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Does tutors' support contribute to a telehealth program that aims to promote the quality of life of office workers? A cluster randomized controlled trial

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ABSTRACT

The quality of life in the workplace can be achieved by creating a place more humanized and strategies that provide wellness to workers. The aim of this study was to investigate the effectiveness of telehealth education program to promote quality of life of office workers.

This is a cluster randomized controlled trial (RCT). The participants were office workers computer users (n = 326). All received 9 audiovisual content (grouped into topics: musculoskeletal health, healthy diet, and mental health) that addresses the real needs identified by them in the focus groups. The intervention group (n = 178) was instructed to seek the tutor support about topics addressed by the audiovisual content. The primary outcome measure was quality of life by WHOQOL-BREF. The secondary outcome measure was level of physical activity of the participants. Data analysis was performed by General Linear Mixed Model. After six months of telehealth education program a general improvement in health and environmental domain, was observed in the intervention group. During that period, a within-group analysis showed that there was a significant improvement in the intervention group, with respect to quality of life in general health ($p < 0.05$) and in the environmental domain ($p < 0.01$).

In the baseline to the eighth month, there were statistically significant changes within-group for the general health ($p < 0.05$) and for the physical domain ($p < 0.01$) in both groups ($p < 0.01$). Telehealth education program promoted an improvement in the participants' quality of life. There was no benefit in favor of the telehealth education program, with tutor support in relation to the conventional program.

Trial registration: The trial was prospectively registered at ClinicalTrial.gov (NCT02980237). The date of registration was August 23, 2016.

1. Introduction

Office workers account for a high prevalence of occupational disorders globally. In Brazil, these workers rank fifth in terms of dismissal and permanent disability and rank first in sick leave [1]. Due to the inherent characteristics of this occupation, employees are faced with great physically and mentally demands [2–5], including long periods of sitting [3].

Office workers are defined as sedentary workers due to low energy expenditure [4–6] for sitting long periods [7], and they develop habits that reinforce an increased sedentary behavior outside work [8]. Sedentary behavior is an important health predictor that is strongly associated with early mortality, fatal and non-fatal cardiovascular diseases, type 2 diabetes, and metabolic syndrome [9]. Non-communicable

Abbreviations: RCT, Randomized controlled trial; WHOQOL-BREF, The World Health Organization; Quality of Life, QL; Qr Code, Quick Response Code; IPAQ, International Physical Activity Questionnaire; ICC, intraclass correlation coefficient; CI, confidence.

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chronic diseases that result from a sedentary lifestyle account for about 9% of premature deaths globally [10]. Musculoskeletal complaints from office workers vary greatly, with a high complaint prevalence related to the neck and the lumbar regions [4,5].

The initiatives of health promotion programs in the workplace are diverse [11–14]. They involve both the need for interventions to promote health and well-being of workers and to reduce stressors in the workplace [13]. They also address the employers' expectations of a return on their financial investments and the impact on the central priorities of organizations [14].

Health promotion programs conducted in the workplace are relevant in terms of changes in health habits and improving overall lifestyle, enhancing the level of physical activity, and improving diet and health [11–16]. Health promotion programs for office workers are highly recommended based on recent evidence regarding the risk of cardiometabolic diseases and premature mortality from excessive sedentary time during seated work [17]. Recommendations include specific goals, such as alternating between standing and sitting and walking during work hours, and other health promotion goals, such as better nutrition, reduced alcohol consumption, reduced smoking, and the reduction of stressors [18]. In addition, interventions of participative ergonomics and on-site training (education in health, training for risk self-management) have shown strong to moderate evidence of the decrease and the control of musculoskeletal complaints in this population [19] in addition to a positive impact on quality of life and changes in health habits [20].

However, due to the lack of time required to implement programs with long on-site units, distance education and health promotion actions through the Internet have appeared to be a promising alternative [16]. Telehealth is a tool that makes health promotion material available due to the positive impact this technology can have on people's lives. Its low cost and the possibility of providing the service to large populations are significant advantages [21]. Nevertheless, telehealth programs must be interactive, user-friendly, engaging, adaptable, and accessible [21]. Telehealth has proven to be an effective means of providing advice and helping to control risk factors. Telehealth programs have been studied in the monitoring of chronic diseases [22]. However, studies conducted at the workplace are scarce [23] usually limited to messaging designed for the self-management of health care [24] or the use of computer software that encourages workers to perform exercises and include schedule breaks [25].

This study contribute for the advancement of knowledge for the field of occupational health by including the development of an audiovisual series content in a reporting format (*narrative structure composed of alternative texts, excerpts and sounds*) that serves as a starting point for the self-management of health care with a staff of online tutors who explain, guide, and influence changes in health behaviors [26]. In addition, it helps to narrow the possible evidence gaps that educational practice through telehealth at work can improve the quality of life of office workers who use computers.

Thus, this study aimed to investigate whether the group that received the online health education program with individualized support had superior results to improvement of quality of life compared to those who received the telehealth program. It was hypothesized that participants in the extended care group (tutor support) would have significantly better quality of life outcomes than those participating in the referral program.

2. Methods

2.1. Study design

This study was a 2-arm parallel, cluster randomized controlled trial (RCT) conducted from May 2017 to January 2018. The participants recruited for this study were administrative workers computer user from a public university in the state of Bahia, Brazil.

The local research ethics committee approved this study (Approval Number: 1.023.328). All participants signed an informed consent form before the inclusion of the study. The CONSORT checklist was used to report this trial [27].

2.2. Participant recruitment

Eighteen departments were included and pre-stratified based on similar characteristics (nine departments for the control group and nine departments for the extended care group). The target population was healthy workers, regardless of gender, aged between 18 and 70 years.

The eligibility criteria were all office workers, each being a computer user, for a minimum period of 6 months, and who had signed the consent form. The exclusion criteria were breastfeeding and pregnant workers or workers on annual leave.

2.3. Procedure

All participants received information about the quality of life (QoL) promotion program, through the institutional website and e-mail, as well as visits to the secretariats, made to invite workers to participate in the program.

To encourage adhesion to the telehealth program, an advertising strategy was created that provided arguments to convince employees to participate. All department managers were consulted, and they supported workers' adherence to the program.

The communication instrument adopted for both groups was Moodle, which is characterized by open-source software for learning support executed in a virtual environment. All participants were able to navigate the web platform. Questions about access and navigation were answered by e-mail. All participants were monitored for video viewing, and if they did not access the material, they were asked about the reasons for their lack of interest. Participants were provided with institutional support to access the web platform during shift work.

During the six-month intervention period, a 20-day uninterrupted interval was given to each audiovisual session. An online educational program was implemented in which video content based on demands identified by a focus group study design [26]. Nine audiovisual sessions were performed and addressed the following topics: 1) musculoskeletal health (four audiovisuals - walking program, back school, muscle relaxation techniques, and work-related musculoskeletal diseases), 2) healthy diet (three audiovisuals - eating and commensality, ultra-processed food and food labeling, oils and fats), and 3) mental health (two audiovisual - meaning of work and burnout syndrome) [26]. The audiovisual can be accessed by the Qr Code (appendix - table 1).

Participants who did not access the video lesson within three days after their publication were informed through an electronic message (through the platform and e-mail) about the importance of their participation. If they did not access it within the next 72 h, a second contact via the platform and email was made to reinforce the request for access to the virtual environment and to carry out the proposed activities according to the group to which they were assigned. Participants who did not perform the activities even after two messages received an email on the 20th day with a satisfaction survey to determine the reasons for not participating. Content view was unlimited while the program was carried out.

The telehealth education program was supported by the professional team (Tutors) including physiotherapist, nutritionist and psychologist, who were responsible for encouraging and strengthening all groups. However, only the extended service group obtained online support to clarify possible doubts about the content available in video classes.

Tutors were trained and qualified with evidence-based practice and socio-interactionist theory, in order to adequately answer possible questions. The training was carried out through meetings of 2 h each, once a week, for a year. Tutors were informed about the objectives of the study and the social context of the participants. In addition, the project coordinators were always available to tutors to answer questions and

help solve problems.

2.4. Interventions

2.4.1. Telehealth with extended care (intervention group)

The participants of this group received audiovisual content, which was elaborated based on the focal methodology of this study, associated with the contributions obtained with a group of workers [26].

The participants in this group received audiovisual content and were encouraged to question all the topics presented. The audiovisual content was prepared based on the focal methodology of this study, associated with the contributions obtained with a group of workers. Participants were informed that the knowledge acquired would only be relevant if difficulties were discussed specifically and in detail by means of questions asked during the online tutorial (e-learning). Standard answers were developed for expected questions. The group of tutors discussed doubts that were not expected, and the respective answers were available only after the group reached a consensus.

The tutors actively participated in the learning process using pedagogical strategies that 1) resulted in compliments for participation in the virtual learning environment; 2) demonstrated active listening by showing interest in helping participants as well as summing up the audiovisual content by means of short texts; 3) presented new information; and 4) suggested goals that include the acquisition of new behaviors. The interactions between workers and the system began on the same day as the publication of the audiovisual material.

2.4.2. Telehealth (control group)

The participants of this group were provided with audiovisual content prepared exclusively for this study based on the result of the focus group; however, there was no tutor support for learning [26].

2.5. Outcome measures

2.5.1. Primary outcome

2.5.1.1. Quality of life. To assess the quality of life of workers was performed by WHOQOL-BREF adapted to Brazilian Portuguese which has adequate reliability and validity measurement properties [28]. The WHOQOL-BREF includes 26 questions, and the answers were formatted in a five-point Likert scale. The questionnaire covers physical, psychological, environmental, social and general quality of life aspects. The domains of these questionnaires were calculated on a scale from zero to 100 points.

2.6. Secondary outcome measure

2.6.1. Lifestyle

The lifestyle was evaluated through the International Physical Activity Questionnaire (IPAQ) to identify the level of physical activity of the participants [29]. The IPAQ was adapted by Brazilian Portuguese and has goods measurement proprieties. The IPAQ contains seven questions related to frequency and duration of walks, moderate and intense activities performed in a week, and whether they are carried out at the workplace, at home, in public transport, or during leisure time. Thus, technical-administrative workers were divided into four groups: a) very active, b) active, c) insufficiently active, and d) sedentary. The continuous measurement of IPAQ was used (in metabolic equivalents [MET: 0.0175 kilocalorie/kilogram/minutes]).

The only difference of the method described in the protocol of the clinical trial, in relation to the study was the pain intensity and musculoskeletal discomfort due to the impossibility of making statistical inferences.

The primary and secondary outcomes were performed by a blinded outcome evaluator at the baseline, in the 6-month, and 2-months after the end of the intervention (8-month).

2.7. Sample size

To reduce the negative impact that clustering studies may have on the interpretation of results, bias correction in relation to effect size and their variances, an intraclass correlation coefficient (ICC) was used to calculate the sample size [30]. Therefore, the sample size was calculated using the statistical PASS 16 program, which considers the intracluster correlation coefficient, the number of events, the expected effect. The assumed intracluster correlation was $\rho = 0.5$, a minimum of 40 participants per group, and a worst-case control rate of 50%. Under these premises, a statistical power of 87% to detect a 15% difference in the rates between the two groups with $\alpha = 0.05$ was expected, resulting in 120 participants for each intervention group. The workers allocation for the two groups of study was carried out by clusters after the analysis of workers characteristics in each department [31].

2.8. Randomization and blinding

The randomization was performed by a blinded and independent researcher using the Randomizer tool (http://www.randomizer.org). After the baseline evaluation, the 326 participants (18 clusters) were randomly allocated to the two Telehealth groups: Extended Care (intervention group) and Telehealth (control group). Participants were not informed of which study group they belonged to.

The blinding was performed by the biostatistician who coded the data and the statistical analysis. It is not possible to blind tutors in charge of guidance.

2.9. Statistical analysis

A 95% confidence interval (CI) was used to determine statistical significance. Analyses were carried out that included all randomized participants in both groups (intervention and control groups). Data were analyzed according to intention-to-treat principles. The continuous variables were expressed by mean and standard deviation values, and the categorical variables were expressed by frequency (%).

Linear mixed effects models were used to analyze longitudinal changes in quality of life (WHOQOL-BREF) and for a continuous measure of physical activity level (IPAQ) from the baseline, at six months, and at eight months. All analyses were performed using IBM SPSS statistics for Windows version 21.0.

3. Results

To obtain the results, data normality was tested by a visual inspection of the histograms, and all data were normally distributed.

3.1. Participant flow and dropout rate

A total of 18 sectors ($n = 398$) were eligible for the study. Of these, 72 individuals refused to participate. At the six-month follow-up to the end of the intervention, 14 participants refused to be reassessed due to lack of time resulting from professional commitments. The dropout rate at the six-month follow-up was 7% in the intervention group and 1% in the control group.

At the eighth month, two months after the end of the audio videos, participants were again invited to be reassessed. The dropout rate was 62% in the intervention group and 30.4% in the control group (Fig. 1).

3.2. Sociodemographic characteristics

The participants were predominantly female with a mean age of 40 years. The sociodemographic variables of the two groups at the baseline are shown in Table 1.

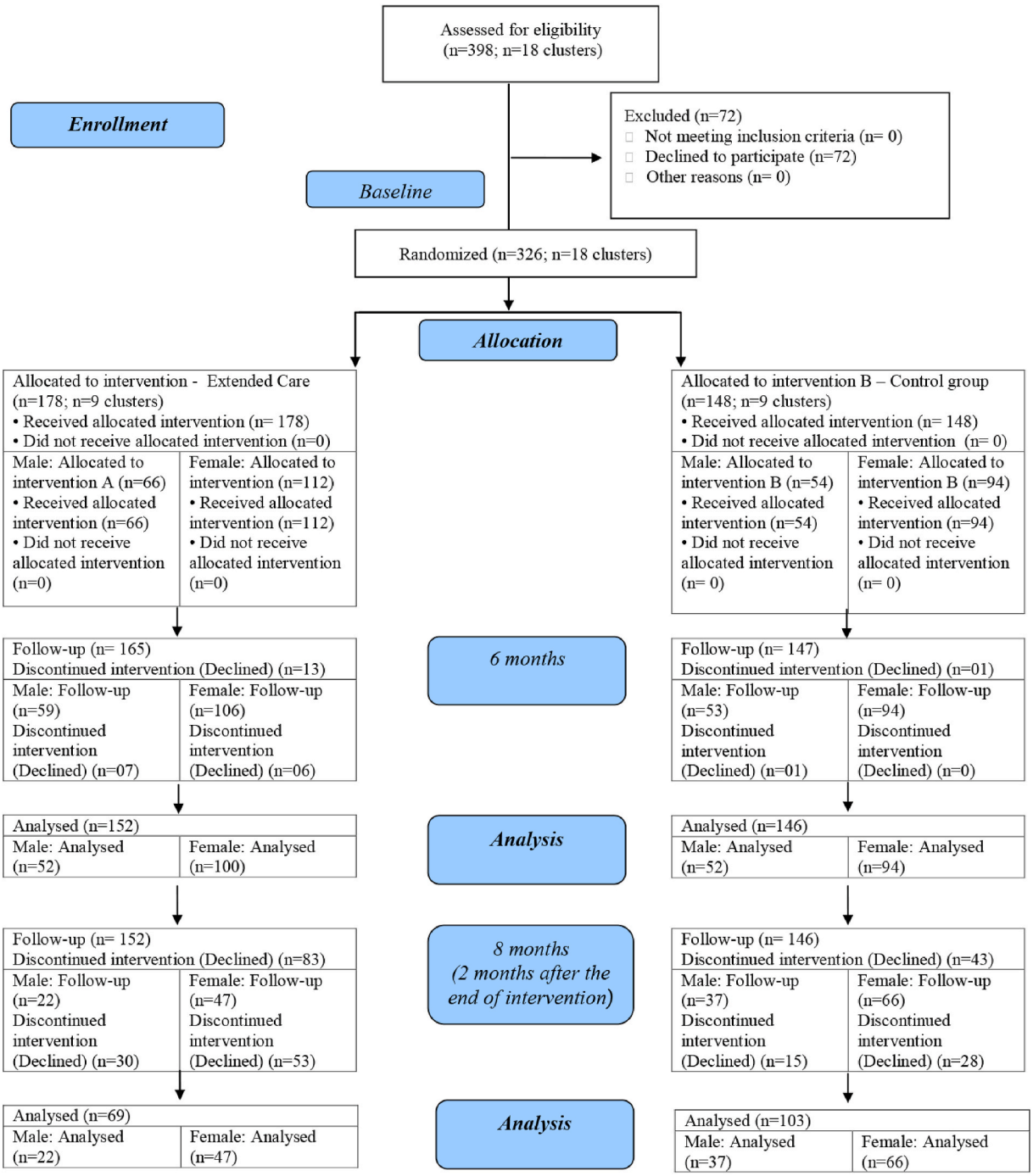

Fig. 1. Flow diagram of recruited participants.

3.3. Effect of telehealth education program on quality of life

The intervention group (extended care) was no more effective than the conventional telehealth program for the quality of life outcomes among office workers (Table 2).

For the within-group comparisons to intervention group the quality of life values were statistically significant based on the WHOQOL-BREF between the baseline and the sixth month for general health ($p < 0.05$) and for the environmental domain ($p < 0.01$). At the baseline for the eighth month, there were statistically significant for general health ($p < 0.05$) and for the physical domain ($p < 0.01$) both extended care and the control group ($p < 0.01$ (Fig. 2 - appendix 1).

3.4. Effect of the intervention on physical activity level

There was no statistically significant change in the physical activity level between the extended care group and the control group for the six-month evaluation using the IPAQ (Table 3).

3.5. Adherence telehealth education program

The audiovisual accesses for the intervention and control groups and the ratio views/participants in counseling for the intervention group are in Table 4.

Table 1
Participant baseline demographic characteristics.

Variables	Groups	
	Intervention (n = 178)	Control (n = 148)
	N (%)	N (%)
Age (years), mean (SD)	40 (9.1)	41 (8.8)
Time in job	8 (4.5)	12 (8.1)
<2 years	35 (19.7)	30 (20.3)
2–5 years	42 (23.6)	54 (36.5)
5–10 years	23 (12.9)	8 (5.4)
10–20 years	31 (17.4)	39 (26.4)
>20 years	16 (9.0)	5 (3.4)
Gender		
Male	60 (33.6)	46 (30.8)
Female	118 (66.4)	102 (69.2)
Weight (Kg), mean (SD)	70 (10.1)	70 (9.6)
Height (cm), mean (SD)	166 (6.0)	164 (6.2)
BMI(kg/m2), mean (SD)	25 (3.0)	26 (3.0)
Education		
Elementary degree	5 (2.8)	12 (8.1)
High school	45 (25.3)	53 (35.8)
University	110 (61.8)	83 (56.1)
NR	18 (10.1)	–
Race		
White	29 (16.3)	27 (18.2)
Black	38 (21.3)	41 (27.7)
Multiracial	59 (33.1)	63 (42.6)
Asian	5 (2.8)	1 (0.7)
Indegenious	–	11 (7.4)
NR		
Travel time from home to workplace		
<1 h	91 (51.1)	69 (46.6)
1–2 h	50 (28.0)	74 (50.0)
2–3 h	8 (4.5)	–
More than 3 h	–	–
NR	24 (13.5)	5 (3.4)
Means of transportation to work		
Public transport	56 (31.5)	38 (25.7)
Automobile	54 (30.3)	77 (52.0)
Motorcycle	10 (5.6)	5 (3.4)
Walking	23 (12.9)	21 (14.2)
Bicycle	4 (0.6)	2 (1.4)
NR	8 (4,5)	5 (3.4)

Intervention (Telehealth with Extended Care); Control (Telehealh); Standard Deviation (SD); NR – Not reported.

4. Conclusion

The results of the study indicate that e-Health education programs are effective in improving the office workers quality of life; however, the expanded care program is as effective as the conventional program. This study suggests that physical activity level does not increase as a result of Telehealth program in the proposed configuration. In addition, the results suggest that e-Health programs for workers should include flexibility of content and low expectations regarding compliance with deadlines for participation in activities.

5. Discussion

The objective of this study was to evaluate the effectiveness of a telehealth program in the workplace that was made available in two ways: a conventional program and a telehealth program with extended care intervention with a team of tutors. It was assumed that individual monitoring tends to be more efficient and gives more support than an autonomous search, and content presented through audiovisual media is a starting point.

The results showed, however, that there was no benefit in favor of the group that received the telehealth education program extended care by a team of tutors over the conventional program. This contradicts our hypotheses that individual monitoring tends to be more efficient and gives more support than an autonomous education. We concluded also based on results that there was low adherence to the telehealth program by both groups, considering the number of accesses and tutoring requests by intervention group (extended care). We reflect on whether the constant encouragement of participation by tutors may have bothered, more than helped to maintain or expand adherence. The literature demonstrates that a long-term (12-month) e-Health program can have a high adherence and can be effective in promoting changes in health behaviors [32]. This experience has shown that intervention time (six months) is adequate to ensure the participants adherence, having been followed in this study. Furthermore, the dropout rate at the 6-month follow-up was low, which is very positive.

In studies on dropout rates of e-Health programs for interventions using mobile technologies or computer programs related to workers' mental health, there has been a variation between 1% and 50% at various follow-up periods (five weeks to 12 months) [33]. Interventions for stress management (21 randomized controlled trials, n = 5260 participants) have shown that only 45% of participants complete proposed interventions [34].

Studies on adherence to interventions for anxiety and depression via the Internet have drawn attention to the fact that dropout and adherence to an e-Health program are distinct concepts [35]. Users can continue to carry out the prescribed program even if they have interrupted contact with the research team or clinic. From this perspective, making the program available to enrollees can be beneficial, even for participants who do not complete (dropout) the study. Studies that evaluate an intervention study in all its dimensions (reach, efficacy or effectiveness, adoption, and maintenance) can contribute to confirming this hypothesis [34–36].

The findings regarding adherence indicate that the inclusion of self-selected participants, i.e., those who voluntarily seek health promotion services and/or quality of life, is the best strategy to increase interest and participation in the activities of a health education program. In this study, recruitment was performed in interested sectors (clusters). In addition, the e-Health education program required a level of commitment that went beyond content delivery, requiring interactions between participants and tutors. Participants generally did not fit into any target group with disabling signs or symptoms, which may have been an additional factor involved in low adherence. It is possible that participants who completed the study were more interested in their health information than participants who dropped out [37].

The primary aim of the study was to evaluate perceptions of quality of life using a set of constructs ranging from how the individuals viewed their positions in life in the context of the culture and the value system regarding their goals, expectations, standards, and concerns [38]. From another perspective, quality of life involves well-being, such as health status, leisure, personal satisfaction, habits, and lifestyle [39]. Due to its social representation, occupation has a significant importance to the quality of life. Occupation is one of the most influential factors in quality of life because individuals spend the most active part of their time at work [40,41]. The program developed based on the focus group meetings allowed for including several dimensions of quality of life for the elaboration of the audiovisuals [26]. The themes directly addressed issues related to musculoskeletal health, food health, and mental health, and in addition, subliminal messages were included in the audiovisuals: the thematic walk program and the meaning of the work were recorded in green surrounded areas (natural environmental) because studies show that greater contact with nature has a significant effect on workers' stress indicators [42].

Both groups presented positive statistically significant changes from the baseline quality of life at the eighth month (unadjusted measure). The extended care group had improved health in general as well as in the physical and environmental domains but not in the psychological or social domains. The control group had a significant improvement only in the psychological domain. When the analysis was performed with the adjusted measure (linear mixed model), no difference between the

Table 2
Intervention effects on quality of life (mean and standard deviation). Results of the linear mixed-effects models. [CI = 95%].

Outcome QL	Unadjusted group mean (SD)[a]						Unadjusted within-group mean difference (baseline minus 6 month)[b]		Unadjusted within-group mean difference (baseline minus 8 month)[b]		Adjusted between-group mean difference (Intervention minus Control)[c]
	Baseline		6 month		8 month						
	Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control	
Intention-to-treat analysis											
General Health	60.3 (8.4)	60.8 (9.2)	62.6 (8.0)	63.9 (8.1)	64.0 (7.8)	62.1 (8.3)	'-2.3 (-4.4 to −0.2)	'-3.1 (-5.5 to −0.7)	−3.5 (−6.0 to −1.1)	−1.8 (-3.6 to 0.0)	−0.1 (-1.6 to 1.4)
Physical domain	55.8 (9.3)	56.6 (9.6)	57.2 (9.5)	58.4 (8.6)	61.4 (9.0)	58.6 (9.9)	'-1.4 (-3.9 to 1.0)	'-1.8 (-4.4 to 0.8)	−5.4 (-8.4 to −2.4)	−1.7 (-4.0 to 0.7)	0.4 (-1.3 to 2.0)
Psychological domain	62.3 (9.7)	61.3 (10.8)	61.2 (9.2)	64.6 (9.6)	64.7 (11.6)	63.8 (10.5)	'1-1 (-1.5 to 3.6)	'-3.3 (-6.1 to −0.4)	−2.4 (-5.5 to 0.8)	−3.2 (-5.5 to −1.0)	−0.6 (-2.4 to 1.2)
Social domain	70.9 (16.6)	70.3 (15.9)	71.0 (14.0)	71.1 (15.2)	74.5 (12.9)	69.6 (17.0)	'0.03 (-4.0 to 4.0)	'-0.9 (-5.3 to 3.5)	−3.3 (-7.3 to 0.8)	−1.3 (-4.6 to 2.0)	1.2 (-1.5 to 4.0)
Enviromental domain	52.1 (11.3)	54.9 (11.2)	61.1 (12.0)	61.5 (11.0)	55.9 (10.9)	56.5 (10.2)	'-9.1 (-12.1 to −6.0)	'-6.6 (-9.6 to −3.5)	'-3.7 (-7.7 to 0.1)	−1.0 (-2.9 to 0.9)	−1.2 (-3.2 to 0.9)
Per-protocol analysis											
General Health	60.8 (7.9)	60.1 (9.4)	62.1 (6.8)	63.2 (8.4)	64.3 (7.9)	61.9 (8.2)	−1.4 (-3.5 to 0.7)	−3.1 (-4.6 to-1.5)	−2.2 (-4.2 to-0.03)	1.3 (−0.3 to 2.9)	−3.5 (−5.6 to −1.4)
Physical domain	56.3 (9.7)	56.7 (10.4)	56.9 (7.6)	59.1 (9.6)	61.4 (9.1)	58.6 (10.0)	−0.6 (-3.2 to 2.0)	−2.4 (-4.4 to-0.4)	−4.5 (-7.1 to-1.9)	0.5 (-1.5 to 2.5)	−5.1 (-7.7 to 2.5)
Psychological domain	62.8 (8.9)	60.5 (11.4)	60.0 (9.5)	63.3 (9.8)	65.2 (11.4)	63.7 (10.4)	−2.4 (-5.3 to 0.5)	−2.8 (-4.7 to −0.8)	−5.2 (-8.1 to-2.3)	−0.4 (-2.4 to 1.5)	−2.4 (-5.3 to 0.5)
Social domain	71.4 (14.0)	67.9 (15.4)	71.8 (13.0)	69.9 (14.8)	75.0 (12.9)	69.2 (16.9)	−3.6 (-7.5 to 0.4)	−2.0 (-4.9 to 9)	−3.2 (-7.1 to 0.7)	0.8 (-2.1 to 3.6)	−3.6 (-7.5 to 0.4)
Enviromental domain	52.5 (12.7)	55.4 (11.2)	59.8 (11.29	60.7 (11.3)	56.1 (11.1)	56.3 (10.0)	−7.2 (-10.5 to −3.9)	−5.2 (-7.1 to-3.3)	3.7 (0.3–7.0)	4.3 (2.5–6.2)	−3.5 (-6.9 to −3.9)

The participant sample (n) was used in the per-protocol analysis.
[a] Intervention: n = 178; Control n = 148.
[b] t de Student Test, Intervention: n = 69, Control n = 103.
[c] Linear mixed-effects model.

baseline groups at the eighth month was observed; however, for all domains (except the social domain for the control group), both groups showed an increase in the mean quality of life, suggesting a possible type II error.

Monitoring of physical activity practice can be a stimulant to increase the participants' physical activity levels, serving as a reminder and influenced by memory bias [43]. Thus, to increase the level of activity, focus on this intervention should be the key point of health promotion programs for office workers. This is because 6–10% of the major noncommunicable diseases can be attributed to physical inactivity [44]. It is for this reason that the first audiovisual content presented in our study, guiding you how to start a walking program, including clothing and hydration care. However, there were no statistically significant changes in the participants' level of activity during the study. The sending of telephone messages or notifications by e-mail stimulating the increased of physical activity level in the short term (1 month). This can be explained by the fact that these are multicomponent strategies (including a use of physical activity monitor), clearly effective in the short term to reduce the time spent on seated work; however, it is not clear whether these gains would be sustained over the long term [33,37,45].

By presenting the Telehealth program in a journalistic format and with an extended care strategy functioned in two ways: the stimulus for self-care and the active (virtual) search of participants who did not interact with the tutor's team. In addition, most interventions are directed toward one of the dimensions of quality of life, while this program was multimodal in nature, which meets health promotion guidelines in the workplace. [46–48] Although enhanced care was evaluated whether maximizing care for participants was the best strategy is unclear. It is possible that simple actions, such as sending SMS notifications and reducing vigilance in participation, may be more effective in promoting health effects.

Therefore, it is important that future studies on e-Health quality of life interventions at work adopt a less rigid structure in which participants have a more flexible participation proposal and the educational contents meet their individual needs. This configuration best suits the reality of heterogeneous groups (regarding socio-demographic characteristics, expectations, and individual needs), as is the case for office workers.

6. Strengths and limitations of the study

The study supports evidence-based practices that apply counseling and that provide answers to specific demands of workers. Appropriate studies for questions raised, preferably with a high level of evidence, were reviewed [14]. The study outline meets the clinical trials quality criteria, including randomization, blinding of participants and evaluators, and conducting analyses based on intention-to-treat. The study

Table 3
Comparison of the level of physical activity between groups (secondary outcome). Results of the linear mixed-effects models. [CI = 95%].

Outcome QL	Unadjusted group mean (SD)[a]						Unadjusted within-group mean difference (baseline minus 6 month)[b]		Unadjusted within-group mean difference (baseline minus 8 month)[c]	
	Baseline		6 month		8 month					
	Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control	Intervention	Control
Vigorous-Work	2708.5 (2820.3)	3369.5 (4023.5)	2604.2 (2438.7)	2883.3 −2631	3346.7 (2718.6)	2901.4 −2856	610.7 (-861 to 2082.5)	486.2 (-1074.5 to 2046.9)	−638.2 (-2172.6 to 896.3)	468.1 (-1149.2 to 2085.3)
Vigorous-house	1681 (1802.4)	1918.2 (2612.5)	1983.2 (2456.4)	1862.1 (2519.7)	2183.1 (2309.6)	1809.6 (2479.4)	−442.1 (-1203.7 to 319.5)	56.1 (-850.4 to 962.6)	−502.1 (-1376.4 to 372.2)	108.6 (-836.3 to 1053.5)
Vigorous-leisure	2052.7 (1724.1)	1968.7 (1473.8)	1780.5 (1104.2)	1947.5 (1126.9)	2389.2 (1420.5)	2237.7 (1423.4)	367.7 (-282.5 to 1017.8)	21.2 (-744.6 to 787)	−336.5 (-1068 to 394.9)	−269 (-1015.3 to 477.2)
Moderate-Work	1623.6 (2189.3)	2320 (2412.5)	1937.5 (1479.6)	2017.6 (1592.1)	3403.8 (3140.8)	2490.3 (2745.9)	−262.7 (-1078.9 to 553.6)	302.4 (-868.4 to 1473.3)	−1780,2 (-3096.5 to −463.8)	−170.3 (-1438.9 to 1098.3)
Moderate-house	1762.7 (1819.8)	1909.1 (2498.7)	1888.7 (2070.1)	1889.6 (2385.5)	1792.8 (1415.5)	1884.9 (2371.2)	−125.1 (-678.6 to 428.4)	19.5 (-810.3 to 849.3)	−1517,5 (-2873.2 to −161.8)	24.2 (-832.5 to 880.9)
Moderate-leisure	2052.7 (1724.1)	1968.7 (1473.8)	1780.5 (1104.2)	1947.5 (1126.9)	2389.2 (1420.5)	2237.7 (1423.4)	367.7 (-282.5 to 1017.8)	21.2 (-744.6 to 787)	−30.1 (-634.3 to 574.1)	−269 (-1015.3 to 477.2)
Walking-Work	738.1 (1015.1)	1890.9 (2957.5)	1001.7 (967.6)	1036.5 (1299.4)	1131.4 (1246.8)	1624.3 (1853.1)	−230.4 (-923.2 to 462.5)	854.4 (-877.7 to 2586.5)	−336.5 (-1068 to 394.9)	266.6 (-1914.5 to 2447.6)
Walking-house	949.4 (1442.2)	1034.1 (1315.3)	999.6 (1277.2)	1027 (1183.1)	981.1 (1491.8)	1042.9 (1186.8)	−21 (-532 to 490)	7.1 (-449 to 463.2)	−393.3 (-1348.9 to 562.3)	−8.8 (-482.9 to 465.3)
Walking-leisure	724.1 (1077.0)	656.8 (708.7)	852.6 (930.7)	784.9 (1029.7)	699.9 (721.0)	607.6 (433.0)	−193.7 (-592.6 to 205.2)	−128.1 (-469 to 212.9)	−31.8 (-596.4 to 532.8)	49.2 (-291.8 to 390.2)

[a] Intervention: n = 178; Control n = 148.
[b] t de Student Test, Intervention: n = 69, Control n = 103.
[c] Linear mixed-effects model.

Table 4
Descriptive analysis of audiovisual access for the intervention and control groups and participants in counseling in the extended care group (intervention group).

Audiovisual Program	Groups				Intervention (n = 178) Extended care		
	Intervention (n = 178)	Control (n = 148)	Intervention (n = 178)	Control (n = 148)			
	Access to audiovisuals (views)		Ratio (views/participants).		Participants (n)	Counseling (n)	Ratio (views/participants)
Walking program	130	125	0.73	0.84	33	45	0.19
Back School	152	109	0.85	0.74	43	73	0.24
Muscle relaxation techniques	103	112	0.58	0.76	20	45	0.11
Work-Related Musculoskeletal Diseases	129	112	0.72	0.78	17	19	0.19
Eating and commensality	107	118	0.60	0.80	12	18	0.07
Ultra-processed food and food labeling	95	101	0.53	0.68	19	23	0.11
Oil and fat	92	83	0.52	0.56	15	22	0.08
Meaning of work	94	90	0.53	0.61	9	11	0.05
Burnout Syndrome	107	93	0.60	0.60	12	15	0.07

results can promote long-term effects on quality of life. In addition, the focus group study contributed to identify the demands of the workers [26]. It is possible to offer the educational program using other technological platforms. This makes it easy to see audiovisuals at any time during the workday.

One of the study limitations involves the randomization by clusters, which was minimized by the simple sample. However, the individual randomization of participants who work in the same space could lead to dissatisfaction among workers who have not been allocated to an Internet support group. The blinding of participants as intended, by cluster randomization may not have been partially achieved; all were already in one place, even if they were in different buildings.

Ethics approval and consent to participate

The local research ethics committee approved this study (Approval Number: 1.023.328). All participants signed a consent form before the inception of the study.

Consent for publication

All participants have given consent for publication.

Availability of data and material

The audiovisual are available Qr Code link. The data will always be available when requested.

Competing interests

The authors declare no competing interests.

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Author's contributions

RRBTM, LDC, and RSP were responsible for the study's conception. All authors contributed to the article writing and proofreading and to approving the final text before submission. All authors read and approved the final manuscript.

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Appendix

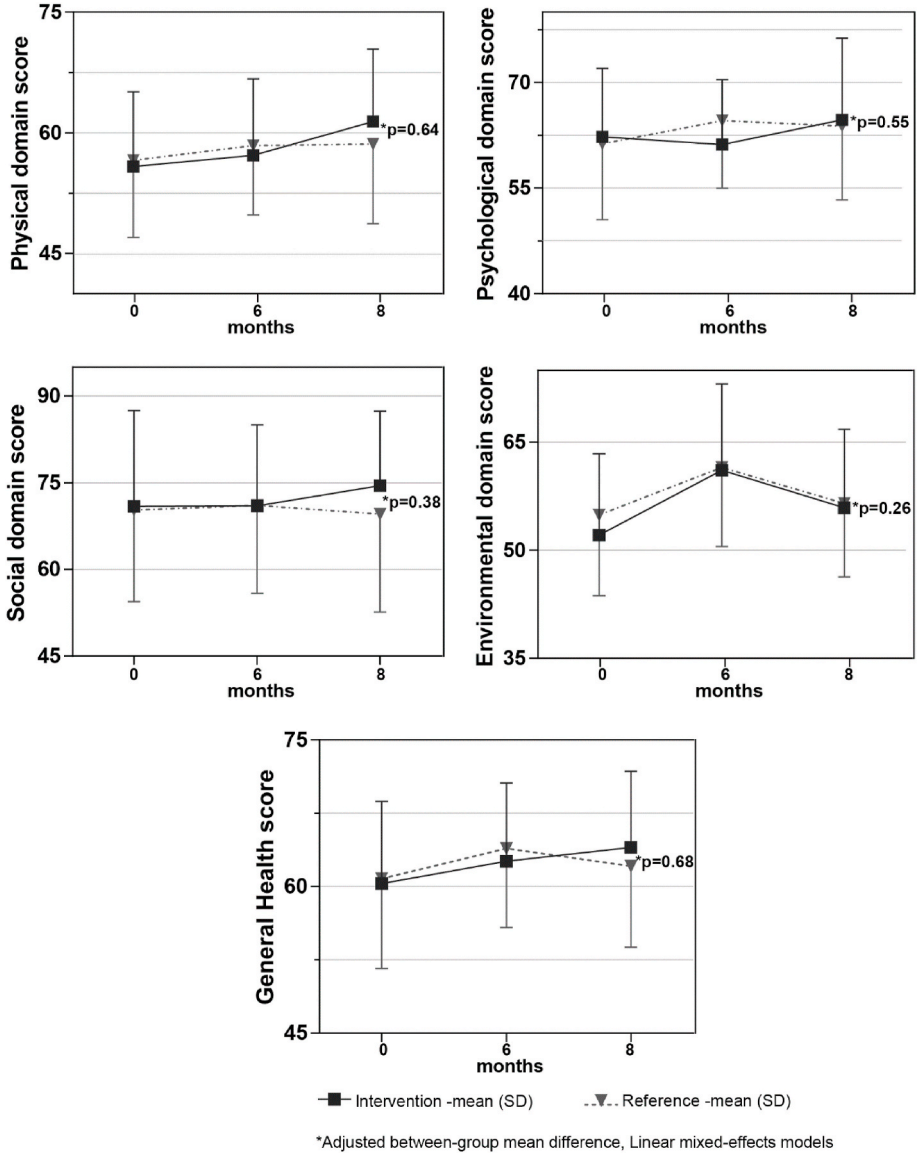

Fig. 2. Mean differences in the domains of quality of life between the intervention and the control groups.

Table 1
Qr Code and audiovisual link

Walking program  https://www.youtube.com/watch?v=fXsTSwIAkUQ	Back School  https://www.youtube.com/watch?v=g3MAb2yZOqY	Muscle relaxation techniques  https://www.youtube.com/watch?v=NmSgLQMdK1Q
Work-Related Musculoskeletal Diseases  https://www.youtube.com/watch?v=jDFQqzzpnl4	Eating and commensality  https://www.youtube.com/watch?v=9sH0MofrNkQ	Ultra-processed food and food labeling  https://www.youtube.com/watch?v=-Qdn8r89h6A
Oil and fat  https://www.youtube.com/watch?v=E-M1sPI2swU	Meaning of work  https://www.youtube.com/watch?v=oOCk6hNIQzM	Burnout Syndrome  https://www.youtube.com/watch?v=DoVKu-EB3aA

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