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ORIGINALES

# Improvement of quality of life for informal caregivers of dependent persons through educational workshops

Mejora de la calidad de vida en cuidadores informales de personas dependientes mediante talleres educacionales

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## ABSTRACT:

**Introduction:** The ageing of the population is associated with an increase in the number of dependent people, with an estimate of 15% living with a disability. The provision of care to family members entails an added responsibility associated with care-related problems, which can have a negative impact on caregivers. Therefore, we propose to design and evaluate a caregiving programme based on caregiver education, measuring knowledge, pain perception, emotional burden and health-related quality of life.
**Objective:** The main objective is to improve the quality of life of informal caregivers through training interventions, in order to decrease the disability caused by caregiving tasks.
Method: 99 caregivers belonging to the Aljarafe-Northern Seville Primary Care Health District participated, divided into control and intervention groups. We designed two educational workshops on care programmes for informal caregivers. They completed a knowledge questionnaire, and different validated scales related to pain, health states and quality of life.
**Results:** Most of the caregivers presented back problems, for which they received pharmaceutical treatment. The implemented intervention was associated with a decrease in pain during basic activities of daily living, care and rest, as well as a reduction in strain index in both groups.
**Conclusions:** Intervention programmes for informal carers of dependent patients are effective in improving the state of health and quality of life of this group, and their implementation should therefore be encouraged in primary care.

**Keywords:** Caregivers, pain evaluation, health education, caregiver effort index, quality of life.

## RESUMEN:

**Introducción:** El envejecimiento de la población está asociado a un incremento de personas dependientes, estimándose que el 15% vive con alguna discapacidad. La prestación de cuidados a familiares supone una responsabilidad añadida asociada a problemas relacionados con el cuidado, que pueden repercutir negativamente en los cuidadores. Por ello, planteamos diseñar y evaluar un programa de cuidados, basado en la educación de los cuidadores, midiendo los conocimientos, la percepción del dolor, la carga emocional y la calidad de vida relacionada con la salud.

**Objetivo:** El objetivo principal es mejorar la calidad de vida de los cuidadores informales mediante intervenciones formativas, con el fin de disminuir la incapacidad causada por las tareas del cuidado.

**Método:** Participaron 99 cuidadores pertenecientes al Distrito Sanitario Aljarafe-Sevilla Norte de Atención Primaria, divididos en grupo control e intervención. Diseñamos dos talleres educacionales sobre programas de atención a cuidadores informales. Cumplimentaron un cuestionario de conocimientos, y diferentes escalas validadas relacionadas con el dolor, los estados de salud y la calidad de vida.

**Resultados:** La mayor parte de los cuidadores presentaban problemas de espalda tomando medicación para ello. La intervención implementada se asoció a un descenso del dolor durante actividades básicas de la vida diaria, los cuidados y el descanso, y disminución del índice de esfuerzo en ambos grupos.

**Conclusiones:** Los programas de intervención en cuidadores informales de pacientes dependientes resultan eficaces para mejorar el estado de salud y la calidad de vida de este colectivo por lo que se debe fomentar su realización desde la Atención Primaria.

**Palabras clave:** Cuidadores, evaluación del dolor, educación en salud, índice de esfuerzo del cuidador, calidad de vida.

# INTRODUCTION

The ageing of the population is associated with an increase in the number of dependent people(1), with an estimate of 15% of the world population living with a disability. A dependent person is defined as that who requires help from another person to carry out basic activities of daily living. Most of such activities, including feeding, dressing and mobilisation, are assisted by the relatives of the dependent person. Thus, the family has become the main provider of cares, establishing a network of informal and/or family caregivers who guarantee these tasks without a financial compensation(2). If life expectancy increases and the population continues to age, we will face a shortage of informal caregivers and the need for important reforms of the public/private Health Systems and Social Care(3,4).

The provision of cares to a relative poses an added responsibility. In many cases, informal caregivers have to renounce their job and reduce the number of social activities to guarantee an adequate attention to the dependent person. This new responsibility has been associated with problems such as an overload of roles and a lack of information, along with economic problems and changes in the health state of the caregiver. All this implies a decrease in the quality of life(5) and the appearance of the so-called “caregiver syndrome”(6). Very frequently, we find that back pain is a symptom associated with the activity of providing care. According to Zuluaga and Estrada(7), manual mobilisation of patients induces a disc load higher than the action limit and even higher than the disc-vertebral unit rupture value. Injuries at the physical level (back lesions, muscular problems and osteoarticular problems) pose a huge economic and social expense, due to the large rate of sick leave and the emotional stress generated in the people who provide the necessary care(5).

Although the quality of life, burden of the disease, dissatisfaction, stress and depression of informal caregivers have been widely studied(8), and some studies have addressed the low back pain of formal caregivers(9), only certain studies have analysed the low back pain of informal caregivers in their homes(8,10). Therefore, we decided to design and evaluate the efficacy of a formative activity for family caregivers that addresses topics about kinesitherapy, ergonomics and relaxation techniques. Moreover, in this educational activity, contents related to the management of the dependent person were taught, with the aim of reducing the disability caused by the role of the caregiver. To determine the efficacy of the activity, we measured the variation between the baseline situation and the final situation of the perception of pain, emotional load and quality of life of these informal caregivers.

## MATERIAL AND METHODS

A multi-centre, quasi-experimental study was conducted, with a control group, on a sample of caregivers attended to by a team of physiotherapists of the Aljarafe-Northern Seville Health District (Spain) in the scope of primary care, in the period of 2015-2019.

The sample of our study was selected through a list of random numbers, which corresponded to the informal caregivers registered in the lists of dependent people of our district. The study included those caregivers who had, under their care, a dependent person with a Barthel index below 60 points that was totally or partially bedbound. Moreover, another requirement to participate in the study was that the caregivers explicitly gave their consent. The study excluded those caregivers with very limiting or acute pathologies and those who were under 18 years of age. A sample size of 100 informal caregivers was calculated, distributed by half in each study group in order to obtain 95% confidence level and 80% predictive power.

A formative activity was designed, which consisted in carrying out two educational workshops based on the best scientific evidence available on education programmes in the management of a dependent relative and postural hygiene (workshop 1), stretching, and relaxation techniques (workshop 2). The content of the theoretical-practical workshop was agreed upon by all the researchers who participated in the study, and the documents were given to the caregivers at the end of the second workshop.

Before the beginning (pre) and end (post) of the formative activity, the knowledge of the participants was evaluated through a self-administered questionnaire, which was designed *ad hoc* and validated by experts. This questionnaire consisted of 10 questions about ergonomics, postural changes and mobilisation, as well as on the socio-demographic characteristics of the caregiver (Annex 1). Similarly, the following validated scales were also used: the visual numeric scale (VNS) of pain(11), the pain spot location pictogram (Figure 2)(12,13), the Spanish version of the Pain Questionnaire(12,13), the Caregiver Strain Index (CSI)(14) and the quality of life scale (EQ-5D)(15,16). Complementarily, the participants were asked about the intake of painkillers.

Once all the baseline information was gathered, the formative activity was taught to them. At the end of this activity, the caregivers completed the questionnaire of knowledge one more time, and all the skills and abilities acquired in these workshops were evaluated.

In order to know, throughout the course of the study, the degree of compliance with the programme of stretching and relaxation exercises, we used the adherence test of Moriski-Green (MG)(17,18), replacing the term “treatment” with “recommended exercises”. The schedule of questionnaires administered is presented in Table 1.

**Table 1. Schedule of questionnaires.**

| Test | Baseline | 3 months | 9 months | 18 months |
|---|---|---|---|---|
| Questionnaire of knowledge | ☐ | ☐ | | |
| VNS of pain | ☐ | | | ☐ |
| Pain pictogram | ☐ | | | ☐ |
| Spanish pain questionnaire | ☐ | | | |
| CSI | ☐ | | | ☐ |
| EQ-5D | ☐ | | | ☐ |
| Adherence to therapy | ☐ | ☐ | ☐ | ☐ |

VNS: visual numeric scale; EQ-5D: EuroQoL questionnaire of quality of life

The outcome variables analysed were: pain intensity (VNS), presence of pain associated with the basic activities of daily living, caregiver tasks and rest, the quality of life (EQ-5D), the caregiver strain index, and the level of knowledge before and after the workshop. The explanatory variables contemplated in the study were: age, sex and occupation of the family caregivers, and the Barthel index of the dependent person.

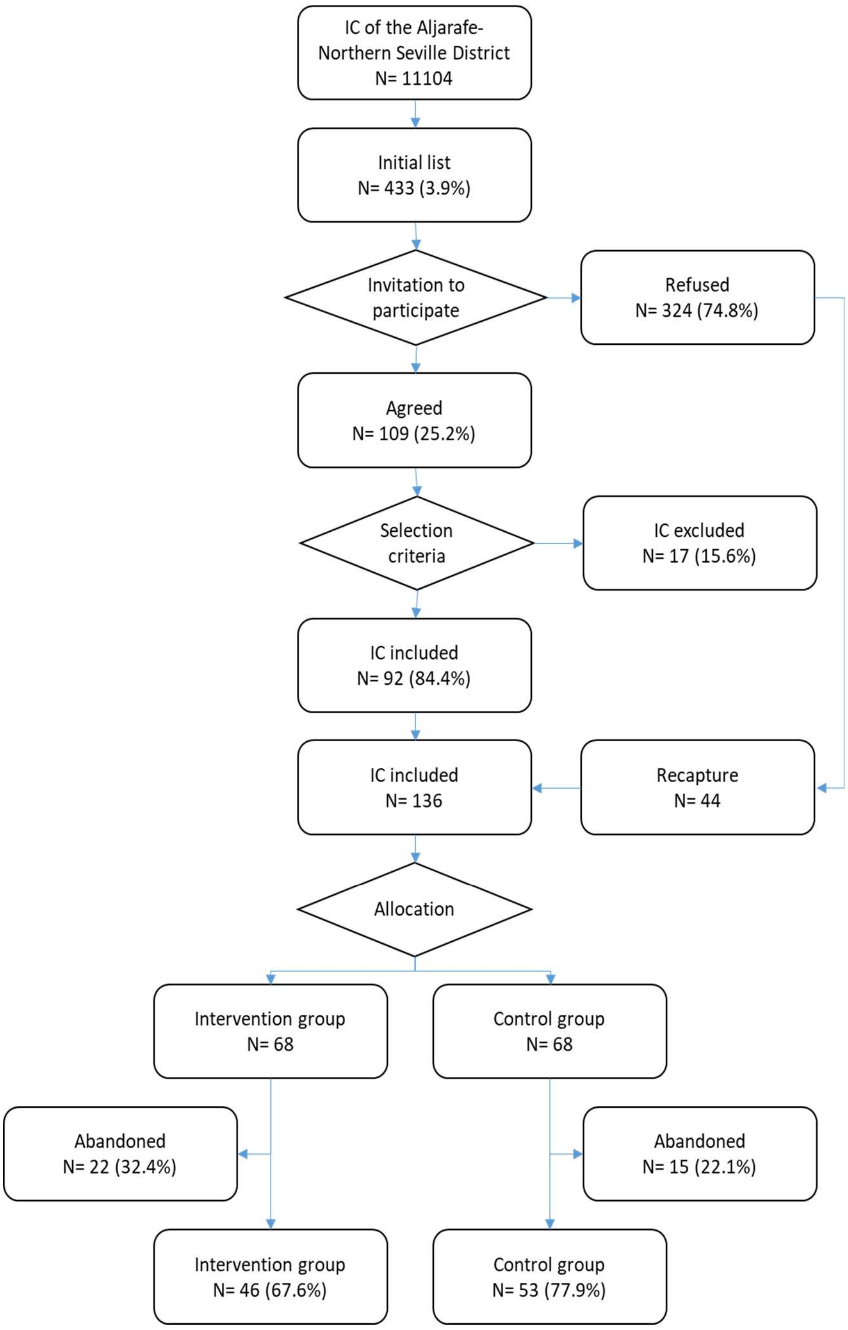
The quantitative variables were expressed through means and standard deviations or median and interquartile range depending on their distribution. The qualitative variables were expressed in number and percentage. An inferential analysis was conducted using the Chi-squared for qualitative variables. For the quantitative variables, we used Student’s t-test in those with normal distribution and Mann-Whitney U-test for those which did not follow a normal distribution. Lastly, a binary logistic regression analysis was performed, using as outcome variable the CSI at the end of the study recodified in low/high (high: CSI >7 points). All analyses were designed as bilateral, accepting a confidence level of 95%. The analyses was conducted using IBM-SPSS v.22.

The study was approved by the Research Ethics Committee of the University Hospitals Virgen Macarena and Virgen del Rocío (Seville, Spain).

## RESULTS

We analysed the questionnaires completed by 99 informal caregivers, of whom 91 (91.9%) were women. The mean age of the participants was 53.8 (SD: 8.1) (95% confidence interval, CI95%: 52.1-55.4) years. Of the total, 46 (46.5%) caregivers participated in the intervention group. Throughout the study, 20 (20.2%) participants were censored: 8 (8.1%) for abandoning the study and 12 (12.1%) due to death of the dependent person (Figure 1).

## Figure 1: Flowchart of participants



The mean Barthel index of the dependent persons was 25.5 (SD: 19.8) (CI95%: 20.0-30.9) points. No statistically significant differences were found between the control group and the intervention group in the variables measured at baseline (Table 2).

### Table 2: Distribution of the variables by study group at baseline

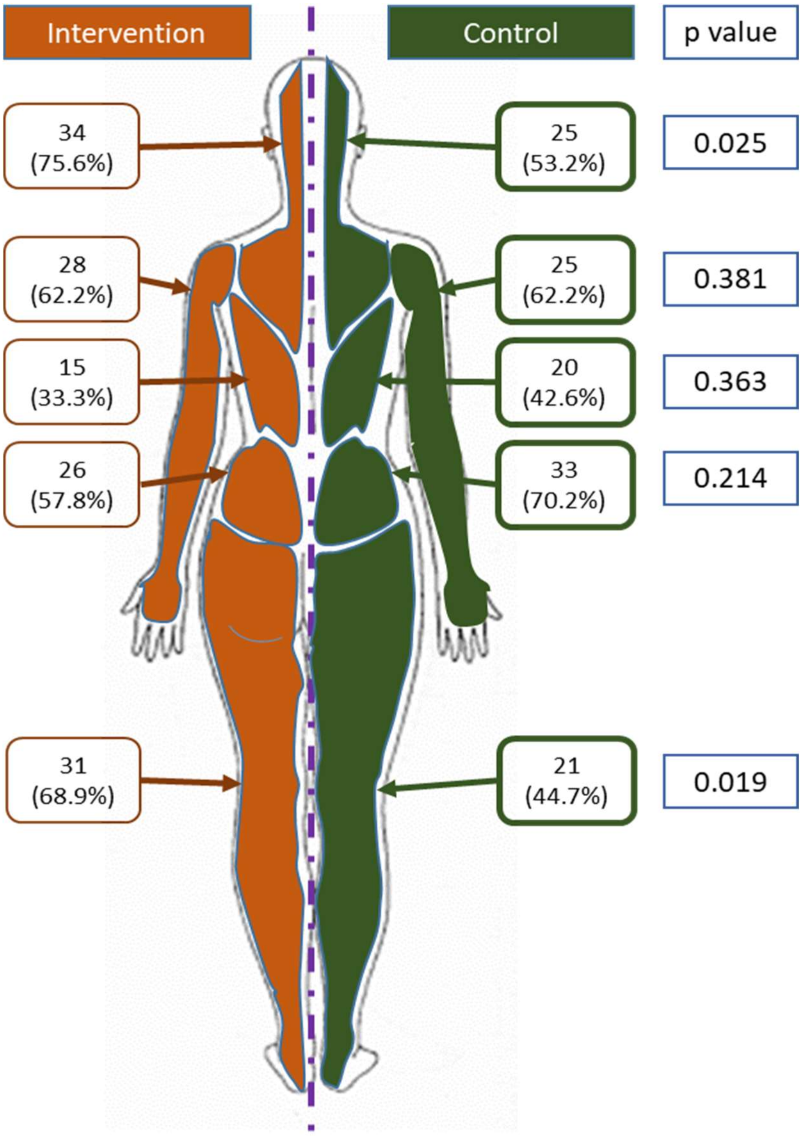
| Variable | Global<br>N= 99 | Intervention<br>46 (46.5%) | Control<br>53 (53.5%) | p value |
|---|---|---|---|---|
| Age, □ ± SD (CI95%) | 538 ± 8.1 (52.1-55.4) | 52.9 ± 7.4 (50.7-55.1) | 54.5 ± 8.7 (52.1-56.9) | 0.331 |
| Sex, N (%) | | | | |
| Woman | 91 (91.9) | 42 (91.3) | 49 (92.5) | 0.834 |
| Man | 8 (8.1) | 4 (8.7) | 4 (7.5) | |
| Barthel index*, □ ± SD (CI95%) | 25.5±19.8 (20.0-30.9) | 24.4±21.3 (15.6-33.2) | 26.4±18.6 (19.2-33.6) | 0.591 |
| Censored, N (%) | 20 (20.2) | 8 (17.4) | 12 (22.6) | 0.516 |
| Osteomuscular history, N (%) | | | | |
| Arthrosis | 18 (18.2) | 8 (17.4) | 10 (18.9) | 0.849 |
| Fibromyalgia | 7 (7.1) | 4 (8.7) | 3 (5.7) | 0.557 |
| Osteoporosis | 6 (6.1) | 2 (4.3) | 4 (7.5) | 0.506 |
| Shoulder pathology | 2 (2.0) | 2 (4.3) | 0 (0.0) | 0.213 |
| Spinalgia | 35 (35.4) | 15 (32.6) | 20 (37.7) | 0.595 |
| Pain during the caregiver tasks, N (%) | 53 (53.5) | 25 (54.3) | 28 (52.8) | 0.88 |
| Pain during rest, N (%) | 48 (48.5) | 20 (43.5) | 28(52.8) | 0.353 |
| EQ-5D, □ ± SD (CI95%) | 65 ± 21.3 (60.7-69.2) | 65.5 ± 20.5 (59.4-71.6) | 64.5 ± 22.3 (58.4-70.7) | 0.791 |
| VNS pain, □ ± SD (CI95%) | 5.0 ± 2.4 (4.5-5.4) | 4.9 ± 2.3 (4.2-5.6) | 5.0 ± 2.4 (4.3-5.7) | 0.736 |
| CSI, □ ± SD (CI95%) | 7.7 ± 3.0 (7.1-8.3) | 8.0 ± 2.6 (7.2-8.8) | 7.4 ± 3.3 (6.5-8.3) | 0.427 |

(*)Barthel index of the caregiver; EQ-5D: EuroQol-5D scale of quality of life, VNS: Visual Numeric Scale of pain; CSI: Caregiver Strain Index.

Regarding kinship, 65.4% of the caregivers were children and 13.5% were children-in-law. With respect to the marital status, 88% were married, and the most frequent profession was that of housewife (64%), followed by agricultural jobs (20%) and others (16%).

Of all the caregivers, 75 (77.3%) claimed to have back problems; the rest described osteomuscular problems. In the pain spot location test (pictogram), 75.6% of the caregivers of the intervention group pointed at the cervical region as the most frequent pain area, whereas the control group highlighted the lumbo-sacral region (70.2%) (Figure 2).

Figure 2. Pictogram representing the distribution of pain spots by study group



A total of 62 (82.7%) had their clinical diagnosis registered in their medical history, and 64 (85.3%) had prescribed medication for this type of problem. Only one of them self-medicated. Throughout the study, the frequency of compliers remained constant, at 54%-56% (Table 3).

**Table 3. Test of adherence to the training programme taught to the intervention population (modified from the Moriski-Green test).**

| **Test adherence to treatment** | **3 months** | **9 months** | **18 months** |
|---|---|---|---|
| **Total of respondents, N (%)** | 36 (78.3) | 36 (78.3) | 35 (76.1) |
| Do you ever forget the exercises taught and the guidelines received? | 20 (43.5) | 20 (43.5) | 19 (41.3) |
| Do you follow the guidelines learned at the indicated times? | 21 (45.7) | 23 (50.0) | 23 (50.0) |
| When you feel well, do you stop performing the exercises? | 15 (32.6) | 24 (52.2) | 18 (39.1) |
| Even if you believe that the exercises are bad for you, do you keep doing them? | 21 (45.7) | 23 (50) | 19 (41.3) |

| | | | |
|---|---|---|---|
| **Non-compliance, N (%)** | | | |
| Compliers | 10 (21.7) | 10 (21.7) | 10 (21.7) |
| Non-compliers | 26 (56.5) | 26 (56.5) | 25 (54.3) |

Regarding the quality of life of informal caregivers, this intervention statistically significantly improved the scores in the subscales of EQ-5D "personal care" and "activities of daily living" in the intervention group with respect to the control group (p=0.0005 and p=0.001, respectively). In the subscale "pain / discomfort", statistical significance was not reached, although there was a lower proportion of people with pain in the intervention group than in the control group (p= 0.082) (Table 4).

**Table 4. Quality of life at the beginning and end of the study according to the study group.**

| | Intervention | | | Control | | |
|---|---|---|---|---|---|---|
| **Subscales EQ-5D, N (%)** | **Baseline** | **18 months** | **p value** | **Baseline** | **18 months** | **p value** |
| **a) Mobility** | | | 1.000 | | | 0.687 |
| I have no problems | 26 (72.2) | 25 (69.4) | | 34 (82.9) | 32 (78.0) | |
| I have some problems | 10 (27.8) | 11 (30.6) | | 7 (17.1) | 9 (22.0) | |
| **b) Personal care** | | | 0.0005 | | | 0.073 |
| I have no problems | 32 (88.9) | 30 (83.3) | | 38 (92.7) | 40 (97.6) | |
| I have some problems | 4 (11.1) | 5 (13.9) | | 3 (7.3) | 1 (2.4) | |
| I cannot take care of myself | 0 (0.0) | 1 (2.8) | | 0 (0.0) | 0 (0.0) | |
| **c) Activities of daily living** | | | 0.001 | | | 0.101 |
| I have no problems | 24 (66.7) | 21 (58.3) | | 26 (65.0) | 22 (55.0) | |
| I have some problems | 11 (30.6) | 14 (38.9) | | 14 (35.0) | 18 (45.0) | |
| I cannot take care of myself | 1 (2.8) | 1 (2.8) | | 0 (0.0) | 0 (0.0) | |
| **d) Pain / discomfort** | | | 0.082 | | | 0.931 |
| I have no problems | 10 (28.6) | 5 (14.3) | | 8 (19.5) | 8 (19.5) | |
| I have moderate pain/discomfort | 19 (54.3) | 24 (68.6) | | 25 (61.0) | 26 (63.4) | |
| I have great pain/discomfort | 6 (17.1) | 6 (17.1) | | 8 (19.5) | 7 (17.1) | |
| **e) Anxiety / depression** | | | 0.550 | | | 0.946 |
| I have no problems | 16 (45.7) | 14 (40.0) | | 12 (29.3) | 13 (31.7) | |
| I have moderate anxiety/depression | 16 (45.7) | 16 (45.7) | | 24 (58.5) | 23 (56.1) | |
| I have great anxiety/depression | 3 (8.6) | 5 (14.3) | | 5 (12.2) | 5 (12.2) | |

EQ-5D: EuroQoL-5D questionnaire of quality of life

The implemented intervention was associated with a decrease of pain during basic activities of daily living (BADL) (p=0.0005), during caregiving (p=0.0005) and during rest (p=0.001). A large number of caregivers were observed in the control group with over 50 points in quality of life (p= 0.002) and with CSI ≤7 points (p=0.0005) with respect to the intervention group. The CSI decreased in both groups and, although the percentage of caregivers with >7 points was greater in the intervention group than in the control group, the baseline-final difference was more relevant in the intervention group than in the control group (-8.6% vs -2.5%) (Table 5).

**Table 5. Comparison between the baseline situation and final situation (18 months) of the outcome variables between the study groups.**

| Outcome variables, N (%) | Intervention | | | Control | | | p value |
|---|---|---|---|---|---|---|---|
| | Baseline | 18 months | Dif | Baseline | 18 months | Dif | |
| **Pain during BADL** | | | | | | | 0.0005 |
| No | 30 (83.3) | 31 (86.1) | 2.8 | 33 (80.5) | 33 (80.5) | 0.0 | |
| Yes | 6 (16.7) | 5 (13.9) | -2.8 | 8 (19.5) | 8 (19.5) | 0.0 | |
| **Pain during caregiving** | | | | | | | 0.0005 |
| No | 27 (75.0) | 29 (80.6) | 5.6 | 30 (73.2) | 30 (73.2) | 0.0 | |
| Yes | 9 (25.0) | 7 (19.4) | -5.6 | 11 (26.8) | 11 (26.8) | 0.0 | |
| **Pain during rest** | | | | | | | 0.001 |
| No | 32 (88.9) | 31 (86.1) | -2.8 | 37 (90.2) | 35 (85.4) | -4.8 | |
| Yes | 4 (11.1) | 5 (13.9) | 2.8 | 4 (9.8) | 61 (14.6) | 4.8 | |
| **EQ-5D quality of life** | | | | | | | 0.002 |
| <50 | 5 (15.6) | 6 (18.8) | 3.2 | 6 (15.8) | 6 (15.8) | 2.8 | |
| ≥50 | 27 (84.4) | 26 (81.3) | -3.1 | 32 (84.2) | 32 (84.2) | -2.6 | |
| **CSI** | | | | | | | 0.0005 |
| No | 12 (34.3) | 15 (42.9) | 8.6 | 19 (46.3) | 20 (48.8) | 2.5 | |
| Yes | 23 (65.7) | 20 (57.1) | -8.6 | 22 (53.7) | 21 (51.2) | -2.5 | |

BADL: basic activities of daily living; Dif: difference between baseline situation and final situation. EQ-5D: EuroQoL-5D questionnaire of quality of life

The multivariate model by binary logistic regression showed that, when controlling for the socio-demographic variables of informal caregivers and the previous level of knowledge, having a high baseline CSI (>7 points) implied a 8.5-fold increase in the probability of having a high final CSI (OR=8.5; CI95%= 1.7-42.3) (p=0.009), although no statistically significant differences were found (p=0.606).

To better understand the influence of the degree of disability of the dependent person on the CSI of the caregiver, we grouped the participants according to their CSI throughout the study and compared them with the Barthel index of the dependent person. Thus, the following groups were created: group “a” gathered the informal caregivers who had a low CSI score in both the baseline and final situations (low/low); group “b” (high/low); group “c” (low/high) and group “d” (high/high). There were statistically significant and clinically relevant differences in the percentage of patients who had a high score throughout the study (group d), being lower in the intervention group than in the control group (33.3% vs 47.8%) (p=0.035) (Table 6). When we analysed the scores of the Barthel index in each of these groups of CSI, it was found that these were worse in the caregivers of group d, that is, those who maintained a CSI >7 throughout the study. Moreover, the caregivers of the intervention group bore a greater burden, with lower Barthel index scores, along the course of the study (p=0.035) compared to the control group.

**Table 6. Variation in the score of the caregiver strain index (CSI) throughout the study by study group based on the Barthel index (BI) score of the dependent person expressed as mean (SD) and its CI95%.**

| | | | Final CSI | |
|---|---|---|---|---|
| | | | **Low (≤7)** | **High (>7)** |
| **Baseline CSI** | **Intervención** | **Low (≤7)** | **Group a**<br>N= 17 (38.1%)<br>BI: 28.8 (23.6) (CI95%: 9.1;48.5) | **Group c**<br>N= 7 (14.3%)<br>BI: 45.0 (10.0) (CI95%: 20.2;69.9) |
| | | **High (>7)** | **Group b**<br>N= 7 (14.3%)<br>BI: 40.0 (21.8) (CI95%: -14.1;94.1) | **Group d**<br>N= 15 (33.3%)<br>BI: 7.9 (12.2) (CI95%: -3.4;-19.1) |
| | **Control** | **Low (≤7)** | **Group a**<br>N= 14 (26.1%)<br>BI: 28.3 (22.3) (CI95%: 5.0;51.7) | **Group c**<br>N= 7 (13.0%)<br>BI: 40.0 (21.8) (CI95%: -14.1;94.1) |
| | | **High (>7)** | **Group b**<br>N= 7 (13.0%)<br>BI: 25.0 (17.3) (CI95%: -18.3;68.0) | **Group d**<br>N= 25 (47.8%)<br>BI: 20.5±15.2 (CI95%: 10.2;30.7) |

Group "a": informal caregivers who scored low in the baseline and final CSI (low/low); group "b": high/low; group "c": low/high and group "d": high/high

# DISCUSSION

This educational intervention enabled a statistically significant decrease in the proportion of family caregivers with pain associated with basic activities of daily living, caregiving tasks and rest, with such decrease being greater in the intervention group than in the control group. Although the quality of life worsened in both groups, the proportion of people who scored less than 5 points in the VNS of the EQ-5D questionnaire was greater in the intervention group than in the control group. Similarly, the CSI decreased in both groups, although the decrease in the percentage of caregivers with a score above 7 was greater in the intervention group than in the control group.

The informal caregivers were relatives of the dependent persons in more than 80% of cases(19). This role of caregiver has fallen on the woman, which has been reported in other studies about the informal care of dependent people, being mainly the responsibility of the wife and/or daughter(20,21), with a mean age of 55-65 years and a medium education level(22,23).

The results of the present study demonstrate the vulnerability of family caregivers to suffer from physical and psychiatric problems, which some authors have defined as the "caregiver syndrome"(22). The care of dependent people has been identified as one of the most stressful events of the family cycle(24). Every day, caregivers conduct a large number of tasks that have a negative impact on their physical and emotional health, making them susceptible to certain pathologies, such as back pain, osteoarticular and/or musculoskeletal problems(25) and psychological problems such as anxiety and depression(26). According to Toribio-Díaz et al, 36.4% of caregivers have jobs, whereas 13.1% reduce their working hours and 5.4% quit their jobs to provide adequate care to the dependent person(3). All these factors contribute to increasing the CSI, which is associated with the pain perceived by these caregivers(27). Ortiz, in her doctoral thesis published in 2019(26), concluded that the baseline profile of informal caregivers is that of a person with an intense overload, low back pain and moderate incapacity, who also perceives very little social support and low quality of life. In our study, such caregivers present a baseline profile similar to that described by Ortiz.

According to the analysed caregivers, regarding the EuroQoL-5D questionnaire, the family caregivers of Alzheimer patients presented more problems in the dimensions of mobility, activities of daily living, pain or discomfort and anxiety or depression than the general population, after controlling for age and sex. This is also reflected by the valuation they assigned to the general health state (VNS) of the EuroQoL-5D, in which the sample of caregivers also obtained a worse valuation in their quality of life compared to the general population(22,28).

Along time, the percentage of informal caregivers with high CSI decreased in both groups, which can be explained by the “hypothesis of adaptation”, which states that the caregiver, despite the progressive deterioration of the dependent person, learns to adapt to the situation, being able to experience improvement. According to this hypothesis, the initial phase of providing care to a dependent person would be the worst moment for caregivers(23,29,30). In our study, this decrease was more pronounced in the intervention group than in the control group, which could be due to the effectiveness of the multidimensional intervention.

The CSI >7 points is associated with a worse quality of life and with a greater level of perceived pain (VNS), which is in line with the results of Gómez-Pisano et al(31).

Our study consisted in a multidimensional programme that addresses measures of kinesitherapy, postural control, ergonomics, mobilisations and relaxation techniques. There are previous therapies that support the efficacy of educational intervention in caregivers. The reviewed literature shows that such programmes have been short in duration and focused on some specific modality of intervention to promote physical activity, postural hygiene, ergonomics, etc.; only some studies address multiple intervention modalities, in the short-medium term. However, they conclude that they improve the health state of the caregiver. Thus, the randomised clinical trial conducted by Araujo on 33 caregivers concluded that a 12-week intervention with training in postural hygiene, combined with kinesitherapy and adaptations in the household, can reduce pain and improve several aspects of the quality of life in family caregivers(10). In the same vein, Bezerra et al recommend the adoption of simple ergonomic measures, adequate working postures and the execution of exercises to prepare for the daily work (exercises of global postural re-education and muscular stretching, both analytical and global), to minimise injury risk factors, reduce low back pain and improve the quality of life(32). In agreement with these and other authors, it can be stated that the establishment of healthy habits in the daily lives of caregivers can improve their quality of life, reduce stress and slow down the deterioration of their health. On the other hand, following the conclusions of Larrañaga33), the lower dedication of caregivers to physical activity and rest can explain their worse response in the scores of mental health and, in our case, pain and quality of life.

The subjectivity of the responses, especially regarding pain and quality of life, could have been associated with an information bias. The requirement of time perceived by the informal caregivers to carry out their tasks limited their attendance to the workshops, and it could have even been a reason to stop participating in the project.

The design of our study limited this activity to the main family caregivers, disregarding the cases in which the responsibility of the care fell on several caregivers who took turns in this role. In fact, Gómez-Ramos and González-Valverde valued this role in the caregivers (47%), although they did not perform a specific analysis of its impact on the variables that they analysed(21).

Thus, we can state that it is necessary to implement multidisciplinary activities of prevention and promotion of health aimed at supporting informal caregivers of dependent people, since the existing literature backs the benefits associated with them for both the person who receives the care and the person who provides the care, reducing the overload and pain perceived by the latter and the hospitalisation of dependent persons(34–36).

According to the results of our study and other relevant studies on this topic, the implementation of activities aimed at multidimensional training reduces pain symptoms and caregiver strain and improves the quality of life. This could be relevant for the decrease of the cost of these musculoskeletal and osteoarticular diseases.

To that end, it would be convenient to design longitudinal studies with intermediate follow-ups to improve the adherence of the caregiver to the programme and determine the cost/effectiveness of these interventions for subsequent implementation in informal caregivers.

# CONCLUSIONS

The conclusions drawn on the study conducted on informal caregivers of our health scope indicate that the intervention programmes in informal caregivers of dependent people are effective in improving the health state and quality of life of this group, thus they must be promoted from the primary care services.

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