 2005; Vallerand et al. 1992). Scores in the dimensions of the scale have shown significative correlations in the expected direction with basic need satisfaction, self-esteem, academic self-concept, satisfaction with life and perceived stress (Núñez et al. 2010b; Lombas and Esteban 2018).

Empathy We employed the Index of Empathy for Children and Adolescents (IECA; Bryant 1982), adapted to Spanish by Mestre et al. (1999). It contains 22 items assessing empathic feelings in different situations (e.g., "I get upset when I see a girl being hurt"). The level of agreement with the statement is indicated on a rating scale ranging from 1 (*never*) to 7 (*always*). In previous studies, the internal consistency of the scale took values between .73 and .81 (Estévez et al. 2016; Pérez-Delgado and Mestre 1999) and scores in this index correlated positively with positive classroom and family environments, and negatively with aggression and family conflict (Estévez et al. 2008a, b, 2016; Jiménez and Estévez 2017).

Results

All data analyses were performed through IBM SPSS Statistics software, version 23. Statistical significance was set at $p < .05$. First of all, means, standard deviation, and Cronbach's alpha for each outcome variable at pretest and posttest were calculated (see Table 1). The minimum acceptable level of reliability of variables was set to .70 as suggested by Bernstein and Nunnally (1994). For most outcome variables, mean values were medium (ranging between 3.1 and 5.1). Large values (higher than 5.2) were observed for Mindfulness (only at the pretest), Self-esteem, Relatedness, Identified Regulation, and External Regulation. And small values (lower than 2.4) were observed for Physical Aggressive Behavior, Relational Aggressive Behavior, and Amotivation. The reliability of the measures employed was higher than .70 in all cases, except for Stress at the posttest that was slightly under the critical value of .70.

Second, in order to evaluate the intervention efficacy, we first performed a multiple linear regression analysis, with Posttest Mindfulness as an outcome variable, and Group (coded 0 for the control group and 1 for the experimental group), Pretest Mindfulness, and their interaction, as predictor variables. In order to control for demographic characteristics, age, and gender were also introduced as predictor variables (see Fig. 1a). Results showed that all predictors were significant. The interaction between Group and Pretest Mindfulness indicated that the intervention only had effect at medium and high levels of Pretest Mindfulness.

Given that the intervention was based on mindfulness and its effect on Posttest Mindfulness was dependent on the level of Pretest Mindfulness, it is reasonable to suppose that the same would happen with the rest of the outcome variables. Consequently, regression analyses conducted on the remaining outcome measures included Pretest Mindfulness and its interaction with Group as predictor variables, along with the Pretest score of the examined variable. Likewise, as before, age and gender were also introduced as predictor variables as statistical control of demographic characteristics (see Fig. 1b).

Once multiple linear regression analyses were performed, assumptions were checked. To check for homoscedasticity, normal distribution of residuals, and linearity, the following graphs were visually examined: (1) a plot where studentized residuals (*SRESID) were represented against predicted standardized values (*ZPRED); (2) a histogram of the standardized residuals; and (3) a graph of the standardized residuals of the observed accumulated probability against the expected accumulated probability (P-P-plot). To check for independent random sampling, we examined if Durbin–Watson statistics values were between 1 and 3. Results showed that the assumption of normal distribution of residuals was not met in the regression analysis conducted on the following outcome variables: Physical Aggressive Behavior, Relational Aggressive Behavior, Identified Regulation, External Regulation, and Amotivation. To solve this problem, pretest and posttest scores of these variables were normalized following the two-step approach suggested by Templeton (2011); first, the variable was transformed into a percentile rank, resulting in uniformly distributed probabilities, and second, the inverse-normal transformation was applied to the results of the first step to form a variable consisting of normally distributed scores with the same mean and standard deviation. New multiple linear regressions with the normalized variables confirmed that the assumption of normal distribution of residuals was met.

Results of multiple linear regression analyses for each outcome variable are presented in Table 2. In the case of Self-esteem, Satisfaction with Life, Relatedness, Emotional Repair, Physical Aggression, Relational Aggression, Affiliation, and Teacher Support, the variable Group was significant or trending towards significance, and the interaction was not, indicating that the effect of the intervention was independent of Pretest Mindfulness. In the case of Mindfulness, Depressive Symptomatology, Perceived Stress, Competence, Emotional Attention, Identified Regulation, External Regulation, and Amotivation, the interaction between Group and Pretest

Table 1 Mean (standard deviation) and Cronbach's alfa of collected variables at pretest and posttest

Category/outcome	Descriptive statistics		Cronbach's alfa	
	Pretest	Posttest	Pretest	Posttest
Mindfulness				
Mindfulness	5.6 (.59)	4.7 (.97)	.84	.87
Psychological well-being				
Satisfaction with life	5.0 (1.30)	4.9 (1.19)	.82	.80
Self-esteem	5.4 (.96)	5.3 (1.05)	.82	.88
Emotional disturbance				
Depressive symptomatology	3.2 (1.15)	3.2 (1.13)	.76	.76
Perceived stress	3.1 (1.27)	3.3 (1.17)	.74	.66
Basic psychological needs				
Autonomy	4.6 (1.12)	4.6 (1.11)	.73	.76
Competence	5.1 (.98)	5.1 (1.05)	.79	.82
Relatedness	5.6 (1.03)	5.5 (1.08)	.82	.84
Emotional intelligence				
Emotional attention	4.3 (1.23)	4.2 (1.17)	.89	.90
Emotional clarity	4.6 (1.13)	4.5 (1.05)	.90	.90
Emotional repair	4.9 (1.10)	4.7 (1.01)	.86	.86
School aggression				
Physical aggressive behavior	1.9 (1.10)	2.2 (1.22)	.94	.95
Relational aggressive behavior	2.1 (1.08)	2.3 (1.15)	.92	.93
Social classroom climate				
Engagement	3.7 (.91)	3.7 (.78)	.76	.72
Friendship and help between schoolmates	4.7 (.96)	4.7 (.80)	.78	.72
Help to teacher	4.0 (1.04)	4.0 (.92)	.81	.79
Academic motivation				
Intrinsic motivation	4.3 (1.29)	4.2 (1.28)	.93	.94
Identified regulation	5.8 (1.18)	5.5 (1.16)	.86	.85
Introjected regulation	4.7 (1.29)	4.5 (1.35)	.78	.83
External regulation	5.9 (1.17)	5.6 (1.18)	.83	.82
Amotivation	1.9 (1.23)	2.2 (1.41)	.86	.90
Empathy				
Empathy	4.7 (.76)	4.7 (.73)	.80	.79

Mindfulness was significant or trending towards significance, informing that the effect of the intervention was different among levels of Pretest Mindfulness. Finally, in the case of Autonomy, Emotional Clarity, Involvement, Intrinsic Motivation, Introjected Regulation, and Empathy neither Group nor the interaction between Group and Pretest Mindfulness were significant, which indicates that the intervention did not have any effect. We note that Pretest Mindfulness was significant in all regression analyses conducted except for External Regulation and Empathy, demonstrating the importance of the relation between mindfulness and most of the outcome variables.

Significant and borderline interactions were further analyzed by using the MODPROBE macro developed by Hayes and Matthes (2009). Specifically, Group was the focal predictor variable and Pretest Mindfulness was the moderator variable. Both variables were centered. In order to analyze the interaction, the effect of the Group was statistically tested by using the *pick-a-point* approach at three representative values of Pretest Mindfulness; one standard deviation above the mean, the mean, and one standard deviation below the mean. Results of these analyses are presented in Table 2 (see column "Conditional effect of Group on moderator variable"). Additionally, the interaction was plotted (see Fig. 2), where regressions lines for the relation between Pretest Mindfulness and the outcome variables at posttest were displayed for both the experimental and the control group. For positive outcomes (Mindfulness, Competence, Emotional Attention, Identified Regulation, and External Regulation), scores were higher in the experimental than in the control group when the value of Pretest Mindfulness was high, and sometimes also medium. An exception to this was found with Emotional Attention, for which the difference was found when Pretest Mindfulness was low. For negative outcomes (Depressive Symptomatology, Perceived Stress and Amotivation), the pattern of results was the other way around; scores were higher for the control as compared with the experimental group.

Third, to identify which intervention effects could be attributed to improvements on the ability of mindfulness, longitudinal mediation analyses were performed to test the mediation role of mindfulness between the intervention and the outcomes (see Fig. 1c). The mediated effects were assessed using the Sobel (1982) tests. We used the bias-corrected bootstrap method ($n = 2000$ resamples) to compute a 95% confidence

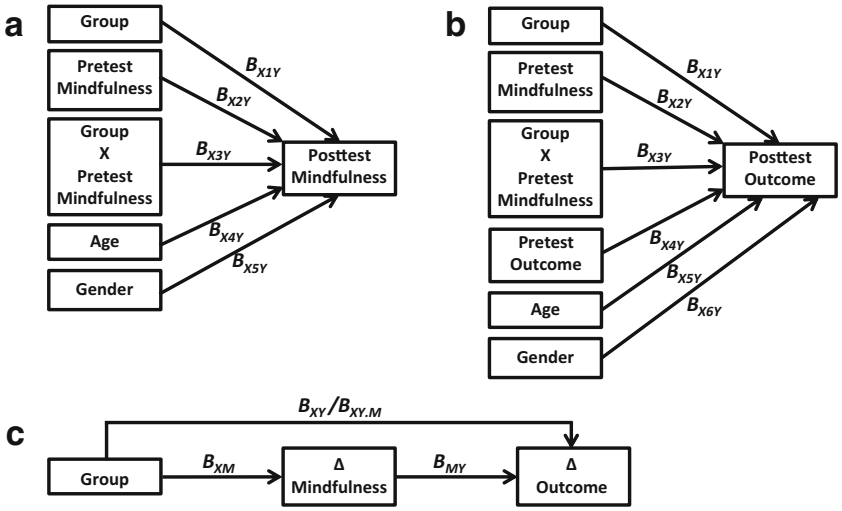

Fig. 1 **a** Diagram of multiple linear regression analysis performed to evaluate the effect of Group, and its interaction with Pretest Mindfulness, on Posttest Mindfulness. **b** Diagram of multiple linear regression analysis performed to evaluate the effect of Group, and its interaction with Pretest Mindfulness, on the rest of outcomes at the posttest. **c** Diagram of mediation analysis performed to evaluate mediation effect of the increment in mindfulness on the relation between the Group and the increment in each outcome

interval of the mediated effect. This approach increases power and reduces bias in the width of the confidence intervals of the mediated effect (MacKinnon 2008). If the upper and lower bounds of these bias-corrected confidence intervals do not contain zero, the mediated effect is significant at the level specified. To calculate the mediated effects, we employed the INDIRECT macro developed by Preacher and Hayes (2008). More specifically, we first calculated the difference scores for all variables, by subtracting posttest scores to pretest scores. Later, we carried out multiple linear regressions analyses on the difference scores of outcome variables, where Group (coded 0 for the control group and 1 for the experimental group) was the predictor variable and mindfulness difference scores were the mediated variable. Again, age and gender were introduced as covariables as statistical control of demographic characteristics. Based on regression coefficients obtained on these regressions, the INDIRECT macro performed bootstrapped Sobel tests to statistically assess the mediated effect of changes in mindfulness on the relation between the intervention and changes in outcome variables.

Results of the bootstrapped Sobel tests are presented in Table 3. Results revealed a significant mediated effect on all outcome variables in the expected direction, except for Autonomy, Emotional Clarity, Emotional Repair, Involvement, Affiliation, Intrinsic Motivation, and Introjected Regulation, where mediated effects were not significant. This indicates that improvements produced by the intervention in outcome variables were mediated by increments in mindfulness levels.

Next, responses of teachers and students to the questionnaire about the acceptability and the utility of the programme were analyzed. Results are presented in Table 4. Teachers scores about the questions related to the utility of the programme were low; with scores of 4 or lower. And, although the mean degree of satisfaction with the implementation of the programme was good (6.5), their answers were very variable (*SD* was 3.1). With respect to their intention to implement the programme in the future, a substantial percentage of the teachers (57.1%) answered positively. In general, students' scores about the questions related to the satisfaction of the programme were slightly lower to the adequate level; with scores of 4.8 or 5. Likewise, 38.1% of the students reported the wish of receiving the programme again in the future.

Finally, we calculated the total time implemented for mindfulness activities, character strengths activities, and both activities together for each classroom (see Table 5). The mean total time implemented for mindfulness activities and character strengths activities was close to 135 min (more than 2 h) in both cases (see Table 5). Thus, the average total time implemented for both types of activities together was 274.8 min (more than 4.5 h). However, the coefficients of variation were higher than 0.68, which indicates large variability among teachers.

Discussion

The first aim of this study was to evaluate the efficacy of a brief version of HCP on well-being, school aggression, and classroom climate in students. Intervention effects were expected to work by augmenting mindfulness levels in all the students. However, results showed that intervention effects on mindfulness were dependent on its initial level (that is, the pretest level). Consequently, intervention effects on the rest of the outcomes might also be dependent on the level of

Table 2 Multiple linear regression analyses for each outcome variable

Category/outcome variable	Multiple linear regression			Conditional effect of Group on moderator variable		
	Predictor variable	B (*SE*)	*p*	Values of the moderator variable	B (*SE*)	*p*
Mindfulness						
Post-Mind.	Group	.22 (.09)	.017	− 1 *SD*	.02 (.13)	.873
	Pre-Mind.	.79 (.07)	.000	Mean	.22 (.09)	.017
	Group x Pre-Mind	.40 (.16)	.011	+ 1 *SD*	.46 (.13)	.001
Psychological well-being						
Post-Self-Est.	Group	.22 (.11)	.051	–	–	–
	Pre-Self-Est.	.09 (.06)	.101	–	–	–
	Pre-Mind.	.56 (.09)	.000	–	–	–
	Group x Pre-Mind	.30 (.19)	.123	–	–	–
Post-Sat.Life	Group	.33 (.13)	.014	–	–	–
	Pre-Sat.Life	.13 (.05)	.010	–	–	–
	Pre-Mind.	.57 (.11)	.000	–	–	–
	Group x Pre-Mind	.14 (.22)	.521	–	–	–
Emotional disturbance						
Post-Depr.	Group	− .22 (.12)	.078			
	Pre-Depr.	.10 (.05)	.041	− 1 *SD*	.12 (.17)	.789
	Pre-Mind.	− .66 (.10)	.000	Mean	− .22 (.12)	.078
	Group x Pre-Mind	− .55 (.20)	.007	+1 *SD*	− .55 (.18)	.002
Post-Stress	Group	−.27 (.13)	.041			
	Pre-Stress	.10 (.05)	.039	− 1 *SD*	.04 (.18)	.830
	Pre-Mind.	− .48 (.10)	.000	Mean	− .27 (.13)	.041
	Group x Pre-Mind	− .50 (.22)	.021	+ 1 *SD*	− .57 (.19)	.002
Basic psychological needs						
Post-Auton.	Group	.07 (.13)	.560	–	–	–
	Pre-Auton.	.04 (.05)	.487	–	–	–
	Pre-Mind.	.29 (.10)	.004	–	–	–
	Group x Pre-Mind	.13 (.21)	.538	–	–	–
Post-Comp.	Group	.13 (.12)	.244			
	Pre-Comp.	.09 (.06)	.116	− 1 *SD*	− .07 (.16)	.684
	Pre-Mind.	.49 (.09)	.000	Mean	.13 (.12)	.244
	Group x Pre-Mind	.33 (.20)	.092	+ 1 *SD*	.34 (.17)	.047
Post-Rel.	Group	.31 (.12)	.008	–	–	–
	Pre-Rel.	.04 (.06)	.453	–	–	–
	Pre-Mind.	.37 (.09)	.000	–	–	–
	Group x Pre-Mind	.24 (.20)	.236	–	–	–
Emotional intelligence						
Post-Emo.Atten.	Group	.06 (.14)	.660			
	Pre-Emo.Atten.	.02 (.05)	.642	− 1 *SD*	.48 (.19)	.020
	Pre-Mind.	− .32 (.11)	.003	Mean	.06 (.14)	.660
	Group x Pre-Mind	− .64 (.23)	.005	+ 1 *SD*	− .33 (.19)	.094
Post-Emo.Clar.	Group	.18 (.13)	.163	–	–	–
	Pre-Emo.Clar.	.11 (.05)	.053	–	–	–
	Pre-Mind.	.20 (.10)	.044	–	–	–
	Group x Pre-Mind	− .02 (.21)	.909	–	–	–
Post-Emo.Repair	Group	.28 (.12)	.019	–	–	–
	Pre-Emo.Repair	.04 (.05)	.414	–	–	–
	Pre-Mind.	.28 (.10)	.003	–	–	–
	Group x Pre-Mind	− .03 (.20)	.875	–	–	–
School aggression						
Post-Phys.Aggr.	Group	− .35 (.11)	.000	–	–	–
	Pre-Phys.Aggr.	.04 (.06)	.562	–	–	–
	Pre-Mind.	− .35 (.11)	.001	–	–	–
	Group x Pre-Mind	− .17 (.22)	.434	–	–	–
Post-Rel.Aggr.	Group	− .45 (.12)	.000	–	–	–
	Pre-Rela.Aggr.	.09 (.06)	.124	–	–	–
	Pre-Mind.	− .25 (.10)	.010	–	–	–
	Group x Pre-Mind.	− .31 (.20)	.126	–	–	–
Social classroom climate						
Post-Involvement	Group	.12 (.09)	.177	–	–	–
	Pre-Enga.	.09 (.04)	.039	–	–	–
	Pre-Mind.	.27 (.07)	.000	–	–	–
	Group x Pre-Mind	− .04 (.15)	.773	–	–	–
Post-Affiliation	Group	.28 (.09)	.001	–	–	–

Table 2 (continued)

Category/outcome variable	Multiple linear regression			Conditional effect of Group on moderator variable		
	Predictor variable	B (*SE*)	*p*	Values of the moderator variable	B (*SE*)	*p*
	Pre-Friend.	.01 (.04)	.768	–	–	–
	Pre-Mind.	.15 (.07)	.035	–	–	–
	Group x Pre-Mind	− .18 (.15)	.214	–	–	–
Post-Teacher.Supp	Group	.23 (.10)	.023	–	–	–
	Pre-Help.Teacher	.07 (.05)	.125	–	–	–
	Pre-Mind.	.22 (.08)	.007	–	–	–
	Group x Pre-Mind	− .10 (.17)	.578	–	–	–
Academic motivation						
Post-Intrin.Mot.	Group	− .22 (.14)	.132	–	–	–
	Pre-Intrin.	− .06 (.06)	.305	–	–	–
	Pre-Mind.	.41 (.12)	.000	–	–	–
	Group x Pre-Mind	.26 (.24)	.284	–	–	–
Post-Iden.Reg.	Group	.03 (.12)	.810			
	Pre-Reg.Iden.	.04 (.06)	.428	− 1 *SD*	− .29 (.17)	.096
	Pre-Mind.	.28 (.10)	.005	Mean	.03 (.12)	.810
	Group x Pre-Mind	.53 (.21)	.011	+ 1 *SD*	.35 (.17)	.049
Post-Introj.Reg.	Group	− .03 (.15)	.822	–	–	–
	Pre-Reg.Introj.	− .01 (.06)	.910	–	–	–
	Pre-Mind.	.26 (.12)	.034	–	–	–
	Group x Pre-Mind	.32 (.26)	.224	–	–	–
Post-Extr.Reg.	Group	.25 (.12)	.042			
	Pre-Reg.Extr.	.08 (.06)	.151	− 1 *SD*	.03 (.17)	.859
	Pre-Mind.	.06 (.10)	.530	Mean	.25 (.12)	.042
	Group x Pre-Mind	.36 (.21)	.079	+ 1 *SD*	.47 (.18)	.008
Post-Amot.	Group	− .29 (.13)	.032			
	Pre-Amot.	.10 (.06)	.081	− 1 *SD*	.11 (.19)	.545
	Pre-Mind.	− .56 (.11)	.000	Mean	− .29 (.13)	.032
	Group x Pre-Mind	− .67 (.23)	.003	+ 1 *SD*	− .70 (.19)	.000
Empathy						
Post-Empathy	Group	.01 (.09)	.905	–	–	–
	Pre-Empa.	.05 (.06)	.378	–	–	–
	Pre-Mind.	− .02 (.07)	.786	–	–	–
	Group x Pre-Mind	.03 (.14)	.823	–	–	–

B, unstandardized coefficient regression; *SE,* standard error of the unstandardized coefficient regression; *p,* probability associated to the unstandardized coefficient regression; *SD,* standard deviation; For the sake of simplicity, age, and gender (control variables) are not showed in the table. The "Pre" prefix refers to the pretest scores and the "Post" prefix to posttest scores. Names of the variables were abbreviated as follows: *Mind.*, Mindfulness; *Self-Est.*, Self-esteem, *Sat.Life*, Satisfaction with Life, *Depr.*, Depressive Symptomatology; *Stress*, Perceived Stress; *Auton.*, Autonomy; *Comp.*, Competence; *Rel.*, Relatedness; *Emo.Atten.*, Emotional Attention; *Emo.Clar.*, Emotional Clarity; *Emo.Repair*, Emotional Repair; *Phys.Aggr.*, Physical Aggressive Behavior; *Rela.Aggr.*, Relational Aggressive Behavior; *Teacher.Supp*, Teacher Support; *Intrin.Mot.*, Intrinsic Motivation; *Iden.Reg.*, Identified Regulation; *Introj.Reg.*, Introjected Regulation; *Extr.Reg.*, External Regulation; *Amot.* Amotivation

mindfulness in the pretest. Having this possibility in mind, our analyses evaluated the effects of Group variable (experimental or control group) and also its interaction with the Pretest Mindfulness variable on the rest of outcome variables. Results have provided evidence of the efficacy of the intervention with the majority of the examined variables. Specifically, results revealed that the intervention might have improved several indexes of psychological well-being (both self-esteem and satisfaction with life), relatedness (a basic psychological need), emotional repair (a component of emotional intelligence), and several aspects of classroom climate (affiliation between students and teacher support); and may have reduced school aggression (both physical and relational). All these results are consistent with previous studies of MBIs with adolescents (for some revisions of the field see Burke 2010; Erbe and Lohrmann 2015; Roeser and Pinela 2014).

The intervention might have also improved mindfulness, competence (a basic psychological need), emotional attention (a component of emotional intelligence), different types of motivation (such as identified regulation and external regulation), and attenuated lack of motivation (that is, amotivation) and indexes of emotional disturbance (both depressive symptomatology and perceived stress). These effects were generally observed at high levels of pretest mindfulness, and less frequently also at medium levels. Specifically, in the case of mindfulness, the effect of the intervention was obtained at both high and medium levels. Given that the hypothetical mechanism of the programme is based on mindfulness, it is

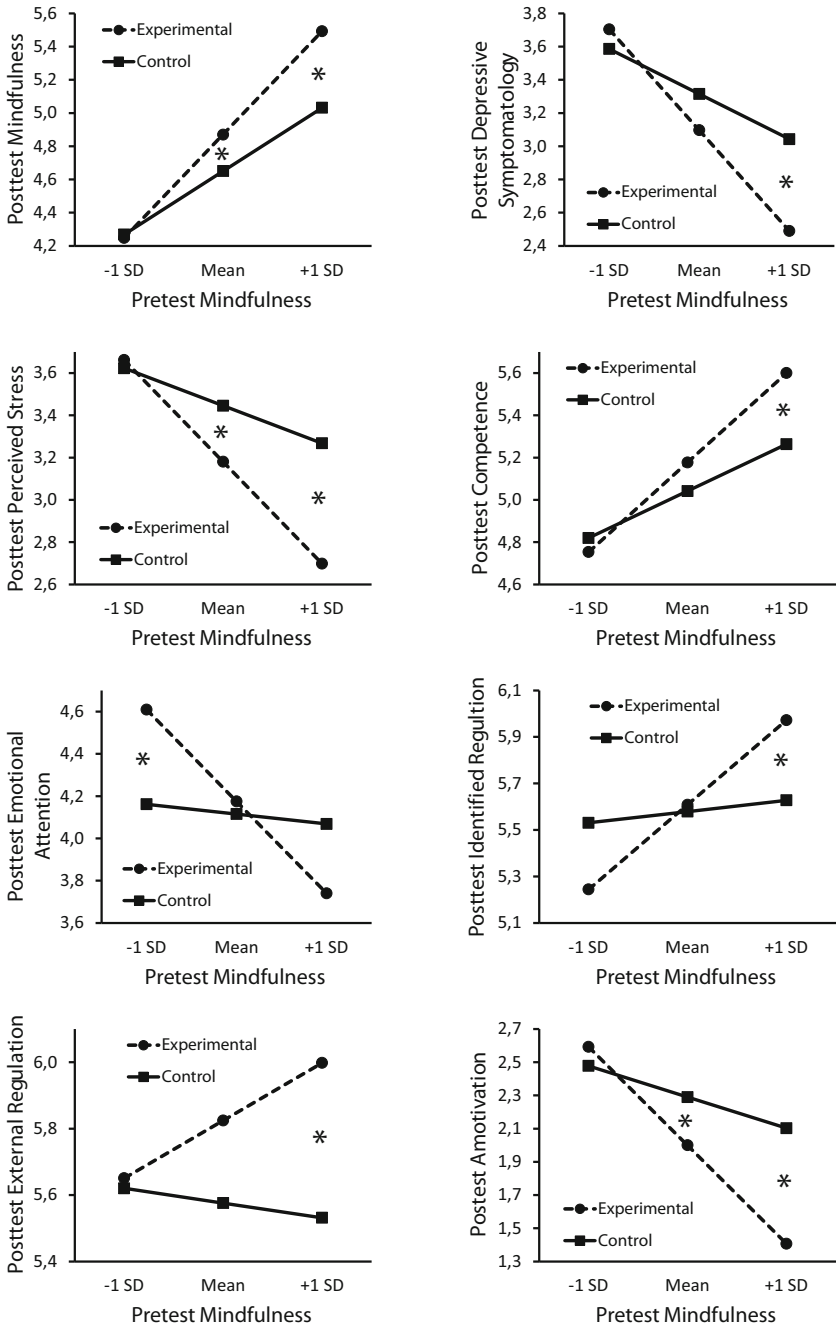

Fig. 2 Regression lines for the relation between Pretest Mindfulness (at three representative values) and outcome variables at the posttest for experimental and control group, for those regression analyses in which the interaction between Pretest Mindfulness and Group was significant or borderline. *Indicates the values of Pretest Mindfulness in which the conditional effect of Group was significant

reasonable to believe that the interaction effect between the intervention and the pretest levels found in mindfulness was manifested in the same interaction effect in the other outcomes. The intervention effect found in mindfulness is a key finding since it provides evidence of the construct validity of the intervention. In other words, it demonstrates that HCP really involved activities related to the mindfulness construct. However, the fact that the effect of the intervention was not demonstrated at low levels may suggest that mindfulness skill should be developed at some degree for the intervention to be effective. We note, however, that the implemented intervention was relatively short in duration. Thus, chances are that a longer duration of the intervention could provide enough practice opportunities to allow students to develop mindfulness skills, irrespective of their initial levels of mindfulness.

On the other side of things, the intervention did not have any effect on autonomy (a basic psychological need); clarity (a component of emotional intelligence); involvement (one aspect of social classroom climate); several types of motivation (such as intrinsic motivation and introjected regulation); and empathy. These findings indicate that results were not as

Table 3 Bootstrapped Sobel tests of the mediated effect of changes in mindfulness on the relation between the intervention and changes in outcome variables

Category/outcome variable	Mediated effect	95% CI	
		LL	UL
Psychological well-being			
Δ Self-Est.	.078*	.008	.177
Δ Sat.Life	.066*	.016	.166
Emotional disturbance			
Δ Depr.	− .075*	− .181	− .019
Δ Stress	− .061*	− .159	− .010
Basic psychological needs			
Δ Auton.	.013	− .254	.103
Δ Comp.	.063*	.007	.154
Δ Rel.	.042*	.002	.125
Emotional intelligence			
Δ Emo.Atten.	− .051*	− .139	− .001
Δ Emo.Clar.	.022	− .015	.099
Δ Emo.Repair	.034	− .006	.127
School aggression			
Δ Phys.Aggr.	− .068*	− .163	− .011
Δ Rel.Aggr.	− .075*	−.180	− .009
Social classroom climate			
Δ Involvement	.021	− .005	.078
Δ Affiliation	.016	− .015	.068
Δ Teacher.Supp.	.037*	.002	.105
Academic motivation			
Δ Intrin.Mot.	.032	− .014	.126
Δ Iden.Reg.	.053*	.011	.148
Δ Introj.Reg.	.027	− .023	.118
Δ Extr.Reg.	.040*	.001	.125
Δ Amot.	− .068*	− .163	− .015
Empathy			
Δ Empathy	.029*	.002	.090

CI, confidence interval; *LL*, lower limit; *UL*, upper limit; Δ, difference score between posttest and pretest. Names of the variables were abbreviated as follows: *Self-Est.*, Self-esteem; *Sat.Life*, Satisfaction with Life; *Depr.*, Depressive Symptomatology; *Stress*, Perceived Stress; *Auton.*, Autonomy; *Comp.*, Competence; *Rel.*, Relatedness; *Emo.Atten.*, Emotional Attention; *Emo.Clar.*, Emotional Clarity; *Emo.Repair*, Emotional Repair; *Phys.Aggr.*, Physical Aggressive Behavior; *Rela.Aggr.*, Relational Aggressive Behavior; *Teacher.Supp.*, Help to Teacher; *Intrin.Mot.*, Intrinsic Motivation; *Iden.Reg.*, Identified Regulation; *Introj.Reg.*, Introjected Regulation; *Extr.Reg.*, External Regulation; *Amot.*, Amotivation.*$p < .05$

positive as expected. In some cases, previous transversal studies have found significant relationships between mindfulness and autonomy (Lawlor et al. 2014) and intrinsic motivation (Levesque and Brown 2007). It is unclear, however, whether these relationships would remain significant after a MBI. In other cases, previous studies have effectively found benefits in emotional clarity (Broderick & Metz 2009), students' engagement (Felver et al. 2014), and empathy (Schonert-Reichl et al. 2015) after a MBI implementation. Because of the paucity of data in this emerging field, more research is needed to account for this discordance.

The second aim of the study was to determine whether the intervention effect on the outcome variables was mediated by mindfulness. In general, our findings go in line with previous evidence on the effect of mindfulness-based interventions. For example, studies on MBSR found that it reduces depression (e.g., Grossman et al. 2010) and perceived stress (e.g., Bränström et al. 2010), whereas it increases empathy (Shapiro et al. 1998) and satisfaction with life (Grossman et al. 2010). Similarly, our results point out that HCP may reduce depression and perceived stress, and increase empathy and satisfaction with life, by promoting changes in mindfulness levels. In addition, in accordance with the systematic review conducted by Randal et al. (2015) about the positive effect of MBIs on self-esteem, the effect on HCP on self-esteem was also mediated through mindfulness.

As previous research has shown, in accordance with SDT (Ryan and Deci 2000), mindfulness should promote the fulfillment of the basic psychological needs (Lawlor et al. 2014; Brown and Ryan 2003), emotional regulation (Brown and Ryan 2003; Meiklejohn et al. 2012; Metz et al. 2013), and behavioral and interpersonal regulatory processes, which in our study should be reflected in less aggression (Schonert-Reichl et al. 2015) and better school climate (Wisner 2014). Our results partially confirmed these findings, since mindfulness mediated the effects of HCP on all basic psychological needs, except autonomy; one of the components of emotional intelligence, namely emotional attention, but not those of emotional clarity and emotional repair; all types of school aggression, and all aspects of classroom climate, excluding involvement. In relation to aggression, we mentioned earlier that according to a critical review (Fix and Fix 2013), MBIs on aggression (which are based on meditation on the soles of the feet) are effective to reduce aggressive behavior. Our study did not use meditation on the soles of the feet, but also led to a reduction of aggressive behavior. With regard to classroom climate, based on data obtained using concept mapping methodology, Wisner (2014) stated that mindfulness programmes have the potential to bring about important changes in classroom climate and student involvement. Our results confirmed the potential of HCP on some aspects of classroom climate, such as affiliation and teacher support, but not on involvement. Likewise, research under the framework of SDT has found evidence that mindfulness is related to self-determined motivation. Specifically, Levesque and Brown (2007) found that trait mindfulness was associated with autonomous (intrinsic) motivation for day-to-day behavior. Our results are partially consistent with this idea because, although mindfulness did not mediate the effect of HCP of intrinsic

Table 4 Mean, standard deviation (or percentage) of the score for each question

Question	Score/percentage
Teachers	
I believe that the programme is useful for augmenting my students' well-being.	4.0 (0.58)
I believe that the programme is useful for improving work climate in my classroom.	4.0 (0.82)
I believe that the programme is useful for improving my relationship with my students.	3.5 (1.26)
My degree of satisfaction with the implementation of the programme is…	6.5 (3.10)
Are you going to keep on implementing the programme in the future?	57.1%
Students	
My degree of satisfaction with the activities of the programme is…	4.8 (1.50)
My degree of satisfaction with the activities of mindfulness is…	4.8 (1.75)
My degree of satisfaction with the activities of character strengths is…	5.0 (1.80)
Would you like your teacher to keep on implementing the programme in the future?	38.1%

Except for the last question asked to teachers and students, whose answers were dichotomous ("yes" or "no"), the rest of the questions were rated on a 11-point scale ranging from 0 to 10. For categorical questions, the percentage of respondents that answered "yes" was calculated. For continuous questions, the mean and standard deviation, in parentheses, were reported

motivation (the most self-determined motivation), it did mediate the effect on amotivation (the least self-determined motivation).

For the majority of outcome variables, the results of the mediation analyses mirrored those of the efficacy analyses. We note some exceptions to this. In the case of emotional repair and affiliation, we found evidence of efficacy but not of mediation. In the case of empathy, we found evidence of mediation, but not of efficacy. And lastly, in the case of emotional attention, we found evidence of efficacy and mediation,

Table 5 Total time (in minutes) implemented in the programme for mindfulness activities, character strengths activities, and both types of activities together for each classroom

Classroom	Total time implemented in mindfulness activities	Total time implemented in character strengths activities	Total time implemented in both types of activities together
1	120	100	220
2	30	190	220
3	105	325	430
4	175	270	445
5	65	10	75
6	355	215	570
7	57	10	67
8	130	38	168
9	148	100	248
10	40	300	340
11	240	0	240
Mean (*SD*)	133.2 (92.1)	141.6 (117.5)	274.8 (149.8)
CV	0.69	0.83	0.55

SD, standard deviation; *CV*, coefficient of variation

but the sign of the mediation analysis effect was opposite to that found in the efficacy analysis. All in all, these divergent findings suggest that the impact of the intervention on the outcome variables cannot be attributed to changes in mindfulness skills solely, but there must be other variables involved. Given that the intervention included the training of both mindfulness skills and the transcendence virtue, it might be the case that the training of the transcendence virtue had an effect on the results observed. Unfortunately, however, this hypothesis cannot be empirically tested since, for the sake of the brevity of the assessment, we did not measure this virtue.

These additional effects had a beneficial impact on outcome variables such as emotional repair and affiliation, contributing to an improved efficacy of the intervention. In other cases, however, they had a detrimental impact on variables such as empathy and emotional attention. Specifically, the positive impact mindfulness had on empathy was counteracted by the additional effects, eliminating its influence. And the negative impact that mindfulness had on emotional attention was counteracted by the additional effects, which turned the effect into positive. We regard the positive effect of the intervention on emotional attention as detrimental because, although emotional intelligence as a general construct has been related to mental health, emotional attention, in particular, has been related to depression, anxiety, and perceived stress (Fernández-Berrocal et al. 2004; Lombas et al. 2014; Martin-Albo et al. 2010). As a solution to this problem, some authors have proposed the replacement of emotional attention, which seems to be pathological, with mindfulness in the assessment of emotional intelligence (e.g., Lombas et al. 2014).

One interesting finding of the present study is that the initial levels of mindfulness predicted the scores in all outcome variables after the intervention except for external regulation

and empathy. Although this is not the first time that the predictive relation between trait mindfulness and psychological variables is investigated (for a review, see Keng et al. 2011), the present study employed a longitudinal design and also controlled for the initial levels of the outcome variables.

The third aim of this study was to evaluate the implementation fidelity and the acceptability of HCP. With regard to the implementation fidelity, although the average degree of teachers' satisfaction with the implementation of the programme was good, the levels of satisfaction varied greatly among teachers, same as the total time dedicated to mindfulness and character strengths activities among classrooms, indicating a very different implementation among teachers in terms of time. We suspect that the differences in the total time dedicated to HCP may indicate problems integrating the activities with the school curriculum. This problem might be solved in the future by designing a school curriculum that takes into consideration the timing and requirements of HPC activities.

In the matter of acceptability, it seems that teachers did not find the programme useful to increase students' well-being, classroom climate, and teacher–student relationship. Future work may consider providing the teachers with larger scientific evidence that supports the beneficial effects of the programme components, so that teachers could appreciate the usefulness of the programme. Moreover, students' satisfaction with the programme activities was borderline to an adequate level, and only a minority of them was willing to receive the programme again in the future. In opposition to that, the majority of teachers had a positive attitude about implementing the programme in the future. These results were unexpected since the acceptability of MBIs are usually high (Zenner et al. 2014). Future research should dig deep into the causes of these results by recollecting qualitative data through group discussions.

One strength of our study is that the students' teachers, rather than mindfulness specialists, implemented the intervention in their own classrooms, which provides evidence of its external validity. It is important to note that in HCP intervention, teachers were trained in the same practices they would implement with their students in such a way that they could serve as models for adolescents' burgeoning mindfulness skills. This could contribute to some of the observed benefits, such as improvements in classroom climate, through improvements in teacher's well-being and capacities to create and sustain supportive relationships with students (Roeser et al. 2012). However, this idea cannot be proved with our data and future research should examine if teachers' practice contributes to the observed benefits. Another strength of this study is that it examined whether the efficacy of the intervention could be attributed to changes in mindfulness. On the contrary, this study did not focus attention on the other component of the intervention; the transcendence virtue. Therefore, future research should investigate the role of this component on the programme efficacy.

Limitations and Future Research

The present study suffers from some limitations. We only collected self-reported measures that may be affected by both social desirability bias (the tendency to answer questions in a manner that will be viewed favorably by others) and by reference bias (which occurs when people use different standards of comparison). Besides, a large number of self-reported measures were administrated, which may have produced fatigue to the participants. The study consisted in a quasi-experimental design that used some control strategies, such as pretests and posttest measures and the employment of a control group. However, the assignment of subjects to experimental and control groups was not random and teachers were not blind to group assignment. In addition to that, the control group was not an active control group. Consequently, expectation bias cannot be ruled out. Furthermore, even though teachers were trained by the authors of the programme, so that teachers could deliver the programme with a high degree of understanding and fidelity, data of the study showed that, at least in terms of time, implementation varied among teachers. Finally, the programme was not well accepted by the majority of students, which could have reduced the magnitude of the intervention effect.

Authors' Contributions ASL: designed and executed the study, executed the data analyses, and wrote the paper. TIJ: designed and executed the study, and wrote the paper. RA: trained the teachers to implement the programme in their classroom. SH: trained the teachers to implement the programme in their classroom. SV: collaborated in the writing and editing of the manuscript. JM: designed and executed the study, and assisted with the data analyses. All authors approved the final version of the manuscript for submission and collaborated with the writing of the study.

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Compliance with Ethical Standards

Research was conducted in compliance with APA ethical standards. All procedures were in accordance with the ethical standards of the University of Zaragoza institutional review board. The manuscript does not contain clinical studies or patient data. Passive consent was obtained from participants' parents or guardians.

Conflict of Interest RA and SH are co-founders of the Happy Classrooms Programme.

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