

Effect of a virtual exercise program on the quality of life of older people during the COVID-19 pandemic

Efeito de um programa virtual de exercícios físicos sobre a qualidade de vida de pessoas idosas durante a pandemia COVID-19

Efecto de un programa virtual de ejercicio físico en la calidad de vida de las personas mayores durante la pandemia COVID-19

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Section Editor

 Paulo Isaac de Souza Campos

Submitted: 10/18/2024

Accepted: 03/11/2025

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ABSTRACT

Objective: to analyze the effect of a virtual physical exercise program on the quality of life (QoL) of older people during the COVID-19 pandemic. **Method:** this was a quasi-experimental before-and-after intervention study, with a quantitative evaluation of the effect of the intervention, carried out between October 2020 and March 2021, with a non-probabilistic sample of older people participating in a socialization group with an emphasis on the practice of physical exercise offered before the implementation of social restriction measures due to the COVID-19 pandemic in the municipality of Pirapora, located in the north of the state of Minas Gerais, Brazil. The WHOQOL-Bref and WHOQOL-Old instruments were used, a questionnaire to characterize the sociodemographic and behavioral characteristics of the group. The intervention consisted of providing a virtual physical exercise program for eight weeks. Data were collected before and after the intervention period. **Results:** 92 older people agreed to take part in the proposed intervention. Analysis of the effect of the virtual physical exercise program revealed a significant increase in the overall WHOQOL-Bref score after the intervention ($p < 0.001$). With regard to the WHOQOL-Old, although there was an improvement in the scores, no significant differences were identified between the two evaluated moments. **Conclusion:** the results of the intervention showed that the participants' overall perception of QoL was positively influenced by the proposed physical exercise program in virtual format.

Keywords: Physical Exercise; Quality of Life; Aging; Older People's Health; COVID-19.

RESUMO

Objetivo: analisar o efeito de um programa virtual de exercícios físicos sobre a qualidade de vida (QV) de pessoas idosas durante a pandemia da COVID-19. **Método:** estudo de intervenção quase-experimental do tipo antes e depois, com avaliação de efeito da intervenção de caráter quantitativo, realizado entre outubro de 2020 e março de 2021, com amostragem não-probabilística de pessoas idosas participantes de um grupo de convivência, com ênfase na prática de exercício físico ofertado antes da implantação das medidas de restrição social devido à pandemia da COVID-19 no município de Pirapora, localizado no norte do estado de Minas Gerais, Brasil. Foram utilizados os instrumentos WHOQOL-Bref e WHOQOL-Old, questionário de caracterização sociodemográfica e comportamental do grupo. A intervenção consistiu na disponibilização de um programa virtual de exercícios físicos durante oito semanas. Os dados foram coletados antes e após o período de intervenção. **Resultados:** 92 pessoas idosas aceitaram participar da intervenção proposta. A análise do efeito do programa virtual de exercícios físicos revelou aumento significativo do escore global do WHOQOL-Bref após a intervenção ($p < 0,001$). Em relação ao WHOQOL-Old, embora tenha sido registrada melhoria dos escores, não foram identificadas diferenças significativas entre os dois momentos avaliados. **Conclusão:** os resultados da intervenção mostraram que a percepção global da QV dos participantes foi positivamente influenciada pelo programa proposto de exercícios físicos no formato virtual.

Descritores: Exercício Físico; Qualidade de Vida; Envelhecimento; Saúde da Pessoa Idosa; COVID-19.

RESUMEN

Objetivo: analizar el efecto de un programa virtual de ejercicios físicos sobre la calidad de vida (CV) de personas mayores durante la pandemia de la COVID-19. **Método:** estudio de intervención, cuasi-experimental, de tipo antes y después, con evaluación del efecto de la intervención, de carácter cuantitativo, realizado entre octubre de 2020 y marzo de 2021, con muestreo no probabilístico de personas mayores, participantes de un grupo de convivencia con énfasis en la práctica de ejercicio físico, ofrecido antes de la implementación de las medidas de restricción social debido a la pandemia de la COVID-19 en el municipio de Pirapora. Se utilizaron los instrumentos WHOQOL-Bref y WHOQOL-Old, además de un cuestionario de caracterización sociodemográfica y comportamental del grupo. La intervención consistió en la disponibilidad de un programa virtual de ejercicios físicos durante ocho semanas. Los datos fueron recolectados antes y después del período de intervención. **Resultados:** 92 ancianos aceptaron participar en la intervención propuesta. El análisis del efecto del programa virtual de ejercicio físico reveló un aumento significativo de la puntuación global WHOQOL-Bref tras la intervención ($p < 0,001$). Con respecto al WHOQOL-Old, aunque se registró una mejora en los puntajes, no se identificaron diferencias significativas entre los dos momentos evaluados. **Conclusión:** los resultados de la intervención mostraron que la percepción global de la CV de los participantes fue influenciada positivamente por el programa propuesto de ejercicios físicos, en formato virtual.

Descriptores: Ejercicio Físico; Calidad de Vida; Envejecimiento; Salud de las Personas Mayores; COVID-19.

How to cite this article:

Aguiar, CB, Caldeira, AP, Silva, RRV. Effect of a virtual exercise program on the quality of life of older people during the COVID-19 pandemic. Rev. enferm. UFPE on line. 2025;19(2): e264620. DOI: <https://doi.org/10.5205/1981-8963.2025.264620>

Introduction

At the beginning of 2020, the world population faced the challenge of the pandemic caused by the new coronavirus (COVID-19), with major social, economic and, above all, health impacts.¹ In addition to these direct impacts, the pandemic highlighted the profound social inequalities that generate invisibility and end up making the way we experience this new world configuration even more dramatic, especially for the most vulnerable groups, including older people.²

Beyond the impacts described above, in the pandemic context the older population was more vulnerable to exposure, being among the groups who were most susceptible to complications from COVID-19, with rates ranging from 50% to 84% of deaths by region in Brazil.³

Changes in the age structure of the population are currently being registered almost everywhere in the world, with a marked aging of the population.⁴ From a biological point of view, the process of senescence, along with functional changes, can interfere with the perception of quality of life (QoL), since this is the product of a series of behaviors, i.e., the routine of activities adopted by the older population being influenced by various physical, psychological and socio-environmental factors.⁵⁻⁶

The World Health Organization (WHO) emphasizes the importance of a good relationship between individuals, their environments and their experiences for the development and maintenance of the functional capacity that enables well-being in old age.⁷

In this sense, knowing how older people perceive their QoL allows us to better understand this relationship from the perspective of those who experience it. Self-assessment of QoL includes the perception of each individual and his or her position in the cultural context and value system of the society in which they live, each aspect contributing to shaping it positively or negatively.⁸

Participation in social groups is therefore a recommended strategy for older people in order to encourage greater social involvement, a fundamental aspect for QoL. These groups offer participants the chance to share their experiences and form a network of mutual support to face the challenges of everyday life, as well as being a place for physical and leisure activities.⁹

Across the country, however, social group activities have been suddenly disrupted by the pandemic, with potential implications for the health of the older population involved in the activities. Although outdoor activities are typically more available and varied, there are many possibilities for exercising at home during periods of social distancing, and records

have shown how much the social impacts of the pandemic have affected general health.^{1,9-10}

In this regard, the major changes imposed on the lifestyles of older people as a result of the pandemic have generated serious emotional consequences, such as feelings of loneliness, depression and anxiety, particularly for those who used to lead physically active lifestyles.³

In this scenario, technology can be used as an instrument to bring physically distant people closer together, as well as an educational tool in many situations. Thus, there is a need to develop *online* interventions aimed at social connection and health promotion for the older population during this period.¹⁰

In turn, the use of social networks, messaging apps or videos sharing instructional materials such as physical exercise programs encourages continuity of care and the maintenance of pre-established bonds. This type of strategy is valid both in periods of social isolation and in periods considered normal, aimed at vulnerable or fragile groups.¹¹

In this context, there is a need to evaluate the perception of older people on the practice of social isolation in a contextualized way, as well as the intervention measures taken to cope with the situation, since few studies address how the measures imposed to cope with the pandemic have impacted the self-assessment of the QoL in contexts of great social deprivation for social groups of older people.^{1,3}

Hence, the relevance of this study lies in the fact that the period of social isolation due to the COVID-19 pandemic has highlighted the disparities in participation in services that offer physical exercise programs for the older population. In the light of the social determinants of health, the challenge of providing strategies to minimize the impact of this type of event on the health of the public in question is even greater, while at the same time making it possible to understand the repercussions on QoL.

Since the use of technology as an interaction setting through remote physical exercise programs is still little explored, this study aimed to evaluate the effect of a virtual physical exercise program on the quality of life of older people during the COVID-19 pandemic in the municipality of Pirapora-MG, Brazil.

Method

This is a quasi-experimental intervention study of the before-and-after type, with a quantitative evaluation of the effect of the intervention conducted between October 2020 and March 2021 with a group of older people participating in a socialization project with an emphasis on physical exercise offered by the municipality before the implementation of

social restriction measures due to the COVID-19 pandemic. The project with socializing groups and regular physical activity for older people has been running for more than a decade, serving 286 participants spread across 11 centers located in different districts of the city that have strategic spaces such as churches, squares, schools, in order to serve a greater number of people referred by professionals from the health unit of reference who observe the need by the user of the service. The project aims to prevent complications resulting from chronic diseases, as well as to strengthen the bond and socialization of this public. The classes offered include aerobic training and stretching given by Physical Education professionals four days a week, each session lasting 60 minutes and of moderate intensity (self-perceived exertion).

The general QoL assessment before the intervention was carried out with the group made up of participants from all the centers; the sample was non-probabilistic, made up of older people who were regular participants in the project and who voluntarily agreed to take part in the study. There was no sample calculation, given the intention to include the entire group that was already taking part in the socialization project. Participants who had difficulty understanding the questions on the questionnaires were excluded, as were those who did not have telephone contact or internet access, since the questionnaire was administered remotely, as was the provision of the exercise program. The assessment of the impact of the intervention was restricted to the participants included in the two phases of the study.

For data collection, we used a semi-structured questionnaire developed by the authors of the study for sociodemographic variables (age, sex, self-reported skin color, marital status, household arrangement, income, and level of schooling), and the behavior adopted during the pandemic, as well as the World Health Organization Quality of Life-Bref (WHOQOL-Bref) and the World Health Organization Quality of Life Assessment for Older Adults (WHOQOL-Old) instruments, both developed by The WHOQOL Group, adapted and validated for the context of the Brazilian population.¹²⁻¹³

The WHOQOL-Bref, a shortened form of the WHOQOL-100, is made up of 26 questions, 2 of which are general questions relating to QoL and overall health, and 24 covering four domains: a) physical; b) psychological; c) social; d) environmental. The WHOQOL-Old has 24 questions divided into six facets: a) sense functioning (SF); b) autonomy (AUT); c) past, present and future activities (PPFA); d) social participation (SP); e) death and dying (DD); f) intimacy (INT). The WHOQOL-Old is a specific instrument for assessing QoL in the older population and should be applied in conjunction with the WHOQOL-Bref.¹³

Data were collected in two stages by telephone by the same researcher, who had been previously trained. The telephone number of each participant was made available to the researcher by the coordinator of the socialization project after the survey objectives had been presented to the municipality secretariat in charge of the service and their consent had been obtained. The collection before the intervention was carried out between October and December 2020, each call lasting an average of 37 minutes; the intervention was carried out over eight weeks, in January and February 2021, and the collection after the intervention took place in March 2021, each application of the instruments lasting an average of 29 minutes. During the contact, the objective of the survey was explained to the participants, who also consented to take part in the study and to the recording of the audio responses. The data collected were stored on media devices and then transferred and stored on a database which was specific to the study.

The questionnaires were administered during the first telephone call, when each participant was asked if they would like to take part in the intervention, as well as receiving an illustrative booklet and a virtual physical exercise program to incorporate into their routine. Those who accepted were notified via messaging application, with instructions on how to use the material. The digital illustrative booklet with a session of physical and stretching exercises to be done at home, as well as the weekly videos containing the physical exercise program, were sent directly to each participant. Those who did not take part in the exercise program did not receive any type of intervention during the period.

Data analysis consisted of descriptive statistics with measures of central tendency and dispersion. To compare the domains/facets of the WHOQOL instruments and the variables of the study group, the Mann-Whitney U test was applied, considering that the data distribution analysis using the Kolmogorov-Smirnov test did not show normal distribution. The Wilcoxon test was used to analyze the means of the domains and facets of the instruments before and after the intervention. All the results were analyzed by using the SPSS software version 20.0, and the criterion adopted for determining statistical significance was 5% ($p < 0,05$).

The research project was approved by the Research Ethics Committee of the State University of Montes Claros - Minas Gerais (UNIMONTES) under opinion No. 4.332.488. All participants registered their consent to the research, confirming their acceptance after reading the informed consent form.

Intervention

The program, made available in virtual format by means of educational material, consisted of videos previously selected by the authors of the study and sent weekly to the research participants for eight weeks. The videos were standardized and instructed by a Physical Education professional from outside the socialization project, containing a sequence of exercises with five stretches for the main muscle groups and ten body exercises aimed at strengthening muscles, improving functionality, flexibility and mobility in the older people, as well as preserving autonomy.

The exercises proposed were shoulder shrugging, abdominal breathing, extending the knees, forward elevation, hip extension, overhead elevation, plantar flexion/dorsiflexion, squats, pelvic elevation and alternating development. The description of how to do each exercise was provided in written and illustrated form, along with guidance on the appropriate materials and space to be used when performing them.

The program's exercise sessions lasted an average of 30 minutes and consisted of three sets of 12 repetitions to each exercise, with a one-minute rest interval between sets. Each participant was instructed to carry out the training following the information contained in the materials, and to do it five days a week in order to maintain at least the recommended basic level of regular physical activity.¹⁴ Given the impossibility of controlling adherence with the regularity planned in the study, the statement that the 40 sessions of the physical exercise program were carried out after the eight weeks of intervention was considered, since the participants were not supervised.

After eight weeks, a second telephone call was made to reapply the questionnaires and assess the QoL in order to compare the perception of the participants before and after the virtual physical exercise program was made available through educational material during the period of social isolation. The answers obtained through the applied instruments were consolidated, and the WHOQOL-Bref domains and the WHOQOL-Old facets were analyzed separately. The scores were calculated using the specific syntaxes developed and recommended by The WHOQOL Group for the Statistical Package for Social Sciences (SPSS®) software. Each domain/facet was represented in percentage scores from zero to 100, with the highest value corresponding to the best perception of the QoL in the studied population.¹²⁻¹³

Results

Before the period of isolation, the socialization project served a total of 286 older people. They were all invited to take part in the survey, but 14 of them were not included in

the sample because they did not have telephone contact or internet access, or because they did not understand the questions on the instruments used, totaling 272 participants at the first stage of the survey. For the intervention, 94 participants were willing to include the physical exercise program in their routine; however, there were two losses due to a lack of telephone contact after three attempts on different days and at different times in the second stage evaluation. Thus, after the proposed program was made available, 92 older people were accounted for statistical analysis.

In the first stage of the study, 272 older people took part, the majority of whom were female (n=239-87.9%), predominantly aged between 60-69 (n=155-57.0%), brown-skinned (n=171-62.9%), married (n=139-51.1%), living with family members (n=150-55.1%), with up to four years of schooling (n=126-46.4%), as shown in Table 1.

Table 1 - Sociodemographic characterization of a group of older people (n=272) participating in a regular physical activity project. Pirapora (MG), Brazil, 2021.

Variables	(n)	(%)
Sex		
Female	239	87,9
Male	33	12,1
Age (years)		
60-69	155	57,0
70-79	101	37,1
≥80	16	5,9
Skin color		
Brown	171	62,9
Black	48	17,6
White	46	16,9
Yellow	4	1,5
Ignored	3	1,1
Marital status		
Married	139	51,1
Widowed	58	21,3
Separated / divorced	47	17,3
Single	23	8,5
Stable union	5	1,8
Household arrangement		
Living with other family members	150	55,1
Living alone with spouse	74	27,2
Living alone	47	17,3
Living with non-family members	1	0,4
Source of income		
Retirement pension	179	65,9
Other	55	20,2
Pension	27	9,9
Self-employment	11	4,0
Years of schooling		
0	14	5,2
1-4	112	41,2
5-8	58	21,2
9-12	66	24,3
≥13	22	8,1

With regard to changes in behavior due to the pandemic, all the assessed participants reported adherence to social isolation, restricting contact with people, and 41 of them (15,1%) reported having left home only for health care. As for difficulty in carrying out routine activities, 165 participants (60,7%) reported a lot of difficulty. The dietary pattern was also maintained by 171 participants (62,9%), and the time spent on television or electronic devices increased for 132 (48,5%) of those interviewed. The practice of physical exercise decreased for 207 (76,1%) participants (Table 2).

Table 2 - Behavioral habits adopted as a result of the COVID-19 pandemic by a group of older people (n=272) participating in a regular physical activity project. Pirapora (MG), Brazil, 2021.

Variables	(n)	(%)
Restriction of contact with people		
"I tried to be careful, to stay away from people, to reduce contact, but I continued working and/or going out."	24	8,8
"I stayed at home, only going out to shop at the supermarket and pharmacy."	207	76,1
"I stayed strictly at home, leaving only for health reasons."	41	15,1
Difficulty in performing routine activities		
"A lot."	165	60,7
"Mild."	30	11,0
"A little."	60	22,1
"None."	17	6,2
Missed being with family and friends		
"Always."	180	66,2
"Often."	71	26,1
"Not often."	18	6,6
"I did not miss it."	3	1,1
Dietary patterns during the pandemic		
"It got much worse."	16	5,9
"It got a little worse."	52	19,1
"It was the same."	171	62,9
"It was better."	33	12,1
Screen time (television, electronic devices)		
"It increased a lot."	54	19,8
"It increased a little."	78	28,7
"It was the same."	131	48,2
"I do not watch television/use electronic devices."	9	3,3
Physical activity during the pandemic		
"It reduced a lot."	114	41,9
"It reduced."	93	34,2
"Unchanged."	56	20,6
"It increased."	9	3,3

The initial measurement of QoL using the WHOQOL-Bref showed an overall score of 65,1 ($\pm$ 5,6). The specific analysis of the different domains showed a significant difference in terms of marital status for the *Social* domain between older people with or without a spouse. In the analysis of household arrangement, the same *Social* domain showed different

scores among older people living alone or with another person. When evaluating age groups, only the *Psychological* domain was different between older people aged up to 79 and those aged 80 or over. In relation to the WHOQOL-Bref results, the *Social* domain was the one that generated the highest mean percentage scores, while the *Physical* domain was the one with the lowest mean percentages for the group evaluated (Table 3).

Table 3 - Quality of life scores obtained from the WHOQOL-Bref instrument among older people during the period of social isolation (n=272). Pirapora (MG), Brazil, 2021.

Sex: Male / Female				
Domains	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
PHY	66,7 (±8,8) / 68,6 (±8,1)	68,6 / 68,6	45,7-80,0 / 42,9-94,3	0,396
PSY	71,3 (±8,0) / 74,1 (±7,8)	70,0 / 73,3	53,3-86,7 / 50,0-96,7	0,052
SOC	78,0 (±4,6) / 77,4 (±8,7)	80,0 / 80,0	66,7-86,7 / 40,0-100	0,699
ENV	72,5 (±9,1) / 71,6 (±8,8)	70,0 / 70,0	55,0-100 / 52,5-100	0,775
Marital status: With spouse / Without spouse				
Domains	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
PHY	66,5 (±7,8) / 68,2 (±8,7)	68,6 / 68,6	45,7-88,6 / 42,9-94,3	0,666
PSY	74,5 (±7,5) / 73,0 (±8,2)	73,3 / 73,3	53,3-96,7 / 50,0-96,7	0,058
SOC	79,6 (±7,1) / 75,0 (±9,0)	80,0 / 73,3	46,7-100 / 40,0-93,3	<0,001
ENV	72,7 (±8,7) / 70,6 (±8,9)	72,5 / 70,0	52,5-100 / 55,0-100	0,060
Household arrangement: Alone / With someone				
Domains	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
PHY	67,8 (±7,8) / 68,5 (±8,3)	68,6 / 68,6	48,6-82,9 / 42,9-94,3	0,687
PSY	73,0 (±7,4) / 73,9 (±7,9)	73,3 / 73,3	56,7-90,0 / 50,0-96,7	0,332
SOC	75,2 (±8,5) / 77,9 (±8,2)	73,3 / 80,0	46,7-93,3 / 40,0-100	0,009
ENV	72,5 (±10,3) / 71,6 (±8,5)	70,0 / 70,0	55,0-100 / 52,5-100	0,643
Age group (years): 60-79 / 80+				
Domains	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
PHY	68,4 (±8,0) / 68,1 (±10,5)	68,6 / 71,4	42,9-94,3 / 48,6-82,9	0,489
PSY	74,1 (±7,8) / 70,2 (±6,9)	73,3 / 70,0	50,0-96,7 / 60,0-86,7	0,013
SOC	77,5 (±8,5) / 76,6 (±5,4)	80,0 / 73,3	40,0-100 / 66,7-86,7	0,240
ENV	71,9 (±9,0) / 69,4 (±7,1)	70,0 / 70,0	52,5-100 / 55,0-80,0	0,379

* Mann-Whitney U-test; PHY: Physical; PSY: Psychological; SOC: Social; ENV: Environmental.

With regard to the WHOQOL-Old, the overall average for the entire instrument was 76,8 (±7,5), and the facets with the highest scores were *Intimacy* and *Sensory Functioning*. Significant differences were identified for the scores *Sensory Functioning* between males and females; *Intimacy* between those with or without a spouse; and *Death and Dying* between older people who live alone and those who live with other people in their household. With regard to age group, there was a significant difference for the *Social Participation* facet, with higher scores for older people aged between 60 and 79 years old (Table 4).

Table 4 - Quality of life scores obtained from the WHOQOL-Old instrument among older people during the period of social isolation (n=272). Pirapora (MG), Brazil, 2021.

Sex: Male / Female				
Facets	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
SF	70,2 (±15,9) / 78,7 (±17,9)	65,0 / 80,0	50,0-100 / 35,0-100	0,012
AUT	72,9 (±11,1) / 70,6 (±9,8)	75,0 / 70,0	50,0-100 / 50,0-100	0,176
PPFA	77,6 (±7,4) / 76,6 (±8,4)	80,0 / 75,0	55,0-95,0 / 50,0-100	0,504
SP	75,9 (±9,9) / 74,6 (±9,6)	80,0 / 75,0	50,0-100 / 40,0-100	0,347
DD	81,8 (±16,9) / 75,8 (±22,4)	85,0 / 85,0	40,0-100 / 20,0-100	0,266
INT	82,9 (±10,8) / 84,1 (±12,9)	80,0 / 80,0	55,0-100 / 25,0-100	0,408
Marital status: With spouse / Without spouse				
Facets	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
SF	76,5 (±17,5) / 80,0 (±18,3)	80,0 / 80,0	40,0-100 / 35,0-100	0,231
AUT	70,7 (±10,3) / 71,2 (±9,6)	70,0 / 70,0	50,0-100 / 50,0-100	0,494
PPFA	76,7 (±8,5) / 76,7 (±8,1)	75,0 / 77,5	50,0-100 / 55,0-100	0,928
SP	74,6 (±10,3) / 75,0 (±8,8)	75,0 / 75,0	40,0-100 / 40,0-95,0	0,820
DD	74,9 (±22,3) / 78,4 (±21,4)	75,0 / 85,0	20,0-100 / 20,0-100	0,129
INT	86,1 (±11,4) / 81,6 (±13,5)	80,0 / 80,0	45,0-100 / 25,0-100	0,008
Household arrangement: Alone / With someone				
Facets	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
SF	80,0 (±19,2) / 77,2 (±17,6)	95,0 / 80,0	45,0-100 / 35,0-100	0,255
AUT	73,2 (±10,0) / 70,4 (±9,9)	75,0 / 70,0	55,0-100 / 50,0-100	0,118
PPFA	76,5 (±7,9) / 76,8 (±8,4)	75,0 / 75,0	55,0-95,0 / 50,0-100	0,799
SP	75,8 (±8,4) / 74,6 (±9,8)	80,0 / 75,0	55,0-100 / 40,0-100	0,480
DD	84,4 (±17,0) / 74,9 (±22,5)	85,0 / 80,0	35,0-100 / 20,0-100	0,009
INT	82,4 (±11,4) / 84,3 (±12,9)	80,0 / 80,0	50,0-100 / 25,0-100	0,246
Age group (years): 60-79 / 80+				
Facets	Mean (standard deviation)	Median	Minimum-Maximum	p-value*
SF	78,0 (±17,8) / 73,2 (±18,7)	80,0 / 65,0	35,0-100 / 45,0-100	0,185
AUT	71,2 (±10,0) / 67,9 (±8,9)	70,0 / 70,0	50,0-100 / 50,0-85,0	0,221
PPFA	76,6 (±8,5) / 77,0 (±6,3)	75,0 / 80,0	50,0-100 / 60,0-85,0	0,578
SP	75,1 (±9,6) / 71,4 (±9,2)	77,5 / 70,0	40,0-100 / 55,0-90,0	0,034
DD	76,3 (±22,2) / 79,3 (±18,9)	85,0 / 85,0	20,0-100 / 40,0-100	0,703
INT	84,1 (±12,8) / 82,3 (±9,6)	80,0 / 80,0	25,0-100 / 65,0-100	0,285

* Mann-Whitney U-test; SF: Sensory Functioning; AUT: Autonomy; PPFA: Past, Present and Future Activities; SP: Social Participation; DD: Death and Dying; INT: Intimacy.

In the second stage of the study, 94 older people agreed to take part in the intervention; however, there were two losses due to a lack of telephone contact after three attempts on different days and at different times, and a total of 92 older people were assessed after the proposed program was made available. Most of the participants in the intervention were female (n=81-88,0%), with an average age of 69,4 years, brown-skinned (n=49-53,3%), married (n=62-67,4%), and living with family members (n=59-64,2%).

Analysis of the effect of the virtual exercise program revealed a significant increase in the overall WHOQOL-Bref score after the intervention ($p < 0,001$). The separate analysis of each domain, although showing an increase in scores, did not reveal any significant differences. In relation to the WHOQOL-Old, no significant differences were identified between the scores of the facets or even for the overall score of the instrument (Table 5).

Table 5 - Quality of life scores obtained from the WHOQOL-Bref and WHOQOL-Old instruments among older people during a period of social isolation ($n=92$), before and after a virtual intervention to encourage the practice of physical exercise. Pirapora (MG), Brazil, 2021.

WHOQOL-Bref scores			
Domains	Virtual Physical Exercise Program Mean (standard deviation) Before / After	Standard error Before / After	p-value*
PHY	68,1 ($\pm 9,1$) / 68,8 ($\pm 7,4$)	0,95 / 0,77	0,336
PSY	75,7 ($\pm 8,9$) / 75,9 ($\pm 7,7$)	0,92 / 0,80	0,799
SOC	79,1 ($\pm 8,8$) / 79,5 ($\pm 8,5$)	0,91 / 0,89	0,592
ENV	74,6 ($\pm 11,2$) / 75,2 ($\pm 10,2$)	1,16 / 1,07	0,690
Total	66,5 ($\pm 6,9$) / 74,1 ($\pm 6,4$)	0,71 / 0,67	<0,001
WHOQOL-Old scores			
Facets	Virtual Physical Exercise Program Mean (standard deviation) Before / After	Standard error Before / After	p-value*
SF	71,9 ($\pm 12,4$) / 73,6 ($\pm 10,7$)	1,29 / 1,11	0,466
AUT	75,7 ($\pm 9,9$) / 75,2 ($\pm 9,0$)	1,04 / 0,93	0,857
PPFA	77,3 ($\pm 9,8$) / 77,2 ($\pm 9,5$)	1,02 / 0,99	0,956
SP	74,3 ($\pm 11,9$) / 74,9 ($\pm 9,9$)	1,24 / 1,03	0,649
DD	76,4 ($\pm 21,5$) / 75,8 ($\pm 20,5$)	2,24 / 2,14	0,819
INT	84,8 ($\pm 13,1$) / 85,7 ($\pm 11,9$)	1,37 / 1,24	0,607
Total	80,3 ($\pm 7,8$) / 80,7 ($\pm 7,1$)	0,82 / 0,75	0,628

(*) Wilcoxon test

Discussion

This study made it possible to verify the QoL of older people taking part in a socialization group in the north of the state of Minas Gerais, Brazil. The scores observed in the first stage were lower than those reported in other studies in relation to some domains and facets through the instruments used.¹⁵⁻¹⁶ Improvements were seen in the assessment of QoL from a multidimensional perspective after the intervention, with eight weeks of a remote physical exercise program. This finding suggests that the strategy offered

contributed to maintaining or boosting the group's physical activity levels during the studied period.

When evaluating the observed values, the specificity of the context of the group surveyed stood out when compared to other studies in the literature.^{17,18} As they were older people who were part of the same socialization group and suddenly subjected to physical distancing with limited social interaction, possible changes in the perception of the aspects and factors that involve QoL were expected. The routine was understood to have been suddenly changed, with social relationships possibly being affected, and these facts may have interfered with the QoL of the older people.^{2,5,10}

It is notable that the use of WHOQOL instruments to assess QoL is widespread in the public health field. However, there are differences in the literature regarding the presentation and interpretation of the results. The criteria for calculating the scores of these tools are diverse in both national and international studies,^{8,19-20} and because there is no uniformity in the use of values or units of measurement, there is difficulty in interpreting and comparing the data.

Regarding the group surveyed, in the first stage of the study there was a predominance of older women. This coincided with the results of most of the studies presented in the literature, in which there was a majority of female participants in projects offering physical exercise. With regard to other demographic characteristics of older people in projects involving physical activity in Brazil, the largest number of participants were older people who were married, retired, aged between 60-69 and living with someone else, similar data to those observed in this study.^{8,19} The similarity of demographic characteristics between the various studies defined a profile of older people who were more involved in physical activities.

This profile reinforces the fact that adopting and maintaining a more active lifestyle brings benefits at all stages of life and can have a major impact on longevity. This behavior strengthens the idea of physical exercise as an agent that promotes health and quality of life, especially for older people in different aspects, whether physical, psychological or social, because as well as avoiding isolation, it also improves functional and cognitive capacity, providing better family and social relationships.^{7,20}

During the COVID-19 pandemic, social distancing, which was recommended and necessary at the time as a strategy to reduce the risks associated with the most severe form of the disease, brought up new challenges and psycho-emotional issues. The distancing measures that made it difficult to maintain recommended levels of physical exercise and

reduce sedentary behavior were just as important for improving physical and mental health as social engagement, which is also a key factor in successful aging.^{4,21}

Within this logic, it is important to point out that periods of social isolation are not usually experienced in the long term, but their impacts can be experienced for a lifetime.¹¹ In the studied group, the behavior adopted by older people during this period stood out, as the limitation of their social circle added to the reduction in regular physical exercise may have influenced the reduction of functional capacities such as autonomy and independence, and may have directly affected the emotional bonds built up until then, as the literature points out.^{4-5,11}

With regard to QoL, the WHOQOL-Bref domains in which the older people surveyed had the highest percentage scores and, consequently, the highest level of satisfaction, were *Social* for older people with a spouse and/or who lived with other people in their household, and *Psychological* for those aged up to 79. These data were confirmed by other studies carried out with older people, which found higher mean scores or points in the same assessed domains.¹⁹⁻²⁰

In relation to the WHOQOL-Bref, the lowest percentage observed was in the *Physical* domain, which is not in agreement with the literature.^{8,15} Although it is not possible to confirm this possibility, the behavior adopted by the older people evaluated with the reduction in the regular practice of physical exercise during the pandemic may explain the data observed in this domain, which evaluates items such as pain and discomfort, energy and fatigue, sleep and rest, mobility, daily activities, dependence on medication, and ability to work, since the systematic practice of physical exercise is an ally to the preservation of physical and functional integrity.²²⁻²³

As for the facets of the WHOQOL-OLD instrument, the highest mean percentages were found in the *Intimacy* and *Death and Dying* facets. It is important to note that the results observed differed from other studies carried out with older people who practiced physical exercise, since the mean percentages achieved by the participants assessed in the group in question exceeded the data described in the literature.^{15,19}

When analyzing the sociodemographic aspects that significantly influenced the QoL, differences were observed in this group when compared to other studies that evaluated the older people's perceptions on their position in life when considering the various intervening factors.^{8,23} The data on the evaluated group reinforced the probable singular interference of each dimension, whether physical, mental, social, among others, in the self-perception of QoL in the evaluated period.

In terms of sex, the women in the group surveyed performed better than the men in the *Sensory Functioning* facet, and this finding coincided with the literature. Studies have revealed greater satisfaction among women in this facet related to the functioning of the senses and less impact of the loss of sensory abilities on the assessment of QoL when compared to men.²⁴⁻²⁵

Older people with a spouse and/or who lived with more people had more contact with family members and friends, as well as a higher frequency of help received or given in their *social* circle,^{18,24} and this was observed in the *Psychological* and *Social* domains. The *Intimacy* facet performed satisfactorily, showing that older people who had people close to them were able to transmit good feelings, and those participants who lived with others reported less fear of death, according to the *Death and Dying* facet. These characteristics may have made it possible to maintain a more active and resilient behavior in the process of losing and controlling autonomy, as found in the research group.^{16,26}

For the group under study, age was a variable that showed a significant difference in the *Social Participation* facet, with older people aged up to 79 showing a higher percentage when compared to octogenarians, a finding reported in other studies.^{19,21} This finding may be related to engagement and participation in community activities, with older people under 80 tending to live with greater protagonism.

It was found that for this group of older people, living with a spouse and/or living with other people at home, as well as age, seemed to have a positive influence on QoL. Loneliness and social isolation often occur simultaneously and affect a significant proportion of the older population. However, initiatives that encourage social interaction and continuous learning, proposals that help boost self-esteem, inclusion and the establishment of new goals in this phase of life can have a positive impact on the QoL of older people.^{3,10}

It should also be noted that active aging in the physical and social spheres is a decisive factor for a satisfactory perception of QoL and health itself. The use of strategies that help people to remain or become physically active enables their autonomy in managing and making decisions about their lives, since older people tend to remain active and independent through socialization and integration into society.^{11,22}

With regard to evaluating the effect of the intervention, adherence to the physical exercise program may have enabled participants to significantly improve their perception of QoL, although they did not show a significant difference in isolation in the WHOQOL-Bref domains. The multidimensional assessment of QoL in the evaluated group showed satisfactory results, thus reaffirming the findings in the literature that physically active older people keep their functional capacities better preserved, which results in a successful aging

process.^{6,18,20} The study demonstrated the importance and positive effect of a virtual physical exercise program, albeit unsupervised, carried out in the home environment through remote guidance over eight weeks for older people during the pandemic.

Likewise, the history of physically active behavior of the evaluated group contributed greatly and positively to the assessment of QoL, as participation in health promotion strategies for older people enables healthy aging and, consequently, favors overall well-being.²⁴ Therefore, the virtual physical exercise program offered was an alternative to stimulate the increase and maintenance of physical activity levels in this population.

In the context of the pandemic, distancing measures were essential for the health of the population, but they may have led to behavioral changes that were not always beneficial, such as a reduction in regular physical exercise and a consequent increase in sedentary lifestyles, which may have had a negative impact on the assessment of QoL.^{2,11,21} From this perspective, the availability of the virtual physical exercise program may have helped the group under study to remain physically active at home and may have positively affected their QoL. This finding has shown that virtual physical exercise programs can be carried out satisfactorily through educational materials.

This study had limitations, especially with regard to the use of a convenience sample, of the application of the instruments by telephone, and of the non-representativeness of the sample in relation to the city of Pirapora. In addition, it was not possible to ensure that acceptance to take part in the intervention implied effective adherence to the proposed program. The lack of national studies assessing the quality of life of physically active older people during the pandemic made it impossible to establish comparisons. However, the study had the merit of presenting possibilities for intervention that proved to be positive for the group assessed.

Based on the observed results, although it is not possible to state it, the study showed that some domains of QoL were lower than expected and recorded by other studies, suggesting a possible influence of the pandemic. On the other hand, the results after the intervention showed that the perception of the QoL of older people was positively influenced by the virtual physical exercise program during the period of social distancing.

In this sense, further studies are needed to develop and offer virtual physical exercise programs for older people, as well as assessment tools to better understand their effects on QoL during the aging process.

Conclusion

The results of the intervention showed a positive effect of the proposed physical exercise program in virtual format on the overall perception of the QoL of older people. The findings of this study are considerable because they contribute, through the use of technological resources, for professionals to develop tools and intervention possibilities aimed at promoting the health of this population in unique contexts.

In view of the data that were found, it is recommended that care strategies be created through viable and safe alternatives that encourage autonomy and independence, especially by maintaining a physically active lifestyle, even during periods of restricted social contact.

As far as the implications for nursing are concerned, innovative practices break with the traditional model of providing care, enabling a broader look at the various factors that affect older people. Thus, advising and disseminating physical exercise programs in different formats to this public is an investment in health education since movement can reduce frailty and encourage behavioral change.

Authors' Contributions

Study design: Cleidiane Berto Aguiar, Antônio Prates Caldeira. **Data collection:** Cleidiane Berto Aguiar. **Data analysis and interpretation:** Cleidiane Berto Aguiar, Antônio Prates Caldeira. **Manuscript writing:** Cleidiane Berto Aguiar, Antônio Prates Caldeira, Rosângela Ramos Veloso Silva. **Critical revision of the manuscript:** Cleidiane Berto Aguiar, Antônio Prates Caldeira, Rosângela Ramos Veloso Silva. **Approval of the final version of the text:** Cleidiane Berto Aguiar, Antônio Prates Caldeira, Rosângela Ramos Veloso Silva.

Conflict of interest

The authors have declared that there is no conflict of interest.

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