





Evaluation of an intervention based on lifestyle modification and coping with chronic pain and stress in reducing pain in hotel housekeepers: a cluster-randomised clinical trial in primary health care

Evaluación de una intervención basada en la modificación del estilo de vida y el afrontamiento del dolor crónico y el estrés para reducir el dolor en camareras de piso: un ensayo clínico aleatorizado por conglomerados en atención primaria de salud

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Abstract

Objective: to assess the effectiveness of a complex multidimensional intervention based on the promotion of healthy lifestyles and the empowerment of hotel housekeepers (HHs) for the management of chronic pain and stress in order to reduce pain and increase physical activity (PA).

Materials and method: multicentre, two-arm, parallel, hybrid type I effectiveness-implementation cluster-randomised clinical trial, carried out in 35 primary care health centres: 17 randomised into the intervention group (IG) and 18 into the control group (CG). Participants: HHs \geq 18 years old, with health coverage in the Balearic Public Health System, who worked as HHs in 2019. Multilevel intervention: individual, group, and community, carried out by nursing, physiotherapy, and psychology staff. The CG received basic health advice from the nursing regarding healthy lifestyles. A six-month follow-up was performed, along with an Intention-to-treat analysis.

Results: 1,223 HHs were included (IG=595, CG=628). After a six-month follow-up, no significant differences were found between the two groups for the chronic pain (60.8%IG-vs-61.9%CG) [OR 1.1 (0.8-1.4)] or PA levels [OR 1.2 (0.9-1.5)].

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Conclusions: an intervention based on the promotion of healthy lifestyles and empowerment of HHs for the management of chronic pain and stress does not improve pain in HHs in comparison to basic health advice.

Keywords: Primary health care. Chronic pain. Lifestyles. Physical activity. Hotel housekeepers. Randomised clinical trial.

Resumen

Objetivo: evaluar la efectividad de una intervención compleja y multidimensional basada en la promoción de estilos de vida saludables y el empoderamiento de las camareras de hotel (CH) para el manejo del dolor crónico y el estrés, con el fin de reducir el dolor y aumentar la actividad física (AF).

Materiales y método: ensayo clínico aleatorizado por conglomerados, multicéntrico, de dos grupos paralelos, híbrido tipo I de efectividad e implementación, llevado a cabo en 35 centros de atención primaria: 17 aleatorizados al grupo de intervención (GI) y 18 al grupo control (GC).

Participantes: CH ≥ 18 años, con cobertura sanitaria en el Sistema de Salud Pública de Baleares, que trabajaban como camareras de piso en 2019. Intervención multinivel: individual, grupal y comunitaria, realizada por personal de enfermería, fisioterapia y psicología. El GC recibió asesoramiento básico de salud por parte del personal de enfermería sobre estilos de vida saludables. Se realizó un seguimiento de seis meses, junto con un análisis por intención de tratar.

Resultados: se incluyeron 1.223 CH (GI = 595, GC = 628). Tras el seguimiento de seis meses, no se encontraron diferencias significativas entre los dos grupos en cuanto al dolor crónico (60,8% GI vs. 61,9% GC) [OR 1,1 (0,8–1,4)] ni en los niveles de AF [OR 1,2 (0,9–1,5)].

Conclusiones: una intervención basada en la promoción de estilos de vida saludables y el empoderamiento de las CH para el manejo del dolor crónico y el estrés, no mejora el dolor en comparación con el asesoramiento básico de salud.

Palabras clave: Atención primaria de salud. Dolor crónico. Estilos de vida. Actividad física. Camareras de piso. Ensayo clínico aleatorizado.

Introduction

The tourism sector in the Balearic Islands (Spain) represented, before the COVID-19 pandemic, 41.3% of the Gross Domestic Product and 41.6% of employment in the region¹. In the hotel sector, housekeepers (HHs) stand out as a professional group with a high risk of developing musculoskeletal disorders (MSD)²⁻⁵. MSD are defined as alterations suffered by body structures that are fundamentally caused or aggravated by work and the effects of the setting in which this takes place⁶. The symptom most described among HHs related to MSD is pain, which is most prevalent in the lumbar and cervical regions and upper limbs^{5,7-10}.

Physical exercise is the best tool for the prevention and treatment of both acute and chronic pain¹¹. In fact, in the presence of pain, maintaining physical activity (PA) is considered first line treatment¹¹. Despite the numerous proven benefits of PA, there exists a great variability of response depending on the person; therefore, it is necessary to insist on its integration in each individual's way of life. Beliefs, readiness to change, motivation, and self-efficacy all play a relevant role in pain coping strategies¹². Among the beliefs of people in pain, the fear of carrying out PA or their occupational tasks have shown a stronger association

with disability and loss of productivity than the actual characteristics of the pain or other biomedical variables¹². Some strategies to increase motivation for doing PA that have been associated with the greatest changes in intention and in the stage of change are goal-setting, action planning, self-monitoring, and problem-solving¹³.

Behavioral change interventions have been proven to be effective in patients with chronic pain¹⁴. Further, interventions with multiple behavioral change components have been associated with greater adherence to PA in patients with chronic pain¹⁵. On the whole, most of the interventions carried out in HHs have addressed issues such as the use of tools for ergonomics and occupational performance¹⁶⁻²¹ and the impact of aerobic exercise on productivity and perceived exertion²¹. However, there are no randomized clinical trials (RCTs) aimed at reducing pain.

Given that the existing literature warned of health problems in HHs – an essential group in the most important economic sector in the Balearic Islands – the need for carrying out an intervention to improve their health-related quality of life was identified. The aim of this study was to assess the effectiveness of a complex, multidimensional intervention based on the promotion of healthy lifestyles and empowerment of

HHs for the management of chronic pain and stress – all applied in the primary health care setting – in reducing pain and increasing PA.

Materials and method

Study design

Multicenter, controlled, two-arm, parallel, hybrid type I effectiveness-implementation cluster-randomized clinical trial of a lifestyle modification intervention.

The protocol was registered in Clinical Trials, with registration number ISRCTN14664526. The analysis was conducted in line with the guidelines of the CONSORT Checklist²².

The project was structured following the phases proposed by the British Medical Council (BMC) with regard to trials for complex interventions²³, in order to promote behavioral changes, improve feasibility, and facilitate their transfer into practice once their effectiveness had been proven. This study corresponds to phase three; that is, its aim was to assess the intervention designed in the previous phases through a randomized clinical trial.

It was carried out in 35 primary care healthcentres in the Balearic Islands (Mallorca, Menorca, Ibiza, and Formentera). Previously, a pilot trial of the intervention had been conducted during the months of October and November 2019 with 30 HHs.

Participants

Inclusion criteria were: i) Being older than 18 years and having health coverage in the Balearic Public Health System, ii) understanding Spanish or Catalan, and iii) having worked as a HHs during the previous season (2019) for at least a fortnight.

People were excluded for the following reasons: i) Being pregnant, ii) inability to work, iii) participating in another clinical trial on lifestyle modification, iv) suffering from a serious psychiatric illness, or v) presenting any positive response in the physical activity fitness questionnaire proposed by The American College of Sports Medicine²⁴.

Recruitment was carried out during the months of December 2019 and January 2020. All possible participants were contacted by telephone to offer their inclusion in the study.

Description of the intervention

The theoretical framework for the intervention was based on the I-Change model²⁵. The intervention was carried out by health professionals (nurses, physiotherapists, and psychologists), all of whom

had experience in the field of primary care and were at that time working in a health center; apart from the psychology staff, who were outsourced due to staff shortages.

Figure 1 shows the diagram of the intervention carried out. Participants who were assigned to the intervention group (IG) received seven sessions: two individual and five group ones. The two individual sessions consisted of a motivational interview by the nursing and physiotherapy staff in which the study variables were collected, and an intervention was carried out in the form of raising awareness of different aspects, such as healthy eating and PA. In order to identify the intervention to be carried out during the individual session, the professionals used Prochaska and DiClemente's transtheoretical model of change²⁶. Additionally, in the two individual sessions, a community intervention was conducted through the prescription of health assets close to the participant.

The nursing sessions were aimed at: i) Acquiring new knowledge regarding smoking, the Mediterranean diet, and physical activity; ii) recognizing the risks associated with unhealthy behaviors; iii) identifying obstacles that impede carrying out changes in daily habits; and iv) motivating a change in attitude concerning healthy behaviors. The objectives of the physiotherapy sessions were to: i) Assess attitude, intention to change, planning, and level of physical activity; ii) evaluate the type, location, and seriousness of their musculoskeletal pain; iii) raise participants' awareness, create motivation, and intention to change; and iv) to plan change strategies. The individual sessions (1 and 2) were 75 minutes long. The group sessions lasted two hours.

The intervention was carried out between the months of January and March 2020.

The control group (CG) was given basic health advice regarding healthy lifestyles from the nursing staff, who were the same ones carrying out the intervention.

After completing the intervention, participants were contacted to arrange an individual interview within two weeks (visit 8). Due to the lockdown beginning on the 14th March, this visit was made by telephone. Additionally, in order to replace the content of the 8th visit and reinforce the topics covered in the previous visits, coordinating nurse (C. Z.-M.) and physiotherapist (C. S.-R.) elaborated a video that was sent to the participants. Six months after the intervention, the last visit was arranged to perform the follow-up (visit 9), also by telephone.

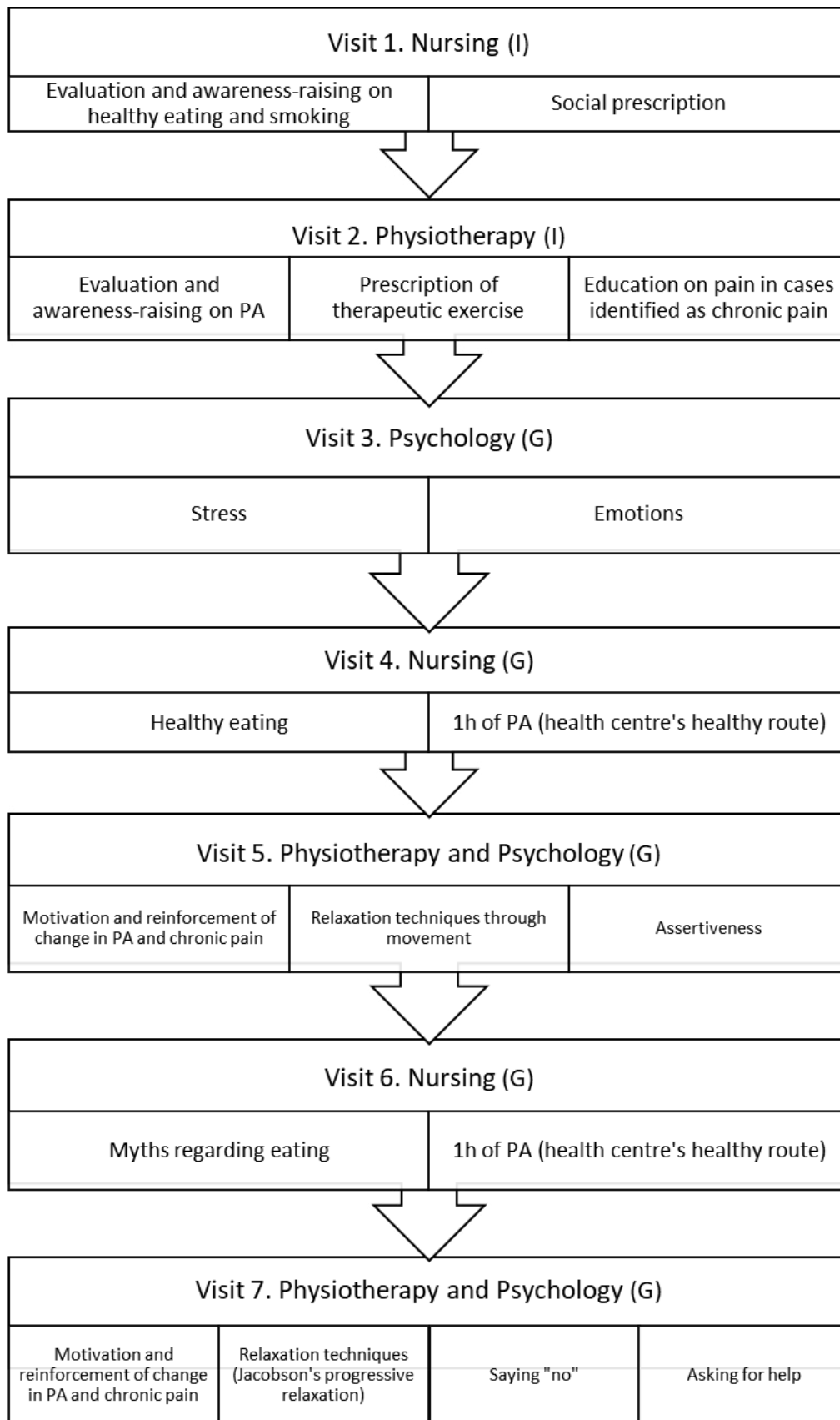


Figure 1. Intervention carried.

Study variables

All variables were collected through an individual interview on visits 1, 2, 8, and 9. The main outcome variable was health-related quality of life (HRQL), initially and after six months, measured using the SF-36 questionnaire, validated for the Spanish population^{27,28}.

Secondary variables

The following secondary variables were also collected through an individual interview:

- Variables related to chronic pain: First, participants were asked whether they suffered from chronic pain –defined in ICD-11 as persistent pain of more than three months' duration²⁹– with two response options (YES/NO). If the answer to the question was yes, the average intensity of chronic pain was recorded overall and for each anatomical location described, measured using the visual analog pain scale (VAS). This scale is made up of a horizontal line in centimetres, which numerically graduates pain intensity with values ranging from 0 (no pain) to 10cm (worst pain imaginable)³⁰. Improvement in this variable was defined by a reduction of at least 1.37cm³⁰. Additionally, subjective improvement of overall pain was recorded using the Patient Global Impressions of Improvement scale (PGI-I)^{31,32}. With regard to pain in the previous seven days, if they answered yes to the question, they were asked to state the maximum and minimum pain intensity, measured by the VAS scale.
- Variables related to physical activity: The International Physical Activity Questionnaire (IPAQ), translated and validated for the Spanish population, was used in its short, 7-item version³³. Determinants of physical activity such as attitude towards change, intention to change, and planning were also recorded. Attitude towards change was measured through the following statement: "I find it healthy to do physical activity" with two response options (YES/NO)³⁴. Intention to change was measured through two questions with two response options (YES/NO) (34): "I am planning on doing 30 minutes' physical activity, 5 days a week in the next 30 days". In terms of planning, study participants were to respond (YES/NO) to the statement: "I have already planned how and when I'm going to do physical activity".
- Sociodemographic variables: Age, nationality, and level of studies.
- Labour variables: Years worked as HHs, type of contract, type of establishment, number of rooms done per day, and number of beds per day.

Statistical analysis

The effectiveness of the intervention was analyzed by intention-to-treat using the generalized estimating equations model, adjusted for the baseline values of the groups. Beta coefficients and cluster-adjusted odd ratios (OR) are presented after crude analysis. Level of significance was set at 5% bilaterally. Losses were analyzed by multiple imputation. Missing data were handled using multiple imputation by chained equations (MICE), generating ten imputed datasets that were combined using Rubin's rules. The imputation model included baseline values, treatment allocation and cluster identifier.

Subgroup analysis was performed for the outcome 'chronic pain'; it was analyzed by age, years working as HHs, and workload the previous season.

Sample size was estimated based on the main effectiveness variable, HRQL. Considering an alpha risk of 5%, a beta risk of 20%, a SD of 18.4 for Spanish women aged 35–44 years, and an intraclass correlation coefficient (ICC) of 0.015 (calculated on the basis of the data obtained in the descriptive study carried out previously), it would be necessary to include at least 17 health centers per arm, with an approximate cluster size of 14 HHs in order to detect a minimum clinically and socially relevant difference of five points in the general health scale score^{35,36} between the IG and CG. Cluster adjustment was performed using the formula $1+(n-1) \times \rho$, where n is the mean cluster size and ρ the intra cluster correlation coefficient. Assuming a loss rate of 15%, the necessary sample was 594 HHs (297 per group).

Randomization was performed at the cluster level: health centers were randomized, such that the recruited HHs already had an assigned group at the time of recruitment. Randomization was carried out using STATA software (version 15) from the research unit of Primary Health Care in Mallorca.

Lastly, the person who performed the statistical analysis was blind to the treatment received by participants throughout the study. Blinding of both participants and clinicians was not possible due to the characteristics of the intervention.

Resultados

The RCT was carried out in 35 health centers: 17 in the IG and 18 in the CG. Finally, a total of 1,223 participants were included: 595 in the IG and 628 in the CG (**Figure 2**.)

Basal characteristics were similar between both groups (**Table 1**). Mainly, HHs had Spanish nationality

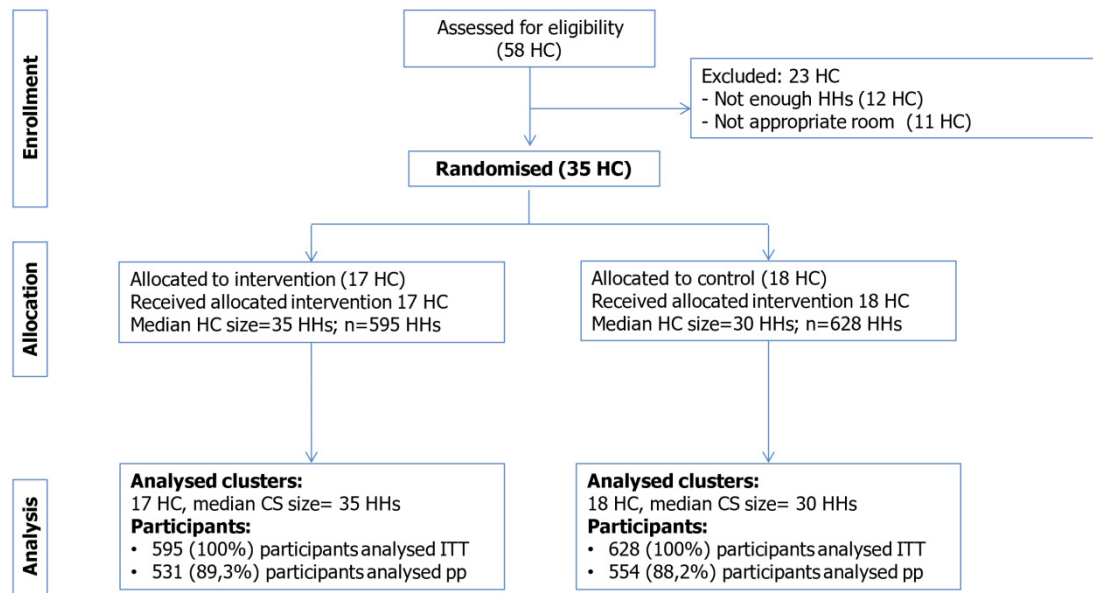


Figure 2. Flow diagram.

Notes: TT, intention to treat analysis. PP, per protocol.

Table 1. Basal characteristics in both groups.

	IG n (%)	CG n (%)
Allocated group (n=1,223)	595 (48.7%)	628 (51.3%)
Age: Mean ± SD (n=1,109)	47.2±8.7 (n=517)	46.4 ± 9.5 (n=592)
Nationality (n=1,217)	Spanish	325 (54.9%)
	Dual nationality	125 (21.1%)
	Others	142 (24.0%)
Type of establishment (n=1,219)	Hotel	380 (64.2%)
	Apartments (hotel-apartment, holiday flat...)	172 (29%)
	Others (agro tourism, hostel...)	39 (6.8%)
Category of establishment (n=1,116)	5 stars	72 (13.4%)
	4 stars	305 (56.7%)
	3 stars	117 (21.7%)
	2 stars	17 (3.2%)
	1 star	2 (0.4%)
	No category	25 (4.6%)
Rooms/day: mean ± SD (n=1,217)	17.4 ± 6.0	18.1 ± 6.8
Beds/day: mean ± SD (n=1,216)	43.9 ± 20.3	42.6 ± 19.4

Notes: IG, intervention group. CG, control group. SD, standard deviation.

and worked in a hotel. The most common establishment category was four-stars, and the mean number of beds made per day was greater than 42 in both groups.

The adherence to the different individual visits was as following: Visit 1, 100%; visit 2, 96.6%; visit 8, 69.4%; and visit 9, 88.7%. Group visits adherence (only for participants in the IG) was as follows: Visit 3, 53.7%; visit 4, 46.4%; visit 5, 39.9%; visit 6, 29.7%.

Table 2 shows the results obtained regarding the chronic pain referred by HHs. No significant changes were found in any of the variables related to chronic pain. After the six-month follow-up, both the IG and CG underwent a reduction in the proportion of people with chronic pain, but no significant difference was observed between both groups [OR 1.1 (95% CI 0.8-1.4)].

Table 2. Results of chronic pain overall and by location.

Variable	Group IG (n=595) CG (n=628)	Baseline	6 months	OR/B (95% CI)	p value
Chronic pain	IG	399 (72.3%)	323/531 (60.8%)	1.1 (0.8-1.4)	0.50
	CG	467 (74.4%)	343/554 (61.9%)		
Intensity of chronic pain	IG	56.9 ± 19.1	5.9 ± 3.8	-0.2 (-2.9-2.5)	0.78
	CG	62.9 ± 20.5	6.6 ± 4.3		
Neck pain	IG	236/552 (42.8%)	153/531 (28.8%)	1.1 (0.8-1.6)	0.65
	CG	287/628 (45.7%)	175/554 (31.6%)		
Intensity of pain	IG	60.2 ± 20.7	63.2 ± 19.7	0.5 (-3.3-4.4)	0.78
	CG	64.1 ± 20.5	65.4 ± 19.9		
Back pain	IG	250/552 (45.3%)	170/531 (32.0%)	1.1 (0.7-1.6)	0.79
	CG	305/628 (48.6%)	194/554 (35.0%)		
Intensity of pain	IG	58.9 ± 19.9	64.1 ± 20.2	1.2 (-2.7-5.1)	0.55
	CG	67.4 ± 21.4	66.3 ± 19.1		
Shoulder pain	IG	212/552 (38.4%)	131/531 (24.7%)	1.3 (1-1.7)	0.1
	CG	246/628 (39.2%)	162/554 (29.2%)		
Intensity of pain	IG	58.5 ± 22.5	62.8 ± 21.1	-2.5 (-6.6-1.5)	0.21
	CG	64.7 ± 20.9	65.5 ± 18.8		
Hand/wrist pain	IG	177/552 (32.1%)	107/531 (20.2%)	1.1 (0.8-1.5)	0.45
	CG	228/628 (36.3%)	132/554 (23.8%)		
Intensity of pain	IG	59.4 ± 21.7	60.2 ± 23.6	-1.2 (-8.9-6.5)	0.75
	CG	66.0 ± 22.2	63.2 ± 22.1		
Knee pain	IG	160/552 (29.0%)	101/531 (19.0%)	1.1 (0.8-1.5)	0.43
	CG	184/628 (29.3%)	126/554 (22.7%)		
Intensity of pain	IG	56.7 ± 24.0	63.2 ± 22.4	1.4 (-4.1-6.9)	0.62
	CG	61.4 ± 22.4	64.2 ± 20.2		
Pain in other locations	IG	137/552 (24.8%)	97/531 (18.3%)	1.3 (1-1.8)	0.08
	CG	176/628 (28.0%)	133/554 (24.0%)		
Intensity of pain	IG	62.1 ± 21.2	72.7 ± 20.5	1.4 (-4.1-6.9)	0.62
	CG	68.4 ± 23.1	71.3 ± 20.2		
Pain in the last 7 days	IG	415/551 (75.2%)	294/518 (56.8%)	1.1 (0.8-1.4)	0.65
	CG	417/624 (66.8%)	295/551 (53.5%)		

Notes: Baseline, values prior to the intervention (recorded during visits 1 and 2); 6 months, values 6 months after completing the intervention (recorded during visit 9). All analyses were performed by intention to treat. For categorical variables, the Odds Ratio (OR) is shown, whereas for continuous variables, Beta (B). IG: intervention group. CG: control group.

Table 3. Results regarding PA and its change determinants.

Variable	IG (n=595) CG (n=628)	Baseline	6 months	OR (95% CI)	p value
PA (IPAQ)				1.2 (0.9-1.5)	0.22
Walking	IG	157/555 (28.3%)	202/546 (37%)		
	CG	198/626 (31.6%)	201/561 (35.8%)		
Moderate	IG	229/555 (41.3%)	260/546 (47.6%)		
	CG	293/626 (46.8%)	270/561 (48.1%)		
Vigorous	IG	169/555 (30.5%)	84/546 (15.4%)		
	CG	135/626 (21.6%)	90/561 (16%)		
PA Determinants					
AttitudetowardsPA	IG	552/550 (99.6%)	528/529 (99.8%)	N/A	
	CG	624/625 (99.8%)	554/554 (100%)		
30-day PA Intention	IG	430/551 (78%)	392/525 (74.7%)	1.1 (0.8-1.5)	0.03
	CG	447/614 (72.8%)	438/554 (79.1%)		
6-month PA Intention	IG	333/551 (60.4%)	418/525 (79.6%)	1.1 (0.9-1.5)	0.56
	CG	441/610 (72.3%)	456/554 (82.3%)		
PA Planning	IG	359/552 (65%)	370/526 (70.3%)	1.1 (0.9-1.5)	0.36
	CG	420/615 (68.3%)	409/553 (74.0%)		

Notes: Baseline, Values prior to the intervention (recorded during visits 1 and 2); 6 months, values 6 months after completing the intervention (recorded during visit 9). All analyses were performed by intention-to-treat. IG: intervention group. CG: control group.

No significant differences in the prevalence of chronic pain were found at the 6-month follow-up among subgroups based on age, years working as HHs, or workload.

Table 3 shows the results regarding PA. Most of the HHs who participated in the study reported engaging in moderate PA. No significant changes were observed between both groups six months after the intervention in relation to PA measured through the IPAQ questionnaire [OR 1.2 (0.9-1.5)]. Additionally, there were no significant changes in the variables related to the model of change in PA.

Discussion

This study shows the results regarding pain following an intervention based on the modification of lifestyles, such as PA, healthy eating, and smoking. To address the determinants of change, an intervention was carried out through education in the neuroscience of pain, prescription of therapeutic exercise, teaching of relaxation techniques, and stress management in a population of HHs. The results reveal that there were no statistically significant differences for the main variable in the HRQL study. Neither were there any positive results for the variables related to pain or PA.

Our study did not reveal any positive results as regards the increase in PA in HHs. However, prior

research point to the potential of PA in mitigating occupational effects in cleaning workers. Studies carried out by Korshøj et al. in 116 cleaners found improvements in several clinical variables, such as cardiorespiratory capacity and aerobic workload^{37,38}, as well as an improvement in different biomarkers related to cardiovascular risk in blood³⁹. Further, HHs have been observed to present high blood pressure^{40,41} and a greater risk of suffering cardiovascular problems⁴², which highlights the importance of doing PA. Although HHs present high levels of occupational PA, a recent review found that this does not confer cardiovascular health benefits⁴³, in contrast to leisure-time PA, the effects of which have been widely reported.

On the other hand, performing PA at the workplace has been shown to be an effective alternative to increase levels of PA, reduce the risk of musculoskeletal disorders⁴⁴, and improve general health in other groups⁴⁵. These benefits have also been reported in similar groups such as the cleaning sector^{37,46,47}. This modality could be an effective alternative to increase adherence to PA in HHs as some of the reasons reported in the literature are lack of free time⁴⁸ and lack of knowledge on how to perform PA correctly⁴⁹.

The COVID-19 pandemic is one of the aspects that may well have affected our study in terms of adherence to PA. The intervention ended in March 2020,

the very month the pandemic started. Among the measures adopted in Spain, the lockdown during the months of March and April and the subsequent restrictions such as the curfew and social distancing might have influenced the adherence to PA of HHs. Along these lines, a systematic review reported an increase in sedentary lifestyles in the general population over said period⁵⁰, which might also have affected our study population.

To the best of our knowledge, there are no RCTs in HHs that have recorded variables related to pain. A recent review identified only eight interventions carried out to promote health in hotel workers⁵¹. The authors stressed that most of the interventions carried out lacked methodological rigor and did not reach statistical significance. Among the studies analyzed, only one RCT was identified. That study, conducted on 1,207 hotel workers, aimed to reduce body-mass index in participants with overweight or obesity through advice on eating and PA. After long-term follow-up, the results were negative⁵². The authors argued that, among other reasons, the low dose could be a key factor. This hypothesis could explain some of our results since, as has been commented for adherence to PA, the interventions most related to pain, such as the prescription of therapeutic exercise, social prescription, or education on pain may have been affected by the pandemic.

A recent RCT carried out in cleaners, a group with similar characteristics to HHs, found that aerobic exercise in the workplace managed to reduce musculoskeletal pain in the upper limbs⁴⁶, also affecting productivity and perceived effort⁵². Despite this, the authors found a statistically significant increase in lower limb pain after the intervention⁴⁶, and further research is needed to find an effective and safe alternative. Lastly, it is necessary to remember the difficulty in achieving effects in lifestyle interventions. Similar programs carried out in the same context also obtained negative results⁵³.

Strengths and limitations

The main strength of this study is the fact that the multi component intervention was designed based on the needs previously identified in a qualitative study^{54,55} and the descriptive cross-sectional study⁷, thus the issue of health in HHs was addressed from different approaches in order to achieve a better result. This study is the largest RCT carried out to date in the group of HHs. In this sense, it is also worth highlighting the fact that it is the first lifestyle modification RCT carried out in this group. Lastly, we consider it a strength to have conducted the intervention from primary care, the ideal setting for this type of intervention.

Despite the above, the clinical trial has several limitations. The first of these lies in the chosen definition of chronic pain. There are several tools available to identify and record chronic pain, but there is still some controversy as to which one is the best choice. In this case, the most common definition was adopted –pain that persists or is repeated for over three months– a definition still in force in the International Classification of Diseases (ICD-11)⁵⁶. Given that the primary objective was health-related quality of life, no specific exclusion criteria for chronic pain were included to identify, for instance, certain phenotypes of people with pain such as persistent nociceptive pain. Hence, the same intervention was performed for all HHs who reported pain lasting more than three months. One possible solution would be to carry out a thorough exploration of the person's pain history, but this was ruled out because the individual interventions already required too much time on behalf of each participant, as there were other goals related to lifestyle modification. Besides, it would have required greater training of professionals and more resources, which would complicate its transfer into clinical practice.

Finally, although the uncertainties caused by the lockdown due to the COVID-19 pandemic –particularly during the final phase of the intervention– and the subsequent unemployment of the HHs due to a significant decline in tourism during the follow-up period, the lack of positive health outcomes, does not support recommending a similar intervention delivered through primary care. Such an intervention could only be suggested if the trial were repeated under optimal conditions and yielded significant positive results.

Conclusions

A multidimensional intervention designed to promote healthy lifestyles and enhance coping strategies for stress and chronic pain did not result in significant improvements in chronic pain or PA levels among HHs compared to basic health advice.

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Ethical aspects

The study was approved by the Ethics Committee of the Balearic Islands (IB4027/19 PI) and by Primary Care Management in Mallorca (PI18/023).

Conflicts of interest

The authors declare no conflicts of interest.

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