



ARTICLE

Evaluation of the “Mais Por Ti” Positive Mental Health Promotion Program for Health Care Professionals: A Quasi-Experimental Study

Sérgio Cunha^{1,*}, Mariana Lima¹, Sónia Rocha², Daniela Machado¹ and Liliana Silva³

¹Psychiatry Department, Local Health Unit of Matosinhos, Matosinhos, Portugal

²Nephrology Department, Local Health Unit of Matosinhos, Matosinhos, Portugal

³Research Department, Local Health Unit of Matosinhos, Matosinhos, Portugal

*Corresponding Author: Sérgio Cunha. Email: sergio.cunha@ulsm.min-saude.pt

Received: 01 March 2026; Accepted: 28 May 2026; Published: 29 October 2026

ABSTRACT: Background: Health care professionals are exposed to occupational stressors that increase vulnerability to psychological distress and reduced well-being. Interventions grounded in positive mental health models may strengthen protective psychological resources in workplace settings. **Methods:** This quasi-experimental, single-group study examined changes associated with participation in the “Mais Por Ti” Positive Mental Health Promotion Program among health care professionals in an urban Portuguese health unit. Participants were assessed at baseline (T1), immediately post-intervention (T2), and six months later (T3) using the Positive Mental Health Questionnaire (PMHQ), the Satisfaction With Life Scale (SWLS), and the Psychological Vulnerability Scale (PVS). Changes over time were examined using paired *t*-tests, and effect sizes were estimated using Cohen’s *d* with 95% confidence intervals. **Results:** At baseline, 236 participants completed the assessment (T2: *n* = 164; T3: *n* = 77). Statistically significant changes were observed across all outcomes. Satisfaction with life increased from T1 to T2 (mean difference = +3.02, *d* = 0.8, 95% CI [2.40, 3.65], *p* < 0.001) and remained higher at follow-up (+2.82, *d* = 0.6, 95% CI [1.68, 3.96], *p* < 0.001). Psychological vulnerability decreased post-intervention (−1.79, *d* = 0.5, 95% CI [−2.36, −1.23], *p* < 0.001) and further at T3 (−2.79, *d* = 0.7, 95% CI [−3.72, −1.86], *p* < 0.001). PMHQ scores also decreased at T2 (−0.18, *d* = 0.8, 95% CI [−0.22, −0.15], *p* < 0.001) and at T3 (−0.24, *d* = 0.8, 95% CI [−0.31, −0.18], *p* < 0.001); given the scoring direction of the instrument, lower scores indicate higher positive mental health. **Conclusions:** Participation in the program was associated with changes over time in positive mental health, life satisfaction, and psychological vulnerability among health care professionals. However, given the single-group design and substantial attrition, these findings should be interpreted with caution. The program may represent a structured workplace-based approach warranting further evaluation in controlled studies.

KEYWORDS: Mental health; health personnel; health promotion; occupational health; workplace; psychological well-being; program evaluation

1 Introduction

The mental health of health care professionals has become a growing concern, particularly in the aftermath of the COVID-19 pandemic, which exacerbated psychosocial risks and mental health vulnerabilities in the workforce [1–3]. Reports from the Portuguese National Health Service for 2021–2024 highlight elevated rates of burnout, workplace harassment, and psychosocial stressors among health care staff, reinforcing the need for structured approaches to support mental health in this population [4]. This pattern is consistent with international evidence indicating high levels of emotional exhaustion, anxiety, and depressive symptoms among health care professionals working in demanding clinical environments [5–7].

Workplace mental health is increasingly recognized as a global public health priority [8,9]. Adverse work environments contribute to absenteeism, presenteeism, reduced productivity, and poor job satisfaction [10]. Health care professionals are particularly vulnerable, with higher risks of stress-related disorders, depression, and suicidal behavior compared to other occupational groups [3,6]. In response, the World Health Organization (WHO) issued guidelines recommending organizational and individual interventions, including workplace-based mental health promotion, literacy training, and periodic reinforcement of interventions, emphasizing the promotion of positive mental health as a central objective of workplace mental health strategies [8]. In alignment with these recommendations, the International Council of Nurses emphasizes that mental health nurses play a key role in promoting psychological well-being in occupational settings, advocating for stigma reduction, early intervention, and the integration of mental health care into workplace health systems [11]. Complementing this perspective, a recent systematic review highlights that multicomponent interventions, such as screening combined with facilitated access to care and organizational support, are significantly more effective than isolated approaches in improving mental health outcomes among health care workers [12,13]. However, implementation remains challenged by barriers such as stigma, limited time, and fragmented access to services, underscoring the need for coordinated, system-level strategies that include the promotion of positive mental health [12,14].

Positive Mental Health (PMH) extends beyond the absence of psychopathology and encompasses psychological strengths, autonomy, resilience-related capacities, and meaningful interpersonal relationships [15,16]. This perspective is consistent with public health approaches to mental health, which emphasize the promotion of well-being, resilience, and adaptive functioning rather than solely focusing on the treatment of mental illness [6,8,17]. Contemporary conceptualizations frame mental health as a continuum ranging from languishing to flourishing, integrating both emotional well-being and positive functioning [18]. This perspective is particularly relevant in occupational contexts, where promoting PMH may help strengthen protective psychological resources and support both individual well-being and professional functioning.

Building on Jahoda's framework, Teresa Lluch developed the Multifactorial Model of Positive Mental Health (MMPMH), which operationalizes PMH into six interrelated factors: personal satisfaction, prosocial attitude, self-control, autonomy, problem-solving/self-actualization, and interpersonal relationship skills [15,19]. These factors are conceptually interconnected, such that changes in one domain may be associated with changes in others, supporting the use of targeted interventions that focus on specific needs while potentially contributing to overall improvements in PMH [16]. The MMPMH conceptualizes PMH as a multidimensional construct that integrates intrapersonal and interpersonal capacities, providing a structured theoretical basis for intervention design aimed at strengthening psychological resources [16,20]. In parallel, Lluch developed the Positive Mental Health Questionnaire (PMHQ), a validated instrument directly aligned with the MMPMH and the PMH construct, enabling the multidimensional assessment of positive mental health across its core domains. The availability of this instrument also supports the operationalization of recommendations from the WHO, which emphasize the promotion and assessment of positive mental health within workplace settings [8]. The MMPMH was selected as the guiding framework for this study due to its multidimensional and operational nature, allowing the design of structured interventions targeting specific components of PMH. The model is particularly suited for applied settings, including occupational contexts [21–23].

Previous studies have shown that workplace interventions, including stress management and cognitive-behavioral approaches, can improve mental health outcomes among health care professionals [12–15]. In addition, psychological interventions have demonstrated consistent, although modest, effects in improving emotional, psychological, and social well-being across different populations [24]. However, there

is still limited evidence from studies examining theory-based interventions employing Lluch's MMPMH that are specifically designed to promote positive mental health in workplace settings, particularly within Portuguese health care contexts. Moreover, interventions that are theory-driven, feasible, and delivered during working hours are especially valuable given the structural constraints of health systems, including staff shortages and workload pressures [22,25,26].

In this context, structured interventions aimed at strengthening dimensions of PMH have shown potential to improve psychological well-being among health care professionals [27,28]. Given their high exposure to emotional demands, occupational stressors, and organizational pressures, health care professionals represent a priority group for interventions aimed at promoting positive mental health in workplace settings. Importantly, such interventions should be tailored to the specific profiles and needs of participants to maximize relevance, engagement, and potential impact [22,27].

Within this framework, a theory-based approach grounded in the MMPMH may provide a structured and relevant framework for promoting positive mental health among health care professionals. This study examines the "Mais Por Ti" program, a modular intervention designed to strengthen protective factors associated with PMH and to enhance the psychological well-being of health care professionals. Specifically, it examines changes associated with participation in the program in terms of PMH, life satisfaction, and psychological vulnerability, with measurements conducted at baseline, immediately post-intervention, and at six-month follow-up.

We hypothesized that participation in the program would be associated with increased PMH, higher life satisfaction, and reduced psychological vulnerability over time.

2 Methods

2.1 Study Design

This study employed a non-randomized, quasi-experimental, single-group pre-test/post-test design with a six-month follow-up. Assessments were conducted at three time points: baseline (T1), immediately after completion of the intervention (T2), and six months post-intervention (T3). Given the absence of a control group, the study design does not allow causal inference, and findings should be interpreted as associations over time.

2.2 Setting

The study was conducted at Local Health Unit of Matosinhos, in northern Portugal, which vertically integrates primary, hospital, and continuing care services within a given geographic area under a single management, between May 2021 and October 2024. The intervention was delivered during paid working hours to minimize disruption to clinical activities and maximize accessibility for staff.

This study was approved by the Ethics Committee of the Local Health Unit of Matosinhos (Protocol No. 20240021). All participants provided written informed consent prior to participation.

The intervention was implemented in multiple cohorts over the study period, reflecting routine clinical practice conditions.

2.3 Participants

A convenience sample of 236 health care professionals was recruited. All employees of the institution were eligible to participate voluntarily. Exclusion criteria were limited to individuals with decompensated severe mental illness.

Participants were recruited through institutional communication channels, including internal email and staff announcements.

2.4 Intervention

The “Mais Por Ti” program was based on Teresa Lluch’s MMPMH and designed by mental health nurses. The intervention was delivered by trained mental health nurses with experience in group-based interventions, who were also involved in the design and development of the “Mais Por Ti” program.

Table 1 presents the structure of the program, including the six factors of the Multifactorial Model, their corresponding criteria and targeted competencies, and the Nursing Interventions Classification (NIC) [29] interventions that guided the design and structuring of the “Mais Por Ti” program content. This structured alignment ensures coherence between the theoretical model, the assessment framework, and the intervention strategy, supporting the internal consistency and ecological validity of the program.

Although the program is structured around the six factors of the MMPMH, the intervention selectively targeted three PMH factors per group, identified at baseline as those with the highest scores (indicating lower levels of positive mental health). This approach was adopted to balance intervention feasibility with effectiveness in a high-demand clinical setting, minimizing disruption to routine care provision while preserving alignment with the MMPMH framework, which allows interventions to focus on priority domains while potentially contributing to broader changes in PMH.

The intervention consisted of four weekly in-person group sessions of two hours each (total of 8 h). Sessions were delivered in small groups ranging from six to ten participants, to facilitate interaction, reflection, and skill development. Each session followed a predefined structure:

- Session 1 was standardized across all groups and focused on individualized feedback based on baseline assessment results, followed by psychoeducation on PMH and the MMPMH framework. This session incorporated a metacognitive approach, based on NIC intervention 4700 (Cognitive Restructuring), to support participants’ understanding of cognitive and emotional processes, alongside exercises designed to enhance self-awareness.
- Session 2 included a standardized component across all groups, focusing on emotional regulation, emotional awareness and vocabulary, the functional role of emotions, and strategies for recognizing and mobilizing affective responses. This session also included training in the use of a visual tool for identifying emotional states. In addition, session content was adapted to address one of the three targeted PMH factors identified at baseline.
- Sessions 3 and 4 were tailored to address two of the PMH factors identified at baseline as priority areas, enabling a more in-depth and targeted exploration of these domains.

While the emphasis on specific domains varied according to baseline profiles, all groups followed a standardized structure and core content, ensuring comparability across cohorts. Thus, the intervention combined standardized core components delivered to all participants with tailored modules targeting specific PMH factors, allowing both consistency and individual relevance.

The intervention incorporated techniques such as self-reflection, cognitive-behavioral strategies, emotional regulation techniques, and skills training in communication and problem-solving, which were selected and adapted from NIC [29] to address the targeted positive mental health factors. Between sessions, participants were encouraged to complete personal development activities designed to reinforce session content and facilitate the transfer of acquired skills to daily professional and personal contexts.

Table 1: Structure of the “Mais Por Ti” program based on the MMPMH.

Factors (F)	Factor's Specific Criteria	Core Dimension	NIC Interventions	“Mais Por Ti” Program Content
F1. Personal Satisfaction	Self-concept; Self-esteem; Life satisfaction; Optimistic future perspective	Relationship with self	4410–Mutual goal setting; 5310–Hope inspiration; 5390–Self-awareness enhancement; 5400–Self-esteem enhancement	Promote self-awareness, self-esteem, and optimism; Encourage the pursuit of flow experiences; Foster a sense of meaning in life
F2. Prosocial Attitude	Altruistic social attitude; Willingness to help and support others; Active predisposition to society; Acceptance of others and social diversity	Social integration	4920–Active listening; 5100–Socialization enhancement; 5440–Support system enhancement	Promote self-fulfillment; Develop empathy, compassion, and altruism; Raise awareness of the benefits of inclusive, accepting, and non-discriminatory behaviors
F3. Self-Control	Ability to cope with stress/conflict situations; Emotional balance/emotional control; Tolerance to frustration, anxiety, and stress	Emotional regulation	4370–Impulse control training; 4470–Self-modification assistance; 5230–Coping enhancement; 5270–Emotional support; 5390–Self-awareness enhancement; 5820–Anxiety reduction; 6040–Relaxation therapy	Promote emotional intelligence; Identify emotional triggers and plan alternative responses; Teach and train calming and relaxation techniques
F4. Autonomy	Ability to have one's own criteria; Independence; Self-regulation of one's conduct; Personal safety/self-confidence	Self-regulation of behavior	4410–Mutual goal setting; 4480–Self-responsibility facilitation; 5250–Decision-making support; 5395–Self-efficacy enhancement; 5480–Values clarification	Strategies for self-reflection, identifying personal values, setting personal boundaries; Assertiveness training
F5. Problem Solving/Self-Actualization	Capacity for analysis; Ability to make decisions; Flexibility/ability to adapt to changes; Attitude for continuous growth and personal development	Adaptive competence	4410–Mutual goal setting; 4420–Patient contracting; 4470–Self-modification assistance; 5230–Coping enhancement; 5250–Decision-making support; 8340–Resilience promotion	Self-analysis techniques; Goal planning; Problem-solving strategies; Promoting a personal growth mindset
F6. Interpersonal Relationship Skills	Ability to establish interpersonal relationships; Empathy/ability to understand the feelings of others; Ability to provide emotional support; Ability to establish and maintain intimate interpersonal relationships	Relational capacity	4340–Assertiveness training; 4920–Active listening; 5100–Socialization enhancement; 5270–Emotional support	Communication styles; Assertiveness training; Emotional regulation; Capacitation in mental health first aid

Note: NIC, Nursing Interventions Classification; Intervention codes correspond to standardized NIC taxonomy.

At baseline, each participant received an individualized personal development plan, updated at the end of the program and again at six-month follow-up.

2.5 Data Sources

Data were collected using validated Portuguese versions of self-administered online questionnaires at T1, T2, and T3. The participants received online questionnaires at the three points of evaluation using the email provided at the beginning of the study.

The following instruments were used:

- Positive Mental Health Questionnaire (PMHQ) (Portuguese version) [30], a 39-item instrument assessing positive mental health across six factors of Lluh's Multifactorial Model (personal satisfaction, prosocial attitude, self-control, autonomy, problem solving/self-actualization, and interpersonal relationship skills). Items are rated on a 4-point Likert scale. In the present study, mean item scores were calculated rather than total summed scores. Consequently, PMHQ scores ranged from 1 to 4, with higher values indicating lower levels of positive mental health, in accordance with the scoring direction of the Portuguese validated version. Internal consistency in the present sample at baseline was excellent (Cronbach's $\alpha = 0.94$).
- Psychological Vulnerability Scale (PVS) (Portuguese version) [31], a six-item instrument assessing cognitive patterns associated with susceptibility to stress and emotional distress. Items are rated on a 5-point Likert scale, yielding total scores ranging from 6 to 30, with higher scores indicating greater psychological vulnerability. Internal consistency at baseline was acceptable (Cronbach's $\alpha = 0.77$).
- Satisfaction With Life Scale (SWLS) (Portuguese version) [32,33], a five-item instrument measuring global cognitive judgments of life satisfaction. Items are rated on a 7-point Likert scale, producing total scores ranging from 5 to 35, with higher scores reflecting greater life satisfaction. Internal consistency at baseline was good (Cronbach's $\alpha = 0.81$).

Cronbach's alpha coefficients were interpreted with caution, as they primarily reflect the degree of interrelatedness among items and may be influenced by scale characteristics such as length and dimensionality [34]. Overall, the internal consistency values observed in this study were considered acceptable to excellent across instruments.

2.6 Statistical Analysis

Descriptive statistics included means and standard deviations for continuous variables and frequencies for categorical variables. Paired *t*-tests were used to examine within-participant changes between baseline, and each follow-up time point among participants with complete paired data. This approach was selected as a pragmatic analytical approach to assess change over time in this quasi-experimental study. However, it does not make full use of all available repeated-measures data and is limited in its handling of missing observations over time. Effect sizes were estimated using Cohen's *d* with 95% confidence intervals (CIs). Baseline comparisons were conducted separately for participants who completed the immediate post-intervention assessment (T2) and those who did not, and for participants who completed the six-month follow-up assessment (T3) and those who lost to follow-up. Independent-samples *t*-tests were used for continuous variables and chi-square or Fisher's exact tests for categorical variables. Statistical significance was set at $p < 0.05$. Analyses were conducted using SPSS Statistics, version 30 (IBM Corp., Armonk, NY, USA).

3 Results

3.1 Participant Characteristics

At baseline (T1), 236 health care professionals completed the questionnaires. Of these, 164 completed the immediate post-intervention assessment (T2), and 77 completed the six-month follow-up (T3). This corresponds to a retention rate of 69.5% at T2 and 32.6% at T3, indicating substantial attrition over time. Across time points, respondents were predominantly female (T1: 94.1%; T2: 95.1%; T3: 92.2%), with a mean age of approximately 45 years and an average of 18–19 years of professional experience. Nurses consistently represented the largest professional group (T1: 54.2%; T2: 62.2%; T3: 62.3%). Table 2 presents baseline characteristics according to follow-up completion status at T2 and T3.

Table 2: Baseline characteristics according to follow-up completion status at T2 and T3.

Baseline Characteristics	Total Sample T1 (n = 236)	Completed T2 (n = 164)	Did Not Complete T2 (n = 72)	p-Value (T2)	Completed T3 (n = 77)	Did Not Complete T3 (n = 159)	p-Value (T3)
Age, mean (SD)	45.91 (9.13)	44.95 (8.95)	48.11 (9.22)	0.014	45.92 (8.51)	45.91 (9.44)	0.990
Years of work, mean (SD)	18.61 (9.56)	18.32 (9.33)	19.29 (10.11)	0.472	19.23 (8.35)	18.31 (10.11)	0.461
Female, n (%)	222 (94.1)	156 (95.1)	66 (91.7)	0.370	71 (92.2)	151 (95.0)	0.394
Professional category, n (%)				<0.001			0.092
Nurse	128 (54.2)	102 (62.2)	26 (36.1)		48 (62.3)	80 (50.3)	
Physician	16 (6.8)	13 (7.9)	3 (4.2)		5 (6.5)	11 (6.9)	
Administrative assistant	24 (10.2)	13 (7.9)	11 (15.3)		5 (6.5)	19 (11.9)	
Health care assistant	40 (16.9)	21 (12.8)	19 (26.4)		8 (10.4)	32 (20.1)	
Other	28 (11.9)	15 (9.1)	13 (18.1)		11 (14.3)	17 (10.7)	
Exercise frequency ≥ 2 times/week, n (%)	75 (31.8)	56 (34.1)	19 (26.4)	0.237	26 (33.8)	49 (30.8)	0.661
Perception of restorative sleep, n (%)	84 (35.6)	52 (31.7)	32 (44.4)	0.464	24 (31.1)	60 (37.7)	0.885
Report conflicts in the workplace, n (%)	84 (35.6)	54 (32.9)	30 (41.7)	0.238	33 (42.9)	51 (32.1)	0.113
Perceived conflict resolution, n (%)				0.617			0.006
Yes	16 (19.0)	10 (18.5)	6 (8.3)		3 (9.1)	13 (8.2)	
Partially resolved	50 (59.5)	32 (59.3)	18 (25.0)		17 (51.5)	33 (20.8)	
PVS, mean (SD)	16.00 (4.78)	15.82 (4.96)	16.28 (4.36)	0.496	16.39 (4.93)	15.75 (4.71)	0.335
PMHQ, mean (SD)	1.81 (0.35)	1.82 (0.34)	1.81 (0.37)	0.927	1.83 (0.36)	1.80 (0.34)	0.532
SWLS, mean (SD)	24.80 (6.23)	24.84 (6.09)	24.71 (6.60)	0.886	24.86 (6.03)	24.77 (6.35)	0.918

Note: Continuous variables are presented as mean (SD) and categorical variables as n (%). T1, pre-intervention; T2, immediately post-intervention; T3, six months post-intervention; PMHQ, positive mental health questionnaire; SWLS, satisfaction with life scale; PVS, psychological vulnerability scale. Independent-samples *t*-tests were used for continuous variables. Chi-square or Fisher's exact tests were used for categorical variables, as appropriate. Exercise frequency was dichotomized into ≥ 2 times/week and < 2 times/week for baseline comparisons. Percentages for perceived conflict resolution were calculated among participants reporting workplace conflict.

Baseline comparisons were conducted to explore potential attrition bias by comparing participants who completed T2 with those who did not, and participants who completed T3 with those who lost to follow-up. At T2, participants who completed the immediate post-intervention assessment were slightly younger on average than those who did not (44.95 ± 8.95 vs. 48.11 ± 9.22 ; $p = 0.014$) and differed in the distribution of professional categories ($p < 0.001$). No statistically significant baseline differences were observed for the main outcome measures at T2.

At T3, no statistically significant baseline differences were observed for demographic or outcome variables, although a difference was identified in perceived conflict resolution ($p = 0.006$). Participants retained at T3 also showed numerically higher baseline psychological vulnerability scores and a higher frequency of reported workplace conflict. These findings should be interpreted cautiously, as attrition may not have been entirely random.

3.2 Health and Workplace Factors

At baseline, 31.8% of participants reported engaging in regular physical activity, and 64.4% indicated insufficient sleep. Workplace conflict was reported by 35.6% of participants, with only 19% considering those conflicts resolved.

3.3 Intervention Effects

Table 3 summarizes the comparisons across the three time points. Overall, participation in the “Mais Por Ti” program was associated with statistically significant changes with moderate-to-large standardized effect sizes across all assessed outcomes, with moderate to large effect sizes. These changes were observed immediately after the intervention and were also present at six-month follow-up, although results at T3 should be interpreted cautiously given the reduced sample size and attrition.

Table 3: Comparison of outcome measures at baseline (T1), post-intervention (T2), and six-month follow-up (T3).

Outcome Measure	Mean Difference $\pm$ SD	<i>t</i>	<i>df</i>	Cohen's <i>d</i>	95% CI	<i>p</i> -Value
T2-T1						
Satisfaction With Life (SWLS)	+3.02 $\pm$ 4.03	9.62	163	0.8	2.40, 3.65	<0.001
Psychological Vulnerability (PVS)	-1.79 $\pm$ 3.66	-6.28	163	0.5	-2.36, -1.23	<0.001
Positive Mental Health (PMHQ)	-0.18 $\pm$ 0.23	-10.05	163	0.8	-0.22, -0.15	<0.001
T3-T1						
Satisfaction With Life (SWLS)	+2.82 $\pm$ 5.02	4.93	76	0.6	1.68, 3.96	<0.001
Psychological Vulnerability (PVS)	-2.79 $\pm$ 4.11	-5.97	76	0.7	-3.72, -1.86	<0.001
Positive Mental Health (PMHQ)	-0.24 $\pm$ 0.29	-7.37	76	0.8	-0.31, -0.18	<0.001

Note: CI, Confidence Interval; SWLS, Satisfaction with Life Scale; PVS, Psychological Vulnerability Scale; PMHQ, Positive Mental Health Questionnaire.

Effect sizes, expressed as Cohen's *d*, ranged from 0.5 to 0.8. All outcome measures showed statistically significant changes over time, with improvements observed following participation in the “Mais Por Ti” program, and changes were still present at six-month follow-up.

Scores on the Satisfaction with Life Scale (SWLS) increased significantly from baseline to post-intervention (mean difference = $+3.02 \pm 4.03$, $d = 0.8$, 95% CI [2.40, 3.65], $p < 0.001$). At six-month follow-up, satisfaction with life remained higher than baseline ($+2.82 \pm 5.02$, $d = 0.6$, 95% CI [1.68, 3.96], $p < 0.001$), suggesting changes remained observable at follow-up.

Participants' scores on the Psychological Vulnerability Scale (PVS) decreased significantly from baseline to post-intervention (mean difference = -1.79 ± 3.66 , $d = 0.5$, 95% CI [-2.36, -1.23], $p < 0.001$). Lower scores

were also observed at follow-up (mean difference = -2.79 ± 4.11 , $d = 0.7$, 95% CI $[-3.72, -1.86]$, $p < 0.001$), although this finding should be interpreted with caution given attrition.

Similarly, Positive Mental Health Questionnaire (PMHQ) scores decreased significantly at both post-intervention (mean difference = -0.18 ± 0.23 , $d = 0.8$, 95% CI $[-0.22, -0.15]$, $p < 0.001$) and follow-up (mean difference = -0.24 ± 0.29 , $d = 0.8$, 95% CI $[-0.31, -0.18]$, $p < 0.001$). Given that higher PMHQ scores reflect lower levels of positive mental health, these reductions indicate improvements following the intervention.

The largest immediate changes were observed in Personal Satisfaction (F1) ($\Delta = -0.21$, $d = 0.33$) and Problem Solving/Self-actualization (F5) ($\Delta = -0.28$, $d = 0.33$).

Between baseline and six-month follow-up (T1–T3), changes were observed across all domains, although these findings should be interpreted cautiously due to reduced sample size ($\Delta = -0.16$ to -0.28 ; $d = 0.37$ to 0.53 ; all $p < 0.001$). The largest long-term effects were observed for Self-control (F3) ($d = 0.53$) and Interpersonal Relationship Skills (F6) ($d = 0.42$), while other factors, including Prosocial Attitude (F2) and Problem Solving/Self-actualization (F5), also demonstrated durable improvements.

Across all measures, 95% CIs did not cross zero, and effect sizes ranged from moderate to large ($d = 0.5$ – 0.8). Overall, the results indicate consistent changes over time in life satisfaction, positive mental health, and psychological vulnerability.

3.4 Summary

Participation in the “Mais Por Ti” program was associated with statistically significant changes across all measured outcomes. Changes in positive mental health, life satisfaction, and psychological vulnerability were observed at six months, although interpretation at this time point is limited by attrition.

4 Discussion

This study examined changes associated with participation in the “Mais Por Ti” Positive Mental Health Promotion Program, based on Teresa Lluch’s MMPMH, among health care professionals in an urban Local Health Unit in Portugal. The findings indicate that participation in the intervention was associated with changes in positive mental health, life satisfaction, and psychological vulnerability over time, with changes observed up to six months. These findings are aligned with growing evidence indicating that psychological interventions are associated with consistent improvements in well-being across both clinical and non-clinical populations [24], while also reinforcing the relevance of structured, theory-based approaches in applied settings [15,35].

4.1 Comparison with Previous Research

The observed changes across all domains of PMH are consistent with previous studies showing that theory-based, structured interventions can strengthen psychological resources among health care professionals [15,21,27]. The largest immediate changes were observed in personal satisfaction and problem-solving/self-actualization, dimensions often compromised by high workloads and chronic stress in health care settings [36]. These findings are particularly relevant when considered alongside evidence demonstrating that adverse working conditions are associated with increased risk of mental health problems and reduced well-being among health care professionals [37]. Life satisfaction also increased significantly, in line with evidence that workplace interventions targeting psychological well-being can improve subjective evaluations of quality of life [10,38]. The reduction in psychological vulnerability is particularly relevant, as higher vulnerability scores have been linked to greater susceptibility to stress, emotional dysregulation, and depression [31].

The observed differences were statistically significant across outcomes. These findings suggest that changes were still present at follow-up among participants retained in the study, although this interpretation should be made cautiously given the level of attrition. Some evidence suggests that interventions targeting coping and adaptive strategies may be associated with longer-term changes [28], which may be consistent with the pattern of changes observed in this study. Furthermore, the pattern of changes across factors may reflect the multidimensional nature of PMH as conceptualized by the MMPMH, encompassing both intrapersonal domains (e.g., self-control, personal satisfaction) and interpersonal domains (e.g., relationship skills, prosocial attitudes). This may indicate complementarity between these dimensions, although conclusions regarding their integration as a pathway to longer-term PMH outcomes should be interpreted with caution.

Although no universally accepted minimal clinically important difference has been established for the PMHQ, SWLS, or PVS scales, the concurrent changes observed across these measures suggest consistency in the direction of results, in line with evidence from studies using multiple mental health outcomes to assess intervention effects [22,24,27,39]. Previous literature suggests that concurrent changes across positive mental health, life satisfaction, and psychological vulnerability may reflect broader changes in perceived well-being [18,22,24]. However, as these constructs were assessed through self-report measures, interpretations should remain aligned with the variables directly measured in this study.

The internal consistency of the instruments used in this study should also be considered when interpreting the findings. The high internal consistency observed for the PMHQ ($\alpha = 0.94$) should be interpreted considering its multidimensional structure, as elevated alpha values may reflect strong inter-item correlations rather than true unidimensionality [30]. In contrast, the alpha values obtained for the PVS ($\alpha = 0.77$) and SWLS ($\alpha = 0.81$) are consistent with expectations for shorter and more homogeneous instruments. These findings highlight the importance of interpreting internal consistency coefficients in relation to the characteristics of each measure rather than relying solely on conventional cut-off values.

4.2 Practical Considerations

The program was brief (8 h), delivered during working hours, and tailored to participants' baseline needs, which may have contributed to participant engagement among those who completed the program. This aligns with the WHO recommendations [8] that organizational mental health interventions should be accessible, low-cost, and integrated into routine workflows. The delivery of the intervention by trained mental health nurses who were also involved in the development of the program may have supported consistency and fidelity, although this may also introduce potential allegiance bias.

4.3 Limitations

Several limitations must be considered. First, the study employed a non-randomized, single-group design without a control group, which restricts causal inference. As such, it is not possible to determine whether the observed changes are attributable to the intervention or to other factors such as regression to the mean, repeated measurement effects, or external influences. Second, outcomes were measured exclusively using self-report instruments, which may be subject to response bias. In addition, substantial attrition was observed across time points, particularly at six-month follow-up. Participants who remained in the study may have been more motivated or may have perceived greater benefit, which could have contributed to an overestimation of long-term effects.

Baseline attrition analyses identified some statistically significant differences between participants retained at follow-up and those who did not complete follow-up, including age and professional category at T2 and perceived conflict resolution at T3, although no statistically significant differences were observed

in the main baseline outcome measures. These findings suggest that attrition may not have been entirely random. However, these analyses were limited to observed baseline variables and may have been underpowered to detect small but potentially meaningful differences in other characteristics. In addition, dropout may have been related to unmeasured factors or to participants' trajectories over time. An intention-to-treat approach was not applied, and attrition bias therefore cannot be excluded. No formal adjustment for multiple comparisons was performed, increasing the possibility of type I error.

Finally, the study was conducted in a single institution, with a predominantly female convenience sample, which limits generalizability to other professional groups and health care settings. The extended implementation period (2021–2024) may also have introduced contextual variability related to organizational or post-pandemic changes. In addition, the use of paired *t*-tests for repeated comparisons represents a relatively simple analytical approach for longitudinal data and does not fully account for the correlation structure of repeated measures or the presence of missing data over time. More robust longitudinal methods, such as mixed-effects models, would allow better use of all available observations and provide less biased estimates under plausible missing data assumptions.

4.4 Implications for Future Research

Further studies employing randomized controlled designs are needed to more rigorously evaluate the program and allow stronger causal inference. Future research should include appropriate control groups and consider stratified or cluster-based designs to account for organizational contexts in health care settings.

Given the level of attrition observed in this study, future studies should incorporate strategies to enhance participant retention and to better understand dropout mechanisms. The use of intention-to-treat approaches and advanced methods for handling missing data is recommended to reduce the risk of attrition bias and improve the robustness of findings.

In addition, the application of longitudinal analytical approaches, such as mixed-effects models, would allow more efficient use of repeated-measures data and provide more accurate estimates of change over time.

Further research should also explore the mechanisms underlying the observed changes, including the specific contribution of different components of the intervention and the role of contextual and individual factors. This may help optimize intervention design and support the scalability and implementation of similar programs in diverse health care settings.

5 Conclusions

Participation in the “Mais Por Ti” program was associated with changes over time in positive mental health, life satisfaction, and psychological vulnerability among health care professionals. These changes were observed immediately after the intervention and were also present at six-month follow-up, although interpretation at this time point is limited by substantial attrition and evidence of differences between some participants retained at follow-up and those who did not complete follow-up assessments. Although the single-group design and participant attrition limit causal inference and generalizability, the findings suggest that brief, structured, MMPMH-based positive mental health promotion programs delivered in workplace settings may be associated with improvements in psychological well-being among healthcare professionals. Further research using randomized controlled and multi-site designs, as well as more robust longitudinal analytical approaches, is warranted to confirm these findings and better understand their potential implications across diverse health care contexts.

Acknowledgement: We sincerely thank the participants whose collaboration was crucial for the success of this study. We also thank the Board of Directors and Nursing Management of the Local Health Unit of Matosinhos for

their support in the implementation of practices that promote well-being and organizational happiness, created and driven by mental health nurses. To the Ethics Committee and Investigation Service of ULS de Matosinhos, our thanks for ensuring adherence to ethical principles and their commitment to mental health research.

Funding Statement: The authors received no specific funding for this study.

Author Contributions: The authors confirm contribution to the paper as follows: conceptualization, Sérgio Cunha, Mariana Lima, Sónia Rocha and Daniela Machado; methodology, Liliana Silva; validation, Sérgio Cunha and Liliana Silva; formal analysis, Liliana Silva; investigation, Sérgio Cunha, Mariana Lima, Sónia Rocha and Daniela Machado; resources, Sérgio Cunha and Mariana Lima; data curation, Sérgio Cunha and Mariana Lima; writing—original draft preparation, Sérgio Cunha; writing—review and editing, Mariana Lima and Liliana Silva; visualization, Sérgio Cunha; supervision, Sérgio Cunha; project administration, Sérgio Cunha. All authors reviewed and approved the final version of the manuscript.

Availability of Data and Materials: The data that support the findings of this study are available from the Corresponding Author, Sérgio Cunha, upon reasonable request.

Ethics Approval: Ethical approval was obtained from the Local Health Unit of Matosinhos Ethics Committee (Protocol No. 20240021). Participation was voluntary. Data were pseudonymized, securely stored, and accessible only to the research team. All participants provided written informed consent prior to participation.

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

References

1. Bouza E, Arango C, Moreno C, Gracia D, Martín M, Pérez V, et al. Impact of the COVID-19 pandemic on the mental health of the general population and health care workers. *Rev Esp Quimioter.* 2023;36(2):125–43. [CrossRef].
2. Gaspar T, Correia M, do Céu Machado M, Xavier M, Guedes FB, Ribeiro JP, et al. Healthy workplace ecosystems (eats): an assessment tool for healthy workplaces. *Psicologia Saúde Doença.* 2022;23(1):253–69. [CrossRef].
3. Maunder RG, Heeney ND, Jeffs LP, Wiesenfeld LA, Hunter JJ. A longitudinal study of hospital workers' mental health from fall 2020 to the end of the COVID-19 pandemic in 2023. *Sci Rep.* 2024;14:26137. [CrossRef].
4. Gaspar T, Telo E, Sousa B, Jesus S, Xavier M, do Céu Machado M, et al. Relatório organizações de saúde do serviço nacional de saúde 2021–2024. Lisboa, Portugal: Laboratório Português de Ambientes de Trabalho Saudáveis; 2024 [cited 2025 Nov 15]. Available from: https://53237d59-ec33-49aa-bc7f-86826566ffa8.filesusr.com/ugd/645903_643e15fba5f24796a5264d090f7ba719.pdf.
5. Alzahrani HG, Ahmed RK, Jowharji TW, Alqarni AS, Agil WMF, AlDulaijan WM, et al. Views on the mental health of medical personnel at work and how it relates to patients' experiences receiving care. *Rev Iberoam Psicol Ejerc Deporte.* 2025;20(1):83–93.
6. Saijonkari M, Paronen E, Lakka T, Tolmunen T, Linnosmaa I, Lammintakanen J, et al. Promotive and preventive interventions for mental health and well-being in adult populations: a systematic umbrella review. *Front Public Health.* 2023;11:1201552. [CrossRef].
7. Aprilia ED, Adam M, Zulkarnain Z, Mawarpury M. What do we know about mental health of medical personnel? A systematic review. *J Psychol Perspect.* 2024;6(2):117–26. [CrossRef].
8. World Health Organization. WHO guidelines on mental health at work. Geneva, Switzerland: World Health Organization; 2022.
9. Søvold LE, Naslund JA, Kousoulis AA, Saxena S, Qoronfleh MW, Grobler C, et al. Prioritizing the mental health and well-being of healthcare workers: an urgent global public health priority. *Front Public Health.* 2021;9:679397. [CrossRef].
10. Arensman E, O'Connor C, Leduc C, Griffin E, Cully G, Ni Dhálaigh D, et al. Mental health promotion and intervention in occupational settings: protocol for a pilot study of the MENTUPP intervention. *Int J Environ Res Public Health.* 2022;19(2):947. [CrossRef].

11. International Council of Nurses. Guidelines on mental health nursing [Internet]. Geneva, Switzerland: International Council of Nurses; 2024 [cited 2025 Nov 15]. Available from: https://www.icn.ch/sites/default/files/2024-07/ICN_MentalHealthNursingGuidelines-2024_EN_web.pdf.
12. Anger WK, Dimoff JK, Alley L. Addressing health care workers' mental health: a systematic review of evidence-based interventions and current resources. *Am J Public Health*. 2024;114(S2):213–26. [[CrossRef](#)].
13. Frias CE, Samarasinghe N, Cuzco C, Koorankot J, de Juan A, Ali Rudwan HM, et al. Strategies to support the mental health and well-being of health and care workforce: a rapid review of reviews. *Front Med*. 2025;12:1530287. [[CrossRef](#)].
14. dos Santos BV, de Miranda FM, da Silva JAM, de Oliveira Sato T, Mininel VA. Estratégias de promoção à saúde mental no trabalho de enfermagem hospitalar: revisão integrativa. *Rev Enferm UFSM*. 2023;13:e36. [[CrossRef](#)].
15. Almeida Teixeira SM, Coelho JCF, da Cruz Sequeira CA, Lluch i Canut MT, Ferré-Grau C. The effectiveness of positive mental health programs in adults: a systematic review. *Health Soc Care Community*. 2019;27(5):1126–34. [[CrossRef](#)].
16. Lluch Canut MT. Salud mental positiva. Cuidar la salud mental positiva, en el contexto de la pandemia COVID-19 y hacía un futuro denominado “nueva normalidad”. *Hermenéutica*. 2021;19:8–22. [[CrossRef](#)].
17. Singh V, Kumar A, Gupta S. Mental health prevention and promotion—a narrative review. *Front Psychiatry*. 2022;13:898009. [[CrossRef](#)].
18. Keyes CLM. The mental health continuum: from languishing to flourishing in life. *J Health Soc Behav*. 2002;43(2):207. [[CrossRef](#)].
19. Almeida Teixeira SM, Ferré-Grau C, da Cruz Sequeira CA, Santos JM, Guerra MM, Lluch MT. Randomized controlled trial to evaluate the efficacy of positive mental health program for adults: study protocol. *Public Health Nurs*. 2025;42(1):154–60. [[CrossRef](#)].
20. Carvalho D, Sequeira C, Querido A, Tomás C, Morgado T, Valentim O, et al. Positive mental health literacy: a concept analysis. *Front Psychol*. 2022;13:877611. [[CrossRef](#)].
21. Liu L, Wu H, Sun T. Editorial: positive psychology in healthcare professionals. *Front Psychol*. 2022;13:883603. [[CrossRef](#)].
22. Miguel C, Amarnath A, Akhtar A, Malik A, Baranyi G, Barbui C, et al. Universal, selective and indicated interventions for supporting mental health at the workplace: an umbrella review of meta-analyses. *Occup Environ Med*. 2023;80(4):225–36. [[CrossRef](#)].
23. Strudwick J, Gayed A, Deady M, Haffar S, Mobbs S, Malik A, et al. Workplace mental health screening: a systematic review and meta-analysis. *Occup Environ Med*. 2023;80(8):469–84. [[CrossRef](#)].
24. Kraiss J, Redelinghuys K, Weiss LA. The effects of psychological interventions on well-being measured with the mental health continuum: a meta-analysis. *J Happiness Stud*. 2022;23(7):3655–89. [[CrossRef](#)].
25. Paterson C, Leduc C, Maxwell M, Aust B, Strachan H, O'Connor A, et al. Barriers and facilitators to implementing workplace interventions to promote mental health: qualitative evidence synthesis. *Syst Rev*. 2024;13(1):152. [[CrossRef](#)].
26. Belita E, Neil-Sztramko SE, Seale C, Zhou F, Zogo CO, Boamah S, et al. Organizational interventions to support and promote the mental health of healthcare workers during pandemics and epidemics: a systematic review. *BMC Health Serv Res*. 2025;25(1):731. [[CrossRef](#)].
27. Mantas-Jiménez S, Reig-García G, Roqueta-Vall-Llosera M, Camara-Liebana D, Masià-Plana A, Lluch-Canut MT, et al. Positive mental health and sense of coherence among emergency medical service professionals. *Front Public Health*. 2024;12:1344872. [[CrossRef](#)].
28. Katsiroumpa A, Moisoglou I, Papathanasiou IV, Malliarou M, Sarafis P, Gallos P, et al. Resilience and social support protect nurses from anxiety and depressive symptoms: evidence from a cross-sectional study in the post-COVID-19 era. *Healthcare*. 2025;13(6):582. [[CrossRef](#)].
29. Butcher HK, Bulechek GM, Dochterman JM, Wagner CM. *Nursing interventions classification (NIC)*. 7th ed. St. Louis, MO, USA: Mosby; 2018.
30. Sequeira C, Carvalho J, Sampaio F, Sá L, Lluch-Canut M, Roldán-Merino J. Avaliação das propriedades psicométricas do questionário de saúde mental positiva em estudantes portugueses do ensino superior. *Rev Port Enferm Saúde Ment*. 2014:45–53.

31. Nogueira MJ, Barros L, Sequeira C. Psychometric properties of the psychological vulnerability scale in higher education students. *J Am Psychiatr Nurses Assoc.* 2017;23(3):215–22. [[CrossRef](#)].
32. Diener E, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Personality Assess.* 1985;49(1):71–5. [[CrossRef](#)].
33. Neto F. The satisfaction with life scale: psychometrics properties in an adolescent sample. *J Youth Adolesc.* 1993;22(2):125–34. [[CrossRef](#)].
34. Edelsbrunner PA, Simonsmeier BA, Schneider M. The cronbach's alpha of domain-specific knowledge tests before and after learning: a meta-analysis of published studies. *Educ Psychol Rev.* 2025;37(1):4. [[CrossRef](#)].
35. Lim WL, Tierney S. The effectiveness of positive psychology interventions for promoting well-being of adults experiencing depression compared to other active psychological treatments: a systematic review and meta-analysis. *J Happiness Stud.* 2023;24(1):249–73. [[CrossRef](#)].
36. Gray P, Senabe S, Naicker N, Kgalamono S, Yassi A, Spiegel JM. Workplace-based organizational interventions promoting mental health and happiness among healthcare workers: a realist review. *Int J Environ Res Public Health.* 2019;16(22):4396. [[CrossRef](#)].
37. Rugulies R, Aust B, Greiner BA, Arensman E, Kawakami N, LaMontagne AD, et al. Work-related causes of mental health conditions and interventions for their improvement in workplaces. *Lancet.* 2023;402(10410):1368–81. [[CrossRef](#)].
38. Picco L, Yuan Q, Vaingankar JA, Chang S, Abdin E, Chua HC, et al. Positive mental health among health professionals working at a psychiatric hospital. *PLoS One.* 2017;12(6):e0178359. [[CrossRef](#)].
39. Hinz A, Mehnert-Theuerkauf A, Glaesmer H, Schroeter ML, Tibubos AN, Petrowski K, et al. Changes in life satisfaction over six years in the general population: a longitudinal study with the satisfaction with life scale (SWLS). *PLoS One.* 2025;20(1):e0316990. [[CrossRef](#)].