

Article

Effectiveness and Long-Term Effects of SER⁺ FELIZ(mente): A School-Based Mindfulness Program for Portuguese Elementary Students

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Abstract: School-based mindfulness programs (SBMPs) have gained global popularity. Yet, there is a need for more rigorous procedures to develop and assess them. This study aimed to address these limitations by examining the effectiveness of a Portuguese SBMP, called SER⁺ FELIZ(mente). The final sample included 190 third and fourth-graders: 99 in the SBMP group and 91 in a wait-list group. Effects on attentional control, emotional regulation and wellbeing were examined in the short term (T2) and 6 months later (T3). We also tested the moderating role of age, gender, and baseline scores. Using a multilevel modeling approach, results showed a clear benefit of SBMP on emotional wellbeing at T2 but not T3. Despite SBMP students surpassing wait-list students in attentional control, cognitive reappraisal, and social wellbeing at T2, these effects were due to a levelling off among SBMP students, coupled with a decline among wait-list students from T1 to T2. These effects were moderated by age at T3. While universal improvements were limited, our SBMP seemed to have acted as a shield against school stressors (i.e., likely, test anxiety at T2). This opens a new avenue for research concerning the role of SBMPs in preventing (rather than repairing) mental-health issues in elementary students.

Keywords: school-based mindfulness programs; attentional control; emotional regulation; wellbeing; elementary students



Citation: Magalhães, S.; Carvalheiras, C.; Ribeiro, C.; Francisco, C.; Mourisco, C.; Leal, T.; Limpo, T. Effectiveness and Long-Term Effects of SER⁺ FELIZ(mente): A School-Based Mindfulness Program for Portuguese Elementary Students. *Educ. Sci.* **2024**, *14*, 1155. <https://doi.org/10.3390/educsci14111155>

Academic Editor: Michael William Dunn

Received: 4 July 2024

Revised: 23 October 2024

Accepted: 24 October 2024

Published: 25 October 2024



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1. Introduction

Schools are crucial access points for implementing programs aimed at promoting the health and wellbeing of young people, particularly in fostering their socio-emotional development and mental health [1,2]. This crucial role was amplified during the pandemic [3], which highlighted the necessity of equipping young people with skills to adaptively handle adverse circumstances that, as we saw recently, can arise suddenly and unexpectedly. School-based mindfulness programs (SBMPs) represent such initiative. SBMPs aim to help in developing skills associated with wellbeing and mental health in school-aged children [4–10], including during challenging times like the pandemic [11–15]. Over the past 15 years, SBMPs have grown in popularity and have been widely adopted across the globe [16]. However, research on SBMPs is still emerging. Despite the promising results, studies have reported inconsistent and mixed effects [5,16–20]. Furthermore, many studies lack scientific rigor, which weakens the reliability of their conclusions [5,6,8,20,21]. Additionally, most existing SBMP studies have been conducted in North America, which may limit results' and programs' applicability to other non-U.S. educational systems [20]. Clearly, there is a need for more rigorous evaluations of SBMPs' effects (e.g., examining the moderators of effectiveness and the sustainability

of those effects) and the development of context-based SBMPs grounded in developmental science and the educational features of the targeted population [22].

SBMPs are a form of mental training that promote students' ability to redirect and sustain attention in the present moment and to recognize and relate to their internal experiences and external circumstances with a non-judgmental, accepting, and compassionate attitude [23,24]. SBMPs typically offer a diverse range of mindful-based practices designed to foster mindfulness by encouraging curious and non-judgmental attention to sensory experiences as well as body, breath, feelings, and thoughts [16]. Many programs also include applying mindfulness to everyday activities, such as eating and daily habits, along with an enhanced awareness of our surroundings and the others around us [16]. Usually, SBMPs are implemented over a period of 5 to 10 weeks, with one long lesson per week and/or daily short lessons, following the mindfulness-based stress reduction format [25]. In these programs, there are two types of mindfulness practices during long sessions: (a) guided meditation, where participants focus on their breath, bodily sensations, or specific objects of attention, which help them to develop focused attention and present-moment awareness, and (b) reflective practices, wherein participants explore and deepen their understanding of sensory and psychological experiences, which help them to gain insight into their inner experiences and develop emotional regulation skills [8].

Reviews and meta-analyses have demonstrated that school-based mindfulness programs (SBMPs) not only enhance students' cognitive and socio-emotional competencies, resilience to stress, mental wellbeing, quality of life, and academic performance, but also reduce attention problems, negative emotions, and symptoms of anxiety, depression, and stress (e.g., [4,5,16–20,26–28]). Additionally, research has shown the benefits of SBMPs for students with academic, emotional, and behavioral disabilities, as these programs help to alleviate psychological distress, improve self-esteem [29], and foster key skills, such as executive functioning, attention, and emotional regulation [30,31]. However, despite these promising outcomes, the underlying mechanisms of these benefits remain underexplored. Scholars continue to debate how SBMPs produce these educational and psychological effects (e.g., [28,32,33]). Roeser et al. [16] have made a significant contribution to this discussion by proposing a theory of change that suggests the success of SBMPs largely depends on the quality of their implementation and their alignment with students' cultural and developmental needs. When such alignment occurs, students are more likely to engage fully with the activities, thereby cultivating mindfulness and self-regulation skills (e.g., emotional regulation and attentional control). These skills, in turn, help students manage emotions, reduce stress, and enhance wellbeing, ultimately improving their mental health [16].

In particular, SBMPs seem to offer substantial benefits for children with academic, emotional, and behavioral disabilities by also promoting socio-emotional wellbeing. Mindfulness training has been shown to enhance emotional regulation and reduce problematic behaviors, such as aggression and impulsivity, among this population [30]. This seems to happen because mindfulness encourages present-moment awareness, allowing students to become more attuned to their emotions and reactions. This increased awareness enables them to regulate their emotions more effectively, thereby minimizing impulsive and aggressive behaviors. Furthermore, research has shown that students with learning or emotional challenges experience improvements in social skills and self-conceptualization and reduced symptoms of depression and anxiety after mindfulness training [34,35]. By equipping these students with effective coping strategies, mindfulness seems to empower them to navigate the complexities of their disabilities by fostering resilience, adaptability, and improved interpersonal relationships both inside and outside the classroom [29,31].

In spite of the overall proposal that mindfulness-based programs may be an asset in school contexts, the authors of the theory of change, along with those of the aforementioned reviews [4–10,16–20,26–28], still caution against generalizing SBMPs' benefits due to the overall low quality of existing studies. Three main limitations have been identified in the field: (1) a lack of studies analyzing participants' characteristics, which are likely to

moderate SBMPs' effects; (2) the limited number of studies conducting follow-up assessments to verify the long-term maintenance of SBMPs' benefits; and (3) a lack of information concerning the degree to which the development and implementation of the programs is developmentally and contextually appropriate, taking into account participants' developmental stages and school systems' educational features [4,7–10]. These three limitations, which provide the basis for the current study, will be further examined in what follows.

Understanding participants' characteristics that moderate SBMPs' effects is crucial as it provides essential insights into who benefits more or less from the program [36]. This knowledge allows for adaptations that can make the programs more effective for those who did not initially benefit from them. Additionally, understanding these moderating characteristics is important not only for improving the specific program under study but also for offering valuable guidance to those designing other programs [36]. One of the key participant characteristics whose potential moderating role on SBMPs' effects deserves to be explored is age, since it provides insights into the impact of developmental issues on mindfulness interventions. There are specific developmental periods during which certain brain regions and networks undergo modifications, making individuals more receptive to certain interventions [4]. Recent reviews suggest that SBMPs are particularly effective for elementary school children, with studies showing greater improvements in mental health symptoms for younger children than adolescents [4,37]. However, it remains unclear if the benefits of these programs are the same within elementary school or even within the same grade. Indeed, few studies have examined the moderating role of age within narrow ranges, and the results have been inconsistent. For instance, in Grade 3, Magalhães et al. [12] found greater socio-emotional benefits among younger students. In Grade 4 and 5, Gould et al. [38] did not find an age effect, with all participants benefiting from the program equally, regardless of age. Another key participant characteristic that is essential for understanding the universality of SBMPs' effects is gender. Recent research has been showing that girls appear to be more susceptible to benefiting from these programs [4,39]. This advantage of girls over boys seems to be explained by how females respond to psychological distress, as it is culturally expected for girls to express their emotions more openly than boys, who seem more prone to suppress them [40]. However, research is not consistent, with a handful of studies showing no gender differences in SBMPs' effects [12,38,41,42]. Finally, another important characteristic for understanding the universality of SBMPs' effects is the role of participants' cognitive and emotional profiles at baseline. The few research studies examining this issue have yielded mixed findings. Some studies have found no evidence of a moderating effect [42]. Yet, others have found that SBMPs are more effective among students with a higher baseline levels of depressive symptoms [43], whereas others showed better results among students with higher baseline scores in executive functioning [44] and attentional skills [12].

Conducting follow-up assessments is relevant because they provide essential insights into whether, how, and for how long the benefits of SBMPs might be sustained. Although there is a common assumption that mindfulness programs can have a potentially life-long impact on mental health and wellbeing [45], research on their long-term effects in school contexts remains scarce [6,8]. Notably, a recent meta-analysis of randomized controlled trials (RCTs) revealed that SBMP students did not outperform their control peers in any outcome category at follow-up [6]. Still, moderator analyses of these follow-up assessments indicated that a larger dose of SBMP led to better outcomes regarding anxiety, stress, and negative behavior. Additionally, older participants showed greater long-term improvements than younger ones in terms of depression and mindfulness outcomes. While this meta-analysis provided relevant insights into the longevity of SBMPs benefits, it also highlighted a lack of high-quality, adequately powered RCTs. Moreover, the studies analyzed included participants aged 18 or younger, meaning clear information about the long-term benefits of SBMPs in elementary school settings could not be provided. The few studies that specifically analyzed the long-term benefits of SBMPs in elementary schools yielded inconsistent results. A study that tested the effects of a 6-week SBMP with 8–9 year-

olds found two encouraging findings. First, at a 14-week follow-up assessment, SBMP students showed better attention scores than controls; second, these follow-up attention scores among SBMP students were also higher than those achieved immediately after the intervention [46]. Conversely, another study testing a 10-week SBMP with 8 to 10-year-olds found no sustained benefits at a 5-month follow-up [47].

Developing and applying programs that are contextually appropriate and suitable for participants' developmental stages is important for ensuring that SBMPs have a meaningful and lasting impact [22]. For example, the recent MYRIAD project, the largest RCT of SBMPs in schools to date, suggested that SBMPs do not represent a universal intervention and could be contraindicated for students with existing or emerging mental health symptoms [18]. A likely contributing factor to this lack of effectiveness was minimal student engagement with the strategies taught [22,48,49]. This negligible engagement could be related to a mismatch between the programs and students' life contexts, interests, and cognitive development. Indeed, prior works have highlighted the importance of tailoring SBMPs to instructors, participants, and contexts to optimize their effects [22,50,51]. Building on these recommendations, the first and last authors of this article developed an SBMP called SER⁺ FELIZ(mente)—in English, Be⁺ HAPPY(ly)—for Portuguese school children aged 8–12 years old [12,13,44,52]. This program aims to address the gaps identified in previous studies by ensuring that the content is developmentally appropriate and contextually relevant.

SER⁺ FELIZ(mente) is an 8-week SBMP aimed to increase Portuguese students' self-awareness and acceptance of themselves, others, and their surroundings through guided meditations and reflective practices. This program consists of 16 30-minute lessons delivered by trained psychologists (two lessons per week, on Mondays and Tuesdays) plus 24 5-minute meditation sessions overseen by schoolteachers (three sessions per week, on Wednesdays, Thursdays, and Fridays). Each 30-minute lesson includes, in order, (a) an audio-guided breathing meditation; (b) a review of the previous contents; (c) two or three audio-guided meditation or reflective practices related to the lesson's topic; (d) a reflection activity about the learned practices; and (e) a final moment to wrap up the lesson. In the 5-minute meditation lessons, schoolteachers are asked to lead a pre-set guided meditation to redirect students' attention to breathing, body sensations, emotions, or thoughts fostering an accepting attitude. On Fridays, schoolteachers are additionally asked to present a weekend challenge to generalize the learned practices. The program is divided into six modules. Module I, the Introduction, presents the program and the concept of mindfulness, encouraging participants to focus on the present moment. Module II, 5 Senses, introduces mindful sensing with attention to the various senses. Module III, Body, teaches awareness and acceptance of bodily sensations. Module IV, Heart, focuses on identifying and managing emotions. Module V, Brain, develops skills to recognize helpful and unhelpful thoughts. Finally, Module VI, Consolidation, includes loving and kindness practices and a review of all learned practices.

The creation of this program followed the Framework for Developing and Testing Mind and Body Interventions published by the National Center for Complementary and Integrative Health. It was also aligned with the Stage Model of Intervention Development by Saunders and Kober [52], which provides stage-by-stage recommendations for developing and testing evidence-based mindfulness interventions for children and adolescents. In Stage 1, we deepened our understanding of the characteristics and effects of SBMPs in youth populations (citation omitted) by drawing on theory and research from cognitive developmental neuroscience [53,54], contemplative science and mindfulness [55], social and emotional learning [56], and positive psychology [57]. In Stage 2, we utilized this knowledge to create a comprehensive, contextualized, and age-appropriate intervention program inspired by other effective SBMPs [58,59]. In Stage 3, the feasibility of this program was assessed in an RCT study to determine the program's potential for a full-scale efficacy trial [44]. This study aimed to explore the effects of mindfulness (vs. relaxation) training on third graders' attention, executive functions (e.g., inhibitory control, working memory, and cognitive flexibility), and literacy-related achievements (e.g., handwriting fluency and

Portuguese grades). Results showed that mindfulness training enhanced cognitive flexibility and executive functions among children with higher baseline scores and improved handwriting fluency and Portuguese grades among all students. The collected data in this study were subsequently utilized to enhance the program, which resulted in the final version previously described. In Stage 4, its efficacy was assessed in three studies with active control groups [12,13,52].

The first study showed that mindfulness training resulted in higher teacher-rated attention and emotional regulation as well as improved grades in Portuguese, Mathematics, and Social Studies among third graders [12]. Additionally, emotional regulation and alerting baseline scores, along with age, were identified as moderating factors influencing the SER⁺ program's effects. The second study found that the SER⁺ program led to increased levels of several facets of mindfulness as well as better text composition abilities and mathematics grades among fourth graders [52]. However, lesson absences, intervention-related knowledge, and social validity did not moderate the effects of the SER⁺ program. Finally, the third study indicated that mindfulness training with daily practice resulted in lower levels of expressive suppression and stress symptoms, as well as higher life satisfaction, among sixth graders [13]. Additionally, both daily and weekly practice led increased cognitive reappraisal self-rated abilities. While the effects of the SER⁺ program on emotional regulation were moderated by gender, age, and baseline expressive suppression, no other moderating effects were identified. Given these positive results, we moved to Stage 5, which aims to understand the effectiveness and the long-term effects of the program in a real-world context, which was the goal of this study.

In summary, while research on SBMPs is encouraging, it is still in its early stages and suffers from methodological limitations. Information regarding moderators of effectiveness and long-term effects is scarce and mixed, making it challenging to understand the added value of these programs in a school context for all students, over time [5,6,8,20,21]. Additionally, there is a growing call for these programs to be context- and age-appropriate [16,22]. To address these limitations, we undertook the present study, which aimed to examine the effectiveness of the SER⁺ FELIZ(mente) SBMP program versus a wait-list control group on elementary graders' attention, emotional regulation, and wellbeing according to the theory of change proposed by Roeser et al. (2022). We examined the effects in the short term (T2—posttest) and long term (T3—6-month follow-up) and tested the potential moderating role of age, gender, and baseline scores at both testing times. Based on the literature review and considering that the program was developed taking into account participants' context and age, we expected increases in attention, emotional regulation, and wellbeing at both T2 and T3 [16]. Furthermore, we anticipated that age, gender, and baseline scores would moderate these benefits, with younger students and girls with higher baseline scores benefiting more from the program than older students and boys with lower baseline scores [4,12,13,39].

2. Materials and Methods

2.1. Participants

The participants were 226 third- and fourth-grade students recruited from five public schools in Northern Portugal. We implemented a stratified randomization process to achieve balanced group sizes, using classroom size as the stratum. For ethical reasons, the SBMP was integrated into the curriculum and administered to all students during class, including those with special educational needs (representing approximately 9% of the final sample). Among the latter, the majority were diagnosed with learning difficulties and attention deficit/hyperactivity disorder. However, students with severe cognitive deficits who were unable to complete the assessment tools and to participate in the programs' activities were excluded from the analyses ($n = 10$), along with 18 students who were not authorized to be included in the data analyses and 8 students who missed a testing session. These exclusions resulted in a data sample of 190 students at T1. The sample sizes for T2

and T3 data collection were 180 and 185, respectively (showing attrition rates of 5% and 3% due to illness).

Concerning the sociodemographic characteristics of the T1 sample, the SBMP group comprised 99 students (49 girls, 50%) from six different classes, with an average age of 8.64 years ($SD = 0.71$). The wait-list control group comprised 91 students (47 girls, 52%) from seven classes, with an average age of 8.63 years ($SD = 0.55$). The educational attainment of the children's legal guardians in the SBMP and wait-list groups was distributed as follows: 3% and 1% completed Grade 4 or below; 7% and 6% completed Grade 6; 20% and 21% completed Grade 9; 31% and 38% completed Grade 12; and 39% and 34% held a university degree. This information was unknown for 9% and 7% of the SBMP and wait-list groups, respectively. There were no group differences in terms of gender ($\chi^2 = 0.09$, $p = 0.77$), age ($t = -0.11$, $p = 0.91$), or legal guardians' educational attainment ($t = 0.14$, $p = 0.89$).

2.2. Procedure

The study plan was approved by the ethical review board of the first and last author's university. Written informed consent was obtained from parents for data collection and analyses, while participants, in accordance with age-appropriate protocols, provided oral consent. The study adhered to the principles outlined in the Helsinki Declaration, and participants had the option to withdraw from the study at any time. Data were collected at three distinct time points. T1, conducted at beginning of the second school term (January 2023), served as the pretest; T2, conducted at the end of the second school term (two months after T1), served as the posttest; and T3, conducted in the beginning of the next academic year (six months after T2), served as the follow-up. At these time points, a protocol consisting of the study's questionnaires was administered in a classroom setting. A trained administrator facilitated the process by providing clear instructions and verbally guiding students through the protocol as they completed it.

As explained in the introduction, the SER⁺ FELIZ(mente) program was implemented over an 8-week period. In each week, two 30-minute lessons were conducted on Mondays and Tuesdays by a psychologists trained in the program, followed by three short 5-minute lessons on Wednesdays, Thursdays, and Fridays overseen by the students' regular schoolteacher. The 30-minute lessons were administered using PowerPoint files containing key topics for presentation. The 5-minute lessons were based on a PowerPoint file, which contained an audio/video file with guided meditation for the children to listen to. The unique task of the teachers was to open the PowerPoint file, capture the children's attention, and play the mediation.

To ensure the SBMP program was implemented according to the established plan, we organized a preliminary 12-hour workshop for all psychologists, supplemented by a series of weekly 1-hour sessions conducted throughout the program's implementation. Additionally, we supplied all psychologists and teachers with checklists to mark the completion of each lesson key steps and to note any participant absences. Records indicated that 94% of the lessons steps were successfully completed. In instances where compliance was not achieved, the instructor addressed any missed step in subsequent lessons. At the end of the program, all steps were implemented across all classes. Furthermore, no child was absent more than three times, nor did any child drop out of the program. Finally, 25% of the lessons across all classes were audio-recorded for independent analyses. These recordings were reviewed by a trained research assistant, who confirmed that all planned steps were successfully executed.

2.3. Measures

To measure attentional control, we used The Attentional Control Scale for Children (ACS-C) [60]. The Portuguese ACS-C [61] comprises an 11-item self-report questionnaire divided into two subscales: attentional focusing (7 items) and attentional shifting (4 items). Respondents rate their agreement with each statement on a 4-point scale ranging from 1 (almost never) to 4 (always). To derive the final score for each subscale and the total score, the responses to the respective items are averaged, with higher scores indicating better

attentional control. The McDonald's omegas for attentional focusing for the SBMP/wait-list groups at T1 were 0.73/0.60, at T2 were 0.71/0.69, and at T3 were 0.71/0.74. However, due to negative or near-zero covariances, it was not possible to estimate reliability for attentional shifting. Thus, we decided to only use the total score. The McDonald's omegas for the total score at T1 were 0.77/0.66, at T2 were 0.83/0.76, and at T3 were 0.83/0.83 for the SBMP and wait-list group, respectively.

To measure emotional regulation, we utilized the Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA) ([62], Portuguese version [63]). This questionnaire consists of 10 items and encompasses two subscales, which evaluate cognitive reappraisal (6 items) and expressive suppression (4 items). Participants are required to rate their level of agreement with each statement on a 5-point scale ranging from "strongly disagree" to "strongly agree". Higher scores on each subscale indicate a greater tendency to employ the corresponding emotional regulation strategy. The McDonald's omegas for cognitive reappraisal for the SBMP/wait-list groups at T1 were 0.58/0.81, at T2 were 0.73/0.86, and at T3 were 0.77/0.84. The McDonald's omegas for expressive suppression for the SBMP/wait-list groups at T1 were 0.65/0.62, at T2 were 0.78/0.77, and at T3 were 0.70/0.70.

Finally, to assess mental health and wellbeing, we chose the Mental Health Continuum Short Form (MHC-SF) [64], Portuguese version [65]. This is a 14-item self-report questionnaire divided into three subscales: hedonic-emotional wellbeing (3 items), eudaimonic-social wellbeing (5 items), and eudaimonic-psychological wellbeing (6 items). Respondents rate their agreement with each statement on a 6-point scale ranging from 0 (never) to 5 (every day). Higher scores indicate greater levels of positive wellbeing. The McDonald's omegas for emotional wellbeing for the SBMP/wait-list group at T1 were 0.57/0.64, at T2 were 0.75/0.68, and at T3 were 0.65/0.65; for social wellbeing at T1 were 0.79/0.58, at T2 were 0.83/0.72, and at T3 were 0.84/0.76; and for psychological wellbeing at T1 were 0.81/0.84, at T2 were 0.85/0.84, and at T3 were 0.88/0.87.

2.4. Data Analysis Strategy

Data analysis was conducted using R Studio 2024.04.1+748, employing the psych, lme4, and ggplot packages [66,67]. It was implemented in three steps.

Firstly, we computed descriptive statistics to assess the sample's characteristics and the suitability of using parametric procedures. Severe deviations from normality were considered absent if skewness was less than $|3|$ and kurtosis was less than $|10|$ [68].

Secondly, to account for the nested structure of the data, we used a multilevel modeling approach. Specifically, the effect of the SBMP on attentional control, emotional regulation and wellbeing at T2 and T3 was tested using a three-level multilevel model. Time points (level 1) were nested within individuals (level 2), and individuals were nested within classes (level 3). Condition was coded as a dummy variable to represent the SBMP (1) and wait-list (0) groups. Random effects were included to account for individual differences not explained by group differences (i.e., individual level and class). Additionally, the model was controlled for T1 scores. In the level 3, each parameter was represented by both fixed and random effects. The SBMP effect on the selected outcome was examined through the interaction terms between (SBMP vs. wait-list group) and time (T2 vs. T1 and T3 vs. T1). Moreover, we used maximum likelihood estimation to derive unbiased and efficient parameter estimates for datasets containing missing values at T2 and T3.

Thirdly, we tested if participants' age, gender, and baseline scores moderated SBMPs' effects by adding age, gender, baseline scores and its interactions with condition and time to the model. This allowed us to examine whether age, gender or baseline scores impacted the magnitude of intervention effects.

3. Results

Table 1 provides a summary of the outcome statistics for both conditions across the three data collection points in the study. An examination of skewness and kurtosis indicated that there were no issues with the data distribution ($Sk < |2|$ and $Ku < |5|$).

Table 1. Descriptive statistics for all dependent variables by condition and testing time.

Measures	SBMP ¹ Group														Wait-List Group														
	T1—Pretest				T2—Posttest				T3—Follow-Up				T1—Pretest				T2—Posttest				T3—Follow-Up								
	<i>N</i>	<i>M</i>	<i>SD</i>		<i>N</i>	<i>M</i>	<i>SD</i>	<i>M_{adj}</i> ²	<i>SE</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M_{adj}</i>	<i>SE</i>	<i>N</i>	<i>M</i>	<i>SD</i>		<i>N</i>	<i>M</i>	<i>SD</i>	<i>M_{adj}</i>	<i>SE</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M_{adj}</i>	<i>SE</i>	
Attentional Control																													
Total Score	94	1.76	0.51	89	1.82	0.55	1.78	0.05	93	1.89	0.52	1.85	0.06	88	1.66	0.36	88	1.51	0.43	1.55	0.05	89	1.69	0.50	1.73	0.05			
Emotional regulation																													
Cognitive Reappraisal	99	4.10	0.48	89	4.14	0.59	4.13	0.06	93	4.04	0.56	4.03	0.06	89	4.07	0.61	86	3.89	0.64	3.89	0.07	91	3.77	0.70	3.79	0.06			
Expressive Suppression	99	2.78	0.82	91	2.57	1.00	2.58	0.07	92	2.58	0.87	2.58	0.07	89	2.77	0.80	88	2.56	0.90	2.55	0.07	89	2.56	0.71	2.55	0.07			
Emotional Wellbeing																													
Emotional Wellbeing	97	4.91	0.81	92	5.19	0.88	5.22	0.06	94	5.02	0.81	5.07	0.06	91	5.01	0.77	87	4.89	0.85	4.86	0.06	91	4.91	0.80	4.88	0.06			
Social Wellbeing	97	4.52	1.00	89	4.55	1.11	4.58	0.11	93	4.39	1.08	4.36	0.11	91	4.60	0.81	87	4.35	0.93	4.31	0.11	89	4.27	0.95	4.24	0.11			
Psychological Wellbeing	98	4.86	0.91	89	4.89	0.88	4.90	0.71	93	4.77	0.90	4.78	0.07	89	4.94	0.83	87	4.81	0.82	4.77	0.07	91	4.80	0.88	4.77	0.07			

¹ SBMP = school-based mindfulness program. ² *M_{adj}* = means adjusted for T1 scores.

3.1. SBMP Effects on Attentional Control

The amount of variance in attentional control explained at the student level was 14%, while the amount of variance explained at the class level was 5%. Results showed a significant condition $\times$ time interaction on attentional control at T2 (estimate = -0.21 , $p = 0.001$), but not at T3 (estimate = 0.09 , $p = 0.19$). Specifically, at T2, SBMP students reported more attentional control than students in the wait-list group. An inspection of the longitudinal effects by group revealed that between T1 and T2, attention control significantly decreased among control students (estimate = 0.16 , $p = 0.001$) but not among SBMP students (estimate = -0.05 , $p = 0.32$). These findings are depicted in Figure 1. Moderation analyses revealed that neither age, gender, nor baseline score influenced these effects at T2. However, at T3, we found a moderating effect of age benefiting younger students (estimate = -0.28 , $p = 0.01$). The complete results are shown in Table 2.

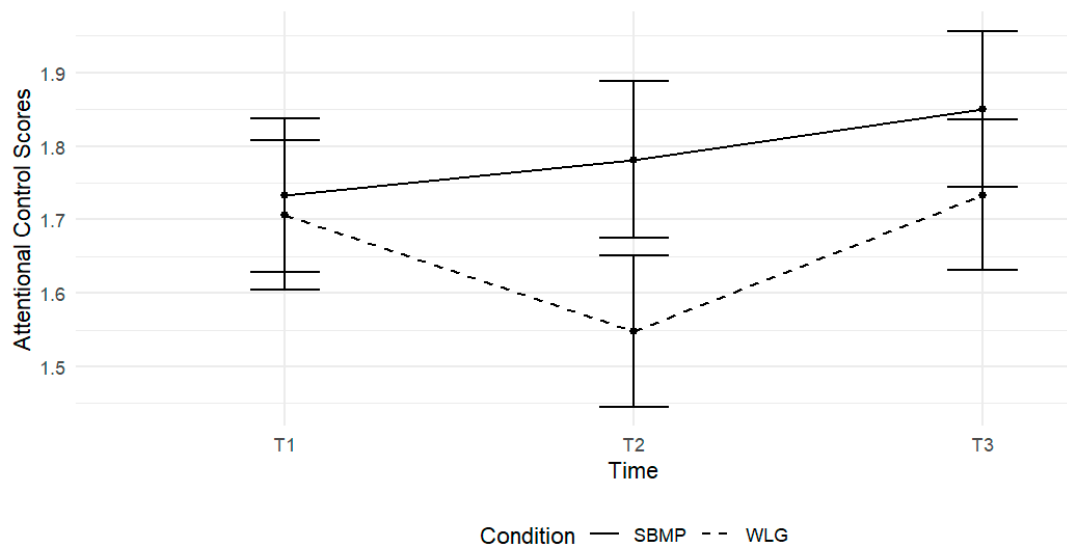


Figure 1. Attentional control scores over T1 (pretest), T2 (posttest), and T3 (follow-up) for the SBMP group and the wait-list group (WLG).

Table 2. Results of multilevel models assessing intervention effects and moderating influences on attentional control at T2 and T3.

Model	Est. (SE) ¹	<i>t</i>	<i>p</i>
Condition $\times$ Time			
Intercept	0.45 (0.08)	5.29	<0.001
Condition	0.03 (0.07)	0.38	0.77
T2	-0.16 (0.05)	-3.22	0.001
T3	0.03 (0.05)	0.55	0.58
T1 Attentional Control	0.73 (0.04)	17.55	<0.001
Condition–T2	0.21 (0.07)	3.00	0.003
Condition–T3	0.09 (0.07)	1.32	0.19
Condition $\times$ Time $\times$ Moderator			
Condition–T2–Age	-0.14 (0.11)	-1.28	0.20
Condition–T3–Age	-0.28 (0.11)	-2.55	0.01
Condition–T2–Gender	-0.14 (0.14)	-1.04	0.30
Condition–T3–Gender	0.05 (0.14)	0.33	0.74
Condition–T2–Baseline Scores	0.04 (0.16)	0.24	0.81
Condition–T3–Baseline Scores	0.05 (0.16)	0.33	0.74

¹ SE = standard error.

3.2. SBMP's Effects on Emotional Regulation

The amount of variance in cognitive reappraisal explained at the student level was 12%, whereas the amount of variance explained at the class level was 2%. We found a significant condition $\times$ time interaction on cognitive reappraisal at both T2 (estimate = 0.24 , $p = 0.02$)

and T3 (estimate = 0.24, $p = 0.02$). Specifically, at both testing times, SBMP students reported using more cognitive reappraisal strategies than control students. An analyses of time effects by group showed that control students' cognitive reappraisal significantly declined between T1 and T2 (estimate = 0.19, $p = 0.01$) and between T1 and T3 (estimate = 0.30, $p < 0.001$), whereas SBMP students' cognitive reappraisal remained stable between T1 and T2 (estimate = -0.04 , $p = 0.54$) and between T1 and T3 (estimate = 0.06, $p = 0.40$). These findings are illustrated in Figure 2. No moderation effects were found. The complete results are detailed in Table 3.

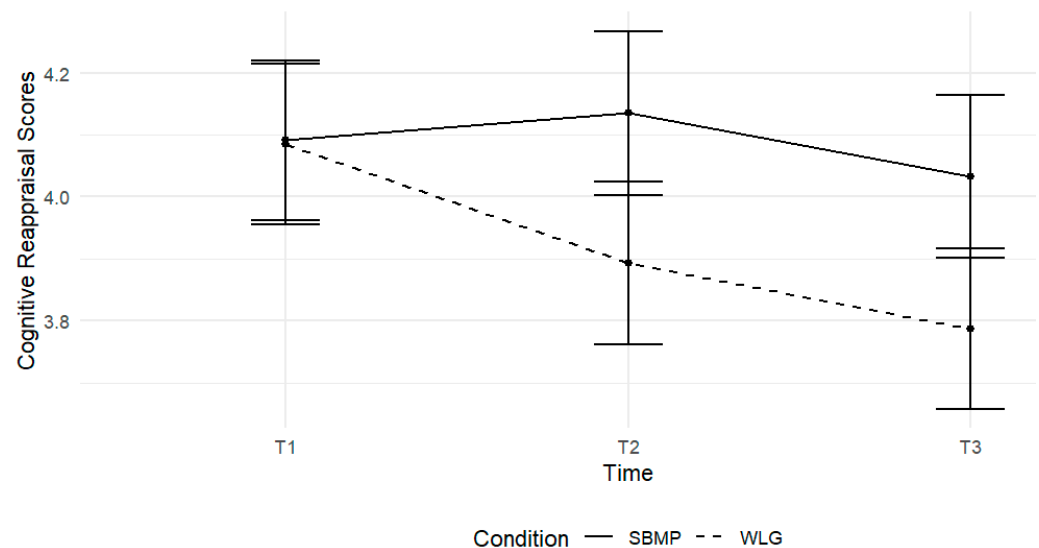


Figure 2. Cognitive reappraisal scores over T1 (pretest), T2 (posttest), and T3 (follow-up) for the SBMP group and the wait-list group (WLG).

Table 3. Results of multilevel models assessing intervention effects and moderating influences on cognitive reappraisal at T2 and T3.

Model	Est. (SE) ¹	<i>t</i>	<i>p</i>
Condition × Time			
Intercept	2.10 (0.18)	11.42	<0.001
Condition	2.01 (0.09)	0.07	0.95
T2	−0.19 (0.07)	−2.59	0.01
T3	−0.30 (0.07)	−4.07	<0.001
T1 Cognitive Reappraisal	0.48 (0.04)	11.51	<0.001
Condition–T2	0.24 (0.10)	2.28	0.02
Condition–T3	0.24 (0.11)	2.35	0.02
Condition × Time × Moderator			
Condition–T2–Age	0.001 (0.71)	0.01	0.99
Condition–T3–Age	0.03 (0.17)	0.18	0.86
Condition–T2–Gender	−0.12 (0.21)	−0.57	0.57
Condition–T3–Gender	−0.35 (0.20)	−1.72	0.09
Condition–T2–Baseline Scores	−0.17 (0.16)	−1.06	0.29
Condition–T3–Baseline Scores	−0.06 (0.15)	−0.39	0.70

¹ SE = standard error.

Regarding expressive suppression, the amount of variance explained at the student level was 11%, while the amount of variance explained at the class level was 2%. Analyses revealed neither a significant condition × time interaction at T2 (estimate = 0.01, $p = 0.94$) or T3 (estimate = 0.01, $p = 0.95$) nor any moderating effects (see Table 4 for full results).

Table 4. Results of multilevel models assessing intervention effects and moderating influences on expressive suppression at T2 and T3.

Model	Est. (SE) ¹	<i>t</i>	<i>p</i>
Condition × Time			
Intercept	1.04 (0.14)	7.43	<0.001
Condition	0.02 (0.10)	0.15	0.88
T2	−0.22 (0.09)	−2.30	0.02
T3	−0.22 (0.09)	−2.31	0.02
T1 Expressive Suppression	0.59 (0.04)	14.58	<0.001
Condition–T2	0.01 (0.13)	0.07	0.94
Condition–T3	0.01 (0.13)	0.06	0.95
Condition × Time × Moderator			
Condition–T2–Age	−0.25 (0.21)	−1.18	0.24
Condition–T3–Age	−0.20 (0.21)	−0.95	0.34
Condition–T2–Gender	−0.36 (0.26)	−1.39	0.17
Condition–T3–Gender	−0.20 (0.26)	−0.78	0.44
Condition–T2–Baseline Scores	0.11 (0.14)	0.81	0.42
Condition–T3–Baseline Scores	0.08 (0.14)	0.57	0.57

¹ SE = standard error.

3.3. SBMP's Effects on Mental Health Wellbeing

The amount of variance in emotional wellbeing explained at the student level was 6%, but no variance was explained at the class level. Results showed a significant condition × time interaction on emotional wellbeing at T2 (estimate = 0.39, $p = 0.001$), but not at T3 (estimate = 0.22, $p = 0.07$). Specifically, at T2, SBMP students reported more emotional wellbeing than control students. An examination of results over time by group revealed that, between T1 and T2, emotional wellbeing significantly increased in the SBMP group (estimate = −0.27, $p = 0.002$) but remained unchanged in the wait-list group (estimate = 0.12, $p = 0.16$). These findings are depicted in Figure 3. Moderation analyses indicated that neither age, gender, nor baseline scores moderated the effects of the SBMP. The complete results are detailed in Table 5.

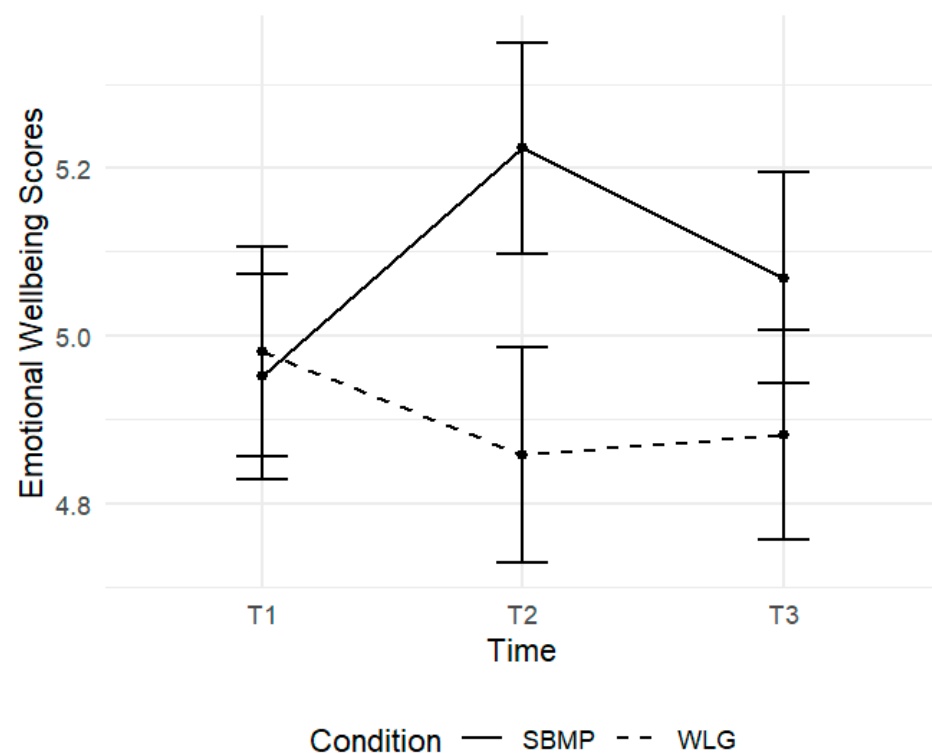
**Figure 3.** Emotional wellbeing scores at T1 (pretest), T2 (posttest), and T3 (follow-up) for the SBMP group and the wait-list group (WLG).

Table 5. Results of multilevel models assessing intervention effects and moderating influences on emotional wellbeing at T2 and T3.

Model	Est. (SE) ¹	<i>t</i>	<i>p</i>
Condition × Time			
Intercept	1.48 (0.19)	7.96	<0.001
Condition	−0.03 (0.09)	−0.34	0.74
T2	−0.12 (0.09)	−1.41	0.16
T3	−0.10 (0.09)	−1.15	0.25
T1 Emotional Wellbeing	0.70 (0.03)	20.17	<0.001
Condition–T2	0.39 (0.12)	3.24	0.001
Condition–T3	0.22 (0.12)	1.79	0.07
Condition × Time × Moderator			
Condition–T2–Age	−0.001 (0.20)	−0.01	0.99
Condition–T3–Age	−0.12 (0.20)	−0.60	0.55
Condition–T2–Gender	−0.43 (0.24)	−1.76	0.08
Condition–T3–Gender	−0.28 (0.24)	−1.16	0.24
Condition–T2–Baseline Scores	0.06 (0.15)	0.42	0.68
Condition–T3–Baseline Scores	−0.05 (0.14)	−0.34	0.73

¹ SE = standard error.

Regarding social wellbeing, the amount of variance explained at the student level was 11%, while the amount of variance explained at the class level was 5%. Analyses revealed a significant condition × time interaction on social wellbeing at T2 (estimate = 0.30, $p = 0.05$), but not at T3 (estimate = 0.16, $p = 0.27$). Specifically, at T2, SBMP students indicated that they experienced more social wellbeing than their peers in the wait-list group. An analysis of longitudinal effects by group indicated that between T1 and T2, social wellbeing scores significantly decreased among control students (estimate = 0.26, $p = 0.02$) but remained stable among SBMP students (estimate = −0.04, $p = 0.68$). These findings are depicted in Figure 4. A moderating effect of age benefiting younger students both at T2 (estimate = −0.67, $p = 0.01$) and T3 (estimate = −0.87, $p < 0.001$) was also found. The complete results are detailed in Table 6.

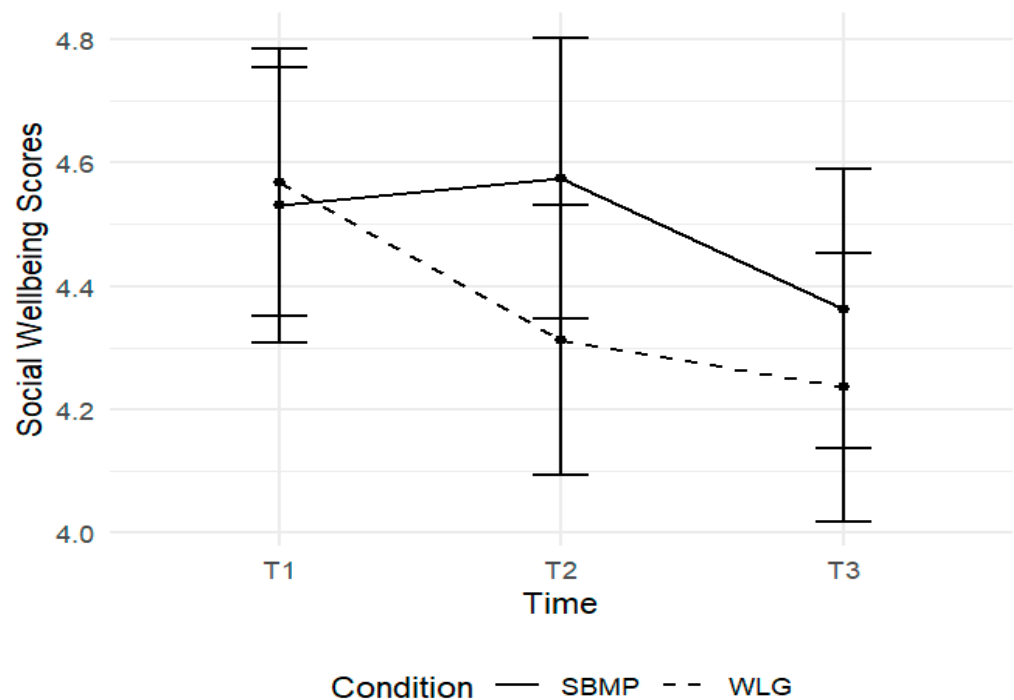
**Figure 4.** Social wellbeing scores over T1 (pretest), T2 (posttest), and T3 (follow-up).

Table 6. Results of multilevel models assessing intervention effects and moderating influences on social wellbeing at T2 and T3.

Model	Est. (SE) ¹	<i>t</i>	<i>p</i>
Condition × Time			
Intercept	1.48 (0.22)	6.81	<0.001
Condition	−0.04 (0.09)	−0.25	0.81
T2	−0.26 (0.11)	−2.39	0.02
T3	−0.33 (0.11)	−3.12	0.002
T1 Social Wellbeing	0.68 (0.04)	16.41	<0.001
Condition–T2	0.30 (0.15)	2.00	0.046
Condition–T3	0.16 (0.15)	1.10	0.27
Condition × Time × Moderator			
Condition–T2–Age	−0.67 (0.24)	−2.74	0.01
Condition–T3–Age	−0.87 (0.24)	−3.63	<0.001
Condition–T2–Gender	0.18 (0.30)	0.60	0.55
Condition–T3–Gender	−0.41 (0.30)	−1.37	0.17
Condition–T2–Baseline Scores	0.02 (0.16)	0.12	0.91
Condition–T3–Baseline Scores	0.06 (0.16)	0.40	0.67

¹ SE = standard error.

Finally, concerning psychological wellbeing, the amount of variance explained at the student level was 13%, but no variance was explained at the class level. We found neither a significant condition × time interaction at T2 (estimate = 0.15, $p = 0.25$) or T3 (estimate = 0.04, $p = 0.77$), nor any moderating effect (see Table 7 for complete results).

Table 7. Results of multilevel models assessing intervention effects and moderating influences on psychological wellbeing at T2 and T3.

Model	Est. (SE) ¹	<i>t</i>	<i>p</i>
Condition × Time			
Intercept	1.73 (0.20)	8.79	<0.001
Condition	−0.03 (0.10)	−0.29	0.77
T2	−0.14 (0.09)	−1.47	0.14
T3	−0.14 (0.09)	−1.50	0.13
T1 Psychological Wellbeing	0.65 (0.04)	17.42	<0.001
Condition–T2	0.15 (0.13)	1.15	0.25
Condition–T3	0.04 (0.13)	0.29	0.77
Condition × Time × Moderator			
Condition–T2–Age	0.14 (0.22)	0.64	0.52
Condition–T3–Age	−0.03 (0.21)	−0.13	0.90
Condition–T2–Gender	−0.13 (0.26)	−0.48	0.63
Condition–T3–Gender	−0.42 (0.26)	−1.60	0.11
Condition–T2–Baseline Scores	0.11 (0.14)	0.80	0.81
Condition–T3–Baseline Scores	−0.25 (0.13)	−1.84	0.07

¹ SE = standard error.

4. Discussion

The present study was conducted to examine the short-term (T2) and long-term (T3) effects of a contextualized and age-appropriate Portuguese SBMP on elementary students' attentional control, emotional regulation (i.e., cognitive reappraisal and emotional suppression), and wellbeing (i.e., emotional, social, and psychological). Furthermore, we examined if age, gender, and baseline scores moderated the SBMP's effects. At T2, results indicated significant group differences favoring SBMP students in their attentional control, cognitive reappraisal, and their emotional and social wellbeing. At T3, only the superiority of SBMP students in cognitive reappraisal persisted. Moderating effects were observed for age at T3, with long-term benefits of SBMP on attentional control and social wellbeing appearing among younger participants.

Over the past 15 years, numerous studies, reviews, and meta-analyses have demonstrated that SBMPs can benefit children's attention, emotional regulation, overall wellbeing, and mental health [4,5,16–20,26–28]. These findings provide support for the theory of

change proposed by Roeser and colleagues [16], claiming that SBMPs cultivate mindfulness and self-regulation skills which boost a sense of wellbeing, ultimately enhancing mental health. Besides highlighting the mechanisms underlying SBMPs benefits on educational and psychological outcomes, the authors of this theory cautioned that these benefits may only occur if the SBMPs are of high quality, appropriate for the target audience, and implemented with extreme fidelity. As described in the introduction, an example of such a program is SER⁺ FELIZ(mente), which was used in the current study. In prior research, we have already shown that this program improved a comprehensive set of cognitive, socio-emotional, and academic outcomes in Grades 3 and 4 [12,52]. Contrary to our expectations, current findings did not totally align with past results. Though there was a general superiority of SBMP students at T2, an inspection of the pattern of results over time revealed that a single clear benefit of the SBMP on emotional wellbeing.

In line with prior research [69,70], results demonstrated that our 8-week SBMP significantly boosted children's emotional wellbeing, immediately measured after the intervention. Emotional wellbeing represents the affective dimension of overall wellbeing and includes three key elements: satisfaction with life, presence of positive emotions, and absence of negative emotions [71]. To be happy with life and experience positive, but not negative, affect is vital for children to manage and alleviate distress effectively, as well as to keep positive mental health [72]. Showing that a brief SBMP may improve these elements is particularly relevant. This enhancement in emotional wellbeing was likely linked to the program's focus on cultivating present-moment awareness and encouraging positive experiences. Unfortunately, this positive effect did not persist over time, replicating past findings. Indeed, a recent meta-analysis of RCTs on SBMPs [6] found no evidence of sustained benefits on wellbeing. However, it should be noted that rather than approaching wellbeing through the positive promotion of mental health, past research has often approached wellbeing through the absence or reduction of illness. This latter approach has been showing a limited or non-existing impact of mindfulness training on emotional wellbeing [6,73,74]. We believe further research is needed to explore SBMPs' effects on wellbeing comprehensively at short and long term.

We also identified group differences at T2 for additional variables, namely, attentional control, cognitive reappraisal, and social wellbeing. Nevertheless, unlike emotional wellbeing, further analyses indicated that these differences were not due to SBMP-induced improvements. Instead, the superior performance of SBMP students in attentional control, cognitive reappraisal, and social wellbeing stemmed from the stabilization of these variables among SBMP students from T1 to T2 combined with a decline among control students. We envision a twofold explanation for these results. They may suggest that our SBMP may have had no impact on these outcomes. This finding aligns with some recent findings, such as those published within the MYRIAD project, which came up with the idea that SBMPs may not represent a universal intervention [18]. Our results could support this idea, indicating that the implemented program was not effective in improving the educational and psychological outcomes that were assessed. However, given the substantial amount of research [4,5,16–20,26–28]—including our own using the same intervention program (citations omitted)—showing the cognitive and socio-emotional benefits of SBMPs, it seems premature, if not unreasonable, to accept this hypothesis. A more plausible explanation for our findings is that while the SBMP may not have improved attentional control, cognitive reappraisal, and social wellbeing, it may have served as a protective factor. In other words, our SBMP may have provided a shield against potential stressors that negatively affected these dimensions in the wait-list group. Before further discussing this idea, we would like the reader to keep in mind some safeguards against these findings being method related. First, despite being in the wait-list group, participants were unaware that their peers were already participating in the SBMP. Second, except the specific intervention-related procedures, all students were subjected to the same educational conditions, as all of them belong to the same school district, sharing the same administration and educational jurisdiction.

Third, no pre-intervention differences were observed in any sociodemographic variables or outcomes measured, indicating comparable groups at the study's outset.

Although our study does not allow us to objectively state what might have caused the significant (self-reported) cognitive and socio-emotional declines observed in the control group, we believe they were related with the timing of data collection. T2, the evaluation moment immediately after the end of the intervention, coincided with a school-test period for all students. This is a well-documented stressor that elevates levels of stress and anxiety [75,76], which can lead to reduced attentional control [77,78], impaired cognitive reappraisal [79,80], and diminished social wellbeing [81], as notably observed among students in the wait-list group. These negative effects were not observed among SBMP students, likely due to the protective effect of mindfulness-based training. This hypothesis aligns with the mindfulness stress buffering account [82], which proposes that mindfulness reduces stress appraisals and stress-reactivity responses. Studies consistently demonstrated that increased mindfulness enhances cognitive reappraisal [13], attentional control [83], and social wellbeing [84], thereby preventing these dimensions from being adversely affected by test-induced stress, as likely observed in the control group. Though more research is clearly needed, it appears that our SBMP might have been effective in helping participants to navigate stress-charged challenging periods, such as testing days at school, by modifying stress appraisals, improving attention, and facilitating social connection. In the future, it would be particularly relevant to examine the specific mechanisms through which mindfulness training may exert its potential protective effects and investigate how individual differences in stress levels and coping strategies may influence the efficacy of SBMPs.

Regarding the long-term effects of the SBMP, excepting the effects on cognitive reappraisal, we observed no group differences at T3 for the sample as a whole. This pattern of findings is in line with Dunning et al. [13], but in contrast with Thomas and Atkinson [46]. A key variable explaining the presence or lack of long-term effects of SBMPs seems to be the instructor. Indeed, a meta-analysis showed significant effects at follow-up when trained teachers delivered the program, but no effects when it was delivered by an external facilitator, such as a researcher [75]. As teachers remain with their students in the classroom upon completion of the study, they may be more inclined to continue incorporating elements of the intervention beyond its end [85]. This ongoing involvement can lead to consistent positive findings at follow-up. Especially when mental health and mindfulness outcomes are considered, the sustained engagement of duly trained teachers appears to be a critical factor in achieving long-term benefits [75]. In our study, teachers did not receive any prior training on the program and were only involved in administering the audio-guided meditations, which ceased once the program reached the end. Although teachers did have the option to be present during the 30-minute lessons implemented by trained psychologists, to our knowledge, they were not interested in having direct access to the program's content. While the overall long-term efficacy of SER⁺ FELIZ(mente) might have been limited, at least when implemented by psychologists, we did find some evidence that our hypothesis of mindfulness training acting as a protective shield persisted over time. Yet, in specific areas and for certain groups.

We observed that the superiority of cognitive reappraisal among SBMP students at T2 was maintained at T3. Again, this sustained superiority was attributable to the stabilization of cognitive reappraisal levels within the SBMP group combined with a decrease in wait-list group scores. This finding seems to indicate that the above-discussed SBMP-induced shielding effect was kept in place over six months, at least in what concerns cognitive reappraisal. Indeed, this effect was not so clear for attention control and social wellbeing, in which a persistent protective effect was observed among younger students, but not among older ones. A question arising from this result is, why did the shield brake for older children at the beginning of a new academic year? Our hypothesis is that our SBMP was not designed to specifically address a crucial change in older participants' lives, that of transitioning to a new grade and an upper educational cycle, requiring specific cognitive and socio-emotional skills not targeted by the program. Specifically, fourth-grade students

moved to the fifth grade, which in Portugal means that (1) they moved to a new school with a larger body of students and professionals; (2) they are enrolled in much more subjects, no longer taught by a single teacher in one classroom; and (3) they began to socialize with a highly diverse group of peers with varying ages and backgrounds. This is a highly complex transition in terms of self-concept, achievement, and relationships, with many adverse effects documented [86,87]. The SBMP SER⁺ FELIZ(mente) is more focused on students' daily challenges (e.g., being bumped at the playground, not being given a requested toy). Thus, it may have not shield older children against these new challenges and systemic changes, despite continuing to protect the younger ones against day-to-day setbacks. As the development of this program is a work in progress, it would be important to future consider adjustments to address specific associated with transitions, which can be very disruptive for children. This could involve the inclusion of extra modules targeting strategies to deal with new academic environments, complex social dynamics in larger schools, and increased academic demands.

In addition to age, we also examined the role of gender in moderating SBMP effects, though none was found. As noted before, understanding moderation effects is crucial as they reveal which subgroups benefit from an intervention and which may require adapted or alternative approaches [36]. The absence of a gender moderation effect in the SBMP results underscores the program's potential to benefit children regardless their gender, suggesting its universality. This is particularly positive given that gender-specific effects are often observed in such programs [4,39], which may compromise its design, implementation, and generalization. For instance, research indicates that specific activities may benefit girls (e.g., those focusing on acceptance and non-judgment of emotions), while others may benefit boys (e.g., mindfulness practices incorporating movement) [39]. To achieve an SBMP that includes a diverse range of practices that work equally among boys and girls is very encouraging. It frees teachers from gender-related concerns and gives them confidence to effectively implement the program in natural classroom contexts, facilitating its administration within the regular curriculum.

Another important aspect to consider when evaluating the universality of SBMPs is the role of baseline cognitive and emotional profiles of participants. In our study, we found no moderating effect of baseline scores on SBMP outcomes, similarly to Van der Gucht and colleagues [42]. This finding suggests that the program may benefit students regardless of their initial cognitive or emotional status, indicating its broad applicability. Moreover, it indicates that the SER⁺ Feliz(mente) program may be effective across diverse student populations, including those with mild special educational needs (ca. 9% of our sample). From an applied viewpoint, the lack of moderating effect of baseline scores supports the integration of mindfulness practices into mainstream education, allowing teachers to confidently implement these programs within diverse classroom settings without concerns about students' individual differences.

Finally, it is important to note that our findings only partially align with those reported in previous studies validating the SER⁺ Feliz(mente) program. In prior research, the program led to a comprehensive set of improvements in cognitive, socio-emotional, and academic outcomes across Grades 3 and 4 [12,52]. In contrast, our study found that the most significant effects observed at T2 were primarily due to a decline in the control group rather than gains within the mindfulness group. One possible explanation for this discrepancy is the timing of the posttest; as noted earlier, our assessments occurred during exam periods, unlike in prior studies. Additionally, we only found moderating effects at T3, indicating that, contrary to Grade 3 studies, baseline scores, gender, and age did not moderate the program's results. This result may be attributed to the diverse characteristics of our larger sample in terms of cognitive and emotional profile as well as age. While the SER⁺FELIZ(mente) program demonstrates consistent support for cognitive and emotional outcomes, the context and timing of assessments and sample characteristics may influence its efficacy.

The strength of this study lies in our efforts to address common methodological limitations in SBMP research. Firstly, we assessed a mindfulness program that was carefully tailored to be developmentally appropriate and culturally relevant. Secondly, several procedures were included to ensure intervention fidelity, documenting the consistent and intended implementation of the program, which indicated high fidelity in program delivery. Thirdly, we evaluated the sustainability of the SBMP's effects six months after the intervention. Lastly, we examined whether age, gender and baseline scores moderated the effects of the SBMP. Collectively, this methodological design allowed us to gather information that led to several conclusions. Even with a developmentally appropriate and culturally relevant SBMP implemented with verified fidelity, universal short- and long-term improvements in attentional control, emotional regulation, and wellbeing outcomes are not guaranteed. Still, the present findings seem to put forward the hypothesis that despite not directly enhancing psychological outcomes, SBMPs may serve as a buffer against the negative effects of stressful circumstances, such as school tests. Furthermore, the study results also aligned with extant research underscoring the importance of considering additional factors in future studies looking to enhance program effectiveness, such as the role of the instructor. More and more research is suggesting that having duly trained teachers implementing SBMPs may be a critical factor in achieving long-term benefits.

Despite the above-listed strengths, it is important to note and reflect on the study's limitations, which suggest caution in generalizing its results. First, as commonly noted in mindfulness research [4–6], this study's findings are constrained by the absence of an active control group. Due to the program's integration into the regular curriculum, including an active control group was impractical. Instead, we utilized a wait-list condition as an alternative to monitor natural changes over time and to control for potential effects from repeated assessments. Though we cannot fully eliminate alternative explanations of our findings related to expectancy effects or other non-specific mechanisms (such as instructor rapport), we did ensure the blinding of participants and their teachers to the conditions, which strongly mitigates these limitations. Additionally, we employed standardized assessment tools and conducted rigorous data analysis to control for potential biases. Nonetheless, future studies should aim to incorporate active control groups to better distinguish between specific program effects and potential confounding variables. Furthermore, it would be crucial to investigate whether a pronounced decline in the control group during school testing periods is a common occurrence. Such understanding may shed light on the contextual factors influencing students' assessments during empirical studies and help researchers to improve the design and implementation of SBMPs.

Another methodological limitation was the inability to randomly assign children to groups, which were both composed of pre-existing homeroom classes. This was dictated by the practicalities of conducting field studies and the need to adapt study procedures to fit school-specific requirements. The cluster randomization inherent in using existing social groups is known to contribute to observed effects. Yet, this effect was statistically controlled in the present study.

Additionally, there is a practical limitation regarding the generalizability of the program, as it requires trained psychologists to implement instructional sessions. This dependence on specialized professionals may present challenges for large-scale implementation in typical school settings, where resources and access to psychologists may be limited. Also, research suggests that SBMPs have stronger long-term effects when delivered by trained teachers [75], as their continued involvement can sustain mindfulness practices beyond the program [85]. In our study, teachers were minimally involved, which may have reduced the program's long-term impact. Future research could explore ways to adapt the program for delivery by classroom teachers or other school staff with appropriate training to increase its feasibility in broader educational contexts.

It should also be noted that SBMP effects were entirely evaluated through self-report measures. Despite providing a direct insight into children's subjective experiences, emotions, and perceptions, which may not be fully captured by observers, there are obvious

limitations associated with this kind of assessment, mainly in this population. These measures may be compromised by factors such as children's cognitive development, varying levels of task engagement, and response biases associated to their current state rather than overall adjustment levels [88,89]. Nevertheless, in this study, we used validated and well-designed questionnaires adapted to the targeted age groups, ensuring age-appropriate language and concepts. Yet, to offer more reliable and comprehensive insights into SBMP outcomes, future studies should incorporate multi-informant data from sources like teachers or parents alongside behavioral tasks. An additional methodological consideration concerns our need to use a global score of the attentional control scale due to the unacceptable reliability of the attentional shifting subscale, which impeded us in scrutinizing SBMP effects on specific dimensions of attention. This should be resolved in future investigations, which could employ more robust measurement tools to facilitate a nuanced understanding of the program's effectiveness.

Lastly, another limitation of this study was that it included mostly White and Portuguese/Latino students, which may restrict its applicability to contexts with other student demographics. Despite the importance of attending to these factors, it is crucial to note that the sample was representative of the Portuguese context, particularly in the Northern region, where Portuguese/Latino students are predominant. Still, as recommended by Chin et al. [90], future research should actively seek to recruit more diverse samples to foster inclusivity and improve the overall generalizability of findings.

5. Conclusions

This study is part of an extensive research program aiming to create an evidence-based SBMP for Portuguese children that is grounded on scientific principles and international recommendations for developing valid, reliable, and feasible mind-body interventions. While our findings showed that universal improvements in Grades 3 and 4 were limited to emotional wellbeing, we believe SER⁺ FELIZ(mente) may have provided a shield against potential stressors (such as test anxiety) that negatively affect students' attentional control, cognitive reappraisal, and social wellbeing. This is an important contribution, showing that a culturally-tailored SBMP with age- and context-appropriate activities and materials may safeguard students' mental health in educational settings. This insight aligns with preventive models like the Multi-Tiered Systems of Support (MTSS), where SBMPs can serve as a Tier 1—that is, a universal or primary—intervention for the majority of students. Tier 1 encompasses the entire school and focuses on core instructions and proactive classroom management strategies that help create a positive and supportive atmosphere. By fostering emotional regulation and resilience, SBMPs like SER⁺ FELIZ(mente) can strengthen Tier 1 supports and help build positive relationships between staff and students. Students who do not respond to these interventions may move into Tier 2, requiring additional support. This opens a new avenue for research concerning the role of mindfulness-based training in preventing (rather than repairing) mental health issues in elementary students, thereby supporting their wellbeing and overall development.

Author Contributions: Conceptualization, S.M. and T.L. (Teresa Limpo); methodology, S.M.; software, S.M.; program implementation, C.C., C.R., C.F. and C.M.; formal analysis, S.M.; investigation, S.M., T.L. (Teresa Leal) and T.L. (Teresa Limpo); resources, S.M. and T.L. (Teresa Limpo); data curation, C.C., C.R., C.F. and C.M.; writing—original draft preparation, S.M.; writing—review and editing, T.L. (Teresa Limpo); supervision, T.L. (Teresa Leal) and T.L. (Teresa Limpo); project administration, S.M., T.L. (Teresa Leal) and T.L. (Teresa Limpo); funding acquisition, S.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the FCT grants 2020.05816.BD attributed to Sofia Magalhães and UIDB/00050/2020 attributed to CPUP.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of the Faculty of Psychology and Education Sciences, University of Porto (protocol code: 2021/03-08b, date of approval: 22 March 2021).

Informed Consent Statement: Written informed consent for participation and research findings' dissemination was obtained from students' legal guardians before the start of the study. After the study's goals and overall procedures were explained to participants, they were asked to give oral consent by raising their hands.

Data Availability Statement: All data are available at the Open Science Framework (<https://osf.io/rma6q>, accessed on 6 June 2024).

Acknowledgments: We are thankful to all the psychologists, teachers, and students who participated in this study.

Conflicts of Interest: The authors declare no conflicts of interest.

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