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ORIGINAL

INTERGENERATIONAL PHYSICAL ACTIVITIES AND WELL-BEING IN CHILDHOOD

ACTIVIDAD FÍSICA INTERGENERACIONAL Y BIENESTAR EN LA INFANCIA

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ABSTRACT

The objective of this work was to examine whether the practice of physical activity shared by grandparents and grandchildren is associated with increased psychological and physical well-being in childhood. In this research, participants were 1080 children aged 6 to 12 (53.61% female and 46.38% male) from northern Spain. Concerning leisure, 32.4% of the children practiced physical leisure activity with their grandparents and considered that sharing leisure with their grandparents contributed to their psychological and physical well-being. The practice of physical activity shared by grandparents and grandchildren was positively associated with the grandchildren's greater perception of physical and psychological well-being. Social and family intervention policies should be aimed at promoting intergenerational settings for family physical activity because of its contribution to children's physical-sports adherence and the increase in children's physical and psychological well-being.

KEYWORDS: psychological well-being; physical activity; grandchildren; grandparents

RESUMEN

El objetivo de este trabajo fue examinar si la práctica de la actividad física de ocio compartida entre abuelos y nietos se asocia con un mayor bienestar psicológico y físico en la infancia. Participaron en esta investigación 1080 niños y niñas de entre 6 y 12 años, 53,61% mujeres y 46,38% hombres, de la zona norte de España. Un 32,4% de niños practicaban actividad física de ocio con sus abuelos y opinaron que el ocio compartido con sus mayores les aportaba bienestar psicológico y físico. La práctica de actividad física compartida entre abuelos y nietos se asoció positivamente con un mayor bienestar físico y psicológico de los nietos. Las políticas de intervención social y familiar deben dirigirse a favorecer entornos de práctica de actividad física familiar intergeneracional por su contribución a la adherencia físico-deportiva de los menores y al incremento de su bienestar físico y psicológico.

PALABRAS CLAVE: Ocio, bienestar, actividad física, nietos, abuelos.

INTRODUCTION

Currently, life expectations and quality of life have increased thanks to scientific and technological advances, marking a process of verticalization in the population pyramid and reflecting a greater demographic representation of older people. These older citizens, in a greater proportion than decades ago, enjoy more positive, healthy, active, satisfactory, and productive aging, driven to a large extent by their participation in significant activities that favor the conservation and optimization of their physical and functional health [1-2].

This demographic variation has produced many changes in family structure and traditional roles, leading to the emergence of new roles and transforming

intergenerational relationships [3]. As a result, although grandparents and grandchildren may not live in the same household, there is a greater presence of grandparents in the lives of their grandchildren [4-8].

The scientific literature supports that contact between grandparents and grandchildren leads to extraordinary well-being for both generations. On the one hand, grandparents feel close to and like accomplices of their grandchildren because they can contribute significantly to their immediate family context. This gives them vitality, joy, and enjoyment, and contributes to active, healthy, and successful aging [12-14]. On the contrary, some studies find that there is no clear benefit or prejudice in this caring relationship between grandparents and grandchildren [15]. On another hand, grandchildren consider their grandparents as familial, educational, and social referents throughout their lives, which produces a relationship of family solidarity [16-18]. Previous studies show that grandchildren's satisfaction with the relationship with their grandparents is strengthened by the assiduousness of the contact, as well as by the performance of activities [19-20]. These activities are often related to accompaniment, attention, protection, and/or care in tasks related to sharing meals, chatting, listening to music, talking on the phone, telling stories, playing, walking, visiting family and friends, arguing, etc.

However, it is interesting to go beyond these protective and caring tasks, which sometimes involve a family obligation or responsibility, and focus on other tasks that provide more engagement and interaction between the two generations.

In this scenario, intergenerational physical activities during leisure time can be an ideal shared activity for both generations. Physical activity refers to any motor action that requires bodily intervention for its performance. Among others are included didactic exercises, traditional sports games, as well as self-managed free activity that benefits personal development, which are carried out in leisure time [21]. These practices are shared by members of different generations, in this case, by grandparents and grandchildren.

These experiences provide benefits for both generations related to pleasure, satisfaction, well-being, and quality of life because they perform an important ludic and human developmental function [22]. They are also carried out in contexts that promote the relationship, socialization, and interaction, as well as the transmission and acquisition of values, traditions, and patterns of behavior and coexistence [23,24]. In particular, for the grandchildren, the performance of a physical activity from an early age favors the acquisition and consolidation of a habit of regular life-long practice, optimizing healthy development [25,26,27,28,29]. And the grandparents derive multiple physical, cognitive, social, affective, and emotional benefits from the practice of physical activity, allowing them to face the processes of aging more actively and healthily [30,31,32,33,34,35].

More specifically, the physical leisure activities shared by grandparents and grandchildren can be a very valuable experience for both of them, not only for their physical benefits but also to strengthen emotional bonds [36]. Besides, the grandparents perceive the benefits of leisure physical activity for their

grandchildren's integral health. They support it directly, practicing it with them, taking them to places to perform physical activity, asking them to be physically active, or rewarding them for this practice. They also support it indirectly, through suggestions to parents to encourage the children to be physically active [37].

However, the changes and needs of today's society have led to a decrease in physical practice due, in part, to domestic activities' facilitating the grandparents' supervision [38]. This has led to a reduction in the practice of shared family physical activity compared to other more sedentary activities, such as eating together or chatting [39]. Previous studies have found that, when grandchildren live in the same household as their grandparents, the grandparents become more involved in caring and learning tasks, whereas, when they do not share housing, there are more opportunities to enjoy leisure time with more active experiences related to entertainment and play [8].

It is important for the grandparents to be physically active models for their grandchildren, and provide them with the necessary support for motor practice, which will minimize health risks like those related to childhood obesity [40].

The benefits of motor practice in general, those linked to the physical activity of leisure shared by grandparents and grandchildren in particular, as well as findings concerning the improvement of the quality of family leisure time in the context of physical activity [41,42], justify the objective of this study, focused on examining whether the practice of grandparents' and grandchildren's shared leisure physical activity is associated with greater psychological and physical well-being in childhood versus the perceived well-being of other leisure experiences shared by the two generations.

MATERIAL AND METHODS

Participants

The population of this work was made up of children from 6 to 12 years of age residing in the north of Spain. This northern area was made up of 8 Spanish provinces: Cantabria, Biscay, Guipuzcoa, Alava, La Rioja, Navarre, Burgos, and Palencia.

Taking into account that every child from 6 to 12 years must be enrolled in an educational center in the Spanish state, the study population was defined based on the statistical data published by the counsels and education departments of each autonomous community. The data collected showed a population size of 250,357 Primary Education students in northern Spain (Figure 1).



Figure 1. Northern area of Spain (according to the Nielsen areas): Cantabria, Biscay, Guipuzcoa, Alava, La Rioja, Navarra, Burgos, and Palencia.

The climate of northern Spain, being the coldest and wettest in the country, resembles the climate of other European and Asian countries. Its flora is one of the most varied on the continent, and its culture is of great richness and variety. Hence, this Spanish region is considered of great international interest.

Setting an absolute error of 3%, a 95% confidence level, and considering the assumption of $p = q = 0.5$, the sample size was estimated at 1075 students. With an experimental mortality of 1.11%, the final sample size consisted of 1063 students. The sampling rate was probabilistic, stratified, and proportionate by provinces. The selection of the final sample units to be surveyed was carried out with clusters, randomly selecting entire educational centers from each of the 8 provinces that make up the northern part of the Spanish state (Table 1).

Table 1. Population and sample under study. Children in Primary Education (6-12 years) in northern Spain

	<i>Provinces</i>	<i>Population</i>	<i>Sample</i>	<i>Number of selected centers</i>
<i>NORTHERN SPAIN</i>	Cantabria	33608	146	3
	Biscay	64813	277	6
	Guipuzcoa	44456	190	4
	Alava	20163	86	2
	La Rioja	19366	83	2
	Navarre	40468	175	4
	Burgos	19774	85	2
	Palencia	7709	34	1
	TOTAL	250357	1063	24

Source: Councils and Education Departments of Cantabria, Basque Country, La Rioja, Navarre, and Castilla León.

Concerning age, 14.0% (n=151) of the participants was 6 years old, 15.6% (n=168) was 7, 18.1% (n=195) was 8, 17.7% (n=190) was 9, 17.4% (n=187) was 10, and 17.2% (n=185) was 11 (some were newly 12 years old).

Regarding whether the grandchildren lived with their grandparents, 94.6% of the children did not live with their grandparents, 3.7% lived with one grandparent, 1.3% with two grandparents, and 0.4% with three grandparents.

Instruments

The absence of a valid and reliable instrument to collect the relevant information for this study led to the development of an ad-hoc questionnaire to gather the data through 7 variables: leisure shared with the grandparents, physical activity of the leisure shared with grandparents, number of grandparents with whom they share physical leisure activity, kinship of the grandparents with whom they share physical leisure activity, gender of grandparents with whom they share physical leisure activity, psychological well-being contributed by shared leisure with their grandparents, and physical well-being contributed by leisure shared with their grandparents. The internal consistency of the scales of psychological and physical well-being provided by leisure shared with grandparents was confirmed in the sample of this study, obtaining Cronbach alpha values of 0.94 and 0.78, which ensured the validity of the instrument.

The variables recorded for this study are defined below:

Leisure shared with grandparents: This is a dichotomic variable that records whether participants share some kind of leisure activity with their grandparents (cultural activities, screen activities, festive activities, creative activities, ludic activities,...). The established categories are: yes/no.

Physical activity shared with grandparents: This is a dichotomous variable that records whether participants share physical leisure activity with their grandparents. The established categories are: yes/no.

Number of grandparents with whom the participant shares physical leisure activity: This is a numerical variable that records with how many grandparents the respondent practices physical leisure activity.

Kinship of the grandparents with whom the participant shares physical leisure activity: This is a categorical variable that identifies whether physical activity is performed with paternal grandparents, maternal grandparents, or both paternal and maternal grandparents.

Gender of the grandparents with whom the participant shares physical leisure activity: This is a dichotomous variable that identifies whether physical activity is practiced with grandmothers, grandfathers, or both grandmothers and grandfathers.

Psychological well-being provided by leisure shared with the grandparents: The information of this variable is collected through a 5-point Likert scale rating the degree of agreement/disagreement with the expression "The leisure that I share with my grandparents helps me to be happier, to enjoy that leisure more, and to have more fun". The value 1 indicates total disagreement and the value 5 indicates total agreement.

Physical well-being provided by shared leisure with the grandparents: The information of this variable is collected through a 5-point Likert scale rating the degree of agreement/disagreement with the expression "The leisure that I share with my grandparents helps me to be fit, control my movements better, and improve my physical form". The value 1 indicates total disagreement and the value 5 indicates total agreement.

Procedure

The questionnaire was applied to students from the different randomly selected schools in each of the 8 provinces that make up the northern part of the Spanish state. Before the application of the instrument, permission was sought from the General Director of Education of each province. After permission was obtained, consent was requested from the parents or legal guardians of the minors. Participants were also informed and ensured at all times about the confidentiality of the responses, as well as the protection of their rights and guarantees. Five previously trained researchers went personally to each center, to interview each participant individually and record their responses in the digitized questionnaire. Within each of the selected clusters (schools), only all those students who provided the signed consent were interviewed. The Ethics Committee of the researchers' university approved this procedure on December 17, 2019. The positive report of this Ethics Committee was recorded with the code CE_02_2019.

Analysis

Using the SPSS 23.0 statistical program, data analysis was performed in two phases: First, a descriptive study was carried out through the frequency statistic, which determined the percentage of children aged 6-12 who share leisure time with their grandparents and of those who engage in physical leisure activity with their grandparents. It also determined, through the means and standard deviations, the degree of psychological and physical well-being that sharing leisure time with their grandparents provides to the children.

In the second phase, an inferential analysis was carried out through two tests: (a) Student's parametric *T*-test for independent samples, to determine possible significant differences in the psychological and physical well-being provided by leisure shared with their grandparents depending on whether or not the shared leisure time involved physical activity, and (b) a one-factor analysis of variance (one-factor ANOVA) to determine possible significant differences in the psychological and physical well-being provided by leisure time shared with their grandparents depending on whether or not a physical activity was performed

during that leisure time. Variance homogeneity was tested to confirm the assumptions of normality and homoscedasticity. Contrasts were also made using multiple post-hoc comparisons; when Levene's statistic showed equal variances, Tukey's test was used, whereas when the variance presented different values, the Games-Howell test was used. Finally, Pearson correlation analysis was performed between the psychological and physical well-being provided by leisure shared with their grandparents and the number of grandparents with whom they engaged in physical activity.

The level of significance established for this study was set at $p < .05$.

RESULTS

Do children from 6 to 12 years old in northern Spain engage in physical activity with their grandparents?

Of the sample of children aged 6 to 12 in northern Spain, 32.4% reported practicing physical activity (PA) with their grandparents during their shared leisure time (Figure 2). Concerning kinship, 17.2% of the children practiced PA with their maternal grandfather, 16.1% with their maternal grandmother, 11.7% with their paternal grandmother, and 10.1% with their paternal grandfather (Figure 3). As for the grandparents' gender, 13.3% of the children practiced PA with both grandparents, 10.2% only with their grandfathers, and 8.9% only with their grandmothers.

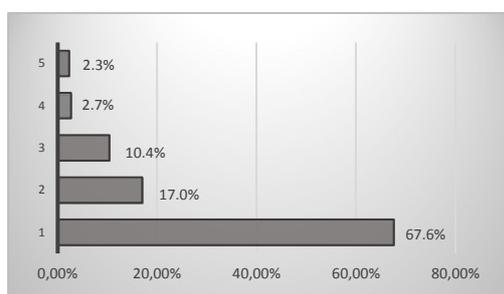


Figure 2. Number of grandparents with whom the children practice PA.

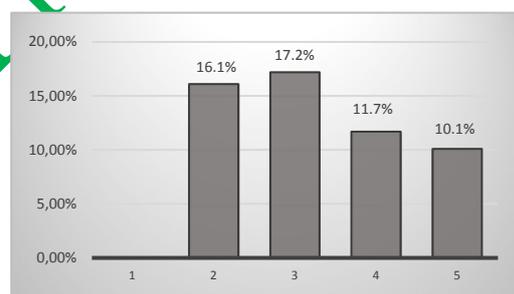


Figure 3. Kinship of the grandparent with whom the children practice PA.

Does the physical and psychological well-being of leisure shared with grandparents increase when one of the activities shared by the two generations is physical activity?

Children aged 6-12 who perform physical activities with their grandparents agree considerably that the leisure shared with their grandparents contributes to their psychological well-being (feeling happier, enjoying specific leisure more, and having more fun) ($M = 4.84 \pm 0.472$), and also that it helps them improve their physical well-being (feeling fitter, better control of their movements, better physical form) ($M = 4.01 \pm 1.116$).

For their part, children who did not share PA with their grandparents, but who did share other leisure activities (cultural activities, screen activities, festive activities, creative activities, ludic activities,...) also highly agreed that the leisure they shared with their grandparents provided psychological well-being ($M = 4.75$

± 0.639). However, they did not particularly agree that it would produce physical well-being ($M = 2.89 \pm 1.426$).

Student's *T*-test for independent samples revealed that children aged 6-12 years perceived to a greater extent that the leisure shared with their grandparents increased their psychological well-being (PA with grandparents 4.84 ± 0.472 ; No PA with grandparents 4.75 ± 0.639 , $p < .10$) and their physical well-being (PA with grandparents 4.01 ± 1.116 ; No PA with grandparents 2.89 ± 1.426 ; $p < .01$) when one of the leisure activities they shared with their grandparents was PA.

Does the physical and psychological well-being of leisure time shared with the grandparents differ depending on the gender of grandparents with whom the children share PA?

The results of the one-factor ANOVA for the gender of the grandparents with whom children aged 6-12 years in northern Spain shared PA rejected the equality of the population variances analyzed in both cases. However, it revealed significant differences in the physical well-being provided by sharing leisure time with their grandparents, but not in their psychological well-being (Table 2).

Table 2. Summary of the one-factor ANOVA: psychological and physical well-being provided by leisure shared with their grandparents vs. gender of the grandparents with whom they share leisure

The leisure I share with my grandparents helps me...	Levene's Statistic	<i>p</i>		Sum of squares	<i>df</i>	Quadratic mean	<i>F</i>	<i>p</i>
...be happier, to enjoy that leisure even more, to have more fun	7.451	.000	Intergroups	2.044	3	.681	1.955	.119
			Intragroups	372.225	1068	.349		
			Total	374.269	1071			
...be fit, control my movements better, improve my physical condition	17.698	.000	Intergroups	298.505	3	99.502	55.988	.000*
			Intragroups	1892.719	1065	1.777		
			Total	2191.224	1068			

Note: $p < .005$. * $p < .05$.

When examining in-depth these significant differences of the multiple comparisons through the Games-Howell test, we observed that children who did not practice PA with their grandparents perceived that the leisure shared with their grandparents provided less physical well-being ($M = 2.89$) than that of children who practiced with their grandmothers ($M = 3.93$), children who practiced PA with their grandfathers ($M = 4.11$), and children who were physically active with both their grandmothers and their grandfathers ($M = 4.00$). However, no significant differences were detected between the three population groups who performed PA with their grandparents (those who practiced PA only with their grandmothers, those who did so only with their grandfathers, and those who did so with both their grandmothers and grandfathers; see Table 3).

Table 3. Multiple comparisons using Games-Howell test: analysis of the physical well-being provided by the practice of shared leisure with grandparents vs. gender of grandparents with whom the children practice PA.

(I) Gender of grandparents with whom they share PA	(J) Gender of grandparents with whom they share leisure time	Difference of means (I-J)	Standard error	p
They do not share	Only share with grandmothers.	-1.036*	.129	.000
	Only share with grandfathers.	-1.218*	.118	.000
	Share with grandmothers and grandfathers.	-1.108*	.106	.000
Only share with grandmothers	Only share with grandfathers	-.182	.158	.657
	Share with grandmothers and grandfathers	-.073	.149	.962
	Share with grandmothers and grandfathers			
Only share with grandfathers	Share with grandmothers and grandfathers	.109	.140	.863

Note: $p < .005$. * $p < .05$,

Does the physical and psychological well-being of the leisure time shared with grandparents differ depending on the number of grandparents with whom the children share PA?

The correlation analysis revealed a positive linear relationship between the physical well-being of leisure shared with their grandparents and the number of grandparents with whom they shared the practice of PA ($r = .308$, $p = .000$) (Figure 4). However, there was no linear relationship between the number of grandparents with whom PA was shared and the extent to which the children perceived that the leisure shared with their grandparents produced psychological well-being ($r = .057$, $p = .064$).

DISCUSSION

As shown in the results obtained, before the COVID-19 pandemic, most of the children of primary education in northern Spain shared leisure activities with their grandparents and, more specifically, one-third of them engaged in leisure PA with their grandparents. This is a remarkable percentage, suggesting that grandparents currently play a more active role and engage assiduously in everyday activities with their grandchildren [43]. This reality makes it easier for grandparents to provide physically active models for their grandchildren and supply them with resources for motor practice, helping to minimize health risks, such as those linked to childhood obesity, as Blanco and colleagues point out [40]. This motor practice during leisure time can be established as an essential factor for the well-being of grandparents and grandchildren.

This work shows that grandchildren share more motor activities in their leisure time with their maternal grandparents. This trend could be due to the increased frequency of contact with maternal grandparents, as the parenting model has not evolved as much as society has projected, and, in most cases, mothers continue to spend more time with their children [19,37].

The primary education students of northern Spain who include PA in the leisure shared with their grandparents reported that these experiences provide satisfaction, enjoyment, and fun. The scientific literature considers these elements essential for valuable leisure time [21,36], and such experiences contribute to the maintenance and improvement of children's fitness and physical condition, a priority in the practice of PA according to many authors [41,44]. This finding confirms what other investigations [46] have glimpsed: that the leisure PA shared by grandparents and grandchildren is positively associated with the children's well-being, both physical and psychological.

Although the scientific literature notes that contact between grandparents and grandchildren promotes well-being in both generations [9-11], this study shows that, in general, the leisure experiences shared by grandparents and grandchildren are associated with high levels of psychological well-being and moderate levels of physical well-being, which rise considerably when the shared leisure is physical-sports. The psychological and physical well-being of leisure shared with the grandparents is independent of the gender of the grandparents with whom PA is shared.

Finally, the results of this research reveal a linear association between the physical well-being that intergenerational leisure provides to grandchildren and the number of grandparents with whom they share PA. This confirms that the degree of physical well-being increases with the increase in the number of grandparents with whom PA is practiced. This shows that the more intergenerational motor practice shared, the higher the possibilities to increase children's physical well-being.

In short, this study finds that leisure shared by grandparents and grandchildren contributes to the quality of life of the children, generating high levels of psychological well-being and if the shared activities are physical-sports, the levels of physical well-being also increase considerably. These findings point to new hypotheses to be contrasted. Considering that motor practice from an early age promotes the acquisition and consolidation of a lifetime habit of regular practice [24-28] and that PA shared with grandparents generates high levels of psychological and physical well-being in children, physical exercise with the grandparents could reinforce the acquisition and consolidation of physical-sports practice.

In short, we note that physical-sports leisure shared with the grandparents contributes to the integral development of healthier grandchildren [25,26,27,28,29].

Given that intergenerational leisure generates benefits at the cognitive, social, affective, and emotional level in the grandparents, favoring a more active and satisfying aging process [30, 31, 32, 33], it would be interesting for future research to determine whether the practice of PA shared with the grandchildren is associated with increases in older people's level of physical and psychological well-being.

Finally, as a limitation of the study, social desirability may have increased the grandchildren's well-being measures. The scientific literature [46] has confirmed that individuals tend to increase the degree of satisfaction and happiness of their responses, especially in the subject under study, which implies intense affective and emotional links.

CONCLUSIONS

Children's physical and psychological well-being is higher when they practice PA with their grandmothers and/or grandfathers, and the more grandparents who exercise physically with the children, the higher the children's well-being. It is recommended to stimulate physical practice shared by young and old from the family institution, the public administrations, the associative fabric, as well as from other public and private institutions.

The fact that one in three children in northern Spain practice PA with their grandparents indicates that the incorporation of this intergenerational practice should be encouraged in the remaining two-thirds of the population. This implies that it is necessary to design, articulate, and implement spaces and times that encourage the motor co-participation of grandmothers and grandfathers from the grandchildren's early ages. These actions must be based on the construction of experiences that are valuable leisure time for both grandchildren and grandparents. To this end, intergenerational leisure programs must jointly meet the needs of grandparents and grandchildren. Grandparents should engage in the experience of physical-sports leisure shared with their grandchildren, prioritizing co-participation, freedom of choice, adaptation to the expectations of both generations, enjoyment, creativity, receptivity, and contemplation.

Current health and social challenges demand new family habits affecting grandparents' and grandchildren's relationships. This obligates further research to analyze the implications that the pandemic has had and will have on leisure time shared by grandparents and grandchildren, to build family and social policies that consolidate the practice of shared leisure activities that increase the well-being of both generations.

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