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Yoga in primary health care: A quasi-experimental study to access the effects on quality of life and psychological distress

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ABSTRACT

Background: and purpose: Yoga is growing in popularity, but its benefits and integration into primary care remain uncertain. Here, we determine yoga effects on quality of life and psychological distress, and evaluate the feasibility of introducing yoga at primary care level.
Materials and methods: This is a prospective, longitudinal, quasi-experimental study, with an intervention (n = 49) and a control group (n = 37). Yoga group underwent 24-weeks program of one-hour sessions. Our primary endpoint was quality of life and psychological distress, as well as satisfaction level and adherence rate.
Results: Participants reported a significant improvement in all domains of quality of life and a reduction of psychological distress. Linear regression analysis showed that yoga significantly improves psychological quality of life (p = 0.046).
Conclusion: Yoga in primary care is feasible, safe and has a satisfactory adherence, as well as a positive effect on psychological quality of life of participants.

1. Introduction

In Portugal's primary health care, anxiety disorders are one of the most frequent mental disorders (16.5%), and 20% of users are depressed at the time of the consultation [1,2]. Many risk factors, including chronic stress exposure, could be involved and/or explain these statistics. Although there is no national data on the magnitude of chronic stress exposure, it is known that benzodiazepines, which are used to treat anxiety and chronic stress-related symptoms, are the most prescribed in the Portuguese Health Service [1–3]. To minimize the adverse effects of medication, new therapy approaches are being recommended, such as Complementary and Alternative Medicine (CAM) [4–7]. Research based on an integrative approach in primary health care suggests that General Practitioners (GPs) should be more involved in delivering, referring or supervising CAM treatments [4–6,8,9]. For example, in Brazil, since CAM was implemented in 2006, the population has access to regular yoga classes in the public health care setting [10].

Yoga, an example of CAM, is a worldwide practice, recognized as a method to promote health and wellbeing [11–17]. It is considered a mindfulness intervention, and several studies support its efficacy in the prevention and treatment of numerous chronic diseases, including cardiovascular diseases, type 2 diabetes and musculoskeletal diseases, as well as stress-related diseases, in particular anxiety and depression [11–22]. Furthermore, yoga is associated with physical, emotional and psychological benefits, namely the improvement of the quality of life [23,24] of its users and the rehabilitation of patients with chronic disabilities [14–16]. An Australian survey from 2014, which studied the referral patterns of GPs (n = 585), reported that 55–56% actively recommended yoga and meditation as effective and safe health-promoting techniques; less than 3% discouraged these practices [25].

Despite the growing popularity of yoga, its therapeutic potential and possible integration into primary health care services need to be investigated in different socio-cultural contexts. To that end, the present

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Abbreviations

WHOQOL-BREF	The World Health Organization Quality of Life Questionnaire, Brief Version
DASS-21	The Depression, Anxiety and Stress Scale with 21 items
CAM	Complementary and Alternative Medicine
GPs	General Practitioners
USISM	Health Unit of São Miguel Island
HCPD	Health Centre of Ponta Delgada

study aimed to determine the effect of yoga on the quality of life and psychological distress of its users, and to evaluate the feasibility of introducing yoga sessions into primary health care.

2. Materials and methods

2.1. Ethics statement

The present study was designed in accordance with international ethical guidelines, and includes, from all participants, written informed consent, confidentiality and an abandonment option in case of expressed will. The study was evaluated and approved (Ref. HDES/CES/390/2016) by the Health Ethics Committee of the Hospital of Divino Espirito Santo of Ponta Delgada and authorized by the Administration Board of the Health Unit of São Miguel Island (USISM), Azores, Portugal.

2.2. Study design and participants

This prospective, longitudinal, quasi-experimental study included two groups: an intervention group (yoga practice) and a control group (usual care group). The study was conducted in the Health Centre of Ponta Delgada (HCPD) at the USISM, between July 2016 and April 2017. Sample size was based primarily on participant and resource availability during the recruitment timeline. Prior to recruitment, we calculated, by online Sampsize calculator (http://sampsize.sourceforge.net/iface/index.html), a minimum sample size of 30 participants in each group, with a power of 90% and using a one-sided test at the alpha 5% level.

Participation was voluntary and the recruitment period occurred from July to September 2016. The enrolment strategy (Fig. 1) was based on invitations by health professionals (e.g., clinicians, nutritionists, psychologists, nurses) and advertising media in the community (e.g., local newspaper, health unit website and posters). Users willing to participate were invited to complete a registration form to verify eligibility criteria.

As eligibility criteria, we included all HCPD users over the age of 18 and without previous experience of regular yoga practice in the last 3 months. We excluded 1) users with physical and/or mental disabilities, and 2) pregnant women. During 3 months, participants were consecutively enrolled and placed into the yoga group (n = 79). The size of this group was limited by the availability of technical resources (i.e., there were a total of five sessions per week for a maximum of 16 users in 1-h session). If not willing to practice yoga, the participant was allocated to the usual care group (n = 66), after age and gender-matched pairing.

2.3. Yoga practice intervention

The intervention was conducted at HCPD from October 2016 through April 2017, and consisted in yoga practice during 60 min per week (i.e., one session), for 24 consecutive weeks, taught by a Yoga Alliance [26] instructor with 200 h training.

Each session was limited to a maximum of 16 participants. The yoga

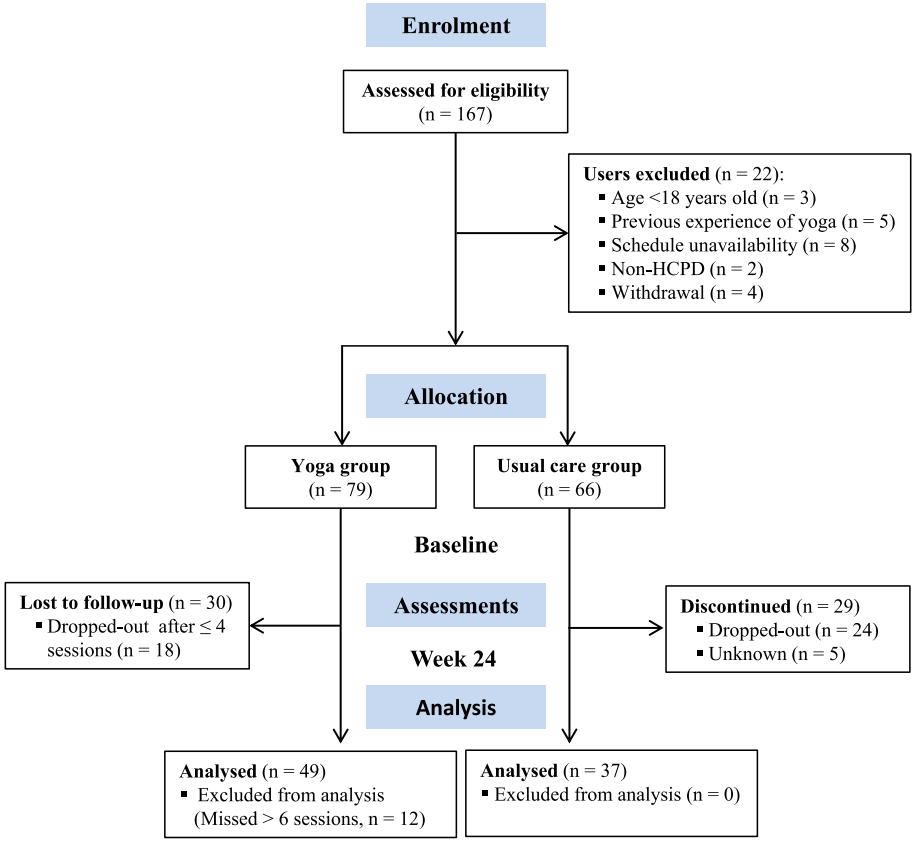

Fig. 1. Flow chart of the study population at the time of enrolment, allocation and assessments.

routine consisted of breathing exercises, progressive articular and myofascial warming-up, followed by *surya namascar* (sun salutation sequence; adapted to the physical condition of each participant), alignment exercises, and postural awareness. Practice also included soft twists of the spine, reversed and balance postures, as well as concentration exercises. During the sessions, the instructor discussed some ethical guidelines of yoga, as for example, non-violence (*ahimsa*) and truthfulness (*satya*), to allow the participant to have a safer and integrated practice. In addition, the participants were encouraged to develop their awareness of the present moment and their body sensations, through a continuous process of self-consciousness, keeping a distance between body sensations and the emotional experience. The instructor emphasized the connection between breathing and movement. Each session ended with a guided deep relaxation (yoga *nidra*; 5–10 min), followed by a meditation practice (5–10 min).

The yoga instructors also encouraged participants to remain within their range of motion or comfort and made appropriate accommodations, as well as postures adjustments for those with health limitations for any exercise. For example: if a participant suffers from osteoarticular problem, like back injury, he/she was repeatedly recommended to avoid spinal hyperextension/flexion; if sacroiliac pain, it was suggested to avoid extreme motion of this joint, like in poses as *Ardha Matsyendrasanaor or Janu Sirsasana*. Elderly users or with osteoporosis practiced balance postures (e.g., *Vrksasana, Ardha Chandrasana, Virabhadrasana III*) with the support of a chair or a wall. Reversed or other postures (where the heart is above the head) and certain types of breathing techniques (e.g., *Kapalabhati* and *Bhastrika Pranayama*) were contraindicated when blood pressure levels were not controlled. If hamstring injury, the participants were recommended to avoid stretching these muscles, like in *Pashimotanassana and Janu Shirsasana*. Props (e.g. blocks, chairs and bolsters) were used to support participants holding yoga poses safely.

2.4. Data collection

Before the first yoga class at HCPD, all participants of the yoga group were assessed by the medical team. This team explained the intervention procedures, including informed consent, and gave a form sheet to collect the demographic (e.g., age, education level) and clinical (e.g., anxiety disorder, osteoarticular disease) data, as well as the two self-report psychometric questionnaires. At the end of the intervention (week 24), we collected data from three questionnaires: two self-report psychometrics scales and yoga practice satisfaction scale. Regarding the usual care group, the first evaluation was applied on the same day of the invitation to enrol and the second one was assessed 24 weeks after by phone, email or by physical presence at the HCPD. Furthermore, during the 6-month intervention, the participants were monitored about yoga-related adverse events.

2.5. Participant's adherence and dropouts

Adherence rate to the yoga sessions was defined as the total number of sessions attended by the participant divided by the total number of expected yoga sessions (n = 24). The dropout rate was calculated as the percentage of participants who did not attend the 24-week evaluation.

2.6. Psychometric questionnaires

Two self-report psychometric questionnaires were administered at baseline and after 24 weeks: a) The World Health Organization Quality of Life Questionnaire, Brief Version (WHOQOL-BREF) aimed to evaluate the user's quality of life, focusing on the individuals' own views of their wellbeing [27,28]. This is a valuable instrument, comprised of 26 questions divided into five domains (physical, psychological, social relationships, environmental wellbeing, and general health perception of quality of life and health); and b) The Depression, Anxiety and Stress Scale with 21 items (DASS-21), in which the psychological symptoms are grouped into three domains: anxiety, depression and stress [29].

2.7. Participants' satisfaction scale

At the end of the study, participants from the intervention group were invited to fill in the Satisfaction Scale. This scale was carefully based on pre-existing work [30–34] and allows a consistent analysis from a conceptual and multidimensional point of view of participant satisfaction. Specifically, this scale aimed to assess intervention feasibility in terms of 1) accessibility to yoga classes in HCPD, 2) implementation (information and service provided regarding registration, schedule and yoga instructor), and 3) comfort and space conditions. The measurement is an anonymous 10-item self-report Likert scale in which responses are ranged from 1 (very dissatisfied) to 5 (very satisfied). The sum of the mean score of the three domains (accessibility, implementation, and comfort and space) was converted into a percentage value to obtain the degree of satisfaction of the users, in which 100% represents the maximum satisfaction level (50 points).

2.8. Statistical analysis

At the end of the study, participants who missed more than six sessions were excluded. All study variables were summarized using descriptive statistics. Changes in WHOQOL-BREF and DASS-21 scores at baseline and week 24 were compared between study groups by the non-parametric Mann-Whitney test, and within-groups using the non-parametric Wilcoxon test. Non-parametric tests were preferred due to rejection of score changes normality in at least one of the study groups (Shapiro-Wilk test). Linear multiple regression analysis was used to study the effect of yoga practice in changes of psychometric scores adjusted for baseline covariates. Associations between categorical variables were tested, using the Chi-square test (or Fishers' exact test, if more than 20% of the cells had frequency lower than 5). All statistical tests were two-tailed considering a significance level of 0.05. Data analysis was conducted with the statistical software IBM® SPSS® Statistics 19.

3. Results

3.1. Participants

The participant's flowchart throughout the study is shown in Fig. 1. Of the 167 users evaluated, 145 (86.8%) were enrolled and 22 (13.2%) did not comply with the eligibility criteria. Of the 145 eligible users that completed the baseline assessment, 79 (54.5%) were allocated to the yoga group and 66 (45.5%) to the usual care group. At the end of the study (week 24), the adherence rate averaged 79.5%. Regarding the dropout rate, the participants of the yoga group showed better results than the usual care group (37.9% *vs* 43.9%, respectively).

3.2. Baseline characteristics

Baseline sociodemographic and clinical characteristics of the study groups are described in Table 1. The majority was female (82.6%), and the average age was 48 (standard deviation, SD = 13.4). Study groups were well balanced regarding age and gender; however, the yoga group had a greater proportion of individuals with higher level of education (91.8% *vs* 56.7%), more divorced/widowed (26.5% *vs* 8.1%) and less singles (22.4% *vs* 40.5%) compared with the usual care group. Regarding clinical status, the yoga group had a higher prevalence of depression (24.5% *vs* 8.1%) and thyroid disease (36.7% *vs* 2.7%) compared with the usual care group. No statistical differences were found in the other clinical variables.

At baseline, the usual care group presented a significantly higher level of quality of life in all WHOQOL-BREF domains compared with

Table 1
Baseline characteristics of yoga and usual care groups.

Participant characteristics	Yoga group		Usual care group	
	(n = 49, 57%)		(n = 37, 43%)	
Mean age				
Years (SD)	47.4	(13.3)	48.4	(13.8)
Age, n (%)				
≤ 32	5	(10.2)	7	(18.9)
33–39	13	(26.6)	3	(8.1)
40–52	13	(26.5)	10	(27.0)
53–65	12	(24.6)	14	(37.8)
≥ 66	9	(10.5)	3	(8.1)
Gender, n (%)				
Male	10	(20.4)	5	(13.5)
Female	39	(79.6)	32	(86.5)
Education, n (%)				
≤ 9 years	4	(8.2)	16	(43.3)
College graduate or postgraduate education	45	(91.8)	21	(56.7)
Marital status, n (%)				
Single	11	(22.4)	15	(40.5)
Married or unmarried partner	25	(51.0)	19	(51.3)
Divorced or widowed	13	(26.5)	3	(8.1)
Clinical condition, n (%)				
Hypertension	12	(24.5)	15	(40.5)
Type 2 diabetes	5	(10.2)	2	(5.4)
Dyslipidaemia	15	(30.6)	8	(21.6)
Obesity or overweight	10	(20.4)	12	(32.4)
Anxiety disorder	21	(42.9)	21	(42.9)
Depression	12	(24.5)	3	(8.1)
Osteoarticular disease	20	(40.8)	13	(35.1)
Thyroid disease	19	(38.8)	1	(2.7)
Others	19	(38.8)	9	(24.3)

the yoga group, except in the general health domain (Table 2). Regarding DASS-21, the mean baseline scores did not differ significantly between groups for the anxiety domain, but significant differences were found concerning stress (4.30 *vs* 6.80; p = 0.005) and depression levels (2.92 *vs* 4.80; p = 0.018; Table 2).

3.2.1. Psychometric outcomes

After 24 weeks, the yoga group showed significant improvements in all domains of quality of life measured by WHOQOL-BREF (Fig. 2): general health (p = 0.003), psychological (p ≤ 0.001), physical (p ≤ 0.001), social (p = 0.002), and environmental wellbeing (p ≤ 0.001), as well as lower levels of depression (p ≤ 0.001), anxiety (p = 0.010) and stress (p = 0.004) analysed through DASS-21 (Fig. 3). On the other hand, within the usual care group, we did not find significant differences in any of the quality of life domains after 24 weeks (except in the environmental wellbeing domain, p < 0.001), nor in the psychological distress domains.

Since study groups were heterogeneous regarding baseline WHOQOL-BREF and DASS-21 scores, we estimated the effect of yoga practice adjusted to baseline scores by means of a linear regression model (Table 3). The yoga group reported a significant improvement in the individual perception of quality of life in the psychological (p = 0.046) and environmental wellbeing domains (p = 0.023). We also observed a marginally significant positive change in the physical domain of the quality of life (p = 0.056) compared with the usual care group (Table 3). None of the intervention participants reported adverse events associated with yoga practice.

3.3. Satisfaction scale with yoga practice

Table 4 resumes the satisfaction levels of the yoga group participants. Forty four (89.8%) participants of the yoga group responded to the satisfaction scale; the remaining 5 (10.2%) did not return the completed questionnaire. The overall satisfaction was very positive (89.6%), mainly at the level of the implementation (subtotal score of 14.5 for a maximum of 15). For this last domain, mean scores were 4.7 points in personal satisfaction with the information about the study and enrolment, 4.9 points in the schedule of the sessions, and 4.9 points regarding yoga instructor's performance.

4. Discussion

To our knowledge, this is the first prospective study to evaluate the therapeutic effects of yoga as a complementary and alternative medicine integrated into a Portuguese primary health care setting. Our findings revealed that the introduction of yoga in the HCPD is feasible and safe, with a positive adherence rate and satisfaction level. Moreover, we found that yoga is a therapeutic approach with good receptivity amongst HCPD users.

Our research demonstrated that 24 weeks of yoga practice significantly improved all domains of quality of life: general health, psychological, physical, social, and environmental wellbeing. The evidence regarding the improvement of physical and psychological quality of life of the yoga group participants is in line with the most relevant [12–15,35,36] and recent [17,18,23,24] studies in the area. Psychophysiological benefits are consistent, reproducible and occur at different levels, in particular: stress reduction, cognitive function improvement, neuromuscular performance, muscle strength and flexibility, as well as emotional regulation. The general positive effect of yoga, based on WHOQOL-BREF, is supported by the integration of body movement with breathing. This allows for neurovegetative relaxation through the activation of the parasympathetic nervous system, evidenced by an improvement of the respiratory function, and the reduction of heart rate, blood pressure, and muscle hypertonia [19]. Additionally, the improvement of social functioning can be explained by the small-group setting of yoga classes, which provides socialization opportunities for participants. The health gain at the physical, psychological and emotional self-perception levels increases the predisposition of participants for social interaction.

This study also demonstrated that the regular practice of yoga improves psychological distress parameters, namely, through the reduction of levels of depression, anxiety and stress. Consistent with these results, Schuver and collaborators [16] in a randomized controlled trial evaluated the effects of 12 weeks of regular yoga practice on depressive symptoms and psychological rumination in depressed women. This study reported a decrease in depressive symptoms between pre- and post-intervention, as well as between baseline and 1-month follow-up. They noticed improvements in rumination levels, which offered participants the opportunity to counteract the automatic cycles of thinking

Table 2
Comparison of psychometric outcomes between yoga group and usual care group at baseline.

Self-report questionnaires	Yoga group		Usual care group		p-value[a]
WHOQOL-BREF, mean (SD)					
General health	67.5	(17.7)	73.7	(10.5)	0.097
Physical	67.6	(14.6)	76.5	(11.5)	**0.003**
Psychological	65.3	(13.7)	72.4	(12.1)	**0.019**
Social	62.6	(19.3)	75.9	(11.6)	**0.003**
Environmental	55.4	(10.9)	60.1	(9.2)	**0.033**
DASS-21, mean (SD)					
Depression	4.8	(4.4)	2.9	(3.8)	**0.018**
Anxiety	4.0	(4.1)	2.4	(2.7)	0.070
Stress	6.8	(4.1)	4.3	(3.1)	**0.005**

WHOQOL-BREF: Brief World Health Organization Quality of Life questionnaire (5 domains, ranged from 0 to 100 for each domain; higher scores indicate better status); DASS-21: Depression, Anxiety and Stress Scale with 21 items (3 domains, ranged from 0 to 21 for each domain, lower score indicates better status); SD: Standard deviation; in bold, significant p < 0.05.

[a] Mann-Whitney test.

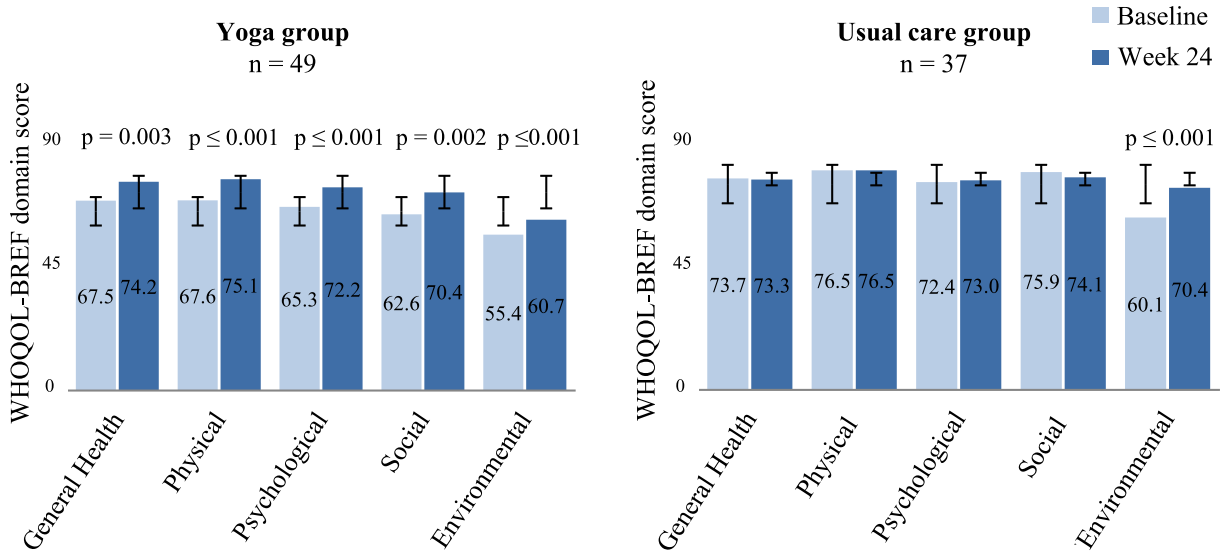

Fig. 2. Comparison of quality of life (WHOQOL-BREF) domains means scores between baseline and after 24 weeks by study groups. The yoga group participants reported significantly improvements in all domains. The usual care group did not reported significant differences at the quality of life domains after 24 weeks, except at the environment wellbeing domain. Only the significant p-values are indicated.

and to initiate a more conscious process of attention. In other words, this process of attention entails directing the mind to physical sensations and to hetero/self-compassionate thoughts. According to Patanjali, the main cause of mental illnesses is due to excessive preoccupation with external recognition, and to the rumination of individual frustrations [37,38]. Removal of these concerns and the search for personal self-realization define one of the nuclear principles of yoga. Therefore, the continuous analysis of internal processes and permanent existential updating allow the yoga user to discover their balance and creative potential.

In the current study, we compared the psychometric results with a usual care group, by linear regression analysis, and concluded that yoga significantly improves the participant's psychological and environmental quality of life. However, no significant differences were found in the psychological distress domains of usual care participants. Gothe et al. [18] also compared the effects of an 8-week yoga program with a control group, and demonstrated that this intervention effectively improved the cognitive functioning of yoga users and lowered their stress levels, while the control group experienced a worsening of stress levels and a deterioration of cognitive performance. Nowadays, the underlying mechanisms associated with mindfulness-based interventions, like yoga, are based on two essential elements: 1) a focus on immediate experience, and 2) an attitude of non-judgmental curiosity and full acceptance of the immediate experience [19]. Although all individuals have these innate abilities, most people live in “autopilot” mode, looking at day-to-day activities through standardized behaviours, while the mind is distant and divergent. Thus, a regular practice of yoga increases the present moment self-awareness and, at the same time, allows the individual to recognize the subtle distractions of the mind [25].

Additionally, the minimal side effects and cost of yoga, compared with other current treatments, make it attractive as a low-cost

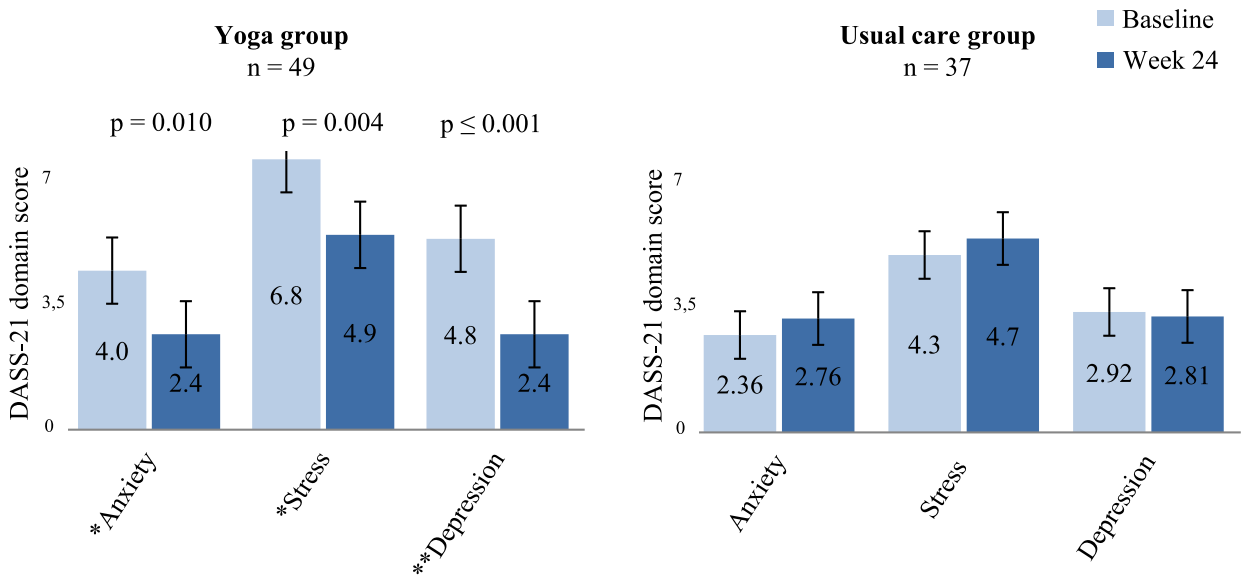

Fig. 3. Comparison of psychological distress (DASS-21) domains means scores between baseline and after 24 weeks by study groups. The yoga group participants reported significantly improvements in all domains of DASS-21 scores. The usual care group does not reported significant differences at any DASS-21 domains after 24 weeks. Only the significant p-values are indicated.

Table 3
Comparison of the psychometric mean scores changes after 24 weeks between yoga and usual care groups by linear multiple regression.

	Yoga group			Usual care group			Group differences
	Baseline	Week 24	Changes[a]	Baseline	Week 24	Changes[a]	Adjusted p-value[b]
WHOQOL-BREF							
General health	67.5	74.2	6.8	73.7	73.3	−0.3	0.096
Physical	67.6	75.1	7.4	76.4	76.5	0.1	**0.056**
Psychological	65.3	72.2	6.9	72.4	73.0	0.6	**0.046**
Social	62.6	70.4	7.8	75.9	74.1	−1.8	0.332
Environmental	55.4	60.7	5.3	60.1	70.4	10.2	**0.023**
DASS-21							
Depression	4.8	2.4	−2.4	2.9	2.81	−0.1	0.145
Anxiety	4.0	2.4	−1.5	2.4	2.76	0.4	0.301
Stress	6.8	4.9	−1.9	4.3	4.70	0.4	0.420

WHOQOL-BREF: Brief World Health Organization Quality of Life questionnaire (5 domains, ranged from 0 to 100 for each domain; higher scores indicate better status); DASS-21: Depression, Anxiety and Stress scale with 21 items (3 domains, ranged from 0 to 21 for each domain, lower score indicates better status).

[a] Changes: mean scores differences between baseline and week 24; in bold, significant $p < 0.05$.

[b] p-value was estimated using linear regression models to compare mean score changes (dependent variables) between study groups (factor) adjusted for baseline scores (covariate).

Table 4
Participants' satisfaction scale.

Domains	Score		
	Mean	Subtotal	Total score (%)
Accessibility to yoga sessions at HCPD		18.0	44.6 (89.6)
1. Schedule of the yoga sessions	4.5		
2. Registration form	4.8		
3. Waiting time between registration and the start of yoga sessions	3.8		
4. Sessions length (minutes	4.9		
Implementation		14.5	
5. Information about the study and enrolment	4.7		
6. Information about the schedule of yoga sessions	4.9		
7. Satisfaction with the yoga instruction performance	4.9		
Comfort and space condition		12.1	
8. Comfort of the space	3.8		
9. Cleanliness of the space	4.0		
10. Quality of yoga equipment	4.3		

Each response is ranged from 1 (very dissatisfied) to 5 (very satisfied). Score range per domain: Accessibility (4-20); Implementation (3-15); Comfort and space condition (3-15). The subtotal score is obtained by the sum of the mean score of each response per domain. Total maximum score is 50.
The sum of the mean score of the three domains (accessibility, implementation, and comfort and space) was converted into a percentage value to obtain the degree of satisfaction of users, in which 100% represents the maximum satisfaction (50 points).

community-based strategy and emotional self-regulation tool for managing psychological distress and promote quality of life [39]. In this context, the integration of yoga as a complementary therapy contributes to preventing and/or treating a number of diseases and to reinforcing the sustainability of the health care system. In practical terms, health centres only need to provide in their facilities: a furniture-free room, yoga mats, foam blocks, bolsters or blankets and a certified instructor for every 10 to 16 users per session.

The present study has several strengths worth mentioning. First, the investigators opted to include reliable and validated psychometric questionnaires for the Portuguese population. Second, the study included a control usual-care group with age and gender matching. Third, the current study applied a 24-weeks intervention, longer than most studies found in literature, which also can constitute an advantage for stabilizing long-term effects. The sustainability of participation was ensured due to strategic factors, such as: the economic and geographic accessibility (free yoga classes at a central location, with public transportation and free parking car), the comfort of the space and materials used, as well as the professionalism, consistency and sympathy of yoga instructors. Together, these factors reinforced the participants' adhesion to the intervention. Furthermore, the sense of security given to participants for practicing yoga within a primary care centre contributed to the success of yoga continuity. Finally, the yoga intervention was focused on individualized mindfulness-based practice, with the collaboration of two certified instructors, trained to adjust the postures and alignments, whenever necessary and according to the individuals' needs.

Despite the strengths discussed above, the study had three major limitations that deserve consideration. First, the nonrandomized design might have introduced sampling bias. Indeed, the use of a convenience sample resulted in a yoga group with a higher education level, less quality of life, and higher levels of stress and depression. This heterogeneity was partially overcome by the linear multiple regression for each score, considering the study group as a factor and the baseline score as a covariate. Nevertheless, conclusions may have limitations towards non-normality of some within-group score changes and presence of other non-controlled confounders. Secondly, in regards to the small sample size, we received more than 80 new requests from persons who would like to enrol in yoga classes. However, due to limitations in technical and financial resources, as well as restricted timelines for the conduction of the study, it was not possible to increase the number of participants. Finally, a blind study was not possible due to the type of intervention and to psychometric self-report parameters that are more susceptible to confounding factors, such as traumatic or protective life events at the time of the measurement.

5. Conclusion

The introduction of yoga at a primary health care is feasible and safe, with satisfactory adherence rate among users. Our findings indicate that 24 weeks of yoga practice significantly improves the psychological domain of quality of life, compared with a usual care control group. Nevertheless, larger and longer-duration randomized trials are needed, in different countries and communities, to evaluate the full range of the effects of yoga.

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Conflicts of interest

The authors declare that they do not have a conflict of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ctcp.2018.10.012.

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