

Identification of Relevant Elements for Promoting Effective Interventions in Old Age

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Abstract

The aim of this review is to identify relevant elements that ensure the effectiveness and efficiency of empirically based interventions (EBI), contrasting virtual and face-to-face intervention on active aging variables based on these indicators. We selected and encoded the 38 intervention studies (24 face-to-face, 12 virtual and 2 both modalities). These studies focus on six dimensions of quality of life, were published in the last decade and provide us data that allow the calculation of effect size and other comparative analysis. Descriptive and multivariate analyses show that the effectiveness of virtual empirically based interventions is comparable with face-to-face intervention depending on EBI indicators. We discuss the contributions and perspectives of such interventions. In conclusion, we advocate the need to increase the requirement of compliance with EBI indicators in interventions of this type.

Keywords: virtual interventions, face-to-face interventions, active aging, empirically based interventions.

Resumen

El objetivo de esta revisión es identificar los elementos relevantes que garantizan la eficacia y eficiencia de las intervenciones basadas empíricamente (IBE) contrastando la modalidad virtual y presencial sobre variables de envejecimiento activo en función de estos indicadores. Se seleccionaron y codificaron los 38 estudios de intervención (24 presenciales, 12 virtuales y 2 ambas modalidades) centrados en las 6 dimensiones de calidad de vida, publicados en la última década y que aportaban datos que permitían el cálculo del tamaño del efecto, así como otros análisis comparativos. Los análisis descriptivos y multivariados practicados muestran una eficacia de las intervenciones virtuales basadas empíricamente comparable con las presenciales dependiendo de los controles practicados. Se discuten las aportaciones y perspectivas de dichas intervenciones a la luz de los resultados y se concluye en la necesidad de aumentar la exigencia de cumplimiento de indicadores IBE en las intervenciones de este tipo.

Palabras clave: intervenciones virtuales, intervenciones presenciales, envejecimiento activo, intervenciones basadas empíricamente.

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Introduction

Recent studies have focused on improving the quality of life, the life satisfaction and the well-being of elderly people, at the same time as emphasizing the importance of optimizing physical, psychological and social components to achieve an active and healthy aging (Brown, Thompson, Zack, Arnold, & Barile, 2015). Such efforts are due to several factors, which include the increasing aging of the population; numerous scientific, social and medical advances; and the success of recent active-aging policies. Active aging's ultimate goal is quality of life, understood as the result of complex relationships between personal characteristics, objective living conditions in different areas, the individual's satisfaction with those conditions, and the evaluation made of these relationships, which is mediated by his or her own cognitive processes and values. Accomplishing healthy aging at a more personal level therefore means achieving well-being and quality of life in dimensions such as emotional and physical factors, mechanisms for self-control, self-regulation and self-image (hereafter SC-SR-SI), and cognitive, socio-communicative and functional aspects— all of this based on the uniqueness and heterogeneity of the elderly adult, not to mention the influencing effects that the environment and each individual's internal mechanisms

of subjective perception exert on these dimensions.

Traditionally, programmes and face-to-face interventions have been implemented for the improvement and optimization of these dimensions (Garnefski et al., 2013; Purath, Keller, McPherson, & Ainsworth, 2013). Recently, virtual tools have begun to be used (Morris et al., 2014; Siriaraya, Siang, & Bobrowicz, 2014). Owing to the recent development of these, there are few studies that use them with a older population. Their use has principally been reactive and medical, and also focused on dysfunctional aspects.

Although some studies extol the comparable efficacy of virtual and face-to-face interventions (Lappalainen et al., 2014), the majority of them do so for other age groups and in other fields. At the same time, others have identified a number of limitations in the design and implementation of virtual interventions that could have an impact on their efficacy (Andersson & Titov, 2014; Axpe & Uralde, 2008). These relate to factors such as the recruitment of the sample, online evaluation and diagnosis, the role of the researcher during the course of the intervention, or simply the ineffectiveness of such interventions in certain areas. As a result, they conclude by proposing the use of face-to-face interventions or, where appropriate, a combination of both modalities. However, none of these stud-

ies pays attention to compliance with empirically based interventions (EBI) indicators, which guarantee the efficacy and efficiency of interventions and which could influence the results, an aspect that will very much be taken into consideration in this investigation.

The aim of this review is to identify relevant elements that ensure the efficacy and efficiency of empirically based interventions (EBI), contrasting virtual and face-to-face intervention on active aging variables based on these indicators. This can serve as a basis for the design of future interventions that overcome the limitations found in the studies carried out so far.

We hypothesize that: (i) there are no differences in the efficacy of interventions based on the modality of intervention; (ii) differential efficiency and efficacy depends on the maximum compliance with EBI indicators; and (iii) the efficacy of interventions must be modulated by other variables such as age.

Method

Search for studies and selection criteria

We carried out a *systematic search* for different articles on intervention using virtual or face-to-face modalities for elderly people carried out between August 2014 and January 2015 through different *da-*

tabases (Medline, Web of Knowledge, Psycodoc, Pubmed and ERIC) using the following *keywords* (and their translations into Spanish): *active aging; emotion; self-efficacy, self-control; physical functioning, coping, social network; communication; social competence; cognition, memory; basic and instrumental activities; older people*. We identified 38 studies (two of which used both modalities of intervention; each modality will be analysed as if it were from an independent study) that met the following *selection criteria*: (1) are studies with elderly people implemented with effective strategies; (2) are for the years 2004-2014; (3) focus on one or more of the following dimensions of quality of life: emotional-affective; physical; SC-SR-SI mechanisms; cognitive; socio-communicative and functional; and (4) provide the data necessary for the calculation of effect size according to Cohen's formula (*d*).

Variables

We used three types of variables:

1. *Quality of life dimensions*, namely: emotional-affective (depression, anxiety, life satisfaction, emotional intelligence, positive and negative emotions, state of mind, stress); physical (physical functioning, balance, stamina, mobility, strength); SC-SR-SI (self-efficacy, self-control, coping,

self-esteem); cognitive (memory, attention, cognitive and mental functioning); socio-communicative (social networks, social role, loneliness); and functional (basic and instrumental activities of daily life). In total, we took into consideration 178 specific variables addressed in the different studies that fit within one of these dimensions;

2. *Characteristics of the studies reviewed*, including: general characteristics of the studies and of the intervention (country, year, scientific field, specific focus, type, context of intervention, duration, type of evaluation tool); characteristics of participants (sample, gender, average age, disorder of the participants, educational and socio-economic level, inclusion criteria); and effect size of the studies; and
3. *EBI Controls*, namely: recording of sessions, type of recording, training of instructors, intervention protocol, modality of intervention contrast, generalization, follow-up, total indicators.

Procedure

After identifying the 38 studies that met the selection criteria, these were analysed according to a recording protocol codified through *Excel* matrices that included the previous variables, calculating effect sizes at the same time. Finally, we performed descriptive and multivariate analyses (GLM).

Data analysis

As a first step, we calculated the studies' effect sizes by applying Cohen's formula or, for cases in which there was no control group, a formula taking the form of subtracting the mean of the pre- from that of the post-, with everything divided by the standard deviation of the control group. Subsequently, we conducted descriptive and multivariate analysis through the general linear model (GLM), using the program SPSS 22.0, around five grouping variables: *effect size*; *modality of intervention*; *total of EBI indicators*; *classification by ages*; and *quality of life dimension*.

Results

Description of the studies included in the review

Characteristics of participants

Half of studies have a design involving two groups (control and experimental). Samples are usually quite small and there is a largely female participation. Table 1 shows a summary of the main characteristics of the samples participating in the studies.

Characteristics of the interventions and EBI controls

The duration of these ranges between 4 and 24 weeks, with a

Table 1
Groups, Sample, Participants per Group, Average Age, Age Range and Gender of the Participants in the Studies Included in the Review

Study	Groups	Sample	Participants per group			Age (M y SD)	Age range	Gender (%)	
			CG	EG1	EG2			EG3	Men
<i>Face-to-face</i>									
Afonso and Bueno (2010)	3	90	30	30	30	—	65-94	78.89	21.11
Avia, Martínez, Rey, Ruiz, and Carrasco (2012a)	1	19	—	19	—	76 (6.67)	57-100	74	26
Avia, Martínez, King, Ruiz, and Carrasco (2012b)	2	45	7	38	—	85.7 (9.25)	57-100	97.5	2.5
Brawley, Rejeski, Gaukster, and Ambrosius (2012)	3	288	93	97	98	71 (5.15)	60-79	67.03	32.97
Clark et al. (2012)	2	360	173	187	—	67.07 (4.83)	60-95	65.8	34.2
Contreras et al. (2006)	2	38	19	19	—	74.9 (7.7)	63-77	92.2	7.8
Garnefski et al. (2013)	2	82	41	41	—	—	—	91.5	8.5
Gitlin et al. (2006)	2	319	159	160	—	48.37 (11.25)	70 and above	81.8	18.2
Gratz and Gunderson (2006)	2	22	10	12	—	79 (5.9)	19-58	—	—
Heckman et al. (2010)	3	295	86	104	105	33.32 (9.98)	50-76	33	67
Hui, Chui, and Woo (2009)	2	111	54	57	—	55.3	60-75	97	3
Kimura et al. (2013)	2	94	37	57	—	68.55 (4.35)	65-90	80.65	19.35
Korte, Bohlmeijer, Cappeliez, Smit, and Westerhof (2012)	2	202	102	100	—	74.3 (5.45)	55-83	76.7	23.3
Logghe et al. (2009)	2	269	131	138	—	63 (6.5)	69-93	71.05	28.95
Logsdon et al. (2010)	2	142	46	96	—	77.15 (4.65)	—	49.3	50.7
Lu, Zheng, Young, Kagawa-Singer, and Loh (2012)	1	19	—	19	—	73.75 (8.5)	31-83	—	—
Nuevo and Montorio (2005)	2	41	24	17	—	54 (11)	53-81	84.56	15.44
Purath et al. (2013)	2	64	35	29	—	65.6 (7.2)	61-85	73.5	26.5
Resnick, Luisi, and Vogel (2008)	2	166	66	100	—	66.2 (5.2)	60 and above	80.72	19.28
Sung, Chang, and Lee (2010)	2	52	23	29	—	73 (8.2)	65-99	44.23	55.77
Vergara and González (2009)	2	37	13	24	—	80.12 (7.55)	57-85	—	—
Wang (2005)	2	48	23	25	—	70.25 (7.5)	65-93	39.59	60.41
Wang, Hsu, and Cheng (2005)	2	94	48	46	—	75.6	65-93	44.68	55.32
Wing, Schutte, and Byrne (2006)	3	175	55	58	62	40.3 (16.04)	18-79	64	36

Table 2

Compliance with EBI Controls by the Studies Included in the Review

Modality	N	Follow-up			Recording of sessions	Training of instructors	Protocol	Intervention modality contrast	Generalization
		1	2	3					
Virtual	14	5	3	1	9	8	12	6	2
Face-to-face	26	12	6	0	18	18	22	11	0

Note. N = Number of studies.

variable number and duration of sessions. All feature pre-post evaluation, with follow-up not being the norm. Among the assessment tools used, self-reporting, and to a lesser extent resolution of tasks, observation and interview predominate. The contexts of intervention are varied: educational services, the home, centres for elderly people, and health and social centres. Table 2 contains a summary of compliance with EBI controls.

Comparative analysis between variables (GLM)

Multivariate analysis performed using the general linear model shows significant *multivariate contrasts* for all grouping variables taken into consideration: *effect size* [$\lambda_{\text{Wilks}} = .072$; $F_{(78, 330)} = 5.957$; $p \leq .001$; $\eta^2 = .584$]; *modality of intervention* [$\lambda_{\text{Wilks}} = .112$; $F_{(26, 112)} = 34.048$; $p \leq .001$; $\eta^2 = .888$]; *total of EBI Indicators* [$\lambda_{\text{Wilks}} = .0001$; $F_{(125, 541.352)} = 37.931$; $p \leq .001$;

$\eta^2 = .894$]; *classification by age* [$\lambda_{\text{Wilks}} = .0001$; $F_{(81, 326.884)} = 53.43$; $p \leq .001$; $\eta^2 = .929$], *y quality of life dimension* [$\lambda_{\text{Wilks}} = .071$; $F_{(130, 537.101)} = 2.939$; $p \leq .001$; $\eta^2 = .411$].

Based on the effect size

There is an inversely proportional relationship in relation to age: the younger the age, stronger the effect of interventions and vice versa. We found significant results according to the modality of intervention. The *post hoc contrasts* reveal differences upon contrasting the small effect sizes (face-to-face) with medium (virtual) in the variable referring to the modality of intervention ($p \leq .05$), a pattern repeated when comparing the post hoc contrasts between the medium and very large effect size (face to face) ($p \leq .04$). However, what seems to influence the efficacy and efficiency of differential interventions most of all is compliance with the maximum number of EBI indicators. Other

Table 3

Statistically Significant Results Taking Effect Size as a Grouping Variable

Variables	Small		Medium		Large		Very large		F	P	η^2
	M	σ	M	σ	M	σ	M	σ			
Age	69.99	10.71	66.15	13.8	56.51	20.2	56.09	16.96	7.62	.001	.15
Modality	1.35	0.48	1.63	0.49	1.71	0.48	1.22	0.43	4.87	.030	.10
Recording of sessions	1.59	0.49	1.47	0.51	1.31	0.48	1.17	0.38	4.43	.010	.10
Online recording of sessions	1.99	0.11	1.81	0.41	2.01	0.01	1.89	0.32	5.07	.002	.10
Training of instructors	1.51	0.51	1.53	0.51	1.11	0.32	1.11	0.32	5.50	.001	.11
Intervention Protocol	1.28	0.45	1.23	0.43	1.11	0.32	1.01	0.01	2.67	.050	.06
Modality contrast	1.54	0.50	1.53	0.51	1.20	0.42	1.06	0.24	6.48	.001	.13
Total EBI indicators	2.47	1.07	2.77	1.43	3.50	0.85	3.94	0.80	9.95	.001	.18

statistically significant results can be found in Table 3.

When we compared the *post hoc contrasts* between the significant variables obtained in tests for intersubject effects between the effect sizes, we found statistically significant differences in 15 of the 66 cases analysed (22.73%). For example, significant differences in the variables relating to the total number of EBI indicators were observed when the small effect sizes were contrasted against very large

($p \leq .001$) and medium against very large ($p \leq .01$).

Based on the modality of intervention

There are no significant differences in the effect of virtual and face-to-face interventions, nor in compliance with EBI. Other statistically significant results have been obtained and are available in Table 4.

Table 4

Statistically Significant Results Taking the Modality of Intervention as a Grouping Variable

Variables	Face-to-face		Virtual		F	p	η ²
	M	σ	M	σ			
Sample	126.46	96.45	67.57	81.85	14.26	.001	.09
Intervention context	3.04	1.84	4.19	2.36	10.47	.002	.07
Recording of sessions	1.41	0.40	1.60	0.49	5.32	.020	.04
Online recording of sessions	2.01	0.01	1.85	0.37	14.66	.001	.10
Written recording of sessions	1.57	0.50	1.81	0.40	9.45	.003	.07
Recording of sessions follow-up meetings	1.83	0.38	1.97	0.18	6.56	.010	.05
Other recording of sessions (phone, videos, external evaluators)	1.78	0.42	1.95	0.22	7.99	.010	.06
Generalization	2.01	0.01	1.95	0.22	4.36	.040	.03

Based on the total number of EBI indicators

The larger samples and those with a lower age are the ones that comply with a larger number of EBI indicators. We also found statistically significant results in relation to the effect size.

Upon comparing the *post hoc contrasts* between the significant variables obtained in tests for intersubject effects between the to-

tal of EBI indicators, statistically significant differences in 39 of the 130 analysed cases (30%) were observed. There is a general trend that is proven by the presence of statistically significant differences upon contrasting studies with compliance with 1 and 2 indicators with ones that meet 3 and especially 4 or more EBI criteria in most of the variables. Further information can be found in Table 5.

Table 5

Statistically Significant Results Taking as a Grouping Variable Total EBI Indicators

Variables	1 (n = 16)		2 (n = 56)		3 (n = 55)		4 (n = 33)		5 or more (n = 18)		F	p	η ²
	M	Σ	M	σ	M	σ	M	σ	M	σ			
	Sample	64.86	21.29	52.71	62.15	154.16	99.41	51.31	76.66	207.07			
Number of groups	2.01	0.01	1.71	0.46	2.25	0.65	2.15	0.38	2.04	0.55	7.61	.001	.22
Age	67.28	2.32	73.77	8.86	69.21	11.16	39.51	14.76	52.47	4.58	29.52	.001	.53
Intervention context	5.01	1.03	3.73	2.73	3.14	2.18	2.92	0.28	3.01	0.33	2.44	.040	.08
Effect size	0.16	0.37	0.11	0.38	0.28	1.12	1.10	1.54	0.42	1.34	4.66	.001	.15

Table 6

Statistically Significant Results Taking as a Grouping Variable Classification by Ages

Variables	Under 65		65-70		70-75		Over 75		F	p	η^2
	M	σ	M	σ	M	σ	M	σ			
Modality	1.5	0.51	1.54	0.51	1.19	0.4	1.48	0.51	3.56	.020	.07
Dimension	2.4	2.25	2.69	1.81	2.86	1.73	4.07	1.63	6.08	.001	.12
Intervention context	2.57	0.5	4.46	1.36	2.14	1.82	4.91	2.51	21.37	.001	.32
Recording of sessions	1.01	0.001	1.46	0.51	1.69	0.47	1.74	0.45	25.35	.001	.36
Online recording of sessions	1.74	0.44	2.01	0.001	2.01	0.001	2.01	0.001	11.66	.001	.21
Written recording of sessions	1.43	0.5	1.62	0.5	1.69	0.47	1.88	0.33	6.74	.001	.13
Recording of sessions follow-up meetings	1.94	0.24	1.69	0.47	2.01	0.001	1.86	0.35	5.7	.001	.11
Other recording of sessions (phone, videos, external evaluators)	1.83	0.38	1.65	0.49	2.01	0.001	1.86	0.35	5.14	.002	.10
Intervention Protocol	1.17	0.38	1.04	0.2	1.11	0.32	1.48	0.51	9.29	.001	.17
Intervention modality contrast	1.29	0.49	1.65	0.49	1.58	0.5	1.36	0.49	4.33	.010	.09
Generalization	1.91	0.28	2.01	0.001	2.01	0.001	2.01	0.001	3.16	.030	.07
Monitoring	1.37	0.49	1.5	0.51	2.01	0.001	1.43	0.51	16.23	.001	.27
Total indicators	3.80	1.21	2.73	1.78	2.31	0.67	2.43	0.55	14.28	.001	.24
Disorder participants	2.14	0.65	2.15	1.01	2.61	0.64	1.67	0.48	12.29	.001	.22

Based on age

The results show a predominance of virtual interventions in people older than 70 years and offer significant data in relation to the quality of life dimension. Interventions related to the *socio-communicative* dimension dominate for those under 65; *physical* factors dominate for those between 65 and 75, and *functional* factors for over 75s.

The *post hoc* contrasts between the significant variables obtained in tests for intersubject effects reveal statistically significant differences in 45 of the 126 cases analysed (35.71%). It is worth highlighting those obtained when comparing the group of 65-70 year-olds and that of 70-75 year-olds

in variables relating to modality of intervention, with *virtual interventions* predominating in the second group ($p \leq .05$). It is also worth highlighting the differences found upon contrasting the group of over-75s (functional) with the rest of the age groups according to the quality of life dimension dealt with: Under 65 ($p \leq .002$) (*socio-communicative*); 65-70 ($p \leq .04$) (*physical*); and 70-75 ($p \leq .05$) (*physical*). We should also underline those found in terms of the total EBI indicators between groups of under-65s and the rest of the groups, with a lower compliance with indicators as age increases: 65-70 years ($p \leq .003$); 70-75 ($p \leq .001$) and over the age of 75 ($p \leq .001$). Other relevant results are available in Table 6.

Based on the quality of life dimension

The results suggest that with a higher age there is a predominance of interventions on *cognitive*, *functional* and *physical* dimensions. This result is reinforced upon analysing the *post hoc contrasts* where what stands out are significant differences found according to age for focuses related to SC-SR-SI (61.4 years) vs. the *cognitive* dimension (75.04 years) ($p \leq .02$); and the *emotional* dimension (59.95 years) vs. the *cognitive* ($p \leq .001$), *physical* (71.5 years) ($p \leq .03$) and *functional* (74.6 years) ($p \leq .04$) dimension. Other statistically significant results in relation to certain EBI indicators (recording of sessions, intervention protocol) can be obtained.

Finally, other *post hoc contrasts* show statistically significant differences in 25 of 210 cases analysed (11.9%), as for example in relation to some criteria of the empirically based interventions.

Discussion

Based on the stated objective, the fulfilment of the hypotheses can be seen. The results obtained confirm the non-existence of significant differences according to the modality of intervention, which had already also been found in other age groups and fields (Chen, Siau, & Nah, 2012; Wagner, Horn, & Maercker, 2014). This is because

the effect of interventions is mainly conditioned by compliance with EBI indicators and by other modulating variables such as the average age of participating samples. Other types of characteristics of groups such as the educational level of participants could also exert an impact, as in most of the face-to-face interventions reviewed a low-medium level of education predominated, with a medium-high level in the case of virtual interventions. There are also other factors in relation to groups that might have an influence, such as the socio-economic level, the level of autonomy and the presence or otherwise of disease/disorder.

With regards to the EBI indicators, we noted how from approximately four indicators the effect of the interventions is big to very big, with no differences existing between the two types of modality in terms of compliance with them. That is, the real effect of interventions measured by effect size (independent of the strategy used) is insufficient to assess the differential efficacy of interventions, and the rest of the EBI indicators are required. Therefore, if EBI indicators are a guarantee of rigour and of efficacy and efficiency of interventions, they must become factors to be carefully kept in mind during any intervention design (Faggiano et al., 2014).

On the other hand, as the average age of the participants increases, the effect of the interven-

tions is lower. This is probably due to the biological, psychological and social changes that occur in the normal aging process and that are associated with the deterioration of different capacities and functions.

As a result of this review, other results in addition to the confirmation of the hypotheses have been obtained.

It is possible to detect age differences associated with the quality of life dimension referred to in the studies. It is well known that nowadays old age is considered as another stage of development, and it is full of new requirements that need to be adapted to as they appear and that need to be met with the right solutions. Probably the first changes that the elderly have to face appear at the emotional and social level and affect the individual's capacities and mechanisms to manage them: retirement, loss of social ties, decrease in confidence in their own abilities, feelings of lack of social validity, and so forth. Subsequently, biological aging will lead to a decrease in physical, cognitive and functional capabilities (Mansilla, 2000). Thus, as age increases, interventions are more focused on these latter dimensions.

Contrary to what one might think, there is a predominance of virtual interventions for people older than 70 years, with especially significant differences found in people aged 65-70 (face-to-face) and 70-75 (virtual). This could be explained by the progressive loss of autonomy

that is associated with age and that negatively affects the elderly person's whole functioning (cognitive, physical and so forth). For this reason, virtual tools can become powerful instruments to overcome these difficulties by allowing an adaptation to all kinds of personal circumstances, overcoming barriers of space and time (Martínez-Pecino, Matos, & Silva, 2013).

In terms of the characteristics of the studies, a duration of interventions that varies between 4 and 24 weeks stands out, with a variable number and duration of sessions. Most of the interventions—whether face-to-face or virtual—are individual, and of a psychological or medical nature. We found important limitations in the studies that include the predominance of a design of only two groups, one control and the other experimental, pre-post usually without follow-up and samples that are usually quite small and predominantly female. The contexts of intervention are varied, with medical contexts predominating, thus confirming an approach based on dysfunctional aspects.

In short, although the results confirm that virtual interventions can be as effective as more traditional methodologies in face-to-face formats, paying attention to compliance with EBI indicators, it is necessary to encourage more studies that employ virtual technologies, as these may be a more efficient, cost-effective method (Lappalainen et al., 2014).

There is a series of constraints to this study that must be taken into consideration. The number of virtual studies is lower than face-to-face ones due to the interest of gerontological research in the use of these tools being recent. Moreover, for the interpretation of effect size Rosenthal's (1996) classification was used, which perhaps may have limited the results of the study in the sense that, with the establishment of greater number of categories, the results are more scattered. Finally, we must not forget that these results should be taken with caution given the difficulties of generalization. Future lines of research could focus on the design and implementation of new intervention programmes in any of the modalities that exceed the limitations found in this study, especially with regards to compliance with EBI indicators, given their role

in ensuring the efficacy of interventions. That said, and knowing the absence of differences in the efficacy of both modalities of intervention, there are multiple reasons that would justify the need to prioritize the design of virtual interventions for older people. We should not forget the influence of new technologies in today's societies and their important role in promoting the integration of the elderly into them, or the advantages that they offer to achieve a greater number of users in any space and at any time or the limited existing research on the subject. There is a field yet to be explored here.

Finally, we should note that the results derived from this research may have important implications at social, institutional and scientific levels.

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