The Review Of
DIABETIC
STUDIES OPEN ACCESS

Effectiveness Of A Behavioral Intervention Program For The Promotion Of Healthy Lifestyles In Caregivers Of People With Disabilities: Empirical Quantitative Research

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Abstract

Background: The research is framed in the purpose of evaluating the effectiveness of a behavioral intervention program for the promotion of healthy lifestyles among informal caregivers of people with disabilities.

Methods: Quasi-experimental study with two groups (one intervention and one control), with pre- and post-measurements. The behavioral intervention program was structured and implemented based on the six dimensions outlined in Nola Pender's Health Promotion Model. The instrument used to assess healthy lifestyles was the HPLP-II. It was directed at informal caregivers of people with disabilities and lasted for 16 weeks. To determine the program's effectiveness, Student's t-test for independent samples and Cohen's d effect size were used to compare the intervention and control groups.

Results: A significant change in healthy lifestyles was observed after the implementation of the behavioral intervention program. The intervention group obtained a total average score of 80.53 on the HPLP-II instrument, compared to 50.80 in the control group. Favorable differences were also observed in the assessed dimensions for the experimental group compared to the control group: interpersonal relationships (14.37 vs. 9.90), nutrition (12.16 vs. 8.95), health responsibility (14.79 vs. 8.25), physical activity (10.79 vs. 5.29), stress management (11.11 vs. 7.65), and spirituality (17.32 vs. 10.85). All reported differences were statistically significant ($t = 5.95$; $p < .001$). Additionally, when comparing the experimental group before and after the intervention, the total score increased from 41.84 to 80.53, with a significant difference ($t = 7.81$; $p < .001$). The effect size was 2.54 (95% CI: 1.483–3.56), indicating a positive and substantial impact of the program on healthy lifestyles in informal caregivers.

Conclusions: The behavioral intervention program proved effective in fostering the adoption of healthy lifestyles in the target population, with significant improvements in the areas of physical activity, healthy eating, interpersonal relationships, health responsibility, stress management, and spirituality.

Keywords: Lifestyles, caregivers, health promotion, health education.

Introduction

1 Background

Lifestyles are the behaviors adopted by individuals that can either positively or negatively affect their health and well-being (1). For years, the promotion of healthy lifestyles has become a key area of interest for the healthcare system and a challenge for health professionals (2).

One of the main functions of public health is to work on changing people's lifestyles, using the salutogenic model as a central axis for health promotion, with the aim of achieving well-being and quality of life at every stage of the life cycle (3).

Several studies have focused on the implementation of healthy lifestyle behaviors in people's daily environments, such as community, family, workplace, and education (1). This highlights the need to target individualized interventions in the various dimensions of human life, such as strengthening interpersonal relationships, increasing health responsibility, physical activity, nutrition, spirituality, and stress management, as proposed by Nola Pender's Health Promotion Model (4).

However, the literature shows that health interventions have largely been based on the biomedical and nosological model, focusing on symptom resolution rather than on preventive approaches, as advocated by the primary health care strategy (5).

In fact, much of the attention has been directed toward the population with disabling medical conditions, while overlooking those who meet their daily and instrumental needs, primarily in their homes. Caregivers are considered an invisible population within the social and healthcare systems (6), especially those who take on informal caregiving roles without any financial compensation, often resulting in a decline in their quality of life across all areas (7). This underscores the importance of promoting programs that foster self-care practices through the adoption of healthy lifestyles in this population (8).

It is the responsibility of all health professionals to work for the well-being of informal caregivers by implementing health promotion and prevention actions that yield measurable improvements in their quality of life (9). Moreover, achieving positive health outcomes in caregivers also has a direct impact on the well-being of the individuals with disabilities they care for (10).

In the field of healthcare, there is a valuable opportunity to develop programs aimed at promoting healthy behavioral changes in informal caregivers of people with disabilities. In this regard, nurses, psychologists, physicians, public health professionals, and others in the health sector can generate evidence that serves as examples of potentially replicable approaches.

Aligned with the above, this study aims to evaluate the effectiveness of a health promotion program focused on healthy lifestyles for informal caregivers of people with disabilities, using a pre-post design with a control group. The focus will be on the dimensions included in Nola Pender's conceptual model. It is expected that the findings will provide valuable insights into the essential role that health professionals play in improving the lifestyles of informal caregivers of people with disabilities in Colombia.

2 Theoretical Framework

Lifestyles are recognized as an abstract and complex concept that has been the subject of study since before 1860. It has been explored by various disciplines such as medical sociology, health anthropology, and health psychology, among others. In particular, epidemiology has extensively used the concept of lifestyle and its connection to health, although often with an interpretation associated with behaviors that may pose risks to well-being (11). Lifestyles are understood as behavioral aggregates that, according to Ambacher, integrate cognitive, affective, interpersonal, and motor dimensions present in individuals (12).

Authors such as De La Torre and Fernández (13) present dimensions related to the improvement of lifestyles, among which are the identification and regulation of emotions, the strengthening of the communicative-social dimensión, which includes the need for relationships and support in decision-making, and the promotion of the educational component, associated with individuals' capacity to process information and reflect in order to achieve behavioral change. The aforementioned aligns with the dimensions proposed by Nola Pender and the purpose of this study.

On the other hand, lifestyles are influenced by socio-educational systems, customs, housing conditions, the urban environment in which one lives, socioeconomic status, relationships with the environment, and interpersonal interactions (14).

The analysis of how lifestyles influence population health has been studied across various social science disciplines. The goal is to broaden and deepen understanding of the topic in order to establish effective intervention strategies, recognizing conditions associated with socio-educational and personal factors (15).

In particular, in so-called “Western” countries, high rates of behaviors that pose health risks have been identified. These include tobacco and alcohol consumption, diets consisting of ultra-processed, calorie-dense, and nutrient-poor foods, physical inactivity, and irresponsible road behavior, among others. These behaviors are closely linked to the three main causes of mortality today: cardiovascular diseases, cancer, and traffic accidents (16). Consequently, they confirm the influence of risky lifestyles on people's health. Nevertheless, individuals typically adopt a range of behaviors, some favorable, others unfavorable, without necessarily displaying entirely risky or entirely protective patterns (17).

The determinants of lifestyle in relation to health can be examined from two different perspectives. One focuses on individual aspects such as biology, genetics, behavior, and psychological factors. The second perspective centers on sociodemographic and cultural factors, considering the influence of social, economic, and environmental contexts on lifestyle habits (18). Both sets of factors may be compromised in the population of informal caregivers of people with disabilities, making it necessary to implement interventions aimed at promoting lifestyles that contribute to better health outcomes for them.

3 Method

The aim of this study was to evaluate the effectiveness of an educational program for informal caregivers, based on the categories proposed in Nola Pender’s conceptual model, which included didactic strategies and participatory workshops designed to encourage positive lifestyle changes, supported by an interdisciplinary team made up of professionals in psychology, nutrition, physical education, medicine, physiotherapy, nursing, and spiritual guidance (priests).

This was a quasi-experimental study involving 19 informal caregivers of people with disabilities, conducted between February 2024 and January 2025. Participation was voluntary and supported by the signing of an informed consent form, in accordance with the guidelines set out in Resolution #8430 of 1993 from the Colombian Ministry of Health (19), ensuring confidentiality and anonymity of the data collected. The study received approval from the ethics committee of the public hospital that coordinates public health actions in a region of Colombia, as per approval record number 16/02/2024.

To meet the objective of the study, 39 informal caregivers with the highest degree of impairment in the evaluated dimensions were identified. The inclusion criterion was a self-reported declaration of never engaging in healthy lifestyle practices.

Subsequently, the G*Power software was used to calculate the sample size needed to compare two means within the same group of subjects. Using an effect size of $d = 0.25$, a Type I error (α) of 0.05, and a power of 0.95, the minimum required sample size was 39 caregivers, 20 in the control group and 19 in the experimental group.

3.1 Data Collection

For the development of the sessions, the intervention proposal was organized into 6 main blocks, each block representing a dimension that makes up Nola Pender's conceptual model. Depending on the results presented by the caregivers for each affected dimension, the number of interventions was justified, which in light of previous research experiences would be between 2 to 3 activities for each one with approximately 22 to 40 sessions for the dimensions of nutrition, physical activity and stress management, and for spiritual growth, interpersonal relationships and responsibility in health ranged from 8 to 12 sessions for each one (20).

Once descriptive results were analyzed, including sociodemographic characteristics and scores obtained from the HPLP-II instrument, it was possible to accurately identify the most affected dimensions and items to be targeted. This was based on behavioral interpretations (participants

answered “never”) and score ranges below 103, in accordance with the scoring criteria of the HPLP-II test, which is also derived from Nola Pender’s Health Promotion Model.

3.2 Intervention Design

A protocol of interventions was designed for each dimension of the model: interpersonal relationships, stress management, spiritual growth, physical activity, nutrition, and health responsibility. The program consisted of six sessions, each with a specific title and description of the activities, justification, duration, required resources, and the responsible professional. The thematic axes were summarized as follows:

- Nutrition Dimension: Nutritional assessment with expert support; blood sample collection for lipid profile and glycemia; dietary plan adjusted to the household food basket; practical explanation of healthy nutritional habits, and follow-up. Supported by a nutrition professional.
- Physical Activity Dimension: Cardiovascular endurance assessment (Tecumseh test); personalized physical exercise plan; personalized support for adherence to the exercise plan. Supported by a physical education professional.
- Stress Management Dimension: Guided relaxation techniques, emotional regulation; coping activities at home to promote catharsis and calm; preferred activities such as dance therapy, crafts, and training in body image acceptance. Supported by professionals in psychology and physiotherapy.
- Spiritual Dimension: Workshops for exploring emotions, recognizing meaningful aspects of life; spiritual retreats using existing strategies that enhance spirituality; assessment of significant persons, beliefs, and religious practices. Supported by priests and spiritual missionaries.
- Health Responsibility Dimension: Medical and nursing consultations under health promotion and maintenance programs; adoption of habits through daily/monthly activity plans (e.g., breast self-exam). Supported by professionals in medicine and nursing.
- Interpersonal Relationships Dimension: Support network and family dynamics; meetings with significant others; group activities with specific purposes. Supported by nursing professionals.

Dates and schedules were coordinated with the informal caregivers, achieving a minimum of three activities per week for each dimension. As the program was implemented with caregivers residing in a geographically dispersed rural area of Colombia, the situation required the health team to travel to nearby population centers, this involved logistical efforts supported by nursing assistants from a local educational institute.

3.3 Measurement Instrument

The pre- and post-intervention measurements were conducted using the Health-Promoting Lifestyle Profile (HPLP-II) developed by Nola Pender, which has suitable properties for assessing health-promoting behaviors that make up a healthy lifestyle. The instrument has an internal consistency (Cronbach’s alpha) of 0.94 for the entire scale (21). It includes 52 items divided into six dimensions: Nutrition (items: 2, 8, 14, 20, 26, 32, 38, 44, 50), Physical Activity (items: 4, 10, 22, 16, 28, 34, 40, 46), Stress Management (items: 5, 11, 17, 23, 29, 35, 41, 47), Interpersonal Relationships (items: 1, 7, 13, 19, 25, 31, 37, 43, 49), Spiritual Growth (items: 6,12,15, 18,24,30,36,42,48,52), Health Responsibility (items: 3, 9, 21, 27, 33, 39, 45, 51).

Scoring categories were as follows: Never ≤ 103, Sometimes 104–186, Frequently 187–207 and Routinely 208.

3.4 Statistical Analysis

Descriptive analyses, mean difference tests (Student’s t-test for independent samples), and effect size calculations (Cohen’s d) were performed. In addition, performance graphs were generated for each factor in Nola Pender’s model (22). All statistical procedures were supported by SPSS software version 25, ensuring precision and reliability in the analyses.

3.5 Description of Sociodemographic, Economic, Occupational, and Clinical Characteristics of Caregivers of People with Disabilities

3.5.1 Control Group

Among the 20 informal caregivers of people with disabilities in the control group, 60% (12 caregivers) were women and 40% (8 caregivers) were men. The average age was 45.75 years. Regarding marital status, 55% were single, 10% in common-law unions, 30% married, and 5% separated.

In terms of educational level, 65% had completed primary education, 15% had no formal education, 15% had finished high school, and 5% had university education.

Socioeconomic status was distributed as follows: 80% lived in stratum 1, 15% in stratum 2, and 5% in stratum 3. In terms of family composition, 70% (14 caregivers) had children and 30% (6 caregivers) did not.

Geographically, the majority 40% (8 caregivers) resided in Pamplona, followed by 25% (5 caregivers) in Silos, 20% (4 caregivers) in Mutiscua, and 5% (1 caregivers) each in Cacota and Chitaga. None lived in Cucutilla. A total of 60% lived in urban areas, while 40% lived in rural areas.

3.5.2 Experimental Group

Among the 19 informal caregivers of people with disabilities in the experimental group, 100% were women. Of these, 78.9% were in adulthood, 15.78% in older adulthood, and 5.26% in youth. The average age was 47 years, ranging from 18 to 64 years old. Regarding marital status, 57% were single, 21% in common-law relationships, 15% married, and 5.2% separated.

In terms of educational level, 60% had completed primary school, 15% had finished high school, 10% had technical education, 5% had university education, and 10% had no formal education. All participants (100%) identified as Catholic.

Socioeconomic strata were distributed as follows: 60% in stratum 1, 15% in stratum 2, and 25% in stratum 3. Regarding family composition, 55% (11 caregivers) had children: 9% had six children, 9% had five, 9% had one, 18% had two, 27% had three, and 27% had four.

Geographically, 60% (12 caregivers) resided in the municipality of Pamplona, 15% in Silos, 10% in Cacota, 10% in Mutiscua, and 5% in Pamplonita. A total of 75% lived in urban areas and 25% (5 caregivers) in rural areas. As for housing, 60% owned their homes, 20% rented, and 20% lived in a relative's house.

Regarding health insurance, 78.94% were affiliated with the subsidized system, and 15.78% with the contributory system. A total of 52.63% were affiliated with Nueva EPS, 36.84% with Sanitas, 5.2% with Comfaoriente, and 5.2% with Coosalud.

In terms of health status, 73.68% reported having no underlying medical condition, while 21.5% mentioned having chronic illnesses.

Out of the 19 caregivers, 31.57% (6 caregivers) cared for 1 to 3 people in addition to the person with a disability, 10.52% (2 caregivers) cared for 4 to 6 people, 5.2% for more than 6 people, and another 5% reported caring for only one person with a disability.

The caregiver’s relationship to the person with a disability was most frequently “mother” (31.57%), followed by caregivers of their children (26.31%), siblings/uncles or aunts (21.5%), and close friends (5.26%).

The duration of caregiving ranged from 6 months to 29 years. A total of 84.21% of caregivers reported providing care 24 hours a day, 5.26% for 12 hours, and 5.26% for 6 hours daily.

- ✓ Once the aforementioned characteristics were identified, the control and experimental groups were matched to mitigate bias.

4 Results

Table 1 presents a comparison between the experimental and control groups across the dimensions of the model. The post-test scores show better performance in the intervention group in each of the dimensions.

TABLE 1. Comparison Between Experimental and Control Groups in the Model's Dimensions.

DIMENSION	ROLE	Mean	SD	Min.-Max.	Student's t (p-value)	Cohen's d (95% CI)
Interpersonal Relationships	Experimental	14.37	4.10	5 - 19	3.76 (<.001)	1.203 (.452-1.93)
	Control	9.90	3.31	5 - 16		
Nutrition	Experimental	12.16	4.07	3 - 20	2.53 (.016)	.811 (.129-1.48)
	Control	8.95	3.85	3 - 17		
Responsability	Experimental	14.79	3.03	9 - 18	6.69 (<.001)	2.142 (1.192-3.06)
	Control	8.25	3.08	2 - 16		
Physical Activity	Experimental	10.79	5.32	0 - 20	4.07 (<.001)	1.305 (.536-2.05)
	Control	5.20	2.98	0 - 10		
Stress Management	Experimental	11.11	4.21	3 - 17	3.09 (.004)	.990 (.274-1.68)
	Control	7.65	2.62	0 - 11		
Spirituality	Experimental	17.32	4.61	6 - 25	4.12 (<.001)	1.321 (.548-2.07)
	Control	10.85	5.15	3 - 19		
TOTAL HABITS	Experimental	80.53	18.87	32 - 113	5.95 (<.001)	1.907 (1.012-2.77)
	Control	50.80	11.65	33 - 71		

Figure 1 illustrates the performance in healthy lifestyle habits, based on the consolidated dimensions of Nola Pender's model for both the control and experimental groups.

FIGURE 1. Comparative Performance of Experimental and Control Groups – Total Habits.

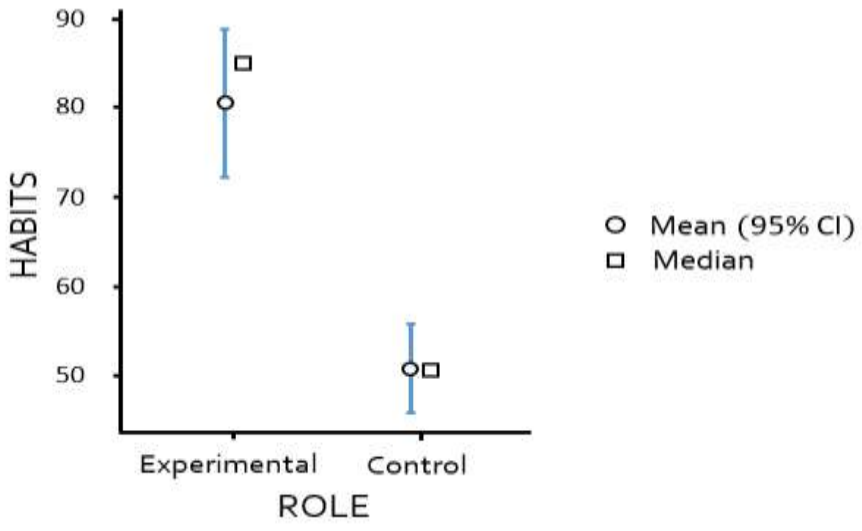


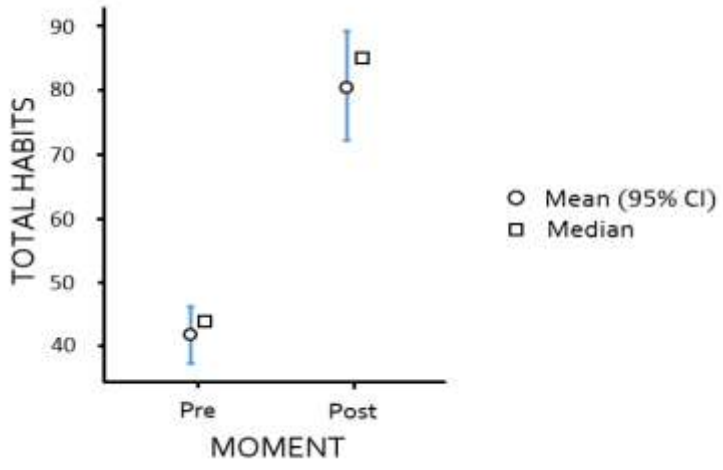
Table 2 shows the comparison within the intervention (experimental) group between pre- and post-measurements, revealing improved performance after the planned interventions were implemented.

TABLE 2. Comparison of Pre- and Post-Measurements in the Model's Dimensions – Intervention Group.

FACTOR	Moment	Mean	SD	Min.-Max.	Student's t (p-value)	Cohen's d (95% CI)
Interpersonal Relationships	Pre	9.32	2.47	5 - 14	4.60 (<.001)	1.49 (.680-2.28)
	Post	14.37	4.10	5 - 19		
Nutrition	Pre	7.53	3.26	2 - 13	3.87 (<.001)	1.26 (.489-2.00)
	Post	12.16	4.07	3 - 20		
Responsibility	Pre	7.32	2.85	3 - 14	7.83 (<.001)	2.54 (1.488-3.57)
	Post	14.79	3.03	9 - 18		
Physical Activity	Pre	2.63	3.00	0 - 12	5.82 (<.001)	1.89 (.992-2.76)
	Post	10.79	5.32	0 - 20		
Stress Management	Pre	5.84	1.68	3 - 10	5.06 (<.001)	1.64 (.798-2.46)
	Post	11.11	4.21	3 - 17		
Spirituality	Pre	9.21	3.68	2 - 16	5.99 (<.001)	1.94 (1.036-2.83)
	Post	17.32	4.61	6 - 25		
TOTAL HABITS	Pre	41.84	10.46	19 - 69	7.81 (<.001)	2.54 (1.483-3.56)
	Post	80.53	18.87	33 - 113		

Likewise, Figure 2 shows greater performance in the total sum of healthy habits, with improved indicators in the post-test measurement.

FIGURE 2. Pre- and Post-Comparison of Performance in the Experimental Group – Total Habits.



5 Discussion

A quasi-experimental study targeting families and using Nola Pender's Health Promotion Model (HPM) showed increases in all dimensions following the implementation of an intervention program, especially in the dimensions of health responsibility and physical activity, which showed a seven-point increase in their means compared to pre-test scores. These findings align with the present study, in which dimensions increased between 4.6 and 8.1 points, respectively, reaffirming the significant contribution of programs designed to improve healthy habits among populations (23).

These results are similar to those of an educational intervention study based on the HPM in patients with heart failure, which reported favorable outcomes in all dimensions except for physical activity (24). However, it's worth noting that in that study, physical activity was the lowest-scoring dimension in the experimental group's pre-test and showed a clinically significant increase by the end of the intervention.

Additionally, a study that aimed to evaluate the effects of peer education assessed through the HPM and quality of life, stress management and self-efficacy among patients with multiple sclerosis showed significant results in the comparison of pre- and post-intervention measures in the experimental group ($p < 0.05$) after three months. However, no differences were found when compared to the control group (25), unlike the present study, which showed statistically significant differences between the experimental and control groups.

In the same vein, the results align with a study evaluating the impact of an HPM-based educational intervention in reproductive-age women in Iran. After the intervention, an increase in healthy lifestyle habits was observed, with statistically significant differences across all dimensions (26).

Likewise, another study on the effect of an educational intervention based on the HPM on treatment adherence in patients with coronary artery disease found favorable results three months later (27), which are consistent with those in the current study comparing experimental and control group measurements.

Furthermore, a virtual health education study using web-based technologies for patients with cardiovascular conditions reported significant outcomes in the intervention group compared to the control group, three months after the intervention, particularly regarding self-care behaviors, physical activity, healthy diet, medication adherence, and stress management (28).

Another study using the same HPM methodology to promote healthy behaviors in adolescents showed positive changes in all dimensions in both pre- and post-tests after the educational intervention, particularly in the areas of spirituality, interpersonal relationships, and health responsibility (29). These results align with the study by Ross et al. (30), which used the same instrument on caregivers of cancer patients and found the highest scores in spirituality and interpersonal relationships, and the lowest in physical activity and nutrition. However, when examining dimensions separately, Carranza et al. (31) found no significant differences ($z = -.481$, $p = 0.630$) in interpersonal support among university students, although there were differences in health responsibility ($z = -2.380$, $p = 0.017$). A synthesis of these findings suggests that, overall, interventions based on the HPM, especially those focused on social support, emotions, spirituality, and self-care, positively impact people's health. In fact, they help individuals cope with stressful life situations and foster an optimistic outlook on the future (31–34).

Specifically regarding the interpersonal relationships dimension, the current study showed an average increase of 4.47 points when comparing the experimental and control groups, and a 5 point increase in favor of the experimental group. This improvement is attributed to the inclusion of educational strategies aimed at strengthening relationships with friends, family, and local organizations through recreational, leisure, and sports activities. These strategies are consistent with the study by Barbosa and Romero (36), who assert that the feeling of positive social connections and affection strengthens the well-being of people with disabilities and their caregivers.

In the stress management dimension, a significant improvement was observed, both in comparisons between the experimental and control groups and between the experimental group's pre- and post-test results. These outcomes align with a recent study demonstrating that relaxation activities, music

therapy, and education on stress reduction techniques positively contributed to well-being (36). These types of interventions were also implemented in the present study.

The health responsibility dimension also improved positively after the intervention with caregivers. Follow-up related to clinical characteristics and medical diagnoses promoted interest in adopting healthy habits, seeking primary care services, adhering to treatment, and engaging in health education as a cross-cutting axis.

The spirituality dimension scored the highest compared to the other dimensions and was the only one with consistently high indicators from the first measurement. Nevertheless, it increased considerably after the intervention, demonstrating the caregivers' strong performance in seeking personal meaning, transcendence, and life purpose through daily actions.

These results match those of qualitative studies describing spirituality as an important resource for caregivers, enabling them to manage their emotions, face challenges and stressors more effectively, and find calm during crises. For caregivers, the belief that their actions are connected to a higher purpose fosters a more optimistic outlook on life (37, 38). This aligns with another study reporting that informal caregivers used spirituality as an effective coping strategy (39) and with findings by Britt et al., who observed that prayer and religious text reading enhanced spirituality and improved caregivers' moods in cases involving patients with dementia (40).

Regarding the physical activity dimension, it showed the greatest increase when comparing pre- and post-intervention results. In the experimental group, the pre-test average was 2.63, which increased to 10.79 in the post-test; in comparison, the control group scored 5.20. This indicates improved performance in this dimension among caregivers. These findings contrast with a study on caregiver/child with disability, which showed no statistically significant differences in physical activity and nutrition dimensions after the lifestyle intervention (41). The positive results here may be attributed to the structure and delivery of activities proposed in the program; however, further applications are needed to confirm this hypothesis.

As for nutrition, despite reported challenges such as limited access to healthy food, financial constraints, and time management, higher scores were observed in the consumption of balanced and appropriate diets after delivering personalized nutritional education. These findings are consistent with those by Puszko et al. (42), who emphasize that the effectiveness of personalized educational strategies depends on prior identification of users' nutritional characteristics and specific health conditions, allowing for tailored guidance according to individual resources and capabilities.

A comprehensive and interdisciplinary evaluation of each model dimension, followed by health education interventions with clear instructions and the use of motivational didactic tools for behavioral change and maintenance, are widely supported in the literature (43–46). In fact, the inclusion of workshops, training, and leisure and recreational activities aligned with the caregivers' daily realities played a key role in achieving the proposed objectives.

Furthermore, this study and previous research show that intervention duration, three months or more, positively affects health, particularly in terms of behavior change and improvements in physical, psychological, social, and cultural aspects (47–49). However, very few studies report favorable outcomes in shorter timeframes. One intervention targeting caregivers showed improved caregiving skills after just six weeks of online education (50), highlighting a valuable approach for future applications, provided participants have the necessary digital literacy and the required technological infrastructure (reliable internet connection and available devices), which was not the case in the current study.

In light of these findings, it is important to intensify studies focusing on health interventions that promote behavior change, increase self-care, and reduce psychological distress (51), taking into account factors such as session duration, number of sessions, material quality, didactics, and motivation, all of which are crucial in quasi-experimental studies.

5.1 Study Limitations

The main limitation was related to the limited availability of informal caregivers of people with disabilities to participate in the planned activities, which made it difficult to carry out the actions in a centralized location. These circumstances led the researchers to modify the meeting schedules and conduct the sessions individually at the caregivers' homes. Additionally, the population was geographically dispersed across rural areas, with limited access to digital tools, which made virtual interventions unfeasible. Therefore, the sessions had to be conducted in person, requiring a costly and time-consuming logistics process for reaching each household. Nevertheless, all planned sessions were successfully completed.

6 Conclusions

The effectiveness of a health education intervention program was demonstrated through tangible changes in lifestyle dimensions, including physical activity, nutrition, spiritual growth, interpersonal relationships, health responsibility, and stress management. Educational processes that incorporate playful and didactic activities, participatory workshops, and recreational spaces serve as essential strategies to promote behavioral changes in health, particularly among rural populations caring for individuals with disabilities.

Biographical notes:

Mayra Alejandra Barajas Lizarazo is a nurse with a master's degree in nursing and a career lecturer at the University of Pamplona, Colombia. She is the founder of the university's nursing program and has received recognition for her work in directing the program and as a researcher with the "El Cuidar" group. She has more than twelve years of experience in university teaching and in healthcare, administration, home care, and research.

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Katty Dayana Escobar Velásquez is recognized for her career in nursing and university teaching. She has extensive experience, with 28 years in healthcare and seven years in university teaching. Before her role at the University of Pamplona, she worked at various healthcare institutions, including Urgencias la Merced, Seguro Social, Cooperativa San José, Saludcoop, and Esimed.

Author Contributions

Program conceptualization and implementation were carried out by M.A.B.L. Data collection and digitalization were performed by K.D.E.V., and data analysis was conducted by A.G.A. K.D.E.V. and A.G.A. curated and jointly interpreted the data. The first draft of the manuscript was written by M.A.B.L. All authors contributed to manuscript revisions. A.G.A. conducted the main supervision and critical review. All authors read and approved the final version of the manuscript.

Acknowledgements

The authors express their special thanks to the informal caregivers who actively participated in the implementation of the intervention activities.

Ethics Statement

This study was approved by the Ethics Committee of the San Juan de Dios Hospital in Pamplona, Colombia. Ethics Committee Approval Number: 16/02/24.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Funding

The authors received funding from the Universidad de Pamplona, Colombia.

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